Standardised Electronic Invoicing for the Increased Efficiency of Australian Small Business

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About the Author

I have a background in ICT and my businesses have implemented and maintained various accounting systems for several SME's. I have also developed in-house accounting software to facilitate the operation of my own businesses.

Introduction

The requirement to accurately record and reconcile all purchasing into a business accounting system for both management and taxation purpose represents both typically a 5% of total business manpower requirement and probably Australia's single biggest double handling exercise. Nearly all businesses of which I have been involved in some way have busily devoted manpower into the exercise of electronic entry of received invoices into their accounting system.

Large business with frequent trade partners are usually able to avoid the expense of this double handling through the setup of B2B gateways and electronic data interchange (EDI). Small business rarely implements EDI due to both lack of systematic streamlining behaviours, costs associated with the implementation of EDI and the lack of willing EDI trade partners.

Some efforts at EDI have recently been included into main-flow small business accounting programs (e.g. MYOB) but compatibility, openness and competitor-willingness to have their software "talk" to competing products clearly demonstrates that a national approach to the problem should be adopted to avoid the typical hurdles associated with commercial interests.

I propose that a government controlled approach to the problem of standardising electronic invoicing would not only pave the way for software manufactures to have openly communicating systems (indeed it could even be mandated) but would ultimately significantly reduce (if not entirely eliminate) the double handling of invoice recording and bring about a significant reduction in the expense of related manpower.

I would note at this stage that this document is far from comprehensive (I ripped it up on the deadline evening) and lacking referenced supporting research (apart from obvious observations). I put this document forward as a prospective seed to hopefully start discussion towards Australia rapidly adopting the competitive advantages of standardised electronic systems for the good of any and all businesses of any size (particularly the small businesses).

A final note. I talk about invoicing but this system in fact should address all aspects of the B2B and B2C paper trail and could do so with little extra effort yet massive rewards.

Immediate Benefits of a Nationally Implemented Electronic Invoicing System

The following is a non-exhaustive list of obvious benefits:

- Much less labour time required (reduced administrative costs for businesses).

- Fewer errors occur because data is not re-entered by a human operator

- Business transactions are able to flow faster due to immediate data availability

- Potential to significantly reduce business paper usage (the environmental factor - all businesses hold huge amounts of paperwork). This also leads to reduced physical storage space requirements and moving costs.

- Easier and much faster access to legacy business records (I have spent hours searching for records from archives when we needed the exact information only available on the original paper copy).

- Information can be accessed anywhere (not locked down to a physical location that is storing paperwork and/or mailing address).

- Quality staff of the required meticulous nature that can accurately double handle invoice information are non-trivial to recruit. These quality staff can be utilised for other more productive tasks.

- Vastly improves the ability of ATO audit staff to validate larger (if not entire) purchasing evidence body. Auditing of this information could be done through a software upload on request.

Rough System Mechanics

I would propose the following key aspects to a National Electronic Invoicing System.

- A compatible accounting/ERP system
- A specification for the exact format that Electronic Invoicing data is encoded.
- A vendor and purchaser online national database
- A transmission and receipt acknowledgement system

Compatible Accounting/ERP system

I would expect that if the government went to the effort of setting up the necessary systems and standards for National Electronic Invoicing that software developers of Australian specific accounting packages would look to provide immediate support for the standard.

It would be relatively easy for existing Australian accounting package providers to incorporate standardised National Electronic Invoicing provided the standard and systems were reliably and clearly developed. Take-up would likely be rapid, particular after a critical mass is achieved. Users would likely angrily reject paper-based invoices as it would amount to increased workload (and ultimately drive businesses not supporting electronic invoicing to upgrade). If take-up of the national system looked slow (potentially due to interfering commercial interests), legislation could be passed to mandate the support of the national system.

I would also note that the open nature of the National Electronic Invoicing standard should be freely available to any party that wished to incorporate the capability into their own "in-house" systems as it is sometimes the case that business will develop their own ERP software specific to their industry. These parties should be at no disadvantage in accessing the national system.

Electronic Invoicing Data Format Specification

I would propose an ASCII plain-text data encoding format with markups. XML or such a derivative would be a prime candidate. A very simple example of an XML like structure:

```
<invoice>
    <vendor>
        <vendor name>
            ABC Pty Ltd
        </vendor name>
        <vendor ABN>
            12 333 444 555
        </vendor ABN>
    </vendor>
... etc ...
</invoice>
```

The major benefits offered by an XML like format include:
- human readable (not possible with binary formats)
- robust
- self documenting
- huge base of programmers familiar with this encoding approach
- system agnostic

The exact markup-tags (e.g. <invoice>) that are available in the format specification would need to be carefully determined by consultation with industry and accounting system experts. The ability for the format to support large hosts of capabilities yet be easy to implement is an absolute must. Non-exhaustively, aspects that must be supported for example include:
- Quotes
- Purchase orders

- Purchase receipts
- item serial numbers
- service invoicing
- etc (all aspects of the paper trail for any type of business and its specific requirements…)

A PDF version of the invoice would also be included in an electronic invoice (to support legacy paper requirements and also allow stylistic capability for branding etc that companies include on paper invoices). The PDF version of the invoice would allow for easy human viewing for invoice validation on receipt etc.

Vendor / Purchaser Online National Database

An online national database of all business vendors / purchasers ideally would be created for the purpose of Electronic Invoicing. This database in fact already exists and most business users have already used it to search ABN details on business.gov.au. The database would need to be extended to allow the storage of user public encryption keys and possibly the email address of the user's accounting system.

Public key encryption offers many benefits to the electronic invoicing system:
- data integrity (avoiding data modification)
- identifying the sender and receiver (digital signature)
- ensuring only the intended receiver has access to the data

A public encryption key belongs to the family of asymmetric encryption which is different from symmetric encryption. Symmetric encryption uses the same key to encrypt and decrypt data. Asymmetric encryption has a pair of keys that are different (known as the public and private key). If data is encrypted with the public key, it can only be decrypted with the private key and vice versa. This offers a great benefit for the electronic invoicing system in that the public key can be published to everyone while the private key is kept secure. Asymmetric encryption is a complex subject beyond the scope of this document but a good overview can be obtained in 10 minutes from wikipedia:
http://en.wikipedia.org/wiki/Public-key_cryptography

Considerable effort would be required to avoid the online database becoming unavailable from failures, denial of service attacks and other malicious behaviours - potentially including modifying the public database's public key records and email addresses. Suitable mechanisms of authentication would also need to be engineered and allowed for to enable users with lost credentials to regain control of their public database record and also to replace compromised keys.

I would recommend looking at the Internet's domain name system (DNS) as a highly distributed and robust mechanism for online domain name database access. This system

structure may be easily modifiable to meet the purposes of a national electronic invoicing system that is highly resilient and robust..

Other safeguards could include user alerts if online database records are changed and alerts for first time users of another user's public key to verify the actual user or re-verify the actual user when a public key record changes (this feature would need to be built into the accounting packages).

Transmission and Receipt Acknowledgement System

The easiest to implement method of transmission would be email. Email is a decades old proven technology that is universally understood and supported.

Transmission of electronic invoices would be to the email address of the receiver's accounting system. Automatic acknowledgement would be emailed confirming receipt of the transmission.

Asymmetric encryption of all emails would be undertaken to protect the email contents, validate the sender and only allow the receiver to decrypt the email. It would also ensure the integrity of the transmission. I would recommend an adaption of a PGP based email encryption and signing system (likely OpenPGP based) in combination with the public key online database. Further info on PGP email encryption can quickly be gained from: http://en.wikipedia.org/wiki/Pretty_Good_Privacy

Conclusion

In the same way that large Australian business look for operational efficiencies to improve competitiveness (e.g. through EDI), Australia also needs to be seen as a large business competing with other countries. As a country we need to be looking for operational streamlining. My proposal to fast-track Australia to having a standardised national electronic invoicing system has the potential to increase man-power efficiency in the private SME environment in the order of potentially several percent. This will not only be good for the economy and productivity of Australian SME's but is likely to be politically popular for any government that champions such a system (provided it isn't seen as an additional big-brother opportunity).