Wake up, Canada, to the US Fed supported BPC and standardized electronic invoicing!

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Elevator summary

From a payments systems perspective, an open, free-to-use and global ISO messaging standard has already been adopted in the US and in Canada. Now there is an opportunity to specify how an open, free-to-use and global ISO document standard can be adopted to support the business procurement processes that trigger the need for payments. Canadian banks, companies and governments should join the Business Payments Coalition, supported by the US Federal Reserve, to collaboratively define a single standards-based e-invoicing interoperability framework for use across all business in both countries.

Executive summary

Other countries have been ahead of the US and Canada in establishing and then adopting standardized practices and document formats regarding electronic invoicing in business. In October 2017 the U.S. Federal Reserve took up the initiative and announced support for a three-year plan to accomplish these goals in order to address streamlining payments of supplier invoices across the US. The Business Payments Coalition (BPC), a group supported by the Fed, has been formed to define and fulfill such a plan in concert with industry, recognizing the incredible importance of the entire economy buying into a single solution to service all. This single open and standards-based solution is intended to satisfy business-to-government, business-to-business and, eventually, business-to-consumer scenarios.

Members of the BPC include banks, companies, vendors, and service providers, and the committee functioning is administered by the Fed. Membership is free of charge.

The BPC has already embraced and is promoting ISO 20022 for messaging for payments, credit transfer, clearing and settlement. This specification is used world-wide.

Moving beyond just payments to define an interoperability framework, the e-invoicing work group within the BPC already is looking at the work of the Australian Digital Business Council (DBC). The DBC adapted for Australian use the European deployment of the OASIS 4-corner model for document exchange and the OASIS Universal Business Language (UBL), internationally standardized as ISO/IEC 19845:2015, for the open and extensible XML document format for procurement (orders, invoices, etc.) and transportation (waybills, logistics, etc.). This document specification also is used in many countries around the world.

In Canada, Payments Canada (formerly the Canadian Payments Association) also has embraced ISO 20022 for end-to-end payment message flows in operating a cross-country payment clearing and settlement system. But the Government of Canada has not made public any kind of plan to address using open standards even for its own supplier invoicing, let alone a whole-of-economy solution for all business.

The opportunity for interested organizations in Canada is that membership in the BPC is open to anyone. As of this writing, Crane Softwrights Ltd. is the only Canadian member of the e-invoicing work group and has committed to help in regard to the OASIS-related specifications under consideration.

Wake up, Canadian banks, companies and governments! This is an amazing opportunity to participate in the creation of a cross-border standards-based e-invoicing interoperability solution tailored to the economies of both of our countries. Such will better service business clients doing procurement and demanding payment using invoicing. Why are you not jumping at the opportunity to be at the table and joining the BPC?

Disclaimer

The opinions and perspectives in this essay are entirely those of Crane Softwrights Ltd. and do not in any manner necessarily represent the views or positions of the US Federal Reserve Bank, the Business Payments Coalition, or the OASIS Universal Business Language Technical Committee.

About the author

Mr. G. Ken Holman, CTO of Crane Softwrights Ltd. in Ottawa, is the chair of the Standards Council of Canada (SCC) mirror committee to ISO TC154 (Processes, data elements and documents in commerce, industry and administration), the chair of the OASIS Universal Business Language (UBL) Technical Committee, the chair of the OASIS Code List Representation Technical Committee, a member of the SCC mirror committee to ISO/IEC JTC 1/SC 32/WG 1 (eBusiness and Open-edi), and a member of the OASIS Business Document Exchange Technical Committee. He is mostly retired from a successful technical career in XML document description and processing with XSLT and XSL-FO for HTML web pages and PDF page composition. He now devotes his work time to volunteer standardization efforts as an XML lead in various projects, while dabbling in overseas volunteer humanitarian work and infrequent high-altitude hiking. See http://www.CraneSoftwrights.com/bio/gkholman.htm [http://www.CraneSoftwrights.com/links/bio-wakeup.htm] for more details.

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1. Finally moving forward in the US

Late in 2015 I wrote the essay "Open specifications open marketplaces!" [Open Marketplaces] documenting how other countries have been ahead of the US and Canada in establishing and adopting standardized practices regarding electronic invoicing in business. I won't reiterate here the details of the examples I document there of successful deployments in Europe and Australia, nor the examples of unsuccessful US and Canadian efforts to implement archaic "invoicing portals" or other 3-corner-model-based solution architectures.

Finally the U.S. Federal Reserve has taken the initiative and in October 2017 announced support for a three-year plan to accomplish this in order to streamline payments of supplier invoices under the moniker "SIPS" (Strategies

for Improving the US Payment System). The Business Payments Coalition [BPC], supported by the Fed, has been formed to define and fulfill such a plan in concert with industry, recognizing the incredible importance of the entire economy buying into a single solution to service all. The coalition's overarching goal is "to make B2B payments more efficient across the end-to-end process, that is, to achieve straight-through-processing across both the procure-to-pay and order-to-cash cycles".

Although not directly linked, streamlining payments also can help from a perspective of the US Prompt Payment Act [Prompt Payment]. Under this act a federal agency is obliged to pay interest on supplier invoices that are not paid when required. This self-imposed penalty currently runs at 2.375% but has been market driven and historically up to 15% in the early 1980s. It is in the government's and the vendors' interest (no pun intended) that valid and proper invoices are paid on time. Note how this principle has two distinct components: the valid and proper invoices, and their timely payment. Therefore, an important aspect of the streamlining of timely payments is the streamlining of the process that leads up to having a valid and proper invoice itself.

Within the BPC is the e-Invoicing work group with the objective to "identify ways to increase the adoption of business-to-business e-invoicing by all types and sizes of U.S. businesses". This single solution is intended to satisfy business-to-government, business-to-business and, eventually, business-to-consumer scenarios. ISO 20022 has an electronic invoice format, but (unsurprisingly) it is oriented around only the payment action. After all, the invoice is a demand from the debtor for payment by the creditor that triggers a series of commitments and settlements ending in a remittance advice of the funds having successfully been obtained by the debtor.

Though the invoice may be the start of the payment cycle, it is in the middle of an extensive procurement cycle whether or not that cycle is reified electronically as documents. The procurement cycle typically begins with the pre-award phase (determining what, specifically, is to be procured and from whom, such as is established through tendering and catalogues), continues to the post-award phase (ordering, invoicing and payment), and follows through with the replenishment phase (determining what, generally, needs to be procured for the next cycle) before starting again. Orthogonal to the procurement but necessary for many organizations are all of the transportation logistics that need to be arranged. Such intersects with procurement at the point of despatch of the goods by the seller to the successful receipt of those goods by the buyer.

The ISO 20022 invoice does not address the need to capture information regarding the procurement and transportation of the goods, which likely are very important to the organizations involved.

Members of the BPC include banks, companies, vendors, and service providers, and the committee functioning is administered by the Fed. The e-Invoicing work group mandate [eInvoicing mandate] reads in part:

> "… collaborates with stakeholders to explore 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 BPC meeting materials are publicly accessible [Meeting Materials]. Moving beyond just payments to accommodate procurement and transportation semantics, the BPC documented in its October 2017 meeting minutes [BPC Oct. 2017] that the committee already is looking at the work of the Australian Digital Business Council (DBC):

> "The BPC will be involved with defining an interoperability framework for the US market. The BPC e-invoicing workgroup has looked at the Australian interoperability framework as a starting point for future efforts."

The DBC adapted for Australian use the European deployment of the OASIS 4-corner model for document exchange and the OASIS Universal Business Language (UBL) [UBL 2.1 - ISO/IEC 19845], internationally standardized as ISO/IEC 19845:2015, for the open and extensible XML document format for procurement (orders, invoices, etc.) and transportation (waybills, logistics, etc.). This specification also is used in many countries around the world. UBL is maintained by the UBL Technical Committee [UBL TC].

But unlike Australia, and now unlike the US, the government of Canada has not made public any kind of plan or vision to address using open standards even for its own supplier invoicing, let alone for a whole-of-economy solu-

tion for all business. If the government isn't going to take the initiative the way the US Fed has taken the initiative, I believe Canadian organizations should be actively participating in and contributing to the BPC to ensure the needs of Canadian business also can be accommodated in their published specifications.

2. The relationship between international standards

In October 2017 the U.S. Federal Reserve announced plans to complete their migration to the ISO 20022 Universal financial industry message scheme [ISO 20022] for their real-time gross settlement system, the Fedwire Funds Service. In the world of payments, credit transfer, clearing and settlement, the emphasis first is for wires and then later for automated clearing houses. The Fed is engaging and enlightening US businesses and other interested parties in the use of this international standard for payments.

The road to ISO 20022 started at Payments Canada (formerly the Canadian Payments Association) in 2013 and by 2016 end-to-end payment message flows using ISO 20022 implemented a cross-country payment clearing and settlement system using this open standard [Payments Canada].

The European Payments Council Single Euro Payments Area relies on ISO 20022, as well as the Australian Payments Clearing Association. The standard is well ensconced and a day-to-day reality for many financial sectors around the world.

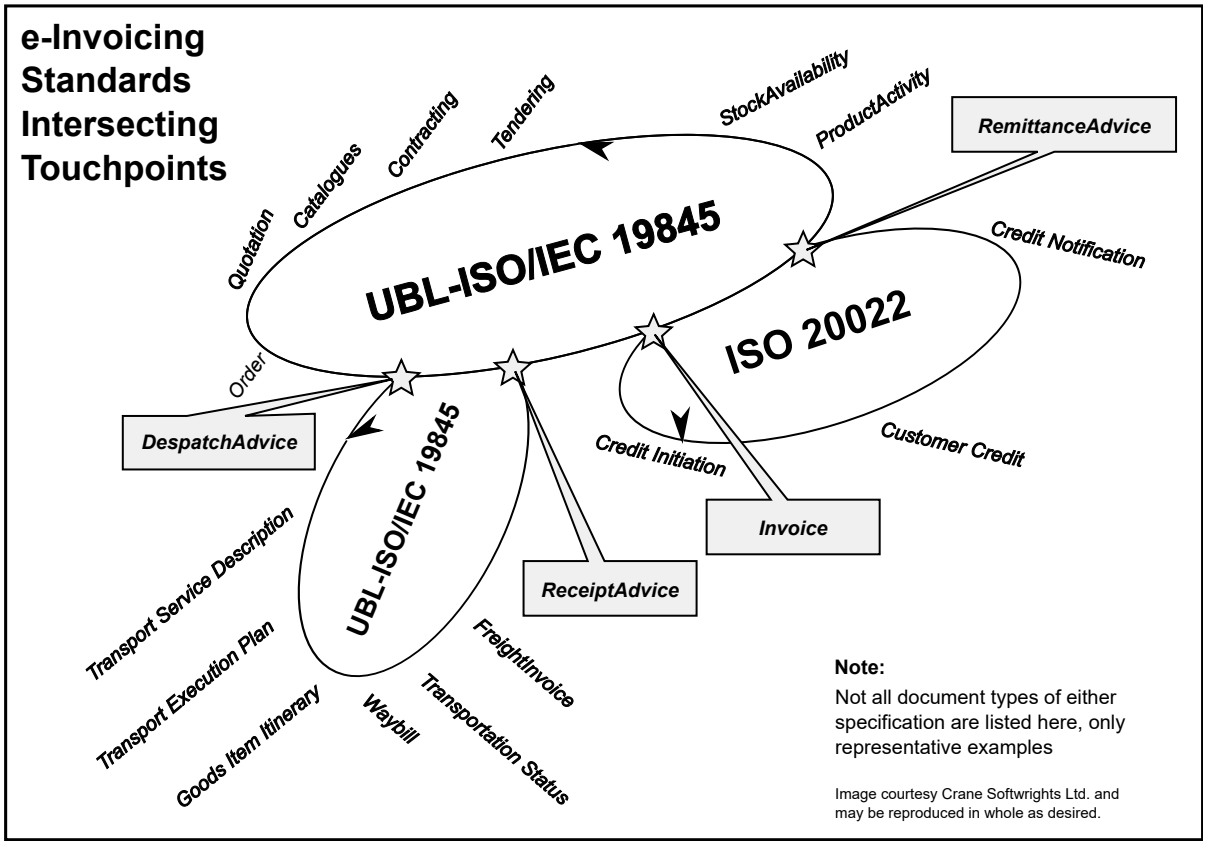
But in Europe and Australia the focus has continued on beyond payments and into the realm of business processes that trigger the need for payments. The focus has been on procurement and, recently in Europe, on transportation. The initial driver in Europe has been government procurement. The initial driver in Australia has been whole-of-economy efficiency.

Regarding procurement, in section 5 of my [Open Marketplaces] essay I describe in detail the Pan-European Public Procurement On-line (PEPPOL) project and how its components fit into the ISO/IEC 15944-20 breakdown of the ISO/IEC 14662 Open-edi Reference Model. In particular I describe there the role of UBL - ISO/IEC 19845 to express the XML syntax of the business objects selected by the CEN Business Interoperability Interfaces project for use in procurement. See Figure 4 in that essay for the depiction of the relationships.

Regarding transportation, in April 2017 the e-Freight project [e-Freight] announced a joint effort to create "One Common Framework for Information and Communication Systems in Transport and Logistics" from FREIGHTWISE, e-Freight, INTEGRITY, Smart-CM, SMARTFREIGHT, EURIDICE, RISING, DiSCwise, iCargo, COMCIS, eMAR and other projects, developing a reference model and logistics information exchange documents. This common framework also is based on PEPPOL and deploys UBL - ISO/IEC 19845 in an exciting (to me) all-encompassing transportation and logistics platform.

The two standards ISO 20022 and ISO/IEC 19845 intersect in providing touchpoint document formats for procurement, transportation and payments. In the following diagram, note the circular depiction of the phases of procurement identified earlier including pre-award (selecting), post-award (buying), followed by replenishment (assessing) that leads back to the next cycle. Representative UBL document types from each phase are shown (though not all of the 65 available document types are itemized). In this diagram one can see from the highlighted call-outs how from within that procurement cycle the DespatchAdvice document bridges the transportation world until the ReceiptAdvice document indicates the goods have been received. Also shown is how the Invoice document bridges the payments world until the RemittanceAdvice document informs of the payment.

Figure 1. Touchpoints within and between ISO/IEC 19845 and ISO 20022



Work has begun in the UBL Payments and Finance Subcommittee [UBL Payfin] to look more closely at how to bridge UBL - ISO/IEC 19845 systems to ISO 20022 systems by reinforcing the parallels and eliminating the gaps between like documents found in the two worlds. This task is introducing new document types and new business objects to UBL to better support users interoperating between platforms for each specification.

And so I find it very promising that the BPC minuted that it is looking at the Australian solution as a starting point, so as to consider an all-of-economy integrated deployment of multiple international standards working in concert. Such avoids any vendor bias or reliance on proprietary solutions or costly platforms and puts all users and suppliers on an even playing field when the final e-invoicing interoperability framework is published.

3. An e-invoicing interoperability framework

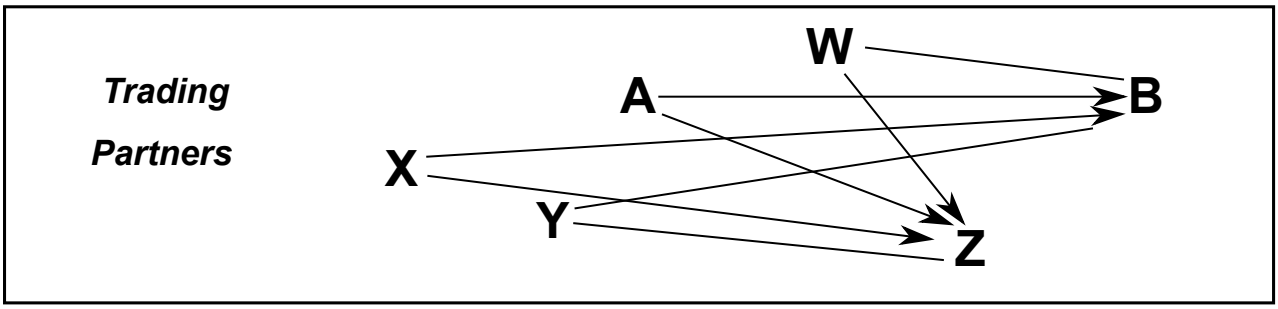
But using internationally-standardized document formats alone cannot comprise an open e-invoicing interoperability framework. All participants need to be able to access all other participants in a democratized networking architecture that prevents communities of users from being disenfranchised from the business environment.

The Australian networking solution being considered as a starting point by the BPC is based on the 4-corner model of service discovery and access point interaction being standardized at OASIS as the Service Metadata Publisher (SMP) within the OASIS Business Document Exchange (BDXR) Technical Committee [BDXR TC]. The PEPPOL project donated its conception and initial implementation of this 4-corner-model architecture for service metadata publishing to OASIS in order to be developed into a globally-useful specification. Australia is going live with the OASIS version and PEPPOL is migrating to the OASIS version through its regular maintenance updates.

