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# IMPLEMENTING E-COMMERCE TAX POLICY

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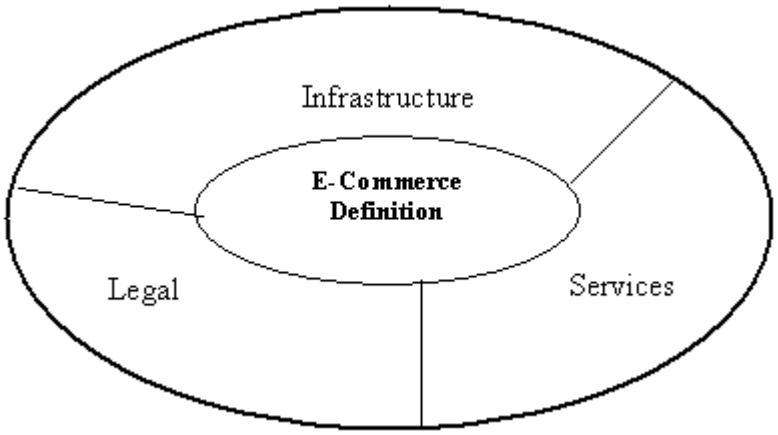
## 1. INTRODUCTION

As e-commerce forced policy makers to question the principles of taxation, the question is whether technology should adapt to meet the revenue needs of government, or whether government should reform itself to the new means of technology. It is apparent that e-commerce dramatically heightened this dialectic relationship between public policy and technology. This paper evaluates the role that different components could play and analyses if and in which way these components can assist in collecting taxes from international transactions. It will take a closer look into the different technical possibilities for the development of an effective system for collection of consumption tax. If technology poses challenges, it also offers solutions.

## 2. E-COMMERCE: THE ELEMENTS AND COMPONENTS

Who owns the Internet? The most straightforward answer is that no one does. There is no single body, which controls all activities on the Internet. It simply exists and virtually impossible to 'switch off'. The Internet comprises of three layers. *First*, it exists as 'physical' infrastructure- as a data network 'managed' at a high level by international bodies and at a day-to-day level; by various public bodies and corporations whose networks it uses. *Secondly*, it exits as a 'service' infrastructure provided by ISPs who offer access to the Internet. *Thirdly*, it exists at the level of users.

The growth potential of e-commerce rests three main components: the services, infrastructure, and the legal. These components combine and interact at the time of any e-commerce activity.

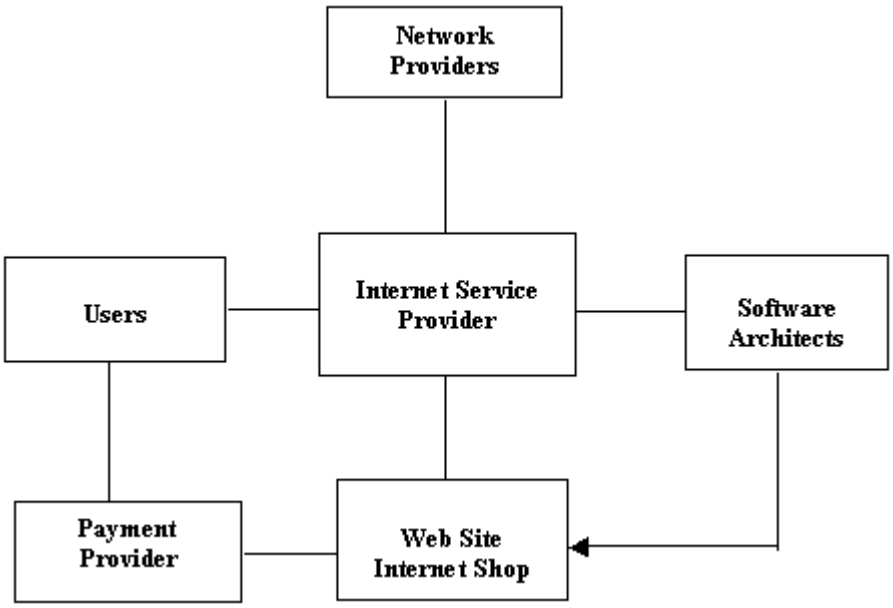


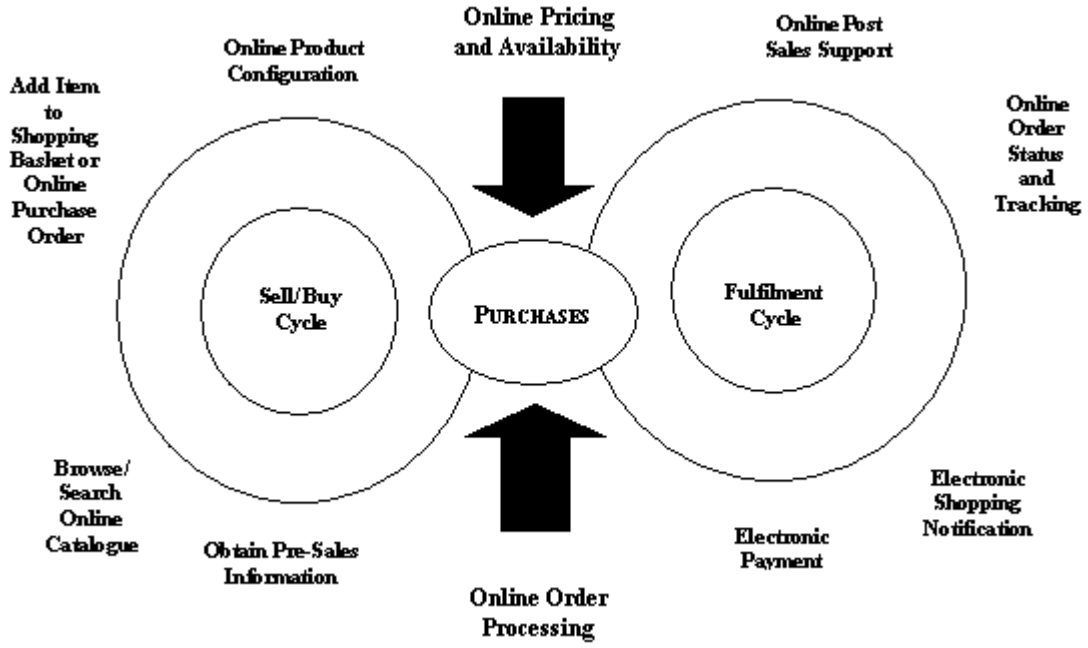
For development of physical infrastructure e-commerce relied on a variety of technologies, the development of which are proceeding at breakneck speeds (e.g., interconnectivity among telecommunications, cable, satellite, or other Internet 'backbone;' Internet service providers (ISPs) to connect market participants to that backbone; and end-user devices such as PCs, TVs, or mobile telephones). The service component of e-commerce is responsible for making sure that commercial transactions can actually take place and provides the viable means for committing to such transactions, such as providing means for making payment over the Internet possible (through credit, debit, or Smart cards, or through online currencies). It also makes possible the distribution and delivery (whether online or physical) of those products purchased over the Internet to the consumer. The legal component affects the conduct of those businesses engaged in and influenced by e-commerce, as well as the relationships between businesses, consumers, and government. Examples include technical communications and interconnectivity standards; the legality and modality of digital signatures, certification, and encryption; and disclosure, privacy, and content regulations.

The detail of each the components and their regulation depends on the requirements of the perspective. The boundaries of the components would accordingly vary to accommodate the scale of need of a perspective. The importance of infrastructure is more for communication and business process perspective. Similarly, the legal regulations that provide certainty of electronic contract, privacy, consumer protection, and taxation would be of much importance for services perceptive.

