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A digital invoice customs exchange (DICE) is a technology-intensive tax compliance regimen for VAT/GST that utilizes invoice encryption to safeguard transactional data exchanged between seller and buyer in both domestic and import/export contexts while simultaneously notifying concerned jurisdictions of the transaction details.

DICE facilitates real-time VAT/GST enforcement as well as real-time commercial contract verification. It is a commercial invoice validation system that prevents tax evasion, most notably missing trader fraud[1] and the non-declared import of tradable services.[2] DICE mimics the most effective administrative enforcement effort ever undertaken by the US IRS – the requirement to disclose the social security numbers of dependents on returns.[3] Tax enforcement is simplified and streamlined when fraudsters know they are (or they are convinced that they could be) being watched – in real-time detail. The fraud stops on its own.[4]

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[1] Europol estimates that missing trader fraud costs the EU in excess of €100 billion per year. Europol, *SOCTA (Serious and Organized Crime Threat Assessment) 2013 – Public Version*, 27 (March 2013).

[2] The Australian Board of Taxation estimates that Australia looses an estimated $1 billion in GST from imported services each year. Productivity Commission Inquiry Report, ECONOMIC STRUCTURE AND PERFORMANCE OF THE AUSTRALIAN RETAIL INDUSTRY xxxviii & 209 (November 4, 2011) No. 56, *available at*: http://www.pc.gov.au/__data/assets/pdf_file/0019/113761/retail-industry.pdf. "Tradable services" is a term coined by the author and first use in the following paper: Richard Ainsworth, *VAT Fraud: The Tradable Services Problem*, 61 TAX NOTES INT'L 217 (January 17, 2011).

[3] Seven million dependents vanished from the tax rolls in 1986, and the IRS recovered three billion dollars in revenue with a simple enforcement measure. Taxpayers were required to list the social security number (SSN) for any dependent they claimed on their tax return. As the authors of *Freakonomics* explain, this measure worked because taxpayers who had found it easy to cheat previously now feared that they could be caught in real-time. Steven D. Levitt & Stephen J. Dubner, *Freakonomics – a rogue economist explores the hidden side of everything,* 2006 (revised and expanded edition) at 238.

> So why do people really pay their taxes: because it is the right thing to do, or because they fear getting caught if they don't? It sure seems to be the latter. A combination of good technology (employer reporting and withholding) and poor logic (most people who don't cheat radically overestimate their chances of being audited) makes the system work.

See: Margaret Milner, Commissioner of Internal Revenue, *Remarks at the Direct Selling Association Tax Seminar*, (July 19, 1990) 95 TAX NOTES TODAY 141-60; Doc 95-7092 (discussing the Tax Compliance Measurement Program and how these audits help the IRS determine areas where significant compliance improvements can be made).

[4] This is an active research field of human psychology, but it has a very real public policy impact. For example, a cardboard cutout of a police officer inside the bicycle cage at a train station in Boston reduced theft of bicycles by 67%. The idea behind the cutout was that if people "though" someone "might be" looking they would think twice about theft. In this case it is really clear that the cop is a cardboard cutout, but the impact was dramatic. Experiments involving subjects using a computer monitor that had graphic with a pair of eyes looking out at the user also have had a measurable impact on honesty responses. *"Cardboard cop" prompts real drop in crime*, BOSTON GLOBE (August 15, 2013) *available at*: http://www.bostonglobe.com/opinion/editorials/2013/08/14/cardboard-cop-prompts-real-drop-crime/twoZrFoyg1qrPQCVLtnF8K/story.html; Martine Powers, *The cardboard cutout cop – there's*

DICE is an emerging compliance solution that has been adopted *in part* by some jurisdictions, but (as of this writing) has not been adopted *in full* by any jurisdiction. Leading contenders for full adoption include Rwanda and Croatia, with the East African Community (Burundi, Kenya, Rwanda, Tanzania and Uganda) being the most likely multi-jurisdictional adopter.

There are two elements to DICE – the *digital invoice* and the *customs exchange*.

DIGITAL INVOICE

To prepare the ground for an effective digital invoice regime a jurisdiction needs to modify commercial law. Paper invoices should be replaced with digital invoices in commercial practice. Brazil, for example, requires an invoice to be digital to be enforceable. Paper invoices are acceptable only as replicas or evidence of the prior digital invoice.

There are two models: the Chilean model that allows companies to voluntarily adopt digital invoices;[5] the Brazilian model that mandates digital invoices for companies of a certain size.[6] In Brazil the threshold has been progressively lowered to bring more businesses into the digital invoice system. Once a firm has begun to use digital invoices it cannot revert to paper. The Brazilian model is preferred for DICE.

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psychology there! BOSTON GLOBE (August 11, 2013) *available at:* http://www.bostonglobe.com/metro/2013/08/10/the-cardboard-cutout-cop-there-psychology-there/xYmonJYU95jxrMb78Xae4J/story.html.

[5] Chile stated its electronic documents project in 2003 with a group of companies selected by the Internal Tax Service (SII). The Chilean system began with invoices, credit an debit notes, and dispatch forms, as well as purchase invoices. In 2005 the model was extended to export documents. In 2008 the *boleta*, or receipt issued to final consumers was allowed to be digital. The Chilean government (since 2005) has made available to small and medium sized firms a free application for the issuance of electronic documents. The companies must only have a certificate from the SII, a digital signature, internet access, and SII authorization as an electronic issuer. Chile has over 15,600 companies using *facturas electrónicas*, with 76% of this total representing micro and small companies. In 2009 the monthly total of tax documents reached 406,315. Newton Oller de Mello, Eduardo Mário Dias, Caio Fernando Fontana, & Marcelo Luiz Alves Fernandez, *The Evolution of the Electronic Tax Documents in Latin America*, Proceedings of the 8th WSEAS International Conference on SYSTEM SCIENCE and SIMULATION in ENGINEERING (2009) 294, *available at*: http://dl.acm.org/citation.cfm?id=1938841.

[6] In Brazil the *digital invoice* has been used for securing internal data for cross-border supplies among the twenty-seven Brazilian states since 2006. It is part of the Brazilian tax modernization program called the *Sistema Publico de Escrituracao Digital* or Public System for Digital Accounting (SPED). When it began the NF-e pilot project. Progress was rapid. By April 2009 there were 25,000 NF-e issuers. The CT-e pilot project began October 25, 2007. It involved two states (São Paulo and Rio Grande do Sul) and 43 companies and transportation firms. By March 1, and April 1, 2009 respectively the firms in Rio Grande do Sul and São Paulo began issuing legally binding CT-e documents. Large-scale adoption of the CT-e began in 2010, and by the end of 2010 there were over 500,000 firms issuing digitally signed, cross-border NF-e invoices. The system is fully in place today. Newton Oller de Mello, Eduardo Mario Dias, Caio Fernando Fontana & Marcelo Alves Fernandez, *The Implementation of the Electronic Tax Documents in Brazil as a Tool to Fight Tax Evasion,* PROCEEDINGS OF THE 13TH WORLD SCIENTIFIC AND ENGINEERING ACADEMY AND SOCIETY (WSEAS) INTERNATIONAL CONFERENCE ON SYSTEMS (2009) 449, 453, *available at*: http://dl.acm.org/citation.cfm?id=1627575&picked=prox

There are six steps in the development of a *digital invoice* system. The following discussion is based on a business-to-business (B2B) transaction within a single jurisdiction. **Some jurisdictions may only adopt the first four steps.** This may occur if the jurisdiction does not consider missing trader fraud to be a problem. The steps are as follows:

STEP 1: The seller generates an electronic file in XML format[7] that contains all necessary contract and tax information for the sale of goods or services (a pro-forma digital invoice).[8] The issuer digitally signs the file (to assure integrity of the data and authorship).[9] The file is then transmitted (through the Internet) to the tax administration. The transmission constitutes a "request for authorization" to use a *digital invoice*.[10]

STEP 2: The tax administration will act on the "authorization of use" request, without which there can be no binding contract. Authorization is not difficult – it (a) is fully automated (without human intervention), (b) is available 24/7, (c) requires only a basic check of the XML file for accuracy and completeness, and (d) should take a few seconds, and probably only a millisecond.

STEP 3: If the XML file is complete and accurate, the tax administration saves a copy of the XML file and an electronic signature is produced. The electronic signature serves as an access key, and is used for verification of complete invoice data by the buyer, seller, the tax administration, or an approved third party. The access key is a fixed-size alpha-numeric bit string. When reproduced on a paper invoice it may appear as a bar code, which facilitates verification. In an audit context it will allow inspectors to immediately call up (in real-time) any invoice in the commercial system with the press of a button on a hand-held scanner.

STEP 4: The seller then composes and transmits a proposed invoice to the buyer. It includes all of the data from the XML file along with the access key produced by the tax administration.[11]

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[7] XML is an acronym for eXtensible Markup Language. It is a set of rules for encoding documents in machine-readable form. It is defined in the XML 1.0 Specification produced by the World-Wide Web Consortium (W3C), and several other related specifications. These are gratis open standards.

[8] It is important to note that these are not "heavy" files. For example, a large supermarket with gross revenues of US$ 1 billion per year, and millions of invoices, would probably deliver a 5 megabyte file in a month. [Example provided by Brazilian tax attorney Eric Kanno, currently an LLM candidate at Boston University School of Law.]

[9] The digital certificate in Brazil is provided by Certsign at: http://www.certisign.com.br/ and Serasa at: http://serasa.certificadodigital.com.br/

[10] In Brazil this transmission is to the State Tax Administration for *Impostos Sobre Circulação de Mercadorias e Prestação de Serviços* (ICMS) verification. The ICMS is the state sales tax and the rate varies depending upon the industry and the Sate. In a VAT/GST jurisdiction this transmission would be for verifying the VAT/GST on a domestic transaction.
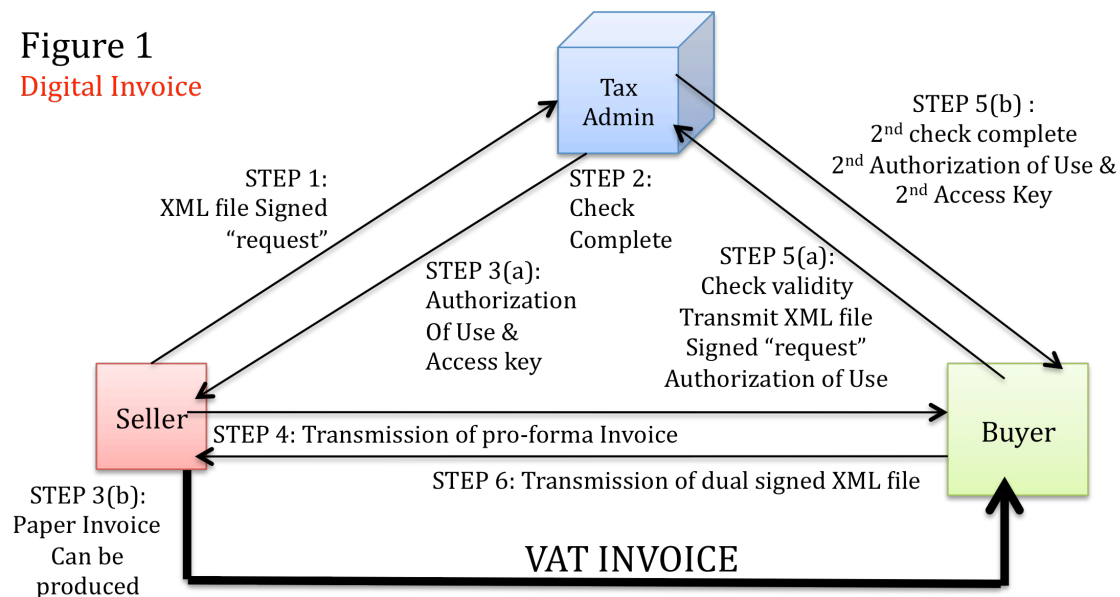
[11] Some jurisdictions may stop at STEP 4. The pro-forma invoice will be allowed as a final invoice. If so, the tax administration has sufficient data to perform an audit of the transaction. However, if there is a missing trader problem in the jurisdiction, stopping at STEP 4 leaves a hole in system. If the buyer in this fact pattern decides to take the goods or services purchased, and sell them on after a mark-up, collect VAT, and then disappear it could be several months before a return is due. In some jurisdictions special reporting rules are applied to small taxpayers. For example in the UK an Annual Accounting Scheme applies if a

STEP 5: The buyer will use the access key to check the validity of the invoice. The buyer will then replicate the steps taken by the seller (above). In other words, the XML file received from the seller will be digitally signed (this time by the buyer), and the file will be transmitted to the tax administration (again) over the Internet. The tax administration will re-verify, save the file, and produce a second access key that will be returned to the buyer. The XML files from seller and buyer should match.