See slide 13 “Interoperability Framework” of the 2017-08-31 BPC meeting materials [Framework] for an illustration of the SMP and UBL components put forward by the e-Invoicing work group.

To better understand how such a framework differs from previously-used architectures for business document interchange, consider the following depiction of document transfers from some parties shown at the left of the group (A, W, X, and Y) to their trading partners shown at the right of the group (B and Z).

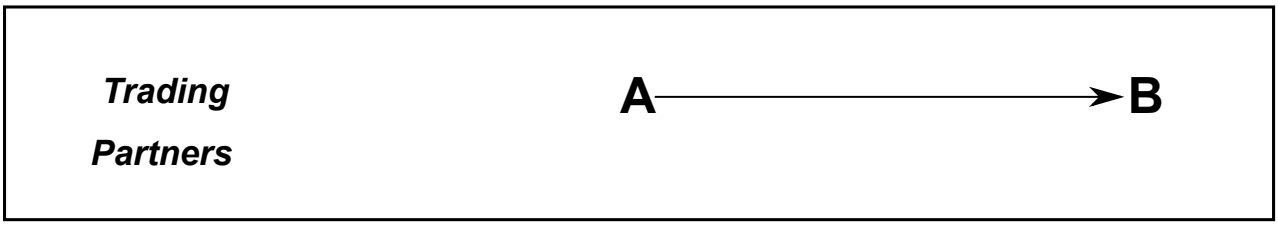
Figure 2. Trading partners with multiple relationships



Without an agreement on a common method of communicating, trading partners B and Z must either accommodate the incoming document formats and protocols, or dictate such to the originating parties. If Z and B use different document formats and protocols, this imposes the burden on the originating parties to support multiple configurations in their systems.

Focusing on just trading partners A and B, one can simplify the diagram to the following, where A needs to send a document to B.

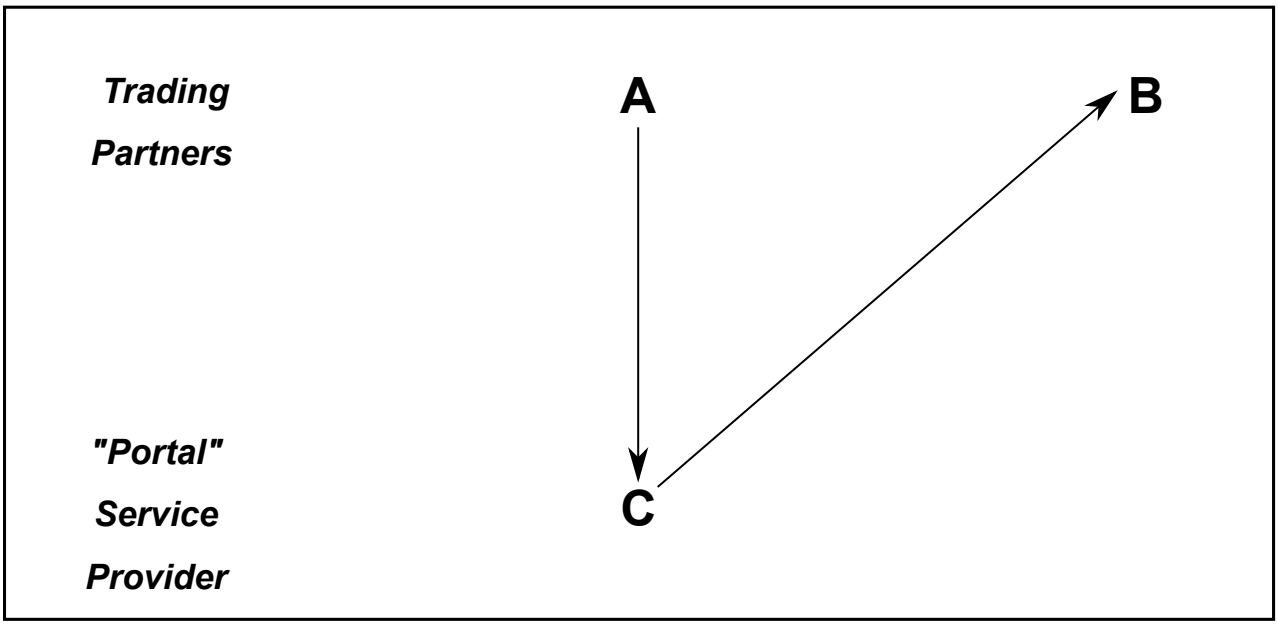
Figure 3. Focusing on two trading partners



The document transfer appears straightforward, however, there may be access restrictions or discovery issues preventing A and B from interoperating directly. Furthermore, A and B might be using different document formats that would force one of the two to capitulate and support the other format.

Traditionally, this has led to the “portal” or “single window” concept of a common service provider C with whom A and B do business. A sends the document to C and C forwards the document to B, possibly providing a document translation service as part of the process.

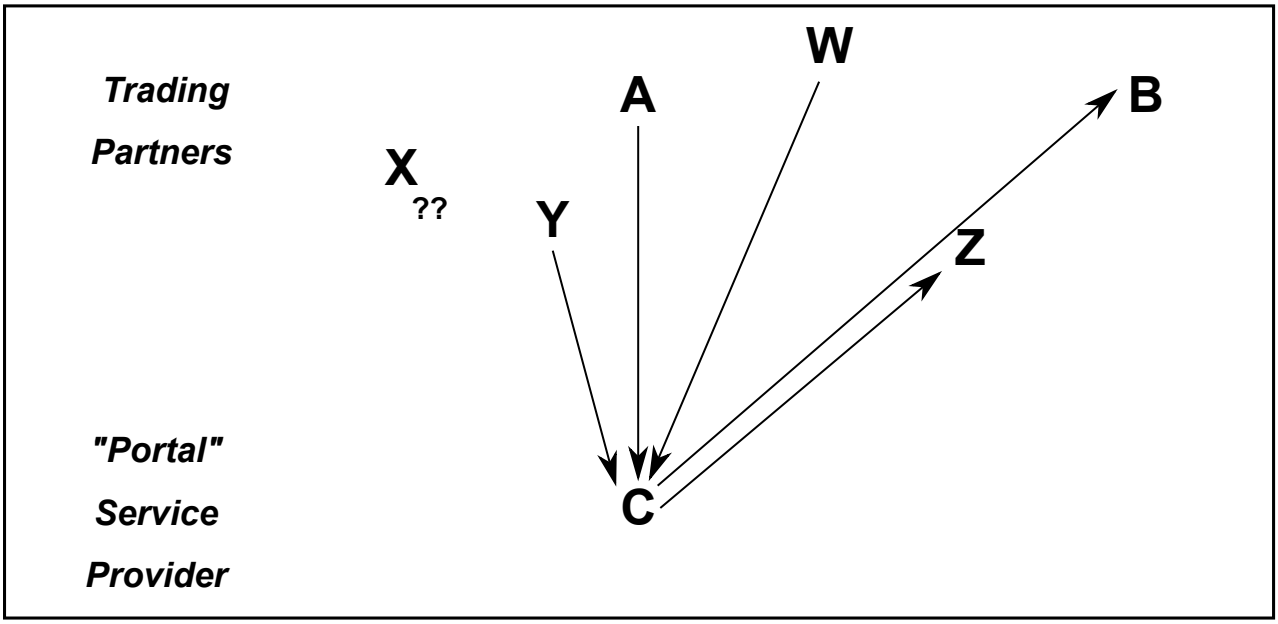
Figure 4. Two trading partners working through a 3-corner network



This readily can be seen to be a 3-corner model with the service provider in the centre. But now C can be the dominant party, mandating the access from A and the access to B. And at first, this may not seem like such a problem other than A and B perhaps having to change the data format of their documents or the nature of their communications protocols if C is unwilling or unable to do so.

However, there is a risk that is not immediately apparent. In the following diagram the other parties W, Y and Z may all accept the constraints imposed by the controlling C party. But what about party X who has been disenfranchised from the trading relationship?

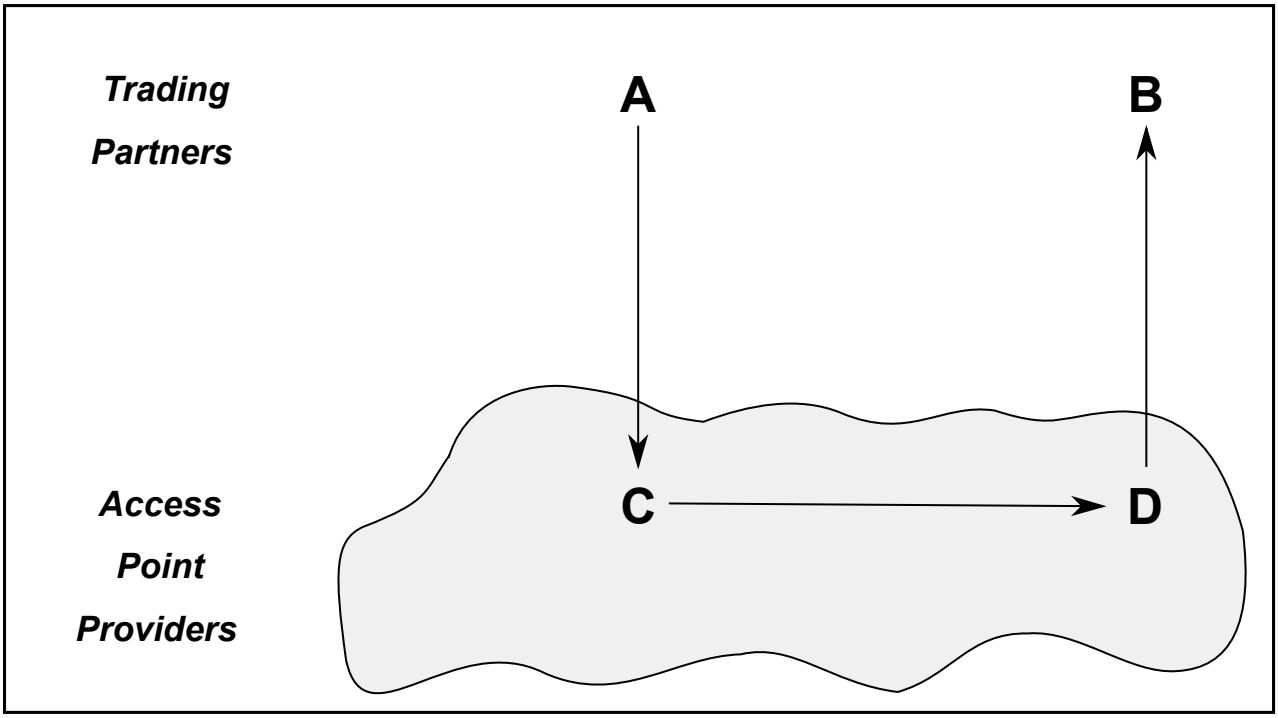
Figure 5. Many trading partners working through a 3-corner network



The access demanded by C might be too expensive for X to afford. Perhaps the document format demanded by C is one not supported by X. Perhaps there might a physical constraint preventing X and C from connecting. Perhaps there is a cross-border issue preventing C from providing the service to X. Even worse there simply might be bad blood between X and C and C simply refuses to let X participate. Moreover, C represents a single point of failure for the entire community. Perhaps C cannot scale their service to accommodate all who need to use the service. For whatever reason or reasons, going through a single service provider can be far too constraining for some of the parties that need to be involved. Yet for many years this has appeared to be the solution that communities worked towards, and I offer evidence in my 2015 essay of the Government of Canada's requested "fully managed service" and the White House's Office of Management and Budget (OMB)'s requested "central collection portal".

Consider, then, the following depiction of the alternative 4-corner-model approach first implemented for electronic invoicing by the PEPPOL project and then donated to OASIS and adopted by the Australian DBC. Here the network is a set of connections between access point providers, each providing a network access service to their respective customers.

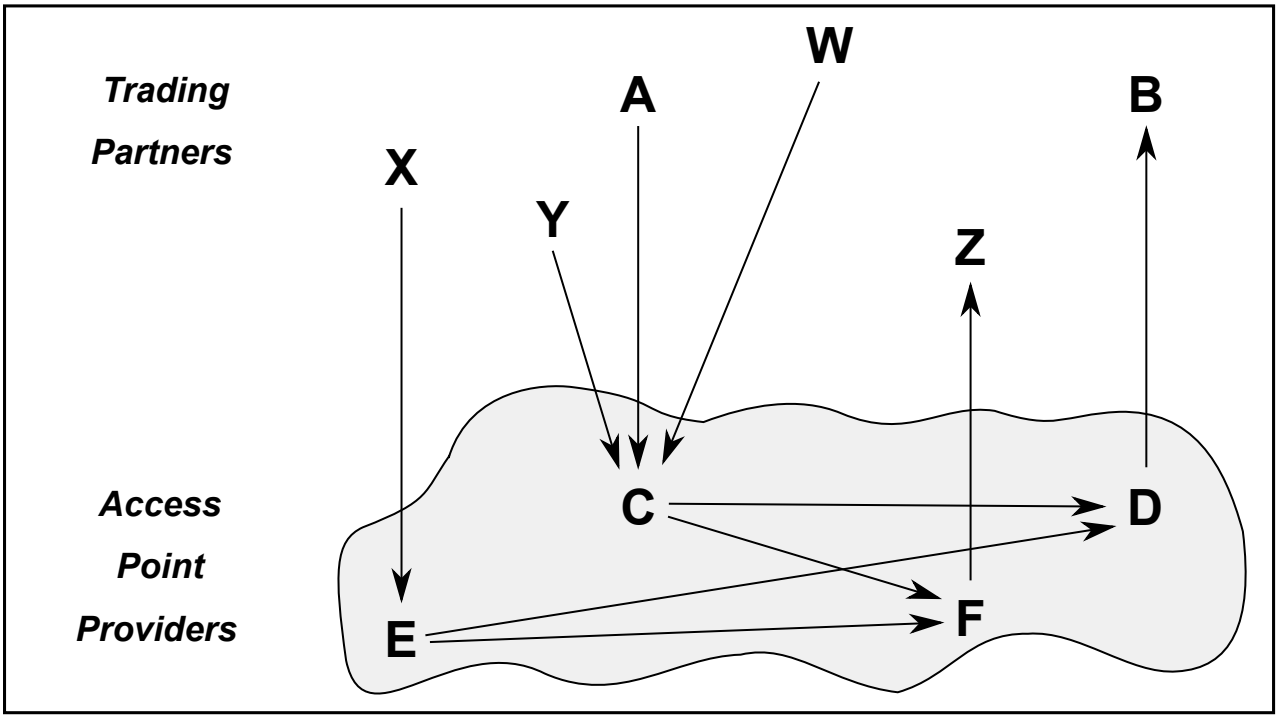
Figure 6. Two trading partners working through a 4-corner network



In the simple example of A sending a document to B, the document is not sent directly between the two parties. Rather, C is an access point providing a network access service to A, and D is an access point providing a network access service to B. The network itself is defined as a suite of service level agreements and commitments regarding document formats and communications protocols, but such is imposed only on the connection between access points C and D, and not on the users A and B. The actual document format and protocol used between A and C are private to the relationship between A and C. Such is the same between B and D and could very well be very different than those between A and C. And either or both could be different than those in the network obligations between C and D.

This nurtures a marketplace for multiple access point providers delivering a common networking service to all of the trading partners. And, again, there are no constraints on the relationship between the trading partners and their access points. The only constraints are on the relationship between access point providers. And so one ends up with a network architecture implemented as follows.

Figure 7. All trading partners working through a 4-corner network



In this architecture, only the access point providers need communicate with each other using UBL - ISO/IEC 19845 or ISO 20022 for the document formats and whatever interchange protocol is agreed upon at the transport layer. There is no obligation for the trading partners to use these network conventions because their relationship with the access point provider is private and can support any document format and any communication protocol. Of course they can choose to support the same network protocols, and then the access point provider's job is simplified, which may lead to cheaper services.

Moreover, larger trading partners may choose to become their own access points. The deployment of PEPPOL has led to the creation of open-source implementations of the OASIS protocols and these implementations are being used by organizations large and small in Europe and Australia. But the bulk of users buy their access service from access point providers rather than committing themselves to the service provision obligations.

But the big opportunity is for a multitude of small access point providers each creating a business to service their particular constituency of users with whom they may already have a relationship of some kind. The users come to them willing to pay for the access service for their documents to be sent and received across the network to and from their trading partners. No-one gets disenfranchised. Those who don't like the access point providers available can nurture a new one to service them or become an access point provider for themselves.

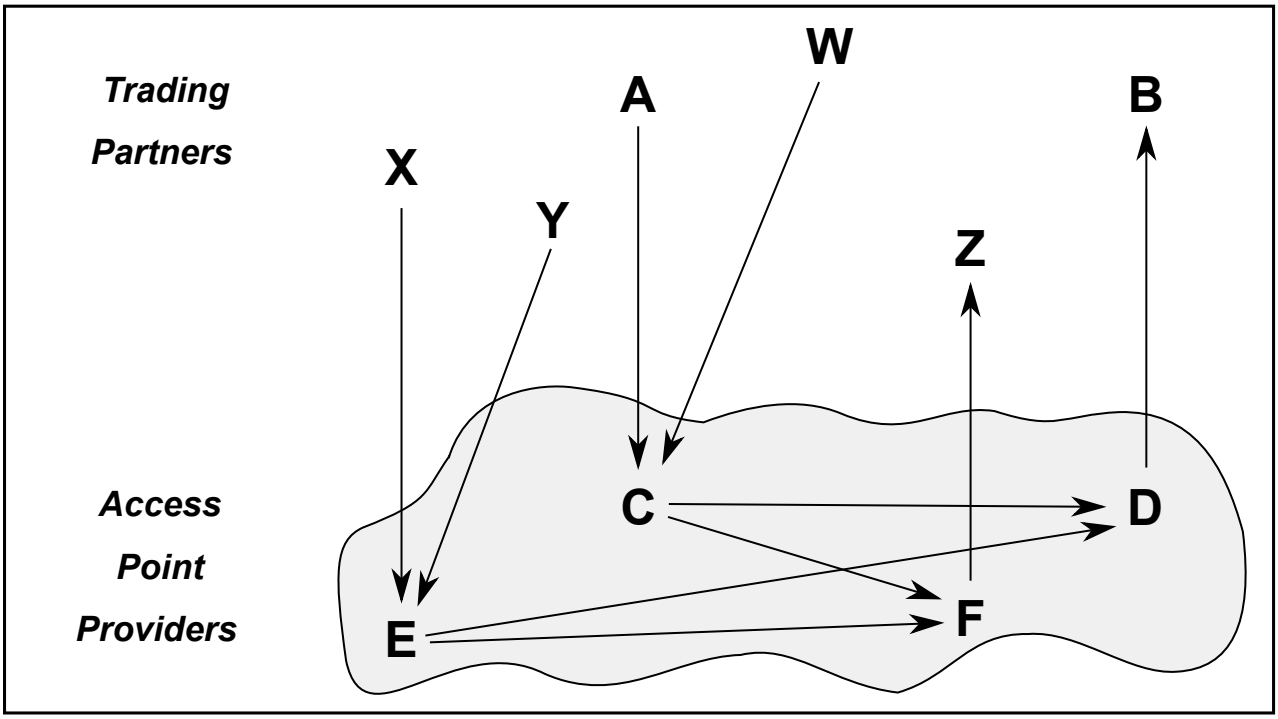
And for all of this, there is no single point of failure. Any one access point provider failing to live up to its service commitments to its customers and to the other access points will not prevent the other access points from fulfilling their obligations because they are using other access point providers.

Surprising to some, this model is not new, until one realizes how well such a system works. There are 4-corner-model implementations of other global systems that have been working for a long time. For example, when using the postal service, one sending a letter to a recipient in another country still gives that letter to their country's postal access provider. The country postal service sends the mail to the target country's postal service within the worldwide agreements and protocols for post. The target country's postal service then collects all of the letters from all countries that are addressed to a given addressee and delivers them according to the postal conventions of the target country. And the very same happens when making a long distance telephone call. Such interoperability solutions

have been real-world deployments of the 4-corner model and PEPPOL made the leap to recognize the same could be done for electronic invoicing.

One particular flexibility with the 4-corner model applied to electronic communications systems over the Internet is the opportunity for parties to change their service provider or buy the services from multiple service providers based on the services provided. Consider in the following diagram compared to the previous diagram where party Y has had a falling out with access point provider C and chooses to use provider E instead.

Figure 8. Changing the access point provider



Perhaps C has raised the cost of doing business beyond what Y can afford. Perhaps C has gone out of business. Perhaps Y is using a new document format not supported by C. All Y has to do is procure the access point service from another access point provider and they are back in business sending their documents to Z and B.

Such an open standards-based e-invoicing interoperability framework has been proven to be successful for procurement and is being adopted, as noted earlier, in new transportation networks. The security and stability of this network architecture is getting the attention of health, construction and other industry sectors. Inherently, this network approach lends itself to cross-network bridges between access points of two separate networks (say, those of two different countries), thus promoting international cross-border interoperability. That the US Fed is considering this open network approach looking forward is very promising.

4. The Fed's three-year planned next step

The U.S. Federal Reserve has been working with the streamlining SIPS programme since 2015. As noted earlier, part of this effort is supporting the BPC that was formed as a volunteer group of organizations and individuals working together to promote greater adoption of electronic business-to-business (B2B) payments and remittance data. As was true for the DBC in Australia, there is no cost to join or to participate in the coalition's efforts, and the BPC is open to any individual or organization interested in its objectives.

But there is work to be done and so all of the volunteers are expected to step up and contribute to the cause.

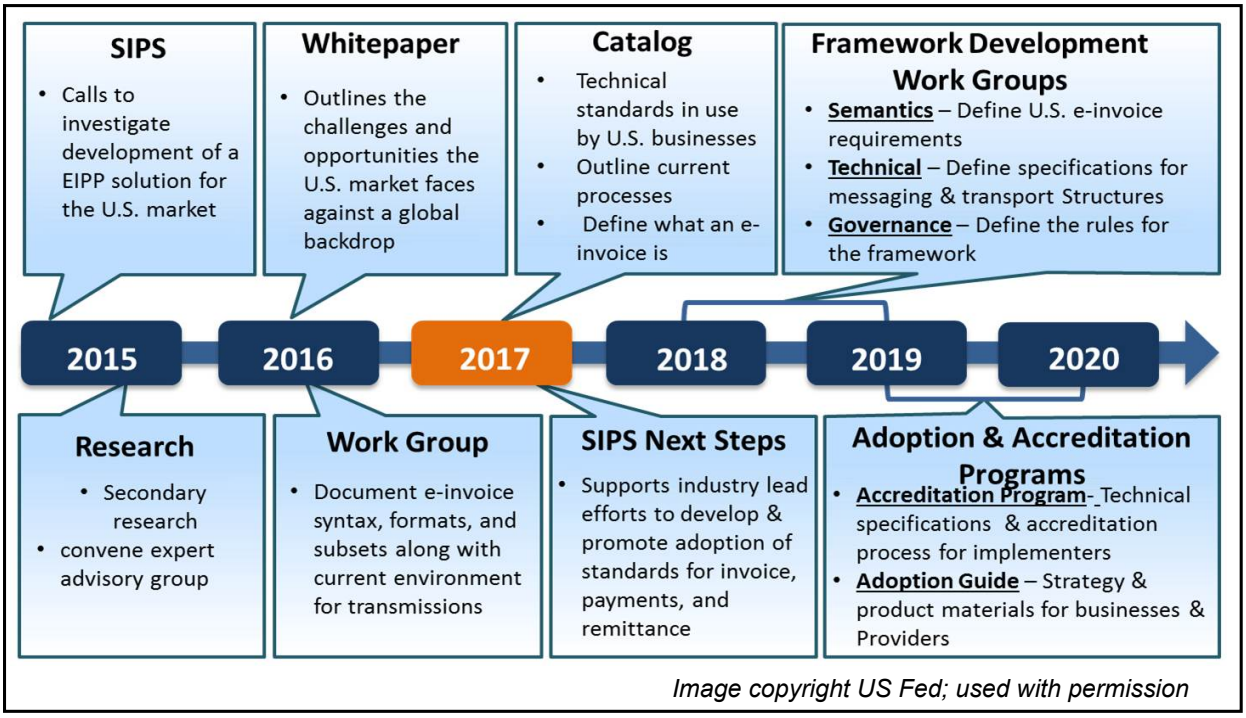
The BPC promotes B2B payments education through regular conference calls, in-person meetings and webinars. It also sponsors and facilitates work groups that develop educational, technical and standards material. Two of the current work groups and initiatives align with the earlier diagram in this essay regarding the intersection of international standards:

- ISO 20022 Education and Promotion Work Group
- e-Invoicing Work Group

Research into determining the pain points, the problems to be solved, and the ways solutions have been designed and deployed worldwide after two years has led to establishing in October 2017 a three-year plan going forward as the next step, detailed at [Next steps].

The following image from the US Fed is an overview of the entire project looking back and looking forward.

Figure 9. The US Fed's three-year plan



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The objective is to aggressively work towards defining all of the semantic, technical and governance aspects of the US e-invoice format and framework in 2018. This meshes well with the OASIS UBL technical committee's calendar for progressing UBL - ISO/IEC 19845 amendments to address any new requirements not already in the specification that are informed by the work of the BPC. Although the BPC has not yet formally selected the specifications to be deployed, that the initial starting point is the Australian model puts the two globally-accepted OASIS specifications in top consideration.

As noted in the October 2017 minutes [Meeting Materials], the BPC is recruiting for its work groups and they would like to have more participation from representatives of the payments industry stakeholders: financial institutions, providers, practitioners, and associations. As mentioned earlier, there is no cost to join and provide your input. Per those minutes, just email business.payments.smb@mpls.frb.org [mailto:business.payments.smb@mpls.frb.org] to join the coalition and its work groups.

5. How Canada can move forward on this

The Government of Canada has talked a long time about open standards and open source policies. The latest of which that I've seen is in a memorandum of understanding between the Treasury Board of Canada Secretariat and the Department of Digital, Culture, Media and Sport, of the United Kingdom of Great Britain and Northern Ireland [MOU] in October 2017 where I see:

> 3. They commit where possible to working towards and conducting their activities based upon the following principles of digital development...
>
> ...
>
> ii. **open standards** – technology requires interoperability and so a clear commitment to a credible royalty free open standards policy is needed;
>
> iii. **open source** – future Government systems, tradecraft, manuals and standards are created as open source where appropriate and are shareable between members;
>
> iv. **open markets** – in government procurement create true competition for companies regardless of size. Encourage and support a start-up culture and promote economic growth through open markets;
>
> ...

Great talk, but for over a decade I have been trying to convince the government to look into the existing open and free-to-use electronic invoicing specifications that now are backed up with available open-source solutions. As I mention in my 2015 essay, the government continues to look at archaic legacy solution architectures, in particular the 3-corner-model "portal" concept and proprietary document formats. Such is not the way of the future, and it hasn't been for a while now that the European 4-corner model is being adopted in Australia and being considered for adoption in the US.

Surely the vision of the BPC and its e-Invoicing work group promotes these important principles of open standards, open source and open markets. And even if Canada had the stomach to try to address an all-of-economy e-invoicing solution and attempt to catch up to other countries on its own, then now is the time to do so when its largest trading partner is already well underway to considering such.

The opportunity for interested organizations in Canada is that membership in the BPC is open to anyone, and so includes Canadians even if it doesn't say so (and I checked!). As of this writing, Crane Softwrights Ltd. is the only Canadian member of the e-invoicing work group and has committed to help in regard to the OASIS-related specifications under consideration.

Wake up, Canadian banks, companies and governments! This is an amazing opportunity to participate in the creation of a cross-border standards-based e-invoicing interoperability solution tailored to the economies of both of our countries. Such will better service business clients doing procurement and demanding payment using invoicing. Why are you not jumping at the opportunity to be at the table and joining the BPC?

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