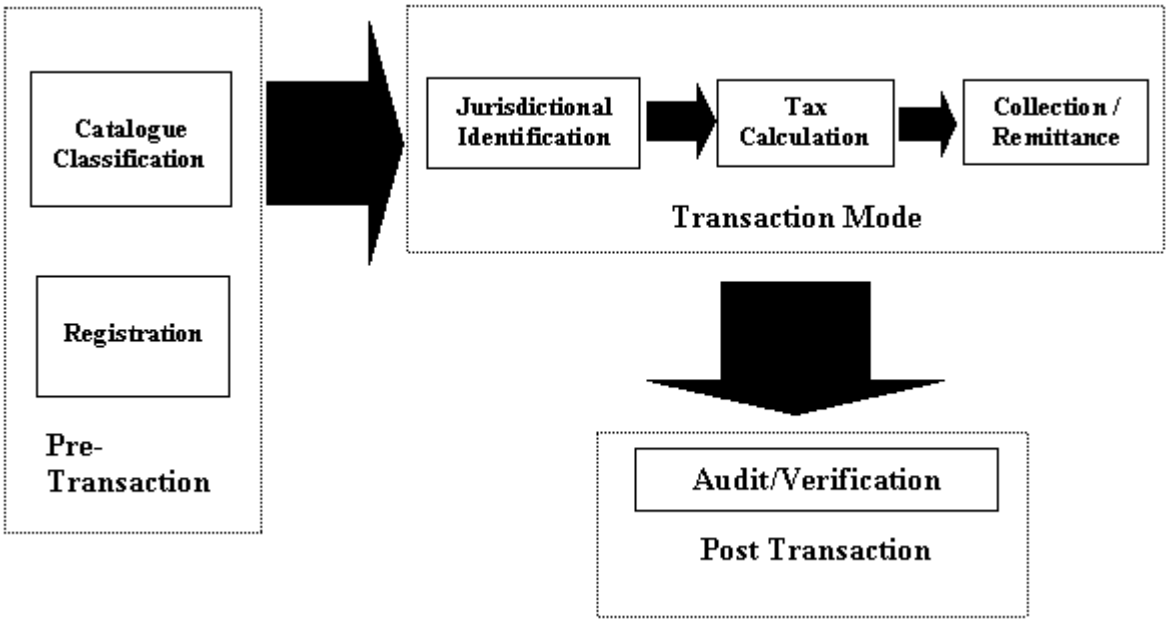
### 3. E-Commerce - A Typical Transaction

Before embarking on the discussion of the proposal, a diagrammatic representation of a typical Internet transaction would be useful.






The importance of this architecture is two fold *first,* the Internet causes disintermediation, that is intermediaries in the physical environment that have been effective for collection of the taxes on consumption occurring in a given jurisdiction have disappeared in the virtual world. The effect of this is the fragmentation of economic activity, so much so that it becomes difficult to establish where, in jurisdictional terms, activities are being carried on and by which legal persons. This is not just a question of anonymity, although that is certainly of administrative significance, but is a question of the diminished importance of location in connection with transactions and need for the parties to know each other's identities. The above architecture shows that there is possibility of re-creating the missing *intermediary*, who can act as tax collector. This new intermediary can be financial institutions such as the (credit card) or Internet service providers (ISP) and can effectively act as surrogate governmental collectors of tax. *Secondly*, from a taxation perspective, it is useful to re-visit Internet and e-commerce environment where the logical model of physical environment of collection of taxes will be required to be implemented for proper collection of consumption taxes.



## 4. A PROPOSAL: SUMMARY STATEMENT

The object of this proposal is to utilise the ISPs as a responsible authority for calculating, collecting and paying of taxes. ISPs are easily identifiable hence participating; States and Local governments would be able to enter into contracts with them to operate the tax administration. The ISPs would be responsible for receiving required information on transactions from a seller and shall provide software for determining the taxability of a transaction, the appropriate tax rate, and the tax due. The proposal would:

### A. REQUIREMENTS

- Involve state of the art e-commerce technology applied to tax calculation, reporting, and payment process.
- Utilise ISP (or any other financial intermediary under a fall back situation) being required to undertake such a role with a profit incentive. Once the consumer approved a transaction (including the sales tax or VAT), the ISP together with the relevant seller website would perform the tax calculation, collection and clearing process.
- Provide jurisdictional verification, to be determined by Digital certificate and assisting to the maintenance of privacy of consumers by minimizing the disclosure of personal information for tax collection purposes**.**
- All States and local governments would utilise uniform, definitions of tangible and digital products and services
- Development of tax compliance software to determine the consumption tax due on each sale. This system would work based on information of the product being sold; the taxing jurisdiction of the purchaser; the registered status of the purchaser. Both e-commerce sellers and ISP would have to use this software.
- Real-time calculation of tax to be based on simple inputs. Tax authorities must all make information on tax rates readily available in a standard form, and must give notice of changes.
- Invoicing standards- global agreement on standard invoice details and layout, including electronic invoices.

### B. CHARACTERISTICS AND BENEFITS

- Maintenance of the database of uniform product classification. Sellers would access the database to retrieve the applicable rate, but preferably would integrate the database into their systems or access the information online in real time.
- Substantially reduce the overall burden on consumers by radically simplifying state and local tax systems, inter-State standardization and simplification of certain key features of consumption tax systems, and this includes harmonized sales/use tax rate per State (keeping US states in mind). The nexus rules should be rationalized into a standardized set of rules where all taxable transactions would be treated equally, i.e., there would be a mechanism for all vendors to collect taxes that are assessed and due, and reducing the aggregate collection costs of all transactions, the benefit of which is intended to all consumers, whether or not they make purchases on the Internet
- Provide a destination based simple and equitable tax system that would impose equal obligations and costs on all sellers, local or remote, regardless of sales channel or technology utilized.
- Development of relevant methodology for auditing the tax transactions. The seller would be subject only to a periodic ‘system check,’ sufficient to ensure that the appropriate information is passed to and received from the ISP.
- The costs of building the system would be borne by the taxing authorities. The cost of development of the software and creation of the Database would share between the different

countries calculated in proportion to the Internet usage of the population. Similarly, the deployment and maintenance costs would be apportioned to revenue agencies according to usage.

## C. LIMITATIONS

- Minimising the frequency of tax rate changes and preventing countries from unilaterally making changes in the product classification, exemption definition or sourcing rules.
- Rationalisation of 'nexus' into a standardized set of rules where all taxable transactions would be treated equally, would require the political will to overturn *Quill*.

## D. SOME FURTHER ISSUES: US SALES TAX

The threshold issues in deciding whether a particular seller of goods or services is subject to sales tax in State A are, first, does State A have the authority to require the seller to pay the tax,[1] and secondly, is the sale one that is subject to tax under the particular regime. In the US, the principal limitations on the states' ability to tax derive from the Commerce Clause and Due Process Clause of the Federal Constitution. The distinction between Commerce Clause limitations and due process limitations is important in that Congress has the power to overrule the first, but not the second. Over the past several decades, a substantial body of law has developed defining the constitutional limits on a state's ability to tax remote vendors, principally in the mail order context. The current U.S. sales/use tax system is governed by the nexus standard as clarified by the Supreme Court in *Quill*.[2] In *Quill*, the Supreme Court held that the Commerce Clause of the Constitution bars a state from burdening interstate commerce by imposing a sales or use tax collection responsibility on a vendor unless that vendor has a physical presence within the state. Accordingly, out-of-state vendors who do not have a physical presence within a state may make sales to an in-state consumer without incurring a responsibility to collect and remit sales or use taxes to the taxing jurisdiction. The U.S. Supreme Court ruled that physical presence is not required for Due Process Clause 'minimum contacts' analysis, but retained the *Bellas Hess*[3] bright-line rule requiring physical presence for Commerce Clause purposes based on the value of certainty and *stare decisis* in fostering business investment. However, the *Quill* court implicitly questioned whether the physical presence test was in fact the right test, and explicitly invited Congress to overrule its holding if it deemed it desirable. Although it is the responsibility of the consumer to self-assess and remit use tax with the appropriate jurisdiction. However there is virtually no compliance or enforcement of this system. This also may be in part due to the complexity that is inherent in sales and use tax system. There are more than 6,000 overlapping state and local jurisdictions, which may impose sales/use taxes. Each jurisdiction is constitutionally empowered to determine both the sales/use tax rate that will apply within its borders, and which transactions it will tax. As noted by the Supreme Court in *Quill*, this has led to an increasingly complicated 'quagmire' of multiple sales/use tax rates, multiple characterizations of the same transaction, and multiple audits of the same transaction by multiple authorities.[4]

Unless Congress acts, the *Quill* decision may mean that states simply cannot constitutionally obtain jurisdiction over remote e-commerce. Congress recognising the special nature of e-commerce sales could reverse *Quill* and eliminate the requirement for physical presence to establish substantial nexus under the Commerce Clause. The question would then be how to articulate and interpret the new standard. The most obvious would be to preserve the overall *Complete Auto*[5] analysis, but to declare that the substantial nexus prong of that analysis would be satisfied if the Due Process Clause is satisfied, *i.e.,* that for purposes of requiring a remote vendor to collect sales tax on a sale into a state, there would substantial nexus if the vendor purposefully directed its activity toward that state. That approach, although appealing in its simplicity, has significant problems. From the state's point of view, this would give them the right to require a much larger category of remote sellers to collect their sales tax, but in the absence of other tools, it would give them no practical way to actually enforce that right. From the e-commerce seller's point of view, this would cause greater compliance problems. Having the obligation to collect sales tax from almost any purchaser, it would require that

the seller would have to determine how much to collect and whom to send it to among thousands of different taxing authorities. However, nexus issues are inherently intractable, involving as they do fundamental fairness concerns and deep constitutional principles. It would be require more of the political will rather than legal to make any changes.