STEP 6: The buyer retains a copy of this file, and transmits it to the seller. A true invoice is now issued containing all of the contract data and both access keys. Goods will now be shipped, or services performed, and the VAT will become due in accordance with the normal provisions of the VAT Act. Importantly, because the buyer will not be allowed an input deduction without a valid invoice, it is this XML file (with two valid access keys) that will support the deduction. A paper invoice will be sufficient, if it contains the access keys because the access keys will allow the original digital invoice to be located in the tax administration's database.

Figure 1 sets out the essential steps of the *digital invoice* regime.

Figure 1
Digital Invoice

Tax Admin

STEP 1:
XML file Signed
"request"

STEP 2:
Check
Complete

STEP 3(a):
Authorization
Of Use &
Access key

STEP 5(a):
Check validity
Transmit XML file
Signed "request"
Authorization of Use

STEP 5(b) :
2nd check complete
2nd Authorization of Use &
2nd Access Key

Seller

Buyer

STEP 4: Transmission of pro-forma Invoice

STEP 6: Transmission of dual signed XML file

STEP 3(b):
Paper Invoice
Can be
produced

VAT INVOICE

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taxpayer's *estimated* taxable turnover for the year is less than £1.35 million. See: HMRC, ANNUAL ACCOUNTING SCHEME FOR VAT, *available at*: http://www.hmrc.gov.uk/vat/start/schemes/annual.htm#2. Because the annual accounting scheme is based on an estimate, missing trader fraud is likely in the first year. No return will be filed at year-end (although monthly estimate payments are due). In this case continuing through *digital invoice* STEPS 5 and 6 will provide the tax administration with real-time data of the buyer's **purchases** and **sales** transactions, and will allow the buyer's status to be remotely audited. Continuing through STEP 6 will also go a long way to convincing the buyer that tax administration can follow his business activity in detail and in real-time. Compliance increases in a setting like this.

There are two further permutations to the basic *digital invoice* scenario, one on the buyer's side the other on the seller's side. On the buyer's side there is the next sale, which may be made to a final consumer; on the seller's side there is the possibility that the seller may be in another jurisdiction and this is an export/import transaction.

The basic *digital invoice* pattern can accommodate both of these permutations.

Buyer's onward (retail) sale. When the buyer (as a retailer) sells on to a final consumer the invoice is a *sales receipt*. In a retail sale, documents are not exchanged between the parties; the price is set and the *sales receipt* goes directly from the retailer to the final consumer. The *sales receipt* is a *digital invoice*. Even though the final consumer cannot use a sales receipt for a VAT/GST input tax deduction, he is able to use the access code embedded in the *sales receipt* to find a digital copy of the receipt in the tax administration's database. The retailer is obligated to remit the VAT/GST on the retail sale less input deductions.

The following four steps explain this permutation of the *digital invoice*.
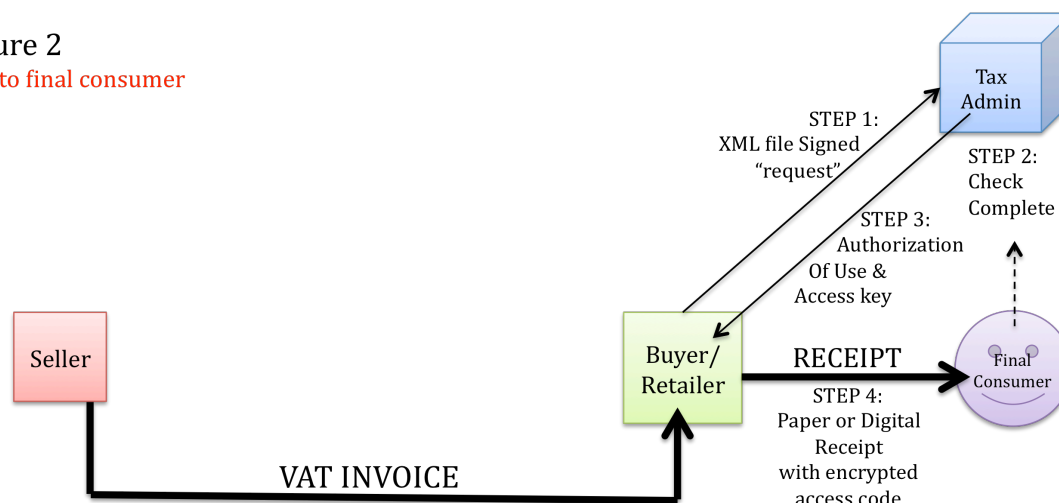
STEP 1: When the retailer makes a sale to a final consumer he submits an XML file to the tax administration requesting permission to issue a tax receipt, and request an access key. As before, the XML file contains all necessary tax information for the sale of goods or services. The retailer will digitally sign the file (to assure integrity of the data and authorship). The file is transmitted (through the Internet) to the tax administration.

STEP 2: The tax administration will act on the "authorization of use" request, without which there can be no binding contract.

STEP 3: If the XML file is complete and accurate, the tax administration saves a copy of the XML file and an electronic signature is produced. The electronic signature serves as an access key, and is used for verification of complete receipt data. As before, this will be a fixed-size alpha-numeric bit string. When reproduced on a paper receipt it may appear as a bar code, which facilitates verification. Tax inspectors are able to immediately call up (in real-time) and verify any receipt in the commercial system.

STEP 4: The retailer issues the certified receipt to the final consumer. The consumer can access the tax administration database with the access key to verify (and reproduce) the contents of the receipt if necessary. Figure 2 illustrates.

Figure 2
Sale to final consumer

STEP 1:
XML file Signed
"request"

Tax
Admin

STEP 2:
Check
Complete

STEP 3:
Authorization
Of Use &
Access key

Seller

Buyer/
Retailer

RECEIPT

Final
Consumer

STEP 4:
Paper or Digital
Receipt
with encrypted
access code

VAT INVOICE

Seller (exporter) to buyer (importer). The other permutation considers the seller as an exporter and the buyer as an importer. Most VAT/GST problems arise in this situation when the supply is a tradable service, or a service sold to a final consumer. Goods pass normally through customs, and are recorded there. Services enter the domestic economy in other ways.[12]

The norm is for domestic buyers of imported services to (a) pay *reverse VAT* (that may or may not require actual cash payment) or (b) perform a *reverse charge* (a set of offsetting accounting entries on the next return). In cases where the domestic buyer is a final consumer some jurisdictions seek to (c) compel the foreign seller to register and collect the VAT/GST. Only in this last instance (c) is the invoice issued by the foreign supplier a VAT invoice. In the others (a) and (b) the cross-border invoice will not mention VAT.

The key to a *digital invoice* regime is the un-enforceability of the underlying contract if the seller has not submitted the required XML file to the tax administration and received back the necessary access key. There should be no difference between a domestic and a foreign supplier in this regard. Both buyer and seller have an interest in

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[12] Algirdas Semeta, the European Commissioner for taxation indicated that the EU Commission is anxious to cooperate. He observes:

> There is no effective way of ensuring compliance if a business located in California, for example, provides e-services to a private individual in Slovakia and does not register for the e-commerce scheme and pay Slovak VAT what can the national tax authorities do realistically? *The Commission is addressing this issue and has asked member states for a mandate to negotiate with third countries on this issue from a collective position of power*. For the time being, though, compliance depends on the willingness of suppliers in third countries to assume their legal obligations.

Algirdas Semeta, *The mini-One Stop Shop for VAT – the start of something big!* WORLD COMMERCE REVIEW (June 2012) 28 (emphasis added).

insuring enforceability. If compliance difficulties arise with foreign sellers it is expected that intermediaries (like customs agents) would assist in processing XML files.

STEP 1: The seller will generate an electronic file in XML format containing all necessary information as before. The issuer digitally signs the files (to assure integrity of the data and authorship). The file is transmitted (through the Internet) to the **destination** tax administration. The transmission constitutes a "request for authorization" to use a digital invoice that will be acceptable to the **destination** jurisdiction.

STEP 2: The **destination** tax administration will act on the "authorization of use" request, without which there can be no binding contract in the destination jurisdiction.

STEP 3: If the XML file is accurate, the **destination** tax administration will save a copy of the XML file and an Internet access key (electronic signature) will be produced as before.

STEP 4: The seller will compose and transmit an invoice to the buyer that will include all of the data from the XML file along with the access key produced by the **destination** tax administration.

STEP 5: The buyer will use the access key to check the validity of the invoice, and replicate the steps taken by the seller (above).

STEP 6: The buyer will retain a copy of this file, and perform either a reverse charge or pay the reverse VAT depending on the statute.

Figure 3 illustrates this situation.

Figure 3
Sale from a foreign supplier
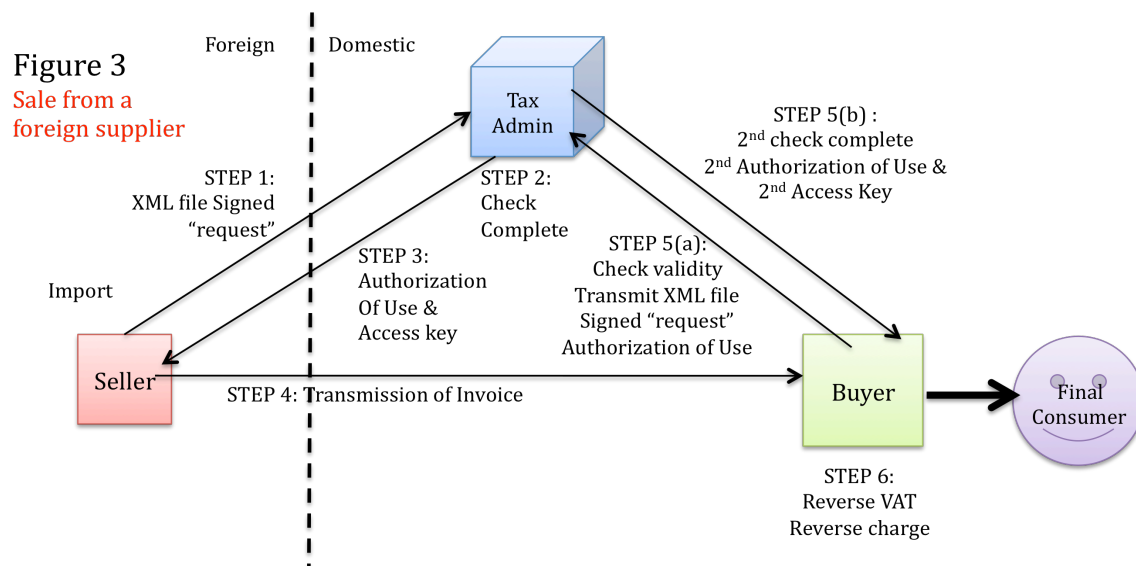
Because a foreign seller will not (normally) be collecting domestic VAT/GST the *digital invoice* regime functions as an "early warning" system for the **destination** tax

administration. It alerts the authorities in advance of a *reverse charge* or *reverse VAT* obligation of the buyer – a taxable transaction is occurring. Compliance should be elevated. Buyers in the **destination** jurisdiction will know that their purchases are being observed and recorded.

CUSTOMS EXCHANGE

The last fact pattern presents a difficult scenario, and the enforcement benefits from the cooperation of a *customs exchange* are needed here. The issue is: How does a jurisdiction create an incentive structure that will induce foreign suppliers to comply with local tax reporting rules? In Figure 3 the only incentive was that both buyer and seller would want an enforceable contract in the destination jurisdiction. A *customs exchange* presents a better incentive paradigm.

With a *customs exchange* both jurisdictions have *digital invoicing* rules in place. When sellers in one jurisdiction (origin) seek to export (good or services) to the other jurisdiction (destination) the tax authorities will cooperate through the exchange to perfect the cross-birder *digital invoice*. There are eight steps involved.

STEP 1: The seller generates an electronic file in XML format containing all necessary contract information as before. The seller digitally signs the files (to assure integrity of the data and authorship). The file is transmitted (through the Internet) to the **origin** tax administration. The transmission constitutes a "request for authorization" to use a digital invoice that will be acceptable to both **origin and destination** jurisdictions.

STEP 2: A check is performed of the XML file for accuracy and completeness.

STEP 3: If the XML file is accurate and complete then the **origin** jurisdiction issues an "authorization of use" *to the seller* in the form of an access key (electronic signature), and *simultaneously* notifies the **destination** jurisdiction with a copy of the XML file and access key through the *customs exchange*. The access key will allow the **destination** jurisdiction direct access to the data submitted in the XML file submitted by the seller in the **origin** jurisdiction's database.

STEP 4: The seller will now produce a pro-forma invoice that includes relevant access codes.

STEP 5: The seller transmits the pro-forma invoice to the buyer. In most cases this document will not mention VAT, because it will be the obligation of the buyer to report VAT (in a reverse charge jurisdiction) or pay VAT (reverse VAT jurisdiction).

STEP 6: The buyer in the **destination** jurisdiction creates an XML file reproducing all necessary contract information (as before). The buyer digitally signs the files (to assure integrity of the data and authorship), and transmits the file (through the Internet) to the **destination** tax administration. The transmission constitutes a "request for authorization" to use a *digital invoice* that will be acceptable to both **origin and destination** jurisdictions.

STEP 7: The **destination** tax administration will match the buyer's XML file with the seller's XML file. If all of the data is complete and matches then it will issue a second "authorization of use," and issue a second access key (electronic signature) to the buyer. The buyer will transmit the XML file and second access key to the seller. The seller will be able to confirm the transaction through the **destination** tax administration's database. This documentation will be sufficient to support the seller's zero-rated export from the **origin** jurisdiction. In addition, the buyer is now on notice, and the destination jurisdiction is aware, that he needs to perform a reverse charge or pay reverse VAT.

STEP 8: The seller will now process a zero-rated supply to the buyer from the **origin** jurisdiction.

Figure 4 illustrates this situation.

Figure 4
Customs exchange
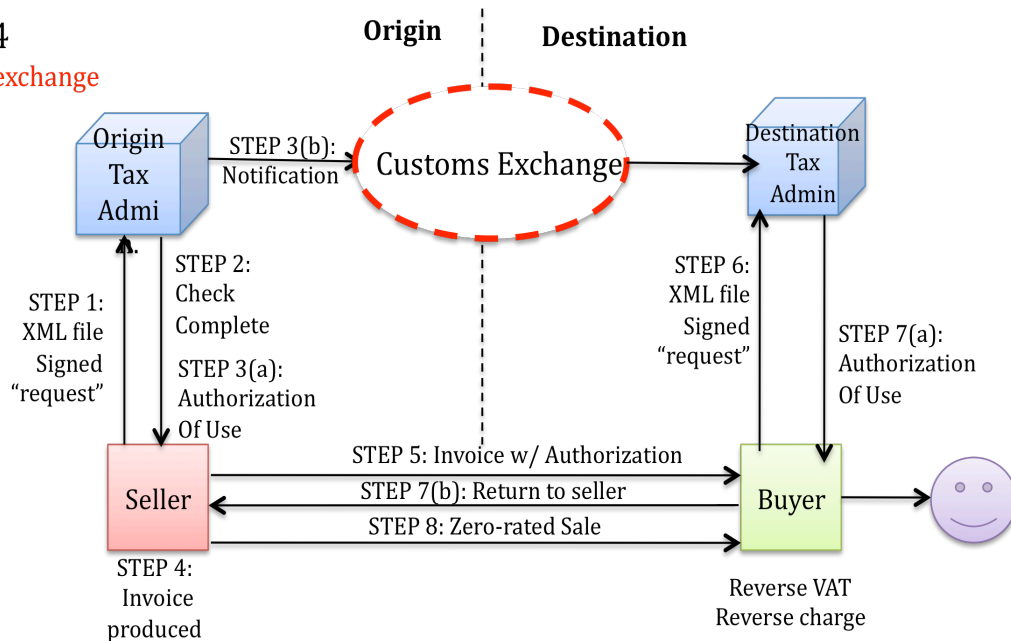
CONCLUSION
A *digital invoice customs exchange* will go a long way to resolving the frauds that plague global VAT/GST systems. Missing trader frauds, MTIC and MTEC, cost the EU

billions of euro annually. The largest VAT fraud in Italian history is a tradable service MTEC fraud.[13]

The underlying premise of the *digital invoice customs exchange* is that tax compliance improves when taxpayers become aware that their activities are monitored in real-time. There is very good evidence that this is the case in tax VAT/GST compliance, and there is very good research in human psychology that explains why this is the case.[14]

Three measures of the success of the *digital invoice* can be taken from efforts undertaken in Quebec, Tanzania, and Sweden to implement a *digital invoice* regime.

Quebec adopted the *digital invoice* in 2011, but only in the B2C retail restaurant sector of the provincial economy (see Figure 2, above). Estimated tax losses in this sector were $420 million annually. In the first year after adoption voluntary compliance increased by $160 million, and estimates are that $2.3 billion will be received by 2018-19. Enforcement actions based on data generated by the *digital invoice* system resulted in an additional $1.3 million in fines.[15]

In Tanzania, after working for two years with a B2B and B2C *digital invoice* regime significant revenue improvements were reported. By June of 2012 revenues were up by 38.1% over projected targets.[16] One of the leading reasons for this was the

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[13] The VoIP fraud was uncovered in 2010 at Fastweb and Telecom Italia. *See:* Richard T. Ainsworth, *The Italian Job – Voice Over Internet Protocol MTIC Fraud in Italy*, 58 TAX NOTES INT'L 721 (May 31, 2010). The fraud was reported in the Wall Street Journal as a a massive VoIP MTIC fraud (the *Operazione "phuncards-broker"* investigation):

> An [Italian] judge … ordered the arrest of 56 people, including one of Italy's richest men as part of an international probe into an alleged $2.7 billion money-laundering and tax-evasion scheme involving two major Italian telecommunications providers.   Prosecutors allege billionaire Silvio Scaglia was part of a ring with mafia ties … between 2003 and 2006, according to a copy of the arrest warrant seen by The Wall Street Journal.

Stacey Meightry & Sabrina Cohen, *Billionaire Is Sought In Sweeping Fraud Probe,* WSJ at B1 (Feb. 24, 2010). See also: Richard T. Ainsworth, *VoIP MTIC – VAT Fraud in Voice Over Internet Protocol,* 57 TAX NOTES INT'L 1079 (March 22, 2010).

[14] Tax administrations that are employing *digital invoices* and *customs exchanges* are tapping into a very promising area of human psychology. This approach offers greater success than emphasizing punishment. *See*: David G. Rand, Anna Dreber, Tore Wllingsen, Drew Fudenberg, & Martin A. Nowak, *Positive Interactions Promote Public Cooperation*, 325 SCIENCE 1272 (September 4, 2009) (indicating that when punishment and rewards are both present, rewards outperform punishment in repeated public goods games and that human cooperation in such repeated settings is best supported by positive interactions with others). The research also shows that the environment has a significant impact on psychological outcome, and the tax authority needs to mold the commercial environment around its desired outcome and the needs of local business. See: David G. Rand & Martin A. Nowak, *Human cooperation*, 17 TRENDS IN COGNITIVE SCIENCES 413 (August 2013).

[15] Quebec Ministry of Revenue, PRESS RELEASES, Évasion fiscale dans le secteur de la restauration Revenu Québec dresse un bilan positif de la première année d'implantation des mev dans le secteur de la restauration (Tax evasion in the restaurant industry Revenu Québec gives a positive assessment of the first year of implementation of MEV in the food sector) (February 14, 2013) *available at*: www.revenuquebec.ca/communique

[16] Sebastian Mrindoko, *TRA Exceeds Tax Collection Targets,* In2East Africa Reporter (August 10, 2012) available at: http://in2eastafrica.net/tra-exceeds-tax-collection-targets/

Electronic Fiscal Device (EFD). Much more can be expected with a fully operational *digital invoice customs exchange* throughout the EAC.

Longer-term results are reported in Sweden. A 2013 report by the Swedish Tax Administration measures their *digital invoice* mandate in the retail sector over a three-year period. Sweden collected a reasonably consistent €355 million in additional VAT revenue per year – over €1billion total in lost VAT.   A large part of the Swedish success is attributable to Retail Innovation's CleanCash device, which is in use in over 75% of the Swedish retail market.[17]

However, CleanCash, like Quebec's MEV, does not automatically report data to the central tax administration. Because these devices do not facilitate remote audit, they fall short of a fully effective *digital invoice*.

In contrast, Tanzania's EFD and Rwanda's Electronic Billing Machines (EBM) are not only more widely deployed throughout the economy (they include B2B invoices within their digital ambit), but they comprehensively make automatic reports to central computers. As a result, a *digital invoice customs exchange* (DICE) is much closer to reality in the East African Community than almost anywhere else.

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[17] Swedish Tax Agency (Skatteverket), *Requirements of Cash Registers - Impact Evaluation of the Cash Register Act 2010* (*Krav på kassaregister - Effektutvärdering* (June 26, 2013) (in Swedish, translation on file with authors).