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The Technological Challenges Facing Developing Countries in the Move to Paperless International Trade

Abstract
Paperless international trade is imminent. Undoubtedly, a gap between the technological capabilities of developed and developing countries is evident in all aspects of society, but more particularly in information and communications. The international business community is now divided not only on economic lines but also on technology lines: developed and developing, hi-tech and low-tech. The technology gap has grave implications for paperless international trade transacting, and that is what this article considers. The article looks at the causes and nature of the information technology (IT) gap and the problems it poses for paperless international trade.

Keywords
developing countries, international trade, information technology gap, paperless documentation

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THE TECHNOLOGICAL CHALLENGES FACING DEVELOPING COUNTRIES IN THE MOVE TO PAPERLESS INTERNATIONAL TRADE

*by Emmanuel T Laryea**

Introduction

Paperless international trade is imminent.[1] Undoubtedly, a gap between the technological capabilities of developed and developing countries is evident in all aspects of society, but more particularly in information and communications.[2] The international business community is now divided not only on economic lines but also on technology lines: developed and developing, hi-tech and low-tech.[3] The technology gap has grave

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1 See Laryea ET, 'Bolero—An Australian Perspective' [2000] *JIBL* (forthcoming); Caplehorn R, 'Bolero.Net—The Global Electronic Commerce Solution for International Trade' [1999] *Butterworths Journal of International Banking and Financial Law* 421; Boss AH, 'International Commercial Use of Electronic Data Interchange and Electronic Communications Technologies', (1991) 46 *Business Lawyer*, 1787; Kindred HM, 'Trading Internationally by Electronic Bills of Lading', (1991) 7 *BFLR* 265.

2 See, Dizard (Jr) WP, *The Coming Information Age: An Overview of Technology, Economics, and Politics* (3rd edn, 1989) Longman, New York, 1; Maherzi L, *World Communication Report: The Media and the Challenge of the New Technologies* (1997) Unesco, Paris, 88-91; *The Missing Link*, Report of the Independent (Maitland) Commission for Worldwide Telecommunications Development (1984), International Telecommunications Union (ITU), Geneva, 10-11.

3 Akwule R, *Global Telecommunications: The Technology, Administration, and Policies* (1992) Focal Press, Boston, 9-16. Of course, it is often argued that there is a correlation between technological and economic advancements.

implications for paperless international trade transacting, and that is what this article considers. The article looks at the causes and nature of the information technology (IT) gap and the problems it poses for paperless international trade.

Causes and Nature of the IT Gap

While developed countries have invested, and keep investing, in the development of their information technology infrastructure and systems, developing countries have done, and continue to do, little or nothing.[4] The result is a growing technology gap between developing and developed countries.[5] This means that, while business entities and government agencies in developed countries are able to deal in paperless trade documents, developing countries lack this capability.

Developed countries have not done much to assist developing countries to develop their information technology infrastructure. The reason may be that information technology has itself grown very quickly over a short period and developed countries themselves are still developing their systems so there has not been time to consider and assist developing countries. But the more probable reason, as this writer sees it, is that the hi-tech world has ignored or does not appreciate the extent of the technological inadequacies of low-tech countries and the challenges they face in the move to global paperless international trade.

In developed countries, the technology to dematerialise trade documents is developed and so the focus is on creating a legal environment conducive to dematerialisation. In a paper delivered to the Australian Chamber of Shipping, for example, Carruthers[6] identified four categories of concern to EDI as follows:

> Firstly, there are communications having no legal significance ... Secondly, there are communications having contractual significance ... Thirdly, there are communications operative to transfer ownership or control of goods or contractual rights ... Fourthly,

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4 Golding P, 'Global Village or Cultural Pillage? The Unequal Inheritance of the Communications Revolution' in McChesney RW, Wood EM, and Foster JB (eds), *Capitalism and the Information Age: The Political Economy of the Global Communication Revolution* (1998) Monthly Review Press, New York, 69, 73-79.

5 Ibid, 73.

6 Carruthers KJ, 'The Legal Implication for Carriers, Shippers, Bankers and Insurers of EDI, With Particular Reference to the Electronic Bills of Lading Regime', a paper prepared for the November 1990 Australian Chamber of Shipping Quarterly Luncheon, Sydney.

> there are communications required by law such as Customs clearances and the like.[7]

Carruthers went on to say, 'the first and the fourth of those categories do not present any significant problems'.[8] In Carruthers' view, which prevails throughout the hi-tech world, communications that have no legal consequences and statutory requirements of government regulatory agencies pose no problems.

Incidentally, Carruthers represented the Maritime Law Association of Australia and New Zealand (MLAANZ) at the conference that promulgated the CMI Rules for Electronic Bills of Lading in June 1990.[9] Obviously, those charting the course of paperless international trade do not appreciate low-tech problems presented by the IT gap. Not surprisingly, the work of UNCITRAL, the ICC and other interested organisations has all focussed on the legal facilitation of dematerialised documentation.[10] This writer suggests that the IT gap presents a formidable problem that needs the serious and urgent attention of the international business community.

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7 Ibid, 2.

8 Ibid.

9 Ibid, 6-7. The CMI Rules for Electronic Bills of Lading were ratified by the 24th Session of the Assembly of CMI on 30 June 1990. The Session was preceded by 34th International Conference of the CMI from 24 to 29 June 1990 at which approximately 40 National Maritime Law Associations were represented.

10 See, as examples, works by the United Nations Commission on International Trade Law (UNCITRAL), United Nations Conference on Trade and Development (UNCTAD), and the United Nations Economic Commission of Europe (ECE), *Legal Aspects of Trade Data Interchange: Bills of Lading and Automatic Data Processing*, TRADE/WP.4/R.159 (1981); *Draft Recommendations on Signatures/Authentication in Trade Documents*, TRADE/WP.4/GE.2/R.111/REV.1 (1979); *Legal Problems and ADP Systems in International Trade*, TRADE/WP.4/GE.2/R.123 (1978); *Trade Data Interchange Restraints*, TRADE/WP.4/R.99 (1980); *Dispensing with a Handwritten Signature in Invoices by Means of Computer Printouts*, TRADE/WP.4/R405 (1986); *Studies Concerning the Replacement of the CIM Consignment Note by an Instrument Suitable for Automatic Data Transmission - Docimel Project*, TRADE/WP.4/R.479 (1987); *Legal Aspects of Trade Data Interchange: Review of Definitions of 'Writing', 'Signature', and 'Document' Employed in Multilateral Conventions and Agreements Relating to International Trade*, TRADE/WP.4/R.819 (1992).

International trade transactions often involve several contractual parties and non-contractual entities in various positions and capacities. A simple trade transaction would at least involve an importer, exporter, a carrier, freight forwarder or shipping agent, an insurer, banks, and government agencies such as customs, revenue, health, and quarantine authorities. A mass of documents including the bill of lading (or similar transport document), an insurance certificate, a customs declaration, orders, invoices, dispatch advice documents, bookings, confirmations is generated.[11] These documents are demanded, furnished and used by various entities, and have varying legal consequences.

For paperless transacting to be successful, the various entities must be capable of supporting electronic versions of the documents they use. The entities may have partial use of computers in their operations, but a fully integrated electronic system that connects users generally is imperative for paperless transacting to operate. There must be a system that connects parties internationally and domestically. For instance, internationally, there must be a system that directly or indirectly connects importers to exporters, banks, carriers and insurers.[12] Domestically, there must be a system that connects importers and exporters to their banks, freight forwarders, brokers, and government agencies such as customs, revenue, health and quarantine authorities.

The systems must support the exchange of structured electronic messages and must be secure and reliable. Electronic data interchange (EDI), defined broadly as the computer-to-computer communication of information in a specified format,[13] is essential.

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11 A study conducted in the USA in the late 1980s found that an average of 46 separate documents was prepared, with an average of 360 copies, under one trade transaction. See van Maaren H, 'EDI in International Trade and Transport: Economic Advantages' [October 1989] *EDI Forum* 169, 170.

12 Examples of such a system are the recently launched BOLERO (Bill of Lading Electronic Registry Organisation), which is discussed in detail in Caplehorn, above n 1; Laryea, above n 1; and, for financial institutions, SWIFT.

13 See Ragsdale CT and Gilbert JP, 'Is EDI Needed for JIT? A Survey of U.S. Firms Using JIT' [1990] *EDI Forum* 13-16; Whitaker RD, 'Letters of Credit and Electronic Commerce', (1995) 31 *Idaho Law Review* 699; Sokol PK, *EDI:*

Security and reliability are a major concern in electronic transacting and probably the primary cause of business' reluctance to adopt paperless transacting.[14] Although proven security mechanisms for electronic systems have been developed,[15] and new techniques keep emerging, issues of security remain important to users.[16] Electronic security for paperless transactions depends not only on the electronic mechanisms, but also on the diligence and competence of operating personnel. 'Proper management is more important to computer security than sophisticated devices.'[17] This is likely to pose a particular challenge to some low-tech countries with a history of corrupt and inefficient business practices.

It has been remarked that 'unless and until all the parties to an international transaction can connect to one system so that every user would see the same invoice, bill of lading, etc',[18] paperless international trade cannot be achieved. Unless the author is referring to contractual parties to a particular transaction, it is submitted that he overstates what is needed to facilitate paperless international trade. While it is ideal for

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The Competitive Edge (1989) Intertext Publications, New York, 12; van Maaren, above n 11, 169.

14 Baum MS, 'Commercially Reasonable Security: A Key to EDI Enforceability' (1989) 6 *Computer Law & Practice* 52; Castell S, 'Evidence, Authorisation and Security: Is the Technology 'Legally Reliable'' (1989) 6 *Computer Law & Practice* 46; Wright B and Winn JK, *The Law of Electronic Commerce*, (3rd ed, 1998) Aspen Law & Business, New York, para 1-9.

15 For the security mechanisms, methods and techniques in electronic systems, see, generally, Garfinkle S and Spafford G, *Web Security and Commerce* (1997) O'Reilly, Cambridge Mass; Amoroso E G, *Fundamentals of Computer Security Technologies* (1994) Prentice Hall, Englewood Cliffs, NJ; Arlin J, *Computer Communications Security: Strategies of the 1990s* (1989) Intertext Publications, McGraw-Hill, NY; and Fites P E, Kratz M P J and Brebner A F, *Control and Security of Computer Information Systems* (1989) Computer Science Press, Rockville; Ford W and Baum M, *Secure Electronic Commerce: Building the Infrastructure for Digital Signatures and Encryption*, (1997) Prentice Hall, Upper Saddle River, NJ.

16 Faber D, 'Electronic Bills of Lading' [1996] LMCLQ 232, 234; Wright and Winn, above n 14, para 1.02.

17 Wright B, *EDI and American Law: A Practical Guide* (1989) The Electronic Data Interchange Association, Virginia, 6.

18 Chandler GF, 'Electronic Transmission of Bills of Lading', (1989) 20 *Journal of Maritime Law & Commerce*, 571, 573.

all entities involved in international trade to be connected to one system, and that should be the ultimate object of the business community,[19] dematerialisation is achievable where parties are connected separately at international and domestic levels. For instance, the customs agency of every port need not be connected to one system for paperless transacting to function. Similarly, an importer or exporter in one country need not be connected to the customs agencies of every country or every other importer or exporter in the world for paperless transacting to operate.

At minimum, importers, exporters, banks, carriers, and insurers must be connected internationally, and importers or exporters and their agents must be connected to banks and government agencies domestically. This will ensure that an importer, for example, can contract electronically with its exporter, receive electronic documents from the exporter, carrier, insurer and other parties that may be involved, and the importer can submit the documents to government agencies for clearance and other purposes.
The threshold technology needed to operate paperless international trade may thus be summarised as below.

1. Importers and exporters (traders) and their agents must have the technology—hardware, software, and other accessories—to install and maintain an electronic system at acceptable international standards. Their system should enable them to create, transmit, receive, store, secure, and retrieve structured electronic data and they must be connected on-line to the international community.

2. Government agencies must have the technology to support electronic systems and must have installed electronic clearance systems to which importers, exporters, freight forwarders, brokers, carriers and other like entities are connected.

3. Banks and other financial institutions must have the technology and must have installed an electronic system to which importers,

19 There may be no reasons all entities should not connect to one system when an acceptable global system is available, such as Bolero is designed to operate.

exporters and other entities are connected and the system be connected to the international business community.

4. There must, in every country, be a minimum national technological infrastructure—technical and regulatory.

The above threshold requirements are lacking in most developing countries and that presents the practical problems.

Traders and Paperless Documentation

Most traders in developing countries—small, medium and large—lack the necessary technology to transact electronically. It may be argued that medium and large businesses should be able to afford the hardware and software needed to contract electronically. However, the costs of establishing electronic systems are high and businesses in low-tech countries may not be willing to outlay such costs.

Even if medium and large businesses in low-tech countries are able and willing to outlay the initial costs to establish electronic systems, low utilisation and consequently low returns from such systems may make them uneconomical. Cost-benefit considerations are a major factor in deciding whether it is worth implementing electronic systems in a business. Negative cost-benefit results hinder establishment of electronic systems by medium and small businesses in developed countries.[20] Business in the electronic age is just as much about seeking profits as business in the paper age.[21] Electronic systems are not widely used in developing countries so the immediate benefits of establishing electronic systems are minimal and unattractive. A critical mass of users is essential to make investments in electronic systems economical.[22]

Traders may be able to establish internet facilities, as such facilities do not require high initial costs and one computer with a modem and a telephone line may be sufficient, but internet access is not enough for

20 Emmelhainz MA, *Electronic Data Interchange: A Total Management Guide* (1990) Von Nostrand Reinhold, New York, 19.

21 Wright and Winn, above n 14, para 1.02.

22 Schware R and Kimberly P, *Information Technology and National Trade Facilitation* (1995) World Bank, Washington DC, 7-8.

international paperless contracting. A comprehensive EDI system is required for business transactions.[23] Ordinary internet access may be used for informal or non-contractual business communications, but EDI is needed for the delivery of structured and secure electronic messages.

Bolero,[24] for instance, can be interfaced with the internet, a laudable feature and a substantial progress from the earlier closed proprietary systems, but users must establish a local user system and generate their own public and private cryptographic keys before they are enrolled to use the Bolero system.[25] Thus, access to the Bolero system requires the establishment and maintenance of a comprehensive local user system with cryptographic functions and security mechanisms acceptable to the Bolero community.[26] This requires substantial investment and detailed planning.[27] Without the requisite electronic systems, paperless transacting will remain outside the capability of traders in developing countries and they will continue to rely on paper documents.

Government Agencies and Paperless Documentation

Various government agencies, particularly central banks, ports, customs and excise, revenue, health and quarantine authorities require information relating to exports and imports from traders, banks, and carriers. The Declaration to central banks by traders of transactions involving foreign currency above a stated amount is common in many

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23 See Benson D, Whitehead G, and Bugg R, *Transport and Logistics* (1994) Woodhead Faulkner, New York; Cooper J, Brown M, and Peters M, *European Logistics: Markets, Management and Strategy* (1994) Blackwell Publishers, Oxford.

24 For an explanation of Bolero, see Caplehorn, above n 1; Laryea, above n 1.

25 See, Bolero Association Ltd, 'Enrolment into the Bolero System' [November 1999] <http://www.Boleroassociation.org>.

26 For a description of the technical requirements from users, see Bolero Association Ltd, 'Digital Signatures in the Bolero System' [November 1999] <http://www.Boleroassociation.org>; Bolero Association Ltd, 'Enrolment into the Bolero System' [November 1999] <http://www.Boleroassociation.org>.

27 For example, Bolero requires a technical report from users as part of the process of enrolment. For the planning and installation of EDI systems, see Leyland V, *Electronic Data Interchange: A Management View* (1993) Prentice Hall, London; Emmelhainz MA, *Electronic Data Interchange: A Total Management Guide* (1990) Von Nostrand Reinhold, New York.

countries.[28] Submission by ship captains of a ship's manifest to port authorities at ports of call is a standard practice. Customs clearances are an integral part of international trade systems.[29] Requirements that traders submit information to tax authorities and retain such information for a minimum period are common. Requirement of information relating to imports and exports by quarantine and health authorities is common.

Traditionally such information is furnished on paper. In paperless international trade, the information should be capable of electronic submission. This means the recipient government agencies must have electronic systems in place, but that is not the case in most developing countries.

Whereas ports in developed countries have established, or have projects underway to establish computerised, processes and communication systems,[30] ports in developing countries remain paper-based and there are no immediate plans to computerise them. While the systems of government agencies remain paper-based, they will require paper documents. Traders who use those systems will likewise continue to produce paper and that may be a major disincentive for them to implement electronic systems.

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28 This is not peculiar to developing countries that have foreign exchange controls in place; many countries that do not have exchange controls, both developing and developed, require declarations of foreign currency transactions as a means of checking money laundering.

29 Morrin JP, 'Customs Requirements and International Trade' (1989) 6 *Computer Law and Practice* 42; van Maaren, above 11, 169.

30 For example, in Australia, see Australian Chamber of Shipping Ltd, 'Issues Paper: Issues of Concern To Shipping', (1996) (available at Australian Customs Service library. A copy is on file with the author) 4-10. For Europe and the USA, see Van Maaren, above n 11.

Banks and Paperless Documentation

Most major banks in developing countries may have the technology to support electronic documents, as they are mainly foreign international banks that come with the technology,[31] but they may not necessarily have installed systems to deal in electronic documents. A number of factors may militate against their implementing electronic systems. For example, the low use of electronic systems in the economy may make the installation of such systems uneconomical. If their customers are electronic systems incapable, the banks have to deal with them on paper even if they have computerised their own systems and this makes computerisation unappealing. Absence of the basic national infrastructure, as discussed below, makes it difficult, costly and unattractive to install electronic systems. Some banks may be connected to SWIFT for interbank funds transfer, but that is not enough to support all trade documents. The international banking market is divided along technological lines.[32]

National Information Technology Infrastructure

Availability of basic national IT infrastructure is a prerequisite to the adoption of EDI systems and therefore dematerialisation in any country. Information technology must be reasonably integrated into the socio-economic and business life of a nation to warrant paperless transacting. As already mentioned, dematerialisation is not feasible if government agencies continue to rely on paper documents.

A minimum technical infrastructure and regulatory framework must be present to ensure paperless transacting. Technical needs include hardware, software, IT experts to design and install systems, IT technicians to maintain and fix systems when something goes wrong, and skilled IT personnel to operate the systems efficiently. A reliable and easily accessible telecommunications network must be present within the

31 See Maduegbuna S, 'The Effect of Electronic Banking Techniques on the Use of Paper-based Payment Mechanisms in International Trade', [1994] JBL 338, 339.

32 Landis K, 'The Perfect Passport to Global Electronic Banking' (October, 1990) 107 *Banker's Monthly* 47, 48.

country and the country must be reliably connected to the outside world. Furthermore, there must be reliable power supplies.

These minimum technical prerequisites are lacking in most developing countries. The hardware, software and accessories are absent. Because the economies are not highly computerised, there is no market for IT equipment so importers hesitate to import them into those countries.

IT experts who will design and install electronic systems, technicians who maintain them once installed, and skilled personnel who will operate them are absent in most developing countries, as the IT industry is yet to be attractive. As electronic systems are not common in those countries, undergraduates and trainees there are less attracted to the IT industry. Moreover, the experts who will train others are themselves unavailable. So the shortage of IT personnel perpetuates itself.

Worse is the lack of a reliable domestic telecommunication network. In some countries there are only a few telephone lines concentrated in a few cities and they are unreliable. Access to the international telecommunication network is erratic and unreliable. Businesses that wish to establish electronic networks are hindered because there is no infrastructure on which to build their systems. The entire national telecommunication infrastructure of some countries needs complete re-engineering to enable electronic networking and paperless transacting. Business is looking to government to provide the basic infrastructure, but government is taking no initiative because it lacks the political will and the funds for such a project. As there is no basic infrastructure on which to build electronic systems, government agencies continue to rely on paper. Private business has to follow suit, as they have to deal with government agencies on paper. In any event, the platforms on which they could build electronic systems are absent so they cannot establish such systems even if they wish to move ahead of government agencies.

Further problems are presented by the lack of reliable power supplies in most developing countries. Power failure and extensive periods of power cuts are a common occurrence in developing countries. In Nigeria, for instance, power cuts are a daily occurrence. This has made Nigerians give the Nigerian Electricity Power Authority (NEPA) the nickname 'Never Expect Power Always' or 'Never Expect Power Anytime'. The situation is the same in Ghana. Electricity was rationed in Ghana in

1998.[33] Such situations make reliance on electronic systems unattractive even if one can afford to install them. Electronic systems operate on electric power and they are delicate. Businesses may lose valuable information and time sensitive transactions from frequent and unexpected power cuts.[34] Electronic systems may be damaged by frequent power failures, and require expensive repairs. Stand-by power generators may have to be provided at additional cost. These will add to the operative cost of the systems and may make their operation less economical.

Another problem in developing countries is the lack of a regulatory framework for IT, which is essential for wide acceptance and efficient operation of electronic systems. It is important that parties relying on electronic systems have a way of allocating risks, of identifying security and privacy responsibilities, and enjoy a reