U.S. Adoption of Electronic Invoicing: Challenges and Opportunities

Payments, Standards and Outreach Group

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Preface

This white paper was authored by staff in the Payment, Standards and Outreach Group (PSOG) of the Federal Reserve Bank of Minneapolis. The authors are grateful for the input and guidance from the Electronic Invoice and Processing Platform External Advisory Group (EAG),[1] a group of business practitioners associated with the Remittance Coalition. Their insight was invaluable in the development of this white paper. The EAG assisted PSOG staff in understanding the subject matter and validating the paper's conclusions, but neither EAG members nor their organizations were asked to endorse the white paper. Readers of this paper who have any comments or questions are invited to send them to Todd M. Albers, of the Payments, Standards and Outreach Group, Federal Reserve Bank of Minneapolis at mpls.psog.events@mpls.frb.org.

Executive Summary

The *Strategies for Improving the U.S. Payment System* paper identified **end-to-end efficiency** as one of five desired outcomes to be pursued by the Federal Reserve in collaboration with industry stakeholders to improve the United States (U.S.) payment system. In the U.S., opportunities to improve payment system efficiency are especially significant in business-to-business (B2B) transactions, which from end-to-end include the invoice, payment and remittance detail.

A major barrier identified by U.S. businesses to adopting electronic payments is the willingness of their trading partner's ability to send or receive automated electronic information (e.g. invoice and remittance information). Although, businesses may choose to implement electronic payments alone and separate from the associated electronic information, often times they maintain and rely on checks if related elements of the end-to-end process, such as the invoice, cannot also be migrated to electronic forms.

Ultimately, businesses strive to achieve straight-through-processing or STP, where they have the ability to receive and process B2B transactions from the invoice through payment through reconciliation without manual intervention. However, while a business can accrue benefits from adopting electronic payments alone, materially greater benefits are gained in lower costs, cash management, fewer errors, risk mitigation and transparency when the entire process is electronic.

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[1] EAG members were drawn mainly from the Remittance Coalition with expertise on the topic of e-invoicing from the view of practitioners and solution providers. Federal Reserve staff supporting the federal governments Invoice Processing Platform served as liaisons to the EAG

Examining available literature and guided by industry practitioners, this paper *U.S. Adoption of Electronic Invoicing: Challenges and Opportunities* seeks to explore the possibility of developing and implementing a standard, ubiquitous B2B electronic invoice and processing platform in the U.S. similar to those that have been developed in other countries, a specific action called for in the paper.

Electronic invoicing (e-invoicing) is the necessary first step to achieving straight-through-processing from "order-to-cash" and "procure-to-pay" for business-to-business payment transactions. Worldwide, e-invoicing approaches are diverse and complex. Differing standards are used depending on the size of the company, industry, and country. Countries with the highest level of e-invoicing adoption are those with government mandates which were put in place to reduce avoidance of the value added tax (VAT) and improve government revenue collection. The main driver of e-invoicing adoption, after government mandates, is voluntary adoption by businesses seeking to gain efficiencies and expense reductions that outweigh implementation costs. Larger companies are much more likely to adopt e-invoicing voluntarily as they have the resources to pursue it and the greatest benefits to gain, given the volume of invoices they process. Smaller companies typically have little control over the use or non-use of e-invoicing, as their larger trading partners or other customers dictate the invoicing method.

In the U.S., e-invoicing adoption rates are comparable to Europe at 25 percent, but unlike Europe, are driven mainly by businesses seeking to optimize the end-to-end process. Larger businesses, in particular, have already made significant investments in e-invoicing processes, systems, and infrastructure, largely using proprietary solutions offered by a variety of service providers. In addition, the Office of Management and Budget (OMB) of the U.S. federal government directed certain federal agencies to transition appropriate business-to-government (B2G) procurements to e-invoicing by end of fiscal year 2018 to improve government effectiveness and transparency while reducing administrative work and costs. OMB-mandated agencies must amend or re-contract with their trading partners to require the use of their e-invoicing solution. This will likely push the e-invoicing adoption rate higher in the U.S.

Business practitioners of all types and sizes and e-invoicing experts see significant opportunities to gain efficiencies and reduce costs by adopting e-invoicing more broadly in the U.S. Savings range from $4 to $8 per paper invoice[2] converted to electronic alternatives, which could result

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[2] Paystream Advisors estimate that businesses reduce costs by $4 to $8 per invoice when migrating from paper to e-invoicing (*2014 Global eInvoicing Report*).

in a potential aggregate annual savings over a hundred billion dollars[3] in processing costs if e-invoicing became ubiquitous in the U.S. E-invoicing provides the opportunity for a business to expand into other areas of the financial supply chain, including workflow automation, working capital improvements such as early payment discount programs and trade financing; and reduction of payment risk and late fees. Related to the latter, as e-invoicing stimulates adoption of electronic B2B payments, additional savings may be gained.[4]

Finally, the societal benefit in reducing paper invoices is substantial. As an example, a reduction of 10 billion paper invoices annually in the U.S. could eliminate close to 200 tons of paper; save over one million trees; and reduce greenhouse gas emissions by 360 tons.[5]

However, barriers to widespread adoption are significant including lack of: 1) information technology (IT) resources to implement change, 2) a compelling individual business case among smaller businesses, 3) common, unified standards or translation software to facilitate change, and 4) industry-led coordination, collaboration and leadership to develop a strategy for change.

Due to the diversity of the U.S. business environment, a "one size fits all" approach is likely not the best approach. Nevertheless, Europe and Australia have developed implementation frameworks to adopt e-invoicing through translation tools and protocols that can take various e-invoicing standards and translate them into one or more common standards while enabling new adopters to use the common standard directly.

Despite these challenges, many U.S. business practitioners are focused on removing many of the obstacles facing them to increase the adoption rate of e-invoicing. The pace of adoption in the U.S., however, is forecasted to be slow for the foreseeable future. Other countries and regions across the global have undertook and developed strategies to accelerate the adoption of e-invoicing. Could the U.S. create a strong, collective business case for implementing a ubiquitous e-invoicing framework in the U.S., or defining other, practical strategies that could motivate industry collaboration and change? This paper hopes to foster additional dialogue on this important topic and in so doing advance the outcome of improved efficiency in the U.S. payment system.

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[3] Based on a) PayStream Advisors estimate of 12-14 billion B2B invoices in U.S., b) Billentis estimate of 15-25 billion B2B invoices in U.S., c) PayStream estimate that 75 percent of U.S. invoices remain paper-based, and d) average cost savings per invoice $4 - $8 from various sources and calculators --e.g., 15-25 billion invoices x 75 percent paper invoices x $4 - $8 cost savings per invoice = $45billion to $150 billion in potential savings. Using the Australian estimate of $8 in savings per invoice generates aggregate savings of $90 billion to162 billion dollars.
[4] The savings depends on the type of electronic payment that substitutes for the check. If it is ACH, the AFP estimates savings at $1.30 to $2.70 per check converted. However, other types of electronic payments may be more expensive than checks – e.g., wires, credit and debit cards. AFP 2015 Payments Cost Benchmarking Survey.
[5] Environmental Impact of Electronic Invoicing: Go Green. Save Green. Koka, Sushmitha, PayStream Advisors, 2009

Introduction

In January of 2015, the Federal Reserve System published the *Strategies for Improving the U.S. Payment System* paper which outlined five strategies to improve the U.S. payment system.[6] Strategy 4 in the paper seeks to "Achieve greater end-to-end efficiency for domestic and cross-border payments."[7] Regarding the former, the paper identifies an important opportunity to improve efficiency and reduce costs by converting the large number of business-to-business (B2B) check payments that remain to electronic alternatives,[8] along with information needed to initiate and reconcile B2B payments – e.g., invoices and remittance detail. Barriers to increasing adoption of electronic B2B payments include 1) electronic payments are more complex to implement than checks; 2) electronic payment capabilities are not ubiquitous among business practitioners, unlike checks; 3) many financial institutions do not provide support needed by small and medium-size businesses to implement electronic payments; 4) business payers are not able to easily find, manage and use the electronic payment identity of their payees; and 5) exchanging payment related information electronically is difficult (e.g., invoices and remittance detail).[9]

The latter barrier highlights the relationship between adopting electronic B2B payments and adopting related information in electronic form – e.g., the invoice. While some businesses choose to implement electronic payments separate from associated information, other businesses retain checks if related elements of the end-to-end process, such as the invoice, cannot also be migrated to electronic forms. Businesses can accrue benefits from adopting electronic payments alone, but materially greater benefits are gained in lower costs, cash management, fewer errors, risk mitigation, and transparency when the entire process is electronic.[10] Ultimately, businesses strive to achieve straight-through-processing or STP, where they have the ability to electronically receive and process a B2B financial transactions from the invoice through payment through reconciliation without manual intervention.

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[6] https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf, page 2.

[7] https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf, page 21.

[8] Check payments amongst large businesses are more than half of payments sent and received; amongst small and micro businesses, check are more than 70 and 90 percent. https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf, page 50.

[9] https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf, page 50.

[10] Paystream Advisors estimate that businesses reduce costs by $4 to $8 per invoice when migrating from paper to e-invoicing (*2014 Global eInvoicing Report*). By comparison, the AFP estimates, in *2015 Payments Cost Benchmarking Survey,* businesses save $1.30 to $2.70 per payment when migrating from checks to ACH payments. However, the cost for electronic payments is higher than check when the electronic method is wire or credit and debit card (not including P-card).

Thus, a specific initiative under Strategy 4 calls for the Federal Reserve to work with the industry, including groups such as the Remittance Coalition,[11] to: *Explore, in 2015, the possibility of developing and implementing a standard, ubiquitous B2B electronic invoice and processing platform similar to ones that have been developed in other countries.*

This white paper reports the results of exploring the topic of a standard, ubiquitous U.S. electronic invoice and processing platform by summarizing:

1. Definitions, basic facts, and benefits of e-invoicing;
2. An analysis of the current state of e-invoicing globally; and
3. Perspectives of industry stakeholders and subject matter experts on the key issues surrounding e-invoicing in the U.S. as identified through focus groups and other industry outreach.

Definitions, Basic Facts and Benefits of E-Invoicing

In 2015, industry experts estimated that about 500 billion bills/invoices (including consumer, business, and government) will be generated globally. Of the 500 billion, only 42 billion or 8.4 percent are estimated to be exchanged electronically.[12] The global adoption rate for e-invoicing varies, and has a strong dependency on the primary adoption drivers in the market (e.g. tax collection mandates, B2B process optimization). In Europe, for example, only 24 percent of invoices were exchanged electronically in 2014; however, with governmental initiatives in place, it is expected to accelerate to 95 percent by 2024. By comparison, while U.S. e-invoicing adoption is similar to Europe at about 24 percent (6.8 billion of about 30 billion invoices[13]), growth is expected to be much slower at 5 percent annually or less. Thus, by 2024 only 38 percent of U.S. invoices are estimated to be exchanged electronically.[14]

Companies, both large and small, submit and receive invoices from their trading partners. Traditionally, a supplier mails a paper invoice to a buyer, incurring costs for paper, postage, and time associated with the physical process. The buyer receives the invoice several days later, depending on the geographic distance of the two companies and the postal service. A payment reminder may also be sent to a buyer who does not pay the first invoice promptly, incurring more paper and postage costs and lengthening the time needed to complete the process.

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[11] The Remittance Coalition is an industry group with a mission to increase the adoption of electronic B2B payments and associated business information – e.g., remittance detail, invoices, etc. The Coalition has about 477 members (Q1 2016) representing accounts payable, accounts receivable, and treasury professionals, banks, vendors, standards bodies, payments groups, and others interested in promoting the Coalition's mission.

[12] E-invoicing/E-Billing: Entering a New Era, Bruno Koch - Billentis, June 5, 2015

[13] *E-invoicing/E-Billing: Entering a New Era*, Bruno Koch - Billentis, June 5, 2015

[14] *2014 Global eInvoicing Report*, PayStream Advisors, 2014

Eventually the supplier receives a paper check for payment, requiring more resources to match the payment manually to the invoice and deposit the paper check at its bank. Finally, the invoice and payment information is archived, which requires paper filing, retention, and storage space.

For the purpose of this paper, an e-invoice is an invoice that has been issued, transmitted and received in a structured electronic format which allows for its automatic and electronic processing. [15] However, the definition in the U.S. also includes e-mailing invoice information either by attaching an Adobe Acrobat (PDF) file or an electronic file that was generated directly from an accounting system and is machine-readable or can be imported into the trading partner's system. Another example, under this definition, is maintaining an online portal whereby the selling company's trading partner is able to download their invoice from the portal. Use of online or web portals is very common, and is indeed the preferred e-invoicing solution in certain industries, such as the retail industry. Once the trading partner receives the e-invoice they can choose to process the invoice in the original electronic format, import it into their accounting system, or print the invoice. As illustrated in the diagram below, e-invoicing offers a more efficient alternative to this traditional paper-based process by bypassing many of the paper handling steps.

e-invoice removes most of the invoice handling steps, both for supplier and customer
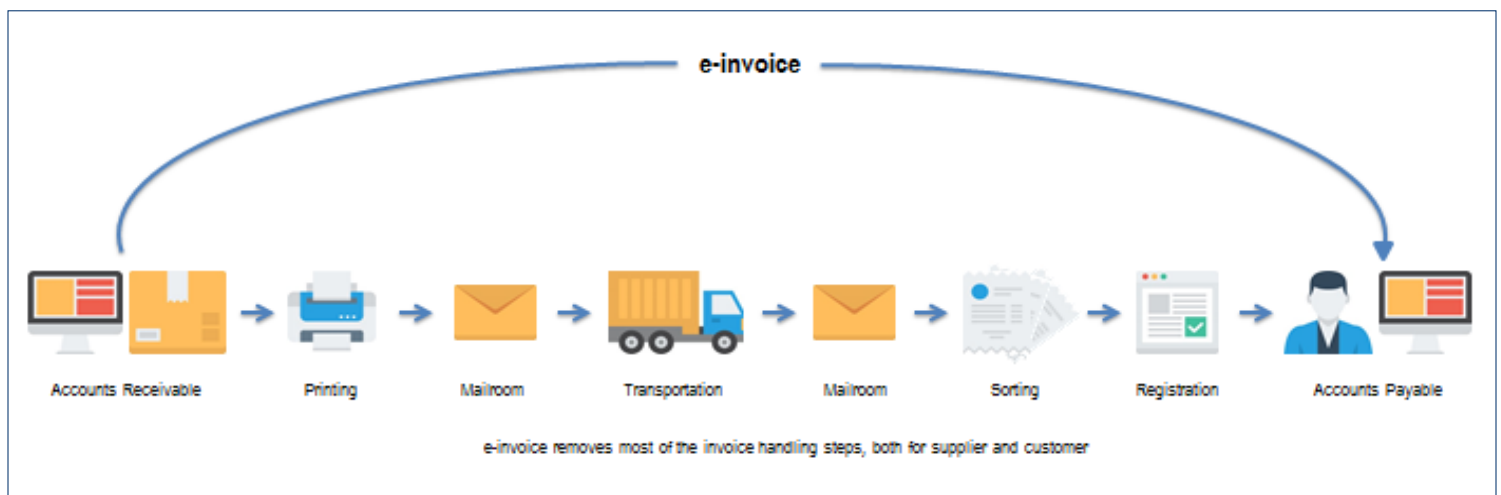
The benefits of eliminating paper and reducing processing time by adopting an e-invoicing system are well documented in the literature and by corporate practitioners. Benefits most often cited are:

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[15] Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic procurement and public procurement.

- **Reduce operating expenses** by eliminating paper and data entry, and automating workflow such as invoice routing and approval.
- **Optimize cash management** by speeding workflow to enable payers to take advantage of early payment discounts and/or payees to provide invoices in a timelier manner leading to improved cash flow and working capital.
- **Minimize risk** of overpayments, duplicate payments, and fraudulent payments.
- **Improve real-time/on-line view and traceability** of all invoice-related documents and ability to archive online.
- **Improve data quality, accuracy and access** to critical business information by reducing manual inputting of information.
- **Reduce complexity** working with trading partners in multiple countries through enhanced, standard processes to improve compliance with tax requirements and other country or regional directives.[16]

As discussed above, e-invoicing is an important part of an efficient financial supply chain, optimizing the end-to-end process of B2B transactions, as it links the internal processes of enterprises to payment systems.
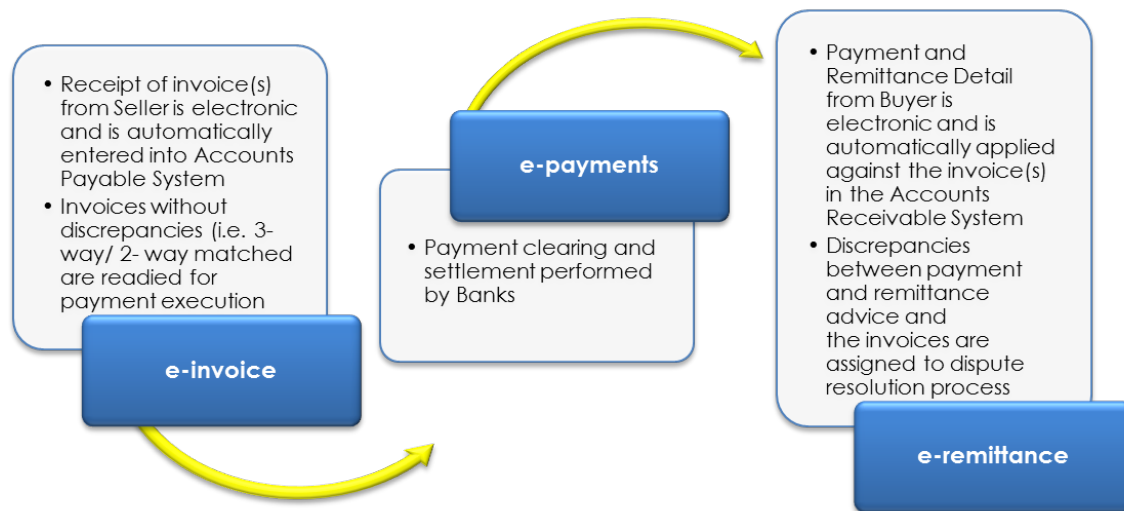
As a result e-invoicing is a vital component of the overall goal of making the end-to-end processes (procure-to-pay and order-to-cash) more efficient. For many U.S. businesses, e-invoicing stimulates increased adoption of electronic payments as their goal is to make the end-to-end process electronic, not just the payment. Indeed, businesses have reported in

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[16] Invoices generated in countries with VAT are considered "tax documents." These requirements can vary greatly by country and typically certifications by governmental authorities are required.

Remittance Coalition and AFP surveys that a barrier to greater adoption of electronic payments is the inability to exchange payment related information electronically such as the invoice.[17] As such, e-invoicing can pave the way to true straight-through-processing from order to payment to reconciliation and catalyze even greater productivity and cost savings across the end-to-end process.

However, these benefits can only be realized fully if trading partners are able to exchange electronic invoicing, payment, and remittance information back and forth while applying automation to the workflow. Estimated cost savings from making the end to end process electronic and more automated are substantial. For example, one expert source asserts that a company that issues paper invoices (average of 1.5 pages per invoice) and converts to a fully electronic and automated process will reduce the cost of issuing invoices by 59 percent per invoice, while the recipient of the invoice will reduce costs by about 64 percent per invoice;[18] resulting in potential savings in accounts payable processing costs of $4 to $8 per invoice.[19] Other sources of cost information estimate similar, significant potential savings from e-invoicing and automation.

There are also differences in how larger and smaller businesses use e-invoices. For larger businesses this often involves transferring electronic invoicing information in a machine-readable format via electronic data interchange (EDI) standards. Smaller businesses with less resources more commonly use an online portal (typically created by a larger trading partner) to enter (through data entry or transfer of electronic file) or retrieve an invoice or accept emails with PDF attachments containing the invoice. Note that while online portals make aspects of the invoicing process more electronic, portals do not necessarily increase work flow automation.

Compounding this scenario, a company may participate in several different invoice processing models. For example, the company's accounts receivable (AR) department may deploy a solution based on a Seller Direct Model, where invoices are presented to customers for processing and approval, and payment is through the Seller's financial institution. The company's accounts payable (AP) department may utilize a provider who is based on the Buyer Direct Model, where the company's suppliers can send to or upload invoices for presentment. The company processes the invoice and sends it to their financial institution for payment initiation to the supplier. Finally, the company may participate in a Network Model, where one or both the AR/AP departments present or are presented with invoices for processing. In the

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[17] *2013 AFP Electronic Payments Survey,* page 3; *2012 Remittance Coalition B2B Survey*, page 10

[18] E-invoicing/E-Billing: Entering a New Era, Bruno Koch - Billentis, June 5, 2015

[19] Analysis of various cost per invoice calculators available from PayStream Advisory CPI and Electronicpayments.org

Network Model, the seller or buyer and their financial institution can perform the payment initiation, or the Network provider may assume the role of a financial intermediary.

Even with the inclusion of several models, AP/AR automation still brings many benefits, including reduction of processing costs, exceptions, and cycle days. It also increases the opportunity to move from paper to electronic payments allowing the company to focus on improvements in working capital (e.g. capture of early pay discounts, supply chain financing).

Global Adoption

E-invoicing applications and adoption around the world varies widely. Countries with the highest level of adoption typically face government mandates requiring e-invoicing use either for tax compliance purposes or to improve the efficiency of B2G transactions. In countries without government mandates, companies typically drive adoption to improve the efficiency and lower the costs of their AR/AP processes and to gain other benefits from e-invoicing as described above.

Latin America

Brazil, Mexico, and Chile are world leaders in e-invoicing adoption due to government mandates to enforce Value Added Tax (VAT) compliance. VAT is a type of consumption tax levied on goods and services at each level of production, including on the value added from seller to buyer, and is added to the final sales price of a product. The seller of the product collects the tax from the buyer and provides it to the governing authority. Given the complexity of VAT, implementation of e-invoicing in countries that have a VAT can improve tax compliance and, thus, the collection of tax revenue. Non-compliance with e-invoicing mandates (which is considered tax evasion) depending on country, can translate into significant fines and even jail time.[20]

Approximately 58 percent of all invoices in Latin America were sent electronically in 2014 compared with 1 percent in 2004.[21] Brazil has the highest adoption rate globally (>90 percent) in the B2B and B2G markets.[22] Brazil transitioned certain business processes to a mandatory paperless solution in 2011, which it continues to enhance. Mexico mandated e-invoicing in 2014, as did Chile for large companies in late 2014, with compliance by small and mid-sized companies required by 2018. Because of the mandates, tax compliance and revenue has increased. For example, Edicom reported that the Chilean Treasury stands to raise $600 million

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[20] Tax-Compliant Global Electronic Invoice Lifestyle Management, Trustweaver, May 2015
[21] 2014 Global eInvoicing Report, PayStream Advisors
[22] E-invoicing/E-Billing: Entering a New Era, Bruno Koch - Billentis, June 5, 2015

in additional tax revenue annually from e-invoicing through the reduction in bogus invoices; the Mexican Tax Administration Service claims that for every dollar invested in tax control, they have gained over $61 in tax receipts.[23] Businesses in Latin America have also benefitted from the mandatory changes. For example, one Brazilian company, Coca-Cola Andina, reduced inbound invoicing costs by upwards of 70 percent.[24] E-invoicing in Latin America is expected to continue to grow, based on more countries in the region consider implementing government mandates.

The typical process for an e-invoice in Latin America starts with the seller of the goods or service. They are required to send a standard invoice file to the central authority for approval prior to the goods/service being released. Once approved, the seller prints a copy of the approved invoice which will be sent along with the goods being shipped. At the same time the selling company sends their trading partner the authorized electronic invoice via e-mail. When the goods arrive at their destination, the trading partner is able to confirm the invoice by matching the electronic version received through e-mail with the paper copy received with the goods/service.

Europe

In Europe, the status of adoption varies by country with the Nordic countries having the highest level of adoption and Eastern Europe having the lowest. In Europe,[25] an estimated 24 percent of all B2B and B2G invoices were sent electronically in 2014, compared with 6 percent in 2004.[26] In several countries, e-invoicing is mandated for B2G transactions but, in contrast to Latin America, not for B2B transactions. Early adaptors of e-invoicing in Europe include Denmark, Finland, Norway, Sweden, Slovenia, Austria, Switzerland, Italy, and Spain. Consequently, these countries also have the highest numbers of e-invoices exchanged electronically in the Europe.

As early as 2002, the European Commission (EC) identified e-invoicing as an opportunity, and in 2005 made it part of the eEuropean Action Plan (eEurope 2005: An information society for all[27]) as part of an effort to digitize the procurement process and encouraged SME to "Go Digital".[28] In 2006, the EC set out to respond to the challenges of globalization for the European business

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[23] Savings are presented in US Dollars. *Electronic Invoice: A Tool Against Tax Evasion*, Edicom, February 4, 2015

[24] *E-Invoicing in Latin America, Navigating the Profits and Pitfalls of Government Mandates*, Institute of Financial Operations and Invoiceware International

[25] Review of the available literature approximates 40 counties comprise of "Europe" when determining the amount of e-invoicing in the region.

[26] *2014 Global eInvoicing Report*, PayStream Advisors

[27] European Commission. COM (2002)263, eEurope 2005: An information society for all.

[28] European Commission. SMEs Europe's Future. eEurope SMEs GoDigital Conference Report.

environment, and identified and recognized two emerging aspects. In order to maintain competiveness in the global economy, innovative approaches needed to be developed to ensure that value chains within the economy would promote efficiency and certainty. Efficiency from removing friction or costs (paper invoices) from the value chain (payments) and certainty of which the operational environment an organization is in makes them more competitive. As Europe adopted the Single Euro Payments Area (SEPA), e-invoicing became a logical area to promote *efficiency* and *certainty* for B2G and B2B payments.

In 2014, the European Union (EU) enacted several directives[29] that require by 2018 public administrations in all 28 EU member states to use certain e-invoice standards for B2G e-invoices. This standard is currently in development with the European Committee for Standardization Project Committee 434 (CEN/PC 434).[30] Adoption of the standard is expected to dramatically increase the number of electronic transactions in the B2G space. In addition, new government mandates can reasonably be expected across Europe as a means to improve tax compliance.

In 2008, The Pan-European Public Procurement Online (PEPPOL) project, jointly funded by the EC and PEPPOL consortium members, was kicked off with the aim to simplify the technology standards for exchanging B2G procurement documents, including e-invoices. PEPPOL developed the Business Interoperability Specifications (BIS) that enables the transmission of electronic procurement documents across borders through an open and secure network. The PEPPOL consortium members included eleven members,[31] and since its inception, five countries (Austria, France, Norway, Sweden, and England) have adopted PEPPOL and are in various stages of implementation.

The European E-invoicing Service Providers Association (EESPA), formed in 2011, is a not-for-profit trade association for e-Invoicing service providers. Its charter is to promote and support public policy (e.g. PEPPOL and CEN/PC434) at the European level and to create an interoperable eco-system for e-invoicing amongst members. Currently, EESPA comprises of over 60 members who provide e-invoicing networks, business outsourcing, financial, technology, and EDI services. In 2014, EESPA reported close to one billion Business-to-Consumer (B2C), B2B, and B2G e-invoices were processed through memberships' networks, of which, 621 million e-invoices were

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[29] Directive 2014/24/EU instructs member states to implement B2G electronic communications into national law by 2016. Directive 2014/55/EU instructs public administrators must accept e-invoicing in public procurement by 2018.

[30] *E-invoicing/E-Billing: Entering a New Era*, Bruno Koch - Billentis, June 5, 2015

[31] PEPPOL Consortium partners included Austria, Denmark, Finland, France, Germany, Greece, Italy, Norway, Portugal, Sweden, and the United Kingdom.

for B2B and B2G transactions. Overall, EESPA reported a 17 percent growth in e-invoicing for B2B, B2G, and B2C in 2014.[32]

With the governmental mandates in place; semantic and syntax models identified; and translation frameworks defined; along with the service providers aligned within the region, the European market is poised for substantial growth in e-invoicing in the near term.

Africa

The majority of countries in Africa are in the beginning stages of e-invoicing adoption, with larger companies driving this development to improve efficiency and not as a result of government mandates. At time of this publication, there is no known government mandate in place amongst the countries in Africa.

Asia-Pacific

The Asia-Pacific region is currently in different stages of e-invoicing adoption, with several countries such as Korea and Singapore requiring e-invoices to facilitate and improve tax collection. Hong Kong and Taiwan do not have mandates in place; however, have seen considerable e-invoicing adoption in certain industries to help enable trade. While other countries like Australia and Vietnam are exploring whole economy approaches to e-invoicing and have piloted e-invoicing initiatives. Then there are countries like China and Japan where the government does not permit e-invoicing or only with special approval.

Singapore, for example, has mandated B2G e-invoices since 2008, resulting in one of the highest adoption rates in the region. South Korea, implemented a VAT system in 1976, and to help improve tax compliance required all B2G and B2B invoices to be electronic by 2010. Indonesia introduced a new VAT electronic invoicing system in 2014, and by July 1, 2016 all corporate taxpayers are mandated to use and submit e-VAT compliant invoices.

Although the Hong Kong government doesn't require e-invoices, it began accepting structured e-invoicing from suppliers in 2013. Currently, eleven Bureaus/Departments within the government participate in the program. In 2000, the Taiwanese government created an e-invoicing platform and an ad hoc group to promote the use of e-invoices. It is responsible for making rules, regulations, and exchange formats concerning the development of e-invoicing

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[32] *Aggregated Volume Statistics Survey Results*. European E-Invoicing Service Providers Association, July 30, 2015

system.[33] Businesses (sellers, buyers, and third-party service providers) must register with tax authorities to participate in the platform.

Australia is an interesting case study for e-invoicing. The Commonwealth Government has not mandated e-invoices, rather, is promoting agenda to expand digital documents in commerce and is doing so through a public-private industry partnership approach. The Australian Business Register[34], under guidance of the Australian Taxation Office, has been investigating opportunities to increase electronic exchange of documents for several years. Recently, the Digital Business Council,[35] a cross section of business groups, industry bodies, technology providers, and government agencies published a paper and plans to begin implementation of an e-invoicing interoperability framework mid-year 2016 which enables B2B and B2G to send and receive invoices electronically. The framework is designed to facilitate adoption by businesses that have existing e-invoicing systems as such businesses can use the framework's software to translate their existing formats into the framework's recommended common, open standards – OASIS Universal Business Language (UBL) 2.1. Small and mid-size businesses that have not yet adopted any form of e-invoicing will be able to implement OASIS UBL directly. Thus, the framework hopes to reduce barriers to adoption as it avoids the cost of disrupting existing invoicing systems to implement a common standard. It has been estimated that over 1.2 billion invoices are generated annually in Australia.[36] With widespread adoption, the Australian Digital Business Council estimates the e-invoicing framework could have an overall economic impact of AUD$7 -10B annually[37] in increased productivity and cost savings.

North America and the United States

Rough estimates suggest the U.S. generates as many as 25 billion invoices annually and exchanges only about 25 percent of these electronically.[38] Thus, the opportunity is significant to improve productivity and save costs in the U.S. through widespread adoption of e-invoicing. While precise estimates are not available, extrapolations from data on invoice volume and savings per invoice and comparing estimates of other countries suggest that aggregated savings

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[33] Trade Facilitation Implementation Guide. United Nations Economic Commission for Europe (UNECE) http://tfig.unece.org/contents/country-examples-e-invoicing.htm.

[34] The Australian Business Register is a part of the Australian Taxation Office, focused on enhancing business productivity by reducing administrative costs to comply with governmental regulations, encourage adoption of new business processes and practices to reduce operating costs, and to influence government policy development and implementation.

[35] Digital Business Council is an industry lead body to oversee the creation of the Australian national framework of standards.

[36] *Implementing E-Invoicing on a Broad Scale*. Koch, Bruno Billentis, July 16, 2015

[37] Savings are in Australian Dollars. *2016 E-Invoicing Interoperability Framework*, Digital Business Council

[38] Based on a) PayStream Advisors estimate of 12-14 billion B2B invoices in U.S., b) Billentis estimate of 15-25 billion B2B invoices in U.S, c) PayStream estimate that 75 percent of U.S. invoices remain paper-based

in the U.S. could range annually in the tens of billion dollars on the low end of over a hundred billion dollars on the high end.[39]

Adoption of e-invoicing in North America is driven primarily by large companies (Fortune 1500 and above) looking to automate their AR and AP processes to gain efficiency benefits, faster processing, and lower costs. In North America (United States and Canada), approximately 24 percent of all invoices were sent electronically in 2014, compared to 15 percent in 2004, and is only expected to grow to 38 percent by 2024.[40] Though the overall adoption rate is the same as Europe, the growth rate for adoption is significantly behind that of Europe and Latin America due, in part at least, to the lack of government mandates such as tax compliance, or broad, coordinated private industry-led efforts.

As mentioned above, countries where a VAT is levied have a natural incentive to either strongly encourage or mandate e-invoicing in order to improve compliance and increase tax revenues. Lacking this incentive in the U.S., most e-invoicing adoption is due to large private companies working to improve the efficiency of their AR/AP processes by requiring their trading partners to submit and receive invoices electronically; typically using X12 EDI standards (see Global Standards and E-Invoicing Models section below).

Approximately seventy-four U.S. federal government agencies[41] within the Department of Agriculture (USDA), Department of the Interior (DOI), Department of the Treasury, and additional ten federal government entities do require e-invoicing from their sellers today. Adoption of e-invoices within the U.S. federal government is set to expand in the future given the recent government decision to require additional federal agencies to transition to it. Specifically, the Office of Management and Budget (OMB) directed[42] federal agencies subject to the CFO Act of 1990 to transition appropriate B2G procurements to e-invoicing by end of fiscal year 2018 to improve government effectiveness and transparency while reducing administrative work and costs. OMB-mandated agencies must amend or re-contract with their trading partners to require the use of the federal government's e-invoicing solution. According to the OMB, the U.S. government is the largest single purchaser of goods and services in the U.S. and receives over 19 million invoices from its suppliers per year of which 12 million are

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[39] Based on a) PayStream Advisors estimate of 12-14 billion B2B invoices in U.S., b) Billentis estimate of 15-25 billion B2B invoices in U.S., c) PayStream estimate that 75 percent of U.S. invoices remain paper-based, and d) average cost savings per invoice $4 - $8 from various sources and calculators --e.g., 15-25 billion invoices x 75 percent paper invoices x $4 - $8 cost savings per invoice = $45billion to $150 billion in potential savings. Using the Australian estimate of $8 in savings per invoice generates aggregate savings of $90 billion to162 billion dollars.

[40] *2014 Global eInvoicing Report*, PayStream Advisors

[41] List of current U.S. federal government agencies who have adopted e-invoicing can be found here: https://www.ipp.gov/agencies/federal-agency-participants.htm

[42] https://www.whitehouse.gov/sites/default/files/omb/memoranda/2015/m-15-19.pdf

paper invoices. A study conducted for the Treasury's Office of Financial Innovation and Transformation estimated that the federal government could save $266 million annually when e-invoicing is fully implemented.[43]

The Federal Reserve in its role as fiscal agent supports the federal government's efforts to fully implement e-invoicing through its provision of the Invoice Processing Platform (IPP). IPP is a secure, web-based service that seeks to make government invoicing more electronic and more efficient from the purchase order to payment notification; it offers five modules including electronic invoicing. The use of IPP is expected to increase due to OMB's directive on e-invoicing. Further, the move to e-invoicing by the federal government may serve to stimulate greater e-invoicing throughout the U.S. marketplace. The argument is if a private business supplier implements e-invoicing to address government requirements, they may well extend this implementation to other businesses they supply.

Another large difference between the U.S. and other countries is the size and diversity of the marketplace. To implement a standard e-invoicing the technical framework, semantics and syntax models, and legal requirements in the U.S. would require significant coordination between governments and businesses and among businesses on a scale not required in other countries that have mandated e-invoicing.

Also, individual small and medium size enterprises (SME) may not find the business case overcome the technical hurdles to transact electronically as compelling compared to large companies, given the relatively small volume of invoices they generate and receive. SMEs are most often driven to adopt e-invoices by their large trading partners as a condition of doing business. Plus, in the U.S., most e-invoices are transferred directly between trading partners. This differs in comparison to Latin America and Europe where tax authorities and third party service providers are typically used and play a role to facilitate the transactions, such as approving the invoice for VAT, and translating documents from one format to another within different e-invoicing processing frameworks (e.g. three corner and four corner models), which results in a more truncated approach. What this means for a SME in the U.S. is that they will likely have to access multiple supplier portals and/or systems of their various trading partners to either retrieve or upload their invoices in the appropriate format. Instead of improving efficiency, this can actually add to the workload of and cost to the SMEs versus work required to mail a paper invoice.

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[43]*Electronic Vendor Invoicing and Payment Processing – Business Case Analysis*, PriceWaterhouseCoopers, January 2011. As Cited in the IPP: Smart Government Invoicing. Electronic Invoicing: Why it Matters. Bureau of the Fiscal Services.

So why is the e-invoicing adoption rate not higher in the U.S. given the emphasis that businesses and governments place on efficiency and expense management? There are several barriers that inhibit faster adoption of e-invoicing in the U.S.

- IT and other technical resources are usually needed to implement a fully electronic and automated e-invoicing system. Such resources are scarce in both businesses and governments, and businesses tend to prioritize their use for revenue generating initiatives (e.g., new products) and regulatory/legal mandates, rather than cost reducing initiatives for back-office operations. Related to this, moving to an e-invoicing system may not be an organizational priority for many businesses and governments given more pressing issues and limited resources to address them.

- While paper processes may be comparatively inefficient and costly, they work. Thus inertia is fostered, so many businesses and governments lack motivation to seek information about the benefits of e-invoicing and the case for change.

- No single, standard or solution or common framework exists in the U.S. to facilitate adoption of e-invoicing by all types and sizes of businesses and governments. This means each individual business interested in converting paper processes like invoicing to electronic forms must analyze a complex and often bewildering environment to determine the best path forward. Further, businesses that decide to implement e-invoicing may need to customize their implementation by trading partner in order to satisfy all their information needs, which adds complexity and cost.

- Given the effort and costs involved, the individual case for adopting e-invoicing may be weak, especially among small to mid-size businesses and governments, if the volume of their invoices is relatively small.

- Finally, the business case for e-invoicing adoption in the U.S. is typically made by individual organizations. Accordingly it is strongest among large businesses and governments with a high volume of invoices and among suppliers that do business with the federal government, given the OMB's directive. At the aggregate level of the U.S. marketplace the business case for broad adoption of e-invoicing seems compelling, assuming cost savings in the range of $4 to $8 per paper invoice converted to electronic form. However, to motivate a broad effort to increase e-invoicing adoption in the U.S. will require a level of industry coordination, collaboration and leadership, which does not exist today.

Global Adoption Conclusions

Widespread adoption of e-invoicing within a country and region can be constrained in several significant ways: by the presence of many, fragmented networks; the heterogeneity of businesses and governments which leads to different e-invoicing requirements and capabilities; and the existing implementation of materially different e-invoicing standards in different countries and regions without a clear migration path to a single, uniform standard or even interoperability among existing standards.

However, many countries are actively working to overcome these challenges. When tax compliance is the primary driver, adoption rates are accelerated, chiefly when the taxing authorities actively participate in the invoice processing flow, this is the case for Brazil, Chile, and Mexico.

In the early 2000's the European Commission identified e-invoicing as a means to improve global competitiveness of European businesses, and set forth efforts to develop a framework to overcome the legal, standards, and technical barriers that existed in the region. For example, CEN/PC 434 addressed the interoperability challenges; by way of PEPPOL offers a public procurement solutions to facilitate adoption of B2G e-invoices; and through EESPA has the e-invoicing providers aligned to support further adoption within the region. Finally, in the cases of the EU, with 2014 directives, member countries are required to adopt B2G e-invoicing by end of 2018. Together, this effort should result in an acceleration of e-invoice adoption in the foreseeable future.

Australia through a public-private business partnership, is defining a whole economy approach through its e-invoicing interoperability framework, with the goal to increasing widespread e-invoicing across the entire economy to reduce costs, and improve efficiencies.

Recent U.S. government mandates for B2G e-invoicing transactions with the intent of reducing costs for government. In the U.S., the primary drivers for companies moving to e-invoicing are to reduce costs through voluntary efforts to improve efficiency and, in many cases because larger trading partners have mandated or encouraged the use of e-invoicing.

E-invoicing standards differ across the global. However, organizations such as Oasis and ISO have defined and developed several semantics and syntax models that are increasingly being used as a standard within a country. One industry observer believes that capitalizing on the ISO 20022 vocabulary for e-invoicing could lead to broader adoption of e-invoicing and reduce

some of today's inefficiencies.[44] Certainly, as adoption of ISO 20022 messaging by U.S. corporations grows in popularity, there may be opportunities to leverage ISO 20022 vocabulary to standardize e-invoicing language. As observed in the NACHA paper referenced below, "ISO 20022 adoption may have additional international spillover to the U.S. when a foreign country is trading with domestic-based companies that use e-invoicing." Other experts suggest that promoting the use of software that can translate between disparate systems and standards may be a better strategy in the near-term to increase e-invoicing and improve efficiency.[45]

Global Standards and Service Providers

Currently, there is no single international or U.S. domestic standard for e-invoicing. Rather, a multitude of standards exist in the marketplace from industry specific (e.g., PIDX for the oil and gas industry) to country specific (e.g., Finvoice), to country or global "preferred" or "commonly used" (e.g., ebXML, EDIFACT, UBL, ASC X.12, etc.), or proprietary specifications established by a service provider or a trading partner.[46] This adds additional complexity for any company wishing to implement e-invoicing—i.e., which standard(s) to use? As a solution to this problem, some third party service providers offer the ability to translate from any standard to any other standard for a fee. Also, some countries (Australia) and regions (Europe) have or plan to implement translation "frameworks" that feature standard translation approaches between legacy systems to new, common e-invoicing standards.

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[44] Quibria, Nasreen. "Introduction to ISO 20022 for U.S. Financial Institutions," NACHA The Electronic Payments Association, 2015.

[45] Executive Advisory Group

[46] Kuehne, Kathrin; Kosch, Lubov; and Cuylen, Angelica, "Will XML-based Electronic Invoice Standards Succeed? - An Explorative Study" (2015). ECIS 2015 Completed Research Papers. Paper 113.

The most widely used technical standards and messages relevant to invoicing are:

Technical Standard	Messages
UN/EDIFACT (United Nations/Electronic Data Interchange for Administration, Commerce and Transport)	Developed as the international standard for the transmission of business data and is widely used across Europe but has seen only modest adoption in the Asian-Pacific region.[47]
Accredited Standards Committee (ASC) X12	Standards for invoicing are used by many large U.S. companies. X12 was chartered over 30 years ago by the American National Standards Institute (ANSI). X12 supports companies with electronic document interchange (EDI) standards in North America; however, it is also widely used outside North America. In addition, ASC X12 contributes to development and maintenance of UN/EDIFACT messages that are broadly used outside of the U.S.[48]
OASIS Universal Business Language (UBL) Standards	Increasingly being used as a method of e-invoice data exchanged. UBL is standard XML business documentation supporting digitization of supply chain documents, including invoices. UBL has several variants 1.0, 2.0, and 2.1, with UBL v2.1 approved as ISO/IEC 19845:2015 standard. UBL has been implemented in instances as a regional standard (e.g. PEPPOL) and country specific versions. Examples of UBL implementations for B2G e-invoicing include – EHF (Norway), Svefaktura (Sweden), ePrior (European Commission DIGIT), the National Health Service (UK), E-Fatura (Turkey), Factura Electrononica (Peru), SimplerInvoicing (the Netherlands), CHORUS- factures (France) and Tradeshift (Globally).[49]
Electronic Business eXensible Mark-up Language (ebXML)	Suite of specifications that allows businesses to conduct business over the internet. Using ebXML, companies have a standard method for exchanging messages, communicating data in common terms, define, and register business processes.
PDF / A (ISO 19005)	ISO standard of the Portable Document Format (PDF) which is specialized for the preservation of electronic documents. In 2012, PDF/A-3 (ISO 19005-3) standard was approved and included an important feature, of which, allows for the inclusion of any type of embedded file within the document. For example, this allows the sender of the invoice to embed a XML file within the body of the PDF. Germany, for Example, adopted and uses this as their standard for e-invoice format.

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[47] http://www.edibasics.com/edi-resources/document-standards/
[48] http://www.edibasics.com/edi-resources/document-standards/
[49] https://www.oasis-open.org/committees/tc_home.php?

E-Invoicing Models

There are numerous service models and providers in the marketplace that provide an array of e-invoicing solutions that are delivered as an on premise or Software as a Service (SaaS) solution for large companies, governments, and SMEs:[50]

- **Seller Direct Model** – Providers offer this model as an on premise or SaaS solution, which allow for the company to e-bill / e-invoice their customers. Delivery of the e-bills / e-invoices can be through various formats and methods, including EDI, email (PDF), or a customer portals (PDF, EDI Download).

- **Buyer Direct Model** – Providers offer this model as an on premise or SaaS solution, which allow for the company to receive e-invoices from their suppliers. Receipt of the e-invoice can be through various formats and methods, including EDI, XML, CSV; Imaged based PDF (loaded into the system via Optical Character Recognition (OCR) software, and WebEDI (upload) via a Supplier Portal.

- **E-Invoicing Network** – Providers offer a network that is open to any interested party versus the direct network SaaS solution. In this scenario, the network is able to receive any file format and output any file format based on the needs of the senders and receivers. Costs are shared among all members of the network.

- **Total Invoice Management** – This model is the same as the E-Invoicing Network with the added service of being able to provide paper invoices to customers.

All of these solutions can be tailored to the company using them, and thus, mitigates the risks of developing and maintaining an in-house e-invoice platform.

Focus Group and Other Practitioner Feedback

The Federal Reserve facilitated a focus group session with eight AR/AP practitioners on September 29, 2015, to gather contemporary information about the perceived benefits and barriers to e-invoicing. Focus group representatives came from financial services, food processing, healthcare, retail, manufacturing, distribution, and energy industries. All companies represented had implemented EIPP to a degree, with some almost entirely electronic, and others just beginning the process of moving to e-invoicing.

Participants were asked to identify and rate the benefit of a standard U.S. platform for e-invoicing for their organization.

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[50] E-invoicing/E-Billing: Entering a New Era, Bruno Koch - Billentis, June 5, 2015

Focus group participants identified the following benefits in implementing an e-invoicing system:

- Decreased cost from invoice processing
- Better able to take advantage of dynamic discounting
- Increased speed of releasing payments
- Improved accuracy—e.g., keying errors reduced and invoice matching rate improved
- Greater overall efficiency; more staff time to focus on complex tasks
- Increased customer (i.e., buyer) satisfaction through customer self-service
- More predictable cash flows
- Facilitates straight-through-processing

As to rating the benefits above, those organizations that were already largely electronic with invoice transactions, both issuing and receiving, saw less of a benefit than those organizations that were less electronic. This is not surprising, as the former have already gained e-invoicing-related benefits via their current system and did not want to incur additional expense or the time to adopt a different, single standard U.S. e-invoicing platform. They believed they would not gain sufficient new benefits to warrant the additional investment.

Participants were then asked to rate the likelihood of establishing and adopting a standard e-invoicing platform in the U.S. in the next few years, using a scale from low to highly likely. Participants agreed the likelihood was "moderate" as a result of the following main barriers to adoption:

- Complexity and diversity of trading partners, including the use of multiple, non-standard AR/AP systems
- Internal complexity including the use of multiple, non-standard Enterprise Resource Planning (ERP) systems and versions in use by accounts payable, and accounts receivables, and treasury management
- Resistance to change, specifically when it requires implementing and accepting electronic payments and EDI standards, especially from smaller organizations as the payment and the invoice are linked
- Risks in validating trading partners—are the electronic invoice and/or payment going to a valid recipient/account?

Participants were then asked to offer any additional comments on moving to a standard U.S. e-invoicing platform and how this could be accomplished. One participant observed that large companies have access to the services of large ERP vendors to help them in this area, while small companies may not have or be able to afford the resources needed to adopt a complex

and sophisticated system. Another suggested that any future standardization efforts around e-invoicing should start with one industry as a "test case."

Additional feedback was provided by the External Advisory Group. This group, comprised of external practitioners knowledgeable about e-invoicing, emphasized that e-invoicing is a key part of a larger "order-to-cash" or "procure-to-pay" end-to-end process and that keen interest exists among Treasury, AR, and AP professionals to achieve greater automation across this entire process. Also, while e-invoicing standards may be viewed positively by some companies and industries, other companies view providing the invoice in whatever format the customer wants (i.e., non-standard) as good customer service. Finally, standardizing remittance information and ensuring that the remittance information is contained within the electronic payment or can be easily re-associated with the payment will help reduce additional manual processing to match the electronic payment to the appropriate invoice.

Conclusions

Stated at the outset, the purpose of this white paper is to work with the industry to:

"Explore, in 2015, the possibility of developing and implementing a standard, ubiquitous B2B electronic invoice and processing platform similar to ones that have been developed in other countries"

The following conclusions are drawn from the review of recent literature and practitioner feedback summarized above:[51]

Status of Global Adoption of E-Invoicing

1. The global environment for e-invoicing is diverse and complex. Different standards or no standards are used to varying degrees around the world, depending on the size and type of company or industry and the business case for adoption, and whether countries, regions, governments, or businesses have imposed mandates.

2. Countries with the highest rate of e-invoicing adoption are subject to government mandates with the objective of improving tax compliance and revenue collection more often than efficiency, cost savings, or other benefits that businesses may seek (although these motivations also exist).

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[51] See VIII C. Bibliography for external sources

3. Countries are using an array of strategies to increase the adoption of e-invoicing in their jurisdictions. Efforts in Europe and Australia that focus on broad adoption of e-invoicing across all types and sizes of businesses and governments offer rich learning opportunities for the U.S. marketplace.

Potential Impact of U.S. Federal Government Mandate

4. The U.S. federal government is seeking to increase the efficiency and cost effectiveness of its own procure-to-pay processes by mandating e-invoicing for companies that do business with federal agencies. It is unlikely, however, that U.S. government mandates will go beyond this domain and would result in a standard, ubiquitous electronic invoicing system in the U.S. However, even without a mandate, the federal government e-invoicing direction may influence change in the private sector as implementation of e-invoicing to accommodate government suppliers may pave the way for implementation of e-invoicing with business suppliers. Future strategies that seek to accelerate e-invoicing adoption in the U.S. may benefit from leveraging the federal government's plans.

Drivers of Process Efficiencies by U.S. Businesses

5. The main driver of world-wide e-invoicing adoption, after national mandates, is voluntary adoption by businesses who expect to gain tangible benefits, typically productivity gains and cost savings that exceed the implementation costs. This is the most common driver among businesses in the U.S.

6. Large companies (Fortune 1500 and above) are much more likely to adopt e-invoicing than SMEs as they have a high enough volume of invoice processing to benefit clearly from automation and greater access to IT and associated resources (e.g., ERP) to support the implementation. Implementing e-invoicing solutions can be complex and solutions are often tailored to meet the needs of different vertical markets or industry segments. Future strategies that seek to accelerate e-invoicing adoption in the U.S. may benefit from leveraging the experience that larger businesses have with adopting e-invoicing to stimulate broader adoption across the U.S. marketplace.

7. Significant investments have been made by U.S. companies who have already implemented e-invoicing systems and processes. Any successful future actions to improve the current environment will need to be designed to leverage these investments to avoid the likely resistance that otherwise will arise.

Addressing Obstacles to Greater E-Invoicing Adoption in the U.S.

8. Business practitioners see significant gaps with the current state of e-invoicing in the U.S. given their objective to achieve straight-through-processing across the entire "order-to-cash" or "procure-to-pay" chain of events with all of their trading partners large and small. A major gap is the lack of unified, open standards across companies, industries, and even countries or alternatively, the lack of widely available, cost-effective translation software that would enable interoperability among different systems and standards. This gap – lack of common standards or translation protocols – impedes adoption not only of e-invoicing but also B2B electronic payments and electronic remittance exchanges. Thus, practitioners agree that significant opportunity exists to improve the efficiency of the B2B process from end-to-end, beginning with the invoice but including the payment and its reconciliation. This opportunity applies to the U.S. and globally.

9. One of the major obstacles in e-invoicing is the integration work required between trading partners. Development of interoperability solutions that simplify integration may lead to accelerated adoption of e-invoicing—e.g., the approach being adopted in Australia.

10. The U.S. environment of B2B payments and B2B electronic data exchange environment is complex and varied, which argues against a "one size fits all" approach to the gaps and pain points that exist. Instead, it may be more effective to focus on and develop "solutions" that address specific gaps and target specific business sizes or industry segments where the greatest benefits can be realized.

11. SME in the U.S. are invoicing their trading partners in the manner requested (e.g., e-mail, fax, electronic, or paper). On the other hand, the method by which SMEs receive invoices is often dictated by their supplier or vendor. Ultimately this means that SMEs have limited control over their use or non-use of e-invoicing. Opportunities to simplify their invoicing processes exist should a more standard way of communicating invoicing information be made available.

12. The variety of standards across the world makes the e-invoicing environment complex for businesses. Many companies have hired third party service providers to help them navigate the different standards and compliance requirements that vary so greatly from country to country. In the U.S. there are scores of service providers that offer e-invoicing solutions, with many of these service providers participating in regions where e-invoicing mandates are in place. These organizations may well be an important part of future strategies to increase adoption and improve efficiency in e-invoicing in the U.S.

The paper emphasizes the need for broad, ongoing industry collaboration to achieve the desired outcomes it sets forth, including the outcome of greater end-to-end efficiency in the U.S. payment system. As discussed above, *improving the efficiency* of business-to-business payment transaction extends beyond payment clearing and settlement alone; it also encompasses the invoice and the remittance detail. Indeed, according to business practitioners, adoption of B2B electronic payments is impeded by the lack of related information in electronic form such as the invoice. Thus, this white paper focused on describing the state of e-invoicing around the world and on summarizing the challenges and opportunities in the U.S. to migrate from a largely paper-based invoice environment to a more efficient, secure, and cost-effective electronic one, given the link to accelerating B2B electronic payments adoption.

The Payments, Standards and Outreach Group at the Federal Reserve Bank of Minneapolis plans to socialize the research and conclusions of this white paper with the industry through groups such as the Remittance Coalition, the Association for Financial Professionals and others to further the industry's understanding on how increased e-invoicing adoption can help promote greater adoption of electronic B2B payments and end-to-end efficiency in the U.S. payment system – a desired outcome identified in the Federal Reserve's *Strategies for Improving the U.S. Payment System* paper.

Appendices

External Advisory Group Members and Liaisons

- Sponsor
    - Claudia Swendseid, PSOG, Federal Reserve Bank of Minneapolis

- PSOG Staff
    - Brian Duncan, PSOG, Federal Reserve Bank of Minneapolis (through December 2015)
    - Todd M. Albers, PSOG, Federal Reserve Bank of Minneapolis
    - Mary Hughes, PSOG, Federal Reserve Bank of Minneapolis

- Members
    - Brad Boe, Performance Food Group
    - Jessica Butler, Attain Consulting Group
    - Nicole Dwyer, Billtrust
    - Sandra Roth, Johnson and Johnson
    - Lyle Wallis, Credit Research Foundation

- Liaisons
    - Elizabeth Ching, Federal Reserve Bank of Boston
    - Christopher Pfeiffer, Federal Reserve Bank of St. Louis

Detailed Results of Focus Group

- Objectives
    - To understand the main barriers to electronic invoicing
    - To assess the current formats in place
    - To identify requirements to move the process forward

- Methodology and Participant Profile
    - An on-line focus group was conducted on September 29, 2015, with organizations who had indicated high interest in this topic to their payment associations.
    - 8 companies participated, 4 who work in Accounts Payable and 4 who work in Accounts Receivable.
    - Focus group representatives came from financial services, food processing, healthcare, retail, manufacturing, distribution and energy industries.

- Benefits
  - Participants were asked to rate the benefit to their organization of having a standard U.S. platform for EIPP on a scale of 1 to 5 with 1 being no benefit and 5 being very beneficial.
  - Those who are not too far along in developing EIPP see a strong benefit to having a standard U.S. platform for EIPP.
  - There is less benefit perceived to those who are highly electronic and satisfied with their current system, as they would need to spend time and money in re-work.
  - The main benefits are:
    - Decreased cost, both less cost of processing and allowing organization to take advantage of discount for earlier payment.
    - Increased speed of transmission of payments and approving and releasing payments.
    - Greater accuracy; no keying errors and greater invoice matching rate.
    - Greater efficiency and saving of staff time.
    - Allows for new tools, like vendor portals.
    - Staff can be diverted to other, possibly more complex tasks.
    - Allows for self-service and fewer calls from customers with questions.
    - Smoother work-flow processes.
    - Increased customer satisfaction with more efficient and more easily accessed processes.
    - More predictable cash flows.

- Barriers
  - Participants were asked to rate the likelihood of a standard U.S. platform for EIPP being established, on a scale of 1 to 5 with 1 being not likely and 5 being very likely.
  - All see moderate likelihood (3 out of 5 rating) of a standard U.S. platform being established, due to all the barriers.
  - The main barriers described are:
    - External complexity, working with all the different AR systems when they receive payments and AP systems when they make payments.
    - Internal complexity, working to integrate with multiple ERP systems within their own organizations.
    - Resistance to electronic payments, particularly from many smaller organizations.

- Risk in validating trading partners and verifying banking information for conducting business electronically.
- Without standards, customizing electronic payments can be more costly than working with a paper-based system.

- Suggestions for Moving to Standard Platform
  - All see moderate likelihood of a standard U.S. platform being established, due to all the barriers.
  - The highly automated Fortune 1,000 can be served by the big ERP systems, such as SAP, Oracle, PeopleSoft and Lawson, but the smaller organizations will need a more complicated effort.
  - One approach suggested by several participants would be to customize the standard EIPP platform by industry or type of payment.
  - Another approach suggested is to start small and build gradually, perhaps with e-checks.

- Other Issues
  - Decision-making for EIPP is often requested by the AR or AP directors and approved by a COO or CFO, with the level of approval rising with the amount of dollars involved.
  - Most participants note some team objectives related to becoming more electronic.
  - Often part of efficiency goals.
  - Can be part of improving customer experience.
  - EIPP systems among focus group participant organizations are equally likely to be developed in-house as to be purchased externally.
  - Accounts receivable is customer facing and generally a higher priority for EIPP than accounts payable.

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