Many commentators also believe that the current system of sales/use taxation must be radically simplified if the current nexus standard is to be altered[6]. A system, which is radically simplified, would potentially lead to better compliance and an increased revenue flow to state and local government as a result. Additionally, a radically simplified system would reduce the cost to state and local governments of administration and enforcement. Further, a simplified system would benefit all vendors because it would reduce their cost of compliance.

Development of such uniform process of classification would not be too difficult as there have been already steps taken through Streamlined Sales Tax System (SSTS). The goal of SSTS is to develop a more simple, uniform, and fair system of state sales and use taxation that significantly reduces the burden imposed on retailers, preserves state and local sovereignty, and enhances the ability of U.S. firms to compete in the global and information economy. Although the proposal is voluntary, retains current law with regard to 'nexus', however the SSTS is step in the right direction.

Radical simplification is, however, only the beginning to dealing with all of the issues regarding the sales and use tax system. If radical simplification could be achieved then there could be standardization and clarification of the nexus rules, i.e.; all taxable transactions could be treated equally regardless of the medium used for purchase. Currently the nexus standard, as upheld by the Supreme Court, required that a vendor must have 'substantial nexus' with a state before the state can impose the obligation of the collection of sales tax. The definition of substantial nexus and what level of activity within a state rises to the level of substantial nexus is the subject of much controversy and had been widely litigated. The nexus rules should be rationalized into a standardized set of rules where all taxable transactions would be treated equally. There appears to be a general consensus that it would be necessary to give the states the ability to require a broader group of remote sellers to participate in the collection and/or enforcement of the existing system of sales and use taxes if we are to deal effectively with the issues of base erosion and discrimination. It is clear that, in reality, any effort to give the state and local tax authorities the power to require more remote sellers to join their tax system must be coupled with efforts to significantly simplify the process and lighten the compliance burden on those sellers. This would require the cooperation of Congress, the state and local tax authorities and industry groups representing the various business interests involved, electronic, and otherwise.

## 5. THE PROPOSAL: DESCRIPTION

In theory, the burden of the sales/use tax or VAT is passed on to the consumer. In practice, it is depended on the particular good or service that is sold. If demand is highly inelastic or if the reach of the tax is sufficiently broad to apply to the consumer's alternatives, it would be passed on. On the other hand, where the consumer could purchase the same good or service through other means that avoid the tax, then the seller who was subject to the tax would almost certainly have to absorb the cost. The assumption that the tax would be or should be passed on to the consumer, is critical to understanding the jurisdictional issues that arise from sales into a state from a remote source and, in particular, to understanding why it important to achieve neutrality.

Virtually all concerned parties agree that state taxes on e-commerce should maintain competitive equality between similarly situated economic actors. The principle of tax competitive equality suggests that those who provide goods or services in e-commerce should be taxed no differently than those who provide goods or services in conventional commerce. It is a principle of consumption tax that state taxes on e-commerce should be uniform, including uniform standards and definitions. Simultaneously the taxes on e-commerce should also be administrable, so that compliance burdens are not excessive and the costs of administration are reasonable.

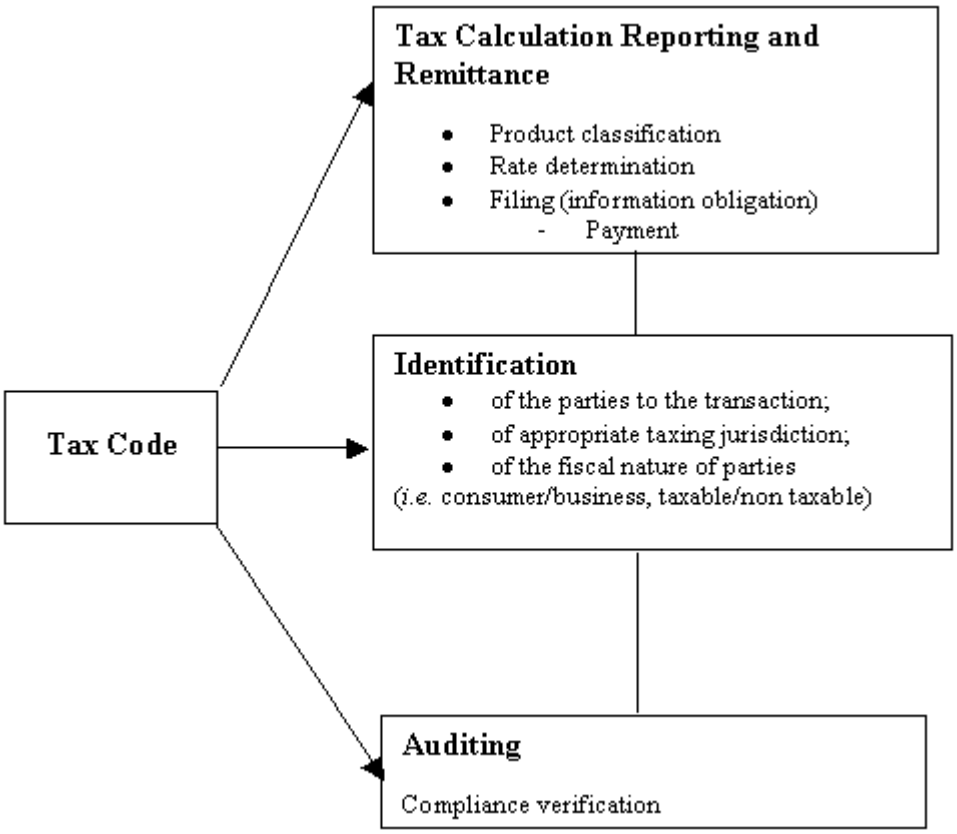
The basic economic activities of governments are to raise and re-distribute revenues and to provide public services. If these activities could be thought as the 'business of government', then just as private businesses are reaping efficiency gains from the Internet and e-commerce, so too could governments increase the efficiency of what it does as a business. The governments should also think about how to use e-commerce to improve services to citizens. The OECD back in 1998 recognised that the e-commerce technologies could also be used for administering tax laws, collecting tax revenues and identified some opportunities offered by the technologies include:

- revolutionising communications between tax authorities and taxpayers and enhancing access to information for taxpayers to help them in complying with their tax obligations;
- tax registration and filing requirements could be simplified;
- electronic assessment and collection of tax can become the norm rather than the exception; and
- easier, quicker, more secure ways of paying taxes and of obtaining tax refunds will be facilitated.

Governments were urged to seize the opportunities offered by the new communication technologies to improve the service they provide to taxpayers, to reduce the cost of complying with tax rules and to use more effectively the resources devoted to the collection of taxes. Though it did not provide any guideline to what part of Internet or what technology could be used it was effectively recognised that it would be ultimately a combination of technology and principles, which would provide the answer to tax collection complexities. What must a solution provide?

- Identification of the parties to the transaction (the status of the customer as a business or a consumer).
- Identify the jurisdiction, which is entitled to tax the sale: this would be the state, which has the appropriate connection with the customer, probably the state where the customer resides but ideally the state where consumption takes place.
- Identify the type of product that is being sold, so that the correct tax rate and other tax rules can be applied.
- Tax calculation-product classification and rate determination.
- Reporting and remitting of taxes to the appropriate government authority and
- Compliance verification- proving to an auditor that taxes was paid.

This is represented in the following diagram:




The system should also provide individuals and businesses an 'architecture of trust'[7] between them which could comprise[8] of:

- authentication to confirm the identity of individuals;
- authorization, to ensure an individual is permitted to conduct a particular function;
- privacy, to ensure others cannot discern what exchanges are taking place;
- integrity, to ensure the transmission is not corrupted; and
- non-repudiation, to ensure the liability and accountability of the sender.

As a matter of pure tax policy, the state has a legitimate interest in administering a tax system that

- Is fair to those who are subject to it;
- minimizes any distortion of economic decision making within the economy;
- does not require undue effort by either the tax collector or the taxpayer to interpret and administer; and
- raises a sufficient amount of revenue to carry out the legitimate functions of government.

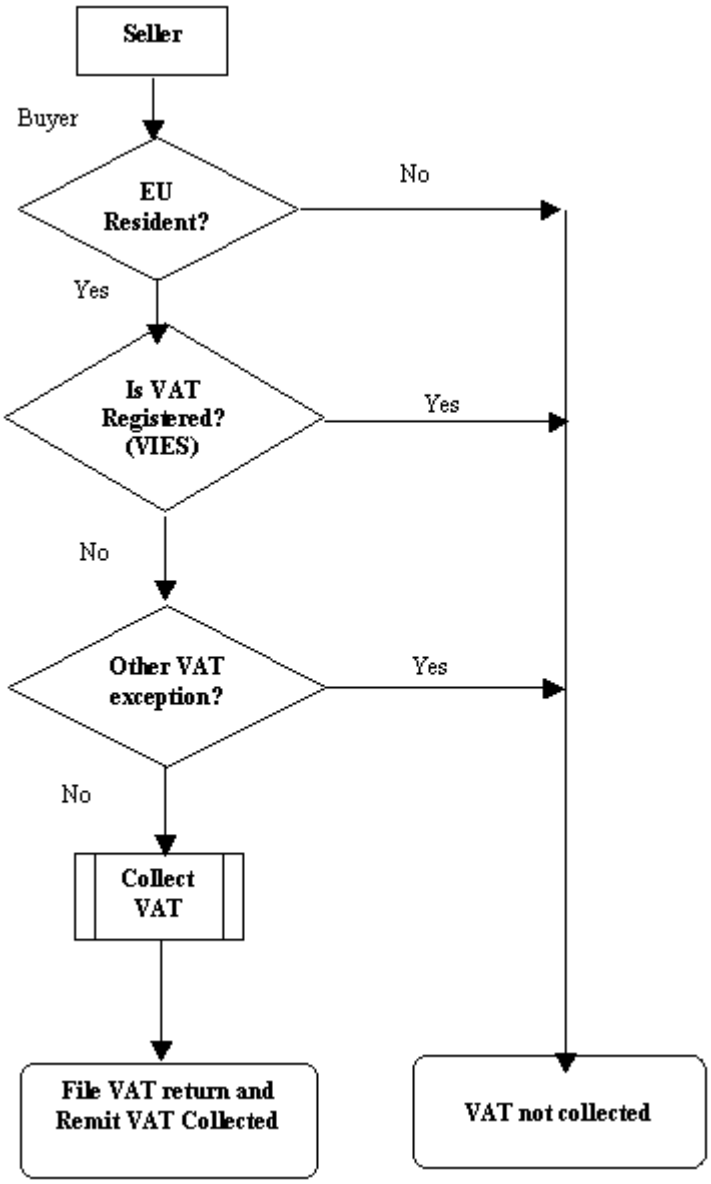
Generally, all four of these goals are best met through a tax system that has as broad a base as possible and that has effective, but socially acceptable methods of enforcement.

The initial focus is on VAT and EU Digital VAT. The EU has already committed itself to tax digital transaction without an effectively describing the possible mode of collection. Assuming the worst-case scenario from a VAT collection and enforcement perspective, a private consumer within the EU downloads a virtual good, e.g. software programme, from a server located in a Caribbean low tax jurisdiction. Payment is made using a non-accounted payment system.

Before implementing any solution for such cases it is necessary to define what the tax authorities need to ensure before taxation in the related EU Member State. The answer is quite simple: it is the

properly calculated tax paid to the Member State where the transaction is taxable requiring the gathering of information and the collection of VAT from residents outside the EU. The other three requirements are, to learn that a (taxable) transaction has taken place, to obtain the information necessary to determine the Member State to apply the appropriate tax rate in which the transaction is taxable and to gather the information to properly calculate the tax due. The required information depends to a great deal on the implementation of the places of supply principle. However, the EU Directive on Digital sales provided that there are two distinct places of supply for digital deliveries in accordance with the varying tax status and location of the recipient. Accordingly, this has created the necessity for identifying the location of supplier. There is difference between taxation of digital transactions originating either from without or within the EU.

The following diagram shows a common workflow of an e-commerce transaction.




This workflow diagram based on the above mentioned elements of indirect taxation adds further issues particularly relevant for imposing EU VAT on digital sales:

- EU Resident: Currently it is not technologically possible to identify with certainty the geographical location of the buyers
- Registration status of the customer for VAT purpose: The tax status of the customer to

determine whether the recipient is registered for VAT purposes or is a private consumer. This however could be solved by modernisation of the VIES system, which the EU Commission has already initiated and it is now available to the traders at the time and place required. However, this does not ensure that the buyer is who he claims to be.

- Other VAT exceptions: Sellers will not be required to collect VAT, under these rules, if their only activity in the EU is the supply of these services, and if the annual sales in EU is below the threshold. If non- EU seller sells only to VAT registered business the seller will not be required to register for VAT.
- The tax rate: There is a potential issue to be addressed concerning the possibilities of different tax rates applying to ostensibly similar goods and services.

In the example scenario mentioned above only two parties are involved in the transaction, the vendor, or rather his server, and the customer and the ISP of the customer. There is a lack of intermediaries such as wholesalers and middlemen. The central element in the proposed new system would be the re-creation of '*intermediaries*', which in this scenario is the ISP. Connections to an ISP are typically made through a local point of presence ('POP'), commonly through a local or toll-free call utilizing telecommunications facilities acquired from other companies. Since ISPs know the identity of the user, and the characteristic nature of Internet requires the ISP to copy all Internet communications, including e-commerce transactions, for subsequent transmission to the user, it is possible they could take the responsibility of keeping track of all financial transactions a particular user makes and act as tax collector.

In order the proposal work effectively all participating States and local governments would enter into contracts with one or more ISPs to operate the tax administration system. The seller and his access provider reside outside a particular jurisdiction (in the above example outside EU) hence they therefore could not be subject to public duties such as the collection of taxes. Again it wouldn't be feasible to enter into contracts with the sellers' ISPs as theoretically there can be 'N' number of ISPs and concluding mutual agreements with them would not even be a theoretical solution. This leaves only the buyers' ISP who could be made liable for the collection of taxes.

Primarily the proposal is aimed to be as simple as possible. The proposal is coherent with the conditions and principles laid down by the OECD Ottawa Taxation Framework Conditions. The system is simple to administer, it would not require any fundamental change to the tax principles, and neither does it contradict any established tax principles. The proposal is consistent with the view that tax policies should be respectful of the fiscal sovereignty of a Nation State. The system only applies the 'applicable tax' for the 'appropriate' jurisdiction. It is consistent with the beliefs that governments should keep the tax and administrative burden on consumers and businesses as low as possible. Hence the proposal, utilizes the available technology at its disposal, based primarily on four basic elements: an ISP, digital certificate, a database of universal product classification, and software for calculation of the tax. It provides a structure, which facilitates the collection and remittance of sales tax or VAT that is due, but currently goes uncollected. ISPs would not impose taxes; they only execute the collection procedure based upon a set of rules and guidelines outlined by revenue agencies.

The collection of sales taxes on remote consumer purchases is not a new tax. The responsibility to pay sales/use tax had always been directed by guidelines and they have never been nullified by court decisions or by federal laws. Similarly from the perspective of EU VAT on digital sales, it is the EU Directive that provides the law and rules to collect the tax on digital sales. The proposal only provides the method and the means to collect the taxes.

E-commerce changed the paradigm under which consumption taxes had been established; selling of intangible goods over the Internet is a relatively new phenomenon for traditional consumption tax structures. Hence, it is more out the necessity that the governments should re-define the tax bases and provide uniform categorizing goods and services that could facilitate a process of coordination. That is, because the e-commerce marketplace is so integrated, the policy toward handling one issue,

even within the national context, has implications for the policy set that is available to policymakers on other issues. The proposal keeping in mind the global reach of e-commerce, would implement the uniform product classification not only within boundaries but also across-boundaries. Further, such an activity should also be carried out under the auspicious of a world trade organisation. The benefit of involving a world organisation would be *firstly*, to provide consistency, and *secondly*, it would encourage the much-needed involvement of developing countries. Such an effort could also initiate cooperation between the developed and developing countries in the broader area of tax policies. The process of uniform product classification would ultimately provide 'tax neutrality'. For example, following the EU approach if all e-commerce transactions were services, they all should be tax the same way. To do otherwise would imply inconsistent VAT treatment of electronic transactions within and outside countries. The approach the EU had taken effectively 'harmonizes up' tax rates in order to maintain tax neutrality.

The system would levy applicable taxes to purchases regardless of the domain of the seller. In effect, due to the uniform product classification, the system would have a universal acceptance. Hence, purchases from the local shop would receive similar tax treatment to purchases made through a catalogue or by e-commerce. From a sales tax or VAT perspective, this means certain socio-economic groups would not receive unfavourable treatment since they do not have Internet access, or they live in certain geographic location.

Why ISPs and why not the financial intermediaries like credit card companies itself would be made responsible for collection of taxes. Financial intermediaries do play important role not only in e-commerce transactions but also in all other forms of remote sell. It has been proposed 'as a way out'. The OECD Consumption Tax TAG and the WP 9 Sub-group have suggested that credit card companies could be enlisted to collect the consumption taxes. One of the reasons for this suggestion was that financial institutions already facilitate the financial transaction between the business and the consumer. There are advantages to this view:

- Over the long run, it is expected that most of the financial intermediation on the internet would be in the hands of institutions that are of sufficient size and sophistication to handle the complexities of offering credit/debit services in what must be the most complex marketplace in history, hence administering a system for the collection of sales tax or VAT could fit fairly naturally into their systems.
- Reliability, respectability, and creditworthiness would be a sine qua non for any successful participant in financial intermediation on the Internet. Thus, a system in which they play a leading role would be more stable and predictable, with comparative lower compliance costs for the tax authorities.
- There is likely to be sufficient nexus between such institutions and the states whose tax they assist to collect; an institution that extends credit to residents of a state will undoubtedly use the resources, including the courts, of that state as part of its own collection and dispute resolution processes, which predictable should work quite adequately for a destination based consumption tax system.

However, there are also disadvantages. A number of financial institutions or credit card companies have already indicated that they do not collect the necessary data to perform the tax collection task. Although financial institutions are in a better position than the seller to know the place of consumption or purchase data that is relevant to collecting the tax on a particular transaction, but they are in an inferior position with respect to knowing what taxable category the product being sold falls into. They would have to be in a position to rely on data given them by either the buyer or seller in determining whether a particular sale is entitled to exemption or a lower rate of tax in the relevant jurisdiction. In fact, financial institutions claim that they are not engaged in the business of selling goods and taxable services and therefore are not equipped to collect and remit consumption taxes. Putting the financial intermediary in the position of tax collector in a credit extension context increases their credit risk with respect to the taxes collected. Compensating them for that risk will be another cost of such a system.

There is also further concern about privacy. A customer's expectation that a financial institution will respect the privacy and confidentiality of their business relationship is fundamental to the relationship between an institution and its customer. To the extent that a card issuer provides or verifies personal information, such as a residential address to a merchant or to anyone else for a purpose unrelated to approval or disapproval of the credit card transaction, raises privacy and confidentiality concerns. A cardholder has a reasonable expectation of privacy in the information that it furnishes to card issuers for obtaining credit. Privacy protections of cardholders' personal information are contained in privacy laws in the United States, the European Union, and in other major jurisdictions around the world. The privacy provisions differ considerably from country to country, and there are restrictions on transferring personal data from the European Union to other countries. A card issuer's access of its records to obtain personal information about a cardholder in order to disclose or verify such information with a merchant could potentially expose the card issuer to liability. An important component of the card issuer-cardholder relationship is the reassurance given to the cardholder that the institution will safeguard personal information in strict confidence. This confidentiality promise is written into many card agreements and policy statements published on the Internet and elsewhere to inform customers of the institution's policy. Such assurances are essential to customer confidence, particularly in the case of on-line transactions, where customers concerns about privacy are especially acute. Credit card issuers are sensitive to consumer fears about revealing their personal and confidential information over the Internet. The public perception that financial institutions to online merchants would release personal information such as a cardholder's place of residence raises industry concerns that this could seriously erode consumer confidence, compromises confidentiality, and could potentially expose them to legal liabilities.

However, even if all the issuers could be drafted as tax collectors, there is always the possibility that credits cards would be replaced by unaccounted digital cash in the future as the principle mean of financial transaction, which would progressively diminish their usefulness in establishing the location of consumers. Digital cash systems are more than a hypothetical possibility. MasterCard and Mondex, for example, have been testing 'smart cards' for several years; and in Denmark, a consortium of banking, utility, and transport companies has announced a card that would replace coins and small bills[9]. A tax system based on credit cards would only exacerbate the trend towards digital cash: the anonymity it offers would become immediately more attractive if governments seek to keep tabs on consumers through their credit transactions. Finally, there is always a psychological barrier particularly in consumers accepting credit card companies and tax agencies working together for collecting taxes.

It is worth considering that these alternate intermediaries have no obligation to serve as tax collectors or even transaction reporters. While seeking a centralized pressure point on which to impose collection or reporting obligations is attractive to the taxing agencies, however it seems unlikely that financial intermediaries would cooperate. For example, rewriting the entire credit card industry's software and billing systems to support a tax reporting, collecting and remittance system would be far too costly to implement. Further making use of credit card companies would not provide any collateral benefit for the growth of Internet and hence e-commerce. The growth of Internet is directly proportional to the cost of development of its infrastructure and cost of accessing Internet. In fact, the more central the player is in the e-commerce arena, and therefore the more attractive as a collection point they would appear to tax agencies. It would therefore be entirely logical to utilize the ISPs as they perform a more central function than their financial counter part. Although working out the system that works well from a compliance point of view while not giving the ISPs an overly burdensome duty of inquiry into the bona fides of the information provided them would be delicate task.

Developing counties would benefit in encouraging an infrastructure that supports e-commerce market conditions. High Internet access rates, low penetration of electronic means of payment (such as credit, debit, or Smart cards), and cumbersome delivery systems are primary obstacles to the growth of e-commerce in such countries. In such a situation making the ISPs accountable and

providing them with financial incentives would encourage them to reduce the cost of Internet access. The number of ISPs operating in most developing countries is quite small hence entering into contact with them would be less burdensome. As most of the technological elements would be developed collectively this would ensure the reliability and performance capability of the technology. Again, it is important in developing countries that do not have the technology or infrastructure to create such a trustworthy and trusted end-to-end systems.

Developing countries often lack well-designed tax policies that are translated into clear legislation and are administratively feasible. This proposal sets out the strategy for encouraging an international cooperation and for developing greater coherence between interested international organizations, it aims to utilize the on going technological advancements and the fundamental infrastructure that is co-related with the development of internet. This collective effort will not unduly burden the developing countries and will provide the much need mechanism for tax collection.

## 6. THE PROPOSAL: ANALYSIS

The system as proposed is to work in two stages. The first stage would involve identification of the parties to the transaction. The ISPs seller's website and identification technologies would act in combination in order to:

- independently verify the location of the consumer,
- identify if it is a taxable sale to a consumer or an exempt sale to business (or to a non-profit organization or government)
- utilise supportive infrastructure allowing controlled access to the information relevant to taxation

In the second stage, the ISP would be responsible for receiving required information on transactions from a seller and would provide software for determining the taxability of a transaction, the appropriate state and local tax rate, and the tax due. The system would be supported by a universal product classification database and all States and local governments would utilize the same definitions of tangible and digital products and services based on that classification. The sellers would be made aware of tax information at the time of the sale, so that the information on tax due would be available to the customer before completion of the transaction. The credit card companies and other electronic payment processors would transfer the tax due to the ISPs for transmittal to the respective governments.

### 6.1 IDENTIFYING THE LOCATION OF CONSUMPTION FOR TAX PURPOSES

#### A. Digital certificates

A prerequisite to any tax is identifying the taxpayers who are participating in an international transaction as well the geographic location of these parties. However, the decentralized nature of the Internet frustrates attempts by e-commerce businesses to identify the location of these parties. The similar problem would be faced by the ISPs when acting as tax collectors. Although they would be aware of the location of the consumer, however they would require verifying it beyond any reasonable doubt. As well as finding out which jurisdiction the customer should be linked to it would be important to find out whether a customer is a business or a consumer.

Digital certificates are suggested as one mechanism that would assist in this process. Digital certificates (also known as electronic credentials or digital IDs) are digital documents attesting to the binding of a public key to an individual or entity. They allow verification of the claim that a given public key does in fact belong to a given individual or entity.[10] Although this technology has been in existence for sometime now but it is not in widespread use. Such technology is mainly used on 'commerce servers'. These server IDs allow web sites to identify themselves to users and to encrypt transactions with their visitors. This kind of digital certificate helps the host server's users know that

they are communicating with a particular host and not an impostor.

Digital certificates go hand in hand with digital signatures. Digital signatures work on key pairs, one of which is public and the other private. The private key is used to encrypt a document while the public key is used to decipher it. The private key needs to be protected to preserve its value. The private key can be stored in various ways. For example, it can be stored on the user's hard disk, on removable media (such as a floppy disk), or on a smart card or other 'smart device'. These digital signatures are usually used with digital certificates to authenticate the attestation in a certificate. They could also be used to digitally sign a VAT invoice so that a business purchaser has an electronic invoice that could form the basis of claiming an input tax credit for VAT paid. The digital certificate could be registered with a so-called 'trusted third party' that could be a government agency or even a private company; the trusted third party would act as a kind of bonding agency to ensure the veracity and accuracy of information given out by the digital certificates[11].

A high degree of international harmonisation would be necessary if any scaleable and reliable PKI is to be used by the ISPs for tax collection purposes. Both the OECD and UNICITRAL have addressed the issue of cryptography[12]. The OECD Guidelines advanced the key principles to govern the emerging PKI as trust, choice, market driven, industry standards, clear liability, and the promotion of international trade. UNICITRAL advanced a full Model Law on Electronic Signatures, and this gives a developed legal framework for certificate service provision within an internationally operative PKI [13]. Article 7 of the Model Law on e-commerce paved the way for electronic signatures[14]; it adopted a *de facto* two level definition of electronic signatures, and extensively provides for a PKI system of digital signatures through a three party conceptualisation of the duties and responsibilities of parties in the context of electronic signatures[15]. The European Commission has also taken initiatives[16] and in relation to electronic signatures, the provision is the Directive on Electronic Signatures[17].

Regulatory and legislative initiatives to build the PKI, at the level of UNITRAL, OECD, the European Union, and the legislative and policy work of the UK, are all promoting the network PKI. It also provides important contribution to the development of the previously discussed 'architecture of trust'. The emergence of the infrastructure is, of course, still only in its early stages and period as to when such network architecture would be in place is difficult to predict[18]. However, through the regulatory structure put in place, and from the initial structure of private sector certificate service providers (CSP) entering into the market, it would appear that the network of cross-certifying CSPs would develop quite rapidly.

For the proposal to work, effectively it would be required to identify whether their customers were consumers or businesses. This is because VAT would need to be applied by suppliers to sales to consumers but not to sales to businesses. Business customers would operate the reverse charge, as they do now. Under the reverse charge system, a business buying certain services and digitised products from abroad pretends that it is selling these items as well as buying them. It then charges VAT on those notional sales, accounts for that VAT and pretends that it had suffered the same VAT on its purchases. The overall effect is the same as if the business had paid VAT on the purchases in the first place.

Some commentators have argued that it would be quite straightforward for suppliers to identify the difference between business customers and consumers, but in fact, it would not. So long as business customers are left to apply VAT to their own purchases, consumers would have a financial incentive to pretend that they were businesses so that suppliers did not impose VAT on them. It would therefore be no use to include a question on an order form, 'Are you a business?' If more subtle questions were designed to check the answer, it would likely to put consumers off: people are not used to being quizzed when they go into shops, and they resent being quizzed when shopping on the Internet[19].

The distinction between consumers and business is not something inherent to Internet technology.

However, Digital certificates have the potential to deliver this feature. A certificate includes the following information: identity of certificate service provider; name and details of signatory; validity period; unique certificate number; limitations/exclusion on third party use; details of how key generated; system for protecting signatory private key; details of revocation provisions, details of service hardware and software; and the certificate service provider's own digital signature. The digital signature on the other hand provides the following features: (i) it is uniquely linked to the signatory; (ii) it was created under the control of the signatory; (iii) its integrity is clear; and, (iv) the integrity of the message is clear form the signature.

It should be noted, however, that in some legal systems, only natural persons might hold certificates and the person in their corporate function may only be distinguishable from the private person using an attribute field. However, such situation could be avoided if the revenue authority in a country, or a trusted third party, certifies businesses as being registered in a particular country or countries for VAT purposes by issuing them digital certificates. If the purchaser presents a digital certificate, the transaction would be relieved from tax. If the purchaser does not present a digital certificate, it would be treated as a consumer, and VAT would apply using the identification techniques, which I am going to discuss below under a fallback situation.

In my view, adoption of the use of digital signatures in conjunction with a digital certificate assist identification process and would be able to provide information such as the location of the user beyond any reasonable doubt.[20] It also would help to determine accountability of a particular transaction, integrity of the documents and records used along with identification of the sale to a consumer or business.

**B. IP Address and Credit Card**

However, in a fall back situation where ISPs are unable to utilize a digital certificate, as an alternative means would be to rely on are IP address, credit card number, credit card billing address, and self-declaration. According to the OECD Consumption TAG, all of these identifiers have some, if not significant, limitations.

Internet Protocol (IP) addresses offer potential in that they are an essential part of every access point to the Internet. However, IP systems would seem to offer limited possibilities in terms of securely identifying a consumer with a taxing jurisdiction at the time a transaction takes place. Even the new IPv6 (Internet Protocol version 6) addresses, which have space for much more information than the old IPv4 addresses, would not carry geographical information, in order to include a predictable geographic component, further work required to be carried out. Even then, customers could use 'anonymising' services to hide the geographical information. In a fall back scenario the pseudo-geographic link between IP number and jurisdiction could be potentially significant. Given today's technology, the limited improvement in location technology offered by IP traces appears to be the best available. However, there is a significant reluctance on the part of business to undertake implementation of such systems because of concerns of the lack of commercial necessity limited utility, costs of implementation and potential for disruption of service in cases of unclear results.

While credit cards are currently the dominant method of payment for goods purchased over the Internet, it is important to note that there have been significant developments towards other payment mechanisms, including digital cash and stored value cards. Alternative payment mechanisms such as digital cash and stored value cards are the second-generation payment systems for many Internet accessible jurisdictions around the world. These payment systems are becoming more widely accepted for e-commerce transactions as new and innovative solutions come to the market place.

Credit card systems as currently designed are not much help in identifying jurisdiction. Although as a part of the marketing purposes the credit card issuers are likely to be interested in whether cards were held for business or personal use, however providing such would case serious customer privacy concern. This would not be a practical option for three reasons:

- Only minimal information about cardholders is passed to suppliers, both in order to reduce the scope for fraud by learning enough about cardholders to impersonate them and because of cardholders' concerns about privacy.
- The status of a cardholder is not computable from the card number. Thus, an additional stage of looking up the status and transmitting it to the supplier would be necessary. While the concept of matching a credit card number to the country of residence was originally thought to have promise, further investigation demonstrated that there was no correlation between numerical Bank Identification Number to geography.
- The determined evader of VAT would simply apply for a new card, telling the card issuer that it was for business use, even if it was in fact for personal use.

It would further raise some troubling privacy issues. Currently, governments generally do not have access to credit card company data unless a particular cardholder is suspected of committing a crime. The use of such data for tax collection purposes would potentially put a detailed record of a person's buying habits in the hand of government authorities on a regular basis, without the normal judicial protections. The possible abuses of that information are enormous and it is doubtful whether many individuals would easily accept the unprecedented invasion of their privacy.

None of the two foregoing would go to deal with every conceivable scenario and they would susceptible to some manipulation. What they do have going for them is that they are (potentially) readily accessible – the question is how to be sure of the information at that point when it is required. It is evident that neither of the two systems of 'IP address' and 'credit card' would individually be capable of providing all the requisite information. However, if they were used collectively and applied by a method of 'tests and check', it would be able to provide a definitive answer. A rule could be made that the jurisdiction given by two tests out of three would be accepted or any other rule of the form "x out of y", if enough tests were available. However, the closer x gets to y, the more often these automatic tests would fail to be decisive. Hence, on the balance, Digital certificate would provide much accurate information, which could also be applied automatically. It would be much easier and reliable to use one decisive method, instead of a combination, and thereby making limited efforts to establish jurisdiction and determine the tax status of the customer.

### 6.2 TAX RATES AND PRODUCT CLASSIFICATION

The key to getting tax calculated correctly is not to make the calculations simple, but to make the required inputs simple. Once the tax jurisdiction and status of the purchaser is determined, the rate of tax for that jurisdiction must be determined. This rate is often dependent on subtle classifications in the domestic tax code. There is no international consensus as to classification and treatment. Therefore, the proposed system would need to elimination multiple definitions of same product or services. It is widely recognized that the current system allows for multiple characterizations of the same product or service when delivered to different jurisdictions, makes the task of compliance for e-commerce businesses extremely cumbersome and unwieldy. This burden would be correspondingly greater for small web-related businesses who do not have the financial or human resources to track changes in these characterizations on international basis. In the proposed system, all the countries and local governments would utilize the same definitions of tangible and digital products and services. Uniform product and service definitions would significantly ease the compliance burden of both traditional and e-commerce businesses. This corrective step would require that States along with their constituent local jurisdictions work together possibly in some organisation such as WTO or OECD to develop the uniform definitions[21]. What is called for is to develop concise, well-formulated definitions, which would be acceptable for all parties. On the other hand, collaboration to develop uniform definitions would motivate certain definitional clarifications, e.g. 'services' vs. 'digitised products,' that would simplify the task of compliance and administration on the parts of both the states and businesses.

Once the jurisdiction and the kind of product is known, the next step will be a universal product coding database 'lookup' which can provide the appropriate tax rate to apply to the value of the sale.

Clearly, the ability to harmonise systems and methods as well as the ability to change tax amounts are factors solely within the competence of the governments of the world. It would thus be the primary responsibility of the governments to create such a database for each taxing jurisdiction. This database would be used to determine which products are to be taxed and which are to be exempted. The countries would be able to change the tax rates. This would also reduce the cost of maintenance of the database and the calculating software.

The design of the database would be kept simple. Each jurisdiction would use one tax computation formula and one set of parameters, applicable to all sales of digitised products. Different classifications for different digitised products would be eliminated, because otherwise each product would need to be coded as "category 1 if sold to jurisdiction A, category 4 if sold to jurisdiction B, category 2 if sold to jurisdiction C" and so on. In such situation people, categorising products would be probable to make mistakes, and changes in categories would be overlooked or misinterpreted.

Countries would not be able to unilaterally make changes in the product classification, exemption definition, or sourcing rules. Instead, an organisation like OECD or WTO would look after for changes that would be necessary from time to time. Countries would be able make changes to the database as and when such requirement would arise and all the participating countries would have to adopt those changes. This database would also be maintained by the same world organization responsible for co-coordinating such an effort, and would be publicly available free of charge on a website so businesses would always have access to the correct information and that format would allow easy downloading into tax computation programs.

For some commentators development of such a database would be a difficult task, apparently because of the magnitude of the task and number of parties involved, in my view there are precedents of such compilations. The World Customs Organisation publishes a Harmonised Tariff, in which all goods (not services) are capable of being classified for customs purposes under thousands of six-digit categories. The Harmonised Tariff is designed to ensure that a particular good is classified under the same Tariff item regardless of the country of export and import. Each country attaches *its* duty rates to the six digit numbers and the duty rates can and do vary by country. Most of the more than 150 major trading nations use the Harmonised Tariff as the basis for applying customs duties to imports.

### 6.3 TAX COMPLIANCE SOFTWARE

The next step for the proposal would be to calculate the consumption tax due on each sale. The world organisation (OECD or WTO) which would be responsible for development of product classification would also contract out to develop the software that would lists the State and Local sales tax and VAT rates on all categories of items for all the countries and some of local governments. It would be a technologically neutral system, designed to be incorporated easily into commercial web sites running on any computing platform. Both e-commerce sellers and ISPs would use this software, which would be free 'shareware'. This would reduce network delays before the consumer committing to the purchase, thus enhancing the purchasing experience. When a consumer makes an online purchase, the software would check the tax rate in the area according to the information about the jurisdiction provided in the digital certificate. If the consumer were not using a digital certificate then the software would calculate the tax rate according to the IP address or credit card details, as appropriate.

All tax calculations would be performed by the software assuming that it would receive the required data to make the calculation. The software would display the tax rate along with all other incidental charges. When the consumer makes the purchase, he or she would simply pay the full amount (cost of the product, Sales tax or VAT, shipping and handling etc). In addition to a formal acknowledgement of the tax due, it would also provide a reference number that would be used for audit purposes.

Some commentators have suggested that the indirect tax system is too complex to be modelled even with current computer and Internet capacity. This is easily disproved, as these aspects of this model are already available in existing commercial products, which offer sales / use tax calculations for the approximately 6400 jurisdictions in the US. A company called 'Taxware' International already employs an online service that tracks all of the sales tax rates of all U.S. state and local tax jurisdictions as well as most VAT jurisdictions and calculates the relevant tax payments (although online vendors must provide customer location information). Combined with IBM WebSphere® Commerce Suite, TAXWARE provides a comprehensive solution for automatically calculating and managing U.S. and international taxes correctly for each transaction from the order information entered into WebSphere Commerce Suite. The new E-Commerce Tax System for IBM represents it is possible to calculate sales, use and consumers' use taxes for both the U.S. and Canada; manage exemption certificates, verify addresses and calculate VAT, Goods and Services tax (GST) and consumption taxes for all of the European Union and most of Asia Pacific and South America[22].

**6.4 COST OF COLLECTION**

Who pays for the cost of collection? Tax authorities should also be prepared to pay for the work that would need to be done in the private sector. Normally, tax authorities expect the private sector to bear the cost of compliance with new laws, and they can use the force of the law to make companies comply. However, here, authorities would have to deal with companies, which would be outside their jurisdictions. Hence, it would therefore be reasonable to expect authorities to pay for the work that would require to be done. The objective always remain the same, the cost of compliance should be proportional to the revenue.

Currently, the supplier who holds the liability for tax collection enjoys the benefits of this positive cash flow. Under this system, the ISP would share in the benefit received by suppliers depending on their relative contributions to the process, or could remit funds to the government immediately. The cost of development of the software and creation of the Database would share between the different countries calculated in proportion to the Internet usage of the population. Similarly, the deployment and maintenance costs would be apportioned to revenue agencies according to usage. The cost of obtaining digital certificate would also be competitive, as it would create a huge new business potential for this sector. It is currently not clear what type of pricing structure would prevail e.g. fixed initial price + annual charge based on number of users, fixed initial price + percentage annual cost or other pricing arrangement. The cost of integrating the system with the respective vendor websites would be bore by the vendor.

The States or Local governments would pay the ISP on a 'per transaction' basis based on negotiated rates so that burdens of tax compliance would fall on the general revenue system, not vendors alone (*Based on Forester Research's current B2C e-commerce sales forecast by category in US, a 5% commission on the estimated tax collected could generate between $400 and $600 million in 2004*). This would act as a source of revenue for the ISPs and hence it the long term it is possible to think of a much reduced cost of Internet access, which will be quite beneficial for growth of e-commerce in developing countries. In addition, vendors could also pay a fee for the ISP for the service, which they would be receiving as part of an end-to-end business system. In such a system, the tax module is generally small relative to the other business modules such as order processing, inventory management systems etc., which are being utilised by the vendor.

**6.5 AUDIT FUNCTION**

The key elements of an auditable system are the detail of the transactions that is available and how easily and in what format that this data may be accessed. The primary audit function would fall on the destination country as the proposal is modelled around the destination principle. Hence, it is the destination country, which will be most interested in compliance. ISPs will act as the principal intermediary in any audit program, thereby alleviating a majority of the burden from businesses. It would be the respective States to decide on the guidelines. The countries should preferably conduct

sales audits in the manner that is customary in law within their state. However, the proposal would favour uniform audit procedures, including uniform record-keeping and retention requirements and a uniform statute of limitations and appeals process. Transaction detail would be retained such that an individual seller can be identified but not an individual buyer. The buyer detail would be retained by the seller. A unique number would identify each transaction by the system. Any transaction reports provided to the seller would also contain this number. This improvement would ease the burden on companies by clarifying and simplifying their audit-related responsibilities. As the system would be capable of providing periodic information on taxable sales and tax receipts collected, hence it is suggested that such procedure is undertaken in regular time interval. Since this system is electronic and since it interfaces at the time of the purchase transaction, revenue officials would have an audit trail that is more comprehensive. It is also suggested that the States should allow the filing of tax returns; and the submission of annual reports on the taxable activity by electronic means.

## 7. PROPOSAL AND E-COMMERCE PERSPECTIVES

*It is not the strongest of the species that survives nor the most intelligent, it is the one that is most adaptable to change.'*[23]

The proposal would be effective and successful from the different perspectives of e-commerce. The proposal is formulated keeping in mind the unique characteristics of the different perspectives. The flexible and dynamic nature of the proposal would make it possible to adapt according to the needs of the different perspective. If the proposal is looked at form the business perspective, it would provide the necessary elements that are useful for development of e-commerce as business process. It would impose minimum compliance burden on sellers and most part of it would use the existing workflow and the technology, which provides the automation of business transactions. As the proposal would use ISP as the tax collecting authority hence from communication perspective it would be using the very infrastructure that makes and connects the network. The proposal would provide collection of consumption tax, as a service and it would form a part of service perspective of e-commerce providing certainty to tax collection. Although it is the obligation of the consumers to pay the applicable tax, however it is the responsibility of the taxing authorities to provide the simplified tax compliance method. The proposal would provide the simplified procedure for compliance. This proposal would also eliminate the multiple definitions of taxable products and service it would encourage uniform reporting requirements across countries, and thereby simplifying the sales information that must be captured, tracked, and reported to each taxing authorities. Finally, together, these features would place the technology issues entailed by this proposal well within the capabilities of current technology.

The proposal is aimed at providing a long-term solution. On the balance of possibility it might seem that the challenge of applying consumption taxes to sales of digitised products to consumers would be too difficult, certainly while the level of such sales remains insignificant. However, there is a counter-argument, to the effect that businesses should want consumption taxes to be applied. The basis of this argument is that businesses within the same jurisdictions as their customers, who do account for tax on those sales, would not wish to be prejudiced by businesses in different jurisdictions that can sell without the burden of tax. Businesses would therefore wish their own tax authorities every success in trying to collect consumption taxes on sales by out-state business. This would level the playing field as between domestic and foreign businesses. It is, however, unusual for businesses to support extensions to the tax base. Certainly, a business would like to see its competitors, selling to customers in its home jurisdiction, lose any cost advantage. On the other hand, a business would wish to have a cost advantage over its competitors selling to customers in other jurisdictions. Therefore, a business might want its own tax authorities to succeed in taxing e-commerce, but it might also want foreign tax authorities to fail. Ultimately taxation is inevitable and any proposal must have the basic elements of fairness and neutrality.

In order to focus on the basic problem, that e-commerce exists in borderless virtual world, which de-emphasised the significance of the place in which economic activity is carried out; the proposal is

aimed to provide a more borderless feeling by involving the very technology that made Internet and e-commerce possible. However this has lead to the question of State Sovereignty; there would be arguments on some of these proposed measures (the proposal for a uniform tax base) would be an unwelcome intrusion on State fiscal sovereignty. That view loses sight of the larger picture. The argument is about the relevance of the above question. The time is right for what might be a turning point in the history of taxation. Until now, national governments have designed and administered their tax polices in near-splendid isolation from one another. Apart from the minimalist and voluntary constrains of the OECD' Model Tax Convention and a network of bilateral treaties to prevent double taxation, States have remained largely autonomous agents of taxation, even as the globalisation of production and commerce and to a lesser extent the globalisation of business regulations have gathered momentum (Braithwaite and Brahos, 2000). The State sovereignty that was possible when local merchants sold primarily tangible products almost exclusively to local customers is no longer possible, or at least not a realistic alternative, as it implies enormous complexity for remote vendors and thus the legal inability to tax remote sales, including those in e-commerce. The most likely result of these developments would be a shift in the relative balance of de facto taxing authority from the domestic to the international level, in short, a globalisation of taxation, as States come to realize that technological changes in nature of commerce require considerably higher levels of international coordination in the field of taxation.

Recognizing that states could no longer formulate and enforce tax policy independently, however, did not indicate that the status of the state as an international actor is in decline. Nor did it suggest that sovereignty is no longer a central concern in international relations. States have always faced situations in which they must cooperate with both internal and external actors. The objective of states, in their efforts to arrive at international agreement on taxation also remains the same, to cede enough sovereignty over its domestic taxation policy in order to reap the rewards of international cooperation without losing the means to control their own domestic environment. A cooperative international effort at formulating well-defined, uniform tax laws would provide the benefits of certainty for electronic commerce and an assured minimum level of tax revenue available to the state in satisfying domestic objectives. Although the formal conception of a state sovereignty views the necessary loss of sovereignty over tax policy as a reduction in state power, a functional analysis views the resulting ability to satisfy the domestic welfare objectives considered above as a more realistic indication of state power. The proposals represent an attempt to craft a compromise between the need for revenue and the power to set state tax rates arguably higher orders of state sovereignty and control over the tax base, arguably a less important aspect of sovereignty.

E-commerce and the Internet represent the opportunity to leap forward to the next stage of economic development, where value is created not just by resource endowments or manufacturing might, but also by knowledge, information, and the use of technology. Keeping in mind the unconventional nature of e-commerce, any solutions to the taxation of e-commerce need to balance the interests of government treasuries against principles of fair and neutral taxation, efficient compliance, and effective tax administration. To quote from the conclusion of the UK government's position paper on the taxation of e-commerce[24]:

*" Progress is being made to give business the certainty it needs about the way in which international transaction will be taxed. The Government is working with international partners on the issues which e-commerce raises in this area to ensure that clarification is provided in a number of area... At the same time, the Government is aware of business concerns that it should not too hastily to change long standing and widely accepted concepts, since changes brought in too rapidly might work inappropriately as technology develops. The Government aggress with this analysis and will continue to monitor closely how developments in technology will affect internal tax rules .....so as to be ready to adopt ..."*

This cautiously optimistic statement reflects the acknowledgment by the major economies of the realties of new technology: that the balance between developing and developed economies can change as a result of growth of e-commerce and that no satisfactory solutions to the related problems

can succeed without a very broad international consensus and substantial utilization of the technology.

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[1] Note that even if the seller is not required to pay the tax, the transaction may still be, at least in theory, taxable. If the product purchased is consumed in the state levying the tax, the consumer may be required to pay a use tax on the value or cost of that product. Most states and localities make no effort to enforce their use tax laws on consumer purchases of this type.
[2] *Quill Corp. v. North Dakota*, 504 U.S. 298, 112 S.Ct. 1904
[3] 386 U.S. 753 (1967).
[4] Ibid
[5] Under the Commerce Clause, a state tax on interstate commerce must meet four criteria in order to be upheld as valid: (1) the tax must be applied to an activity that has substantial nexus with the state;(2) the tax must be fairly apportioned to activities carried on by the taxpayer in the state; (3) the tax must not discriminate against interstate commerce; and (4) the tax must be fairly related to services provided by the state. *Complete Auto Transit v. Brady*, 430 U.S. 274 (1977)
[6] Proposals Submitted to Advisory Commission on Electronic Commerce. See "Establishing a Framework to Evaluate E-Commerce Tax Policy Options" by Rich Prem of Deloitte & Touche, San Francisco; Hal Varian and Alan Auerbach of the University of California-Berkeley; Austan Goolsbee, the University of Chicago; Annette Nellen, San Jose State University; Scot Grierson, Deloitte & Touche, Costa Mesa and Ed Jajeh and Tara Bradford of Deloitte & Touche, San Francisco. The report was based on issues and ideas raised in an"E-Commerce Taxation Roundtable" on October 1, 1999 at UC-Berkeley.
[7] Lessig called this an 'architecture of trust'
[8] Gail L. Grant, *Understanding Digital Signatures*, at p 14, as excerpted in Lessig, at p 40.
[9] Elinor Harris Solomon, *Virtual Money* (New York: Oxford University Press, 1997), at 70
[10] A more elaborate definition indicates: "A digital certificate is an electronic "credit card" that establishes your credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains your name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting and decrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real. Some digital certificates conform to a standard, X.509. Digital certificates can be kept in registries so that authenticated users can look up other users' public keys." Whatis.com, located at <http://www.whatis.com/digitace.htm>.
[11] For a discussion of trusted third parties in the context of digital signatures, see Brian W. Smith & Paul S. Tufaro, *To Certify or Not to Certify? The OCC Opens the Door to Digital Signature Certification*, 24 OHIO NORTH. UNIV. L. REV. 813 (1998) (noting that certification authorities are "essential to the development of electronic commerce and electronic banking"); A. Michael Froomkin, Innovation and the Information Environment, The Essential Role of Trusted Third Parties in Electronic Commerce, 75 Or. L. Rev. 49 (1996)
[12] OECD Guidelines on Cryptographic Policy, and UNICITRAL Model Law on Electronic Signatures
[13] Though purporting to be technology neutral, the Model Law unquestionably works towards a PKI implementation of digital signatures: para 14, and para 21.
[14] Art 7, Model Law on Electronic Commerce
[15] Murray, Jamie (2003) Public Key Infrastructure Digital Signatures and SystematicRisk (Due for

Publication) cited with permission from Author.
[16] Directive 1999/93/EC & 2000/31/EC
[17] 1999/93/EC
[18] DTI Consultation on the implementation of the Electronic Signatures Directive, paragraph 13
[19] This was recognised in the Consumption Taxation TAG paper, annex II, paragraph 11
[20] Electronic Signatures in Global and National Commerce Act, S. 761, 106th Congress (June 30,2000) (effective October 1, 2000). The legislation permits individuals to use binding electronic signatures for interstate or foreign commerce. A digital signature has been defined as follows: 'A digital signature (not to be confused with a digital certificate) is an electronic rather than a written signature that can be used by someone to authenticate the identity of the sender of a message or of the signer of a document. It can also be used to ensure that the original content of the message or document that has been conveyed is unchanged. Additional benefits to the use of a digital signature are that it is easily transportable, cannot be easily repudiated, cannot be imitated by someone else, and can be automatically time-stamped. A digital signature can be used with any kind of message, whether it is encrypted or not, simply so that the receiver can be sure of the sender's identity and that the message arrived intact. A digital certificate contains the digital signature of the certificate-issuing authority so that anyone can verify that the certificate is real.' Whatis.com, located at http://www.whatis.com/digitasi.htm.
[21] A similar type of product classification system is already in use: United Nations Central Products Classification System
(available at www.un.org/depts/unsd/class/cpcprof.htm).
[22] TAXWARE International, Inc. 'TAXWARE's E-Commerce Tax System for IBM', http://www.taxware.com/
See www.taxware.com/Zproducts/salesuse/sutaxsys.htm).
[23] Charles Darwin
[24] Inland Revenue publication Electronic Commerce: The UK's Taxation Agenda (1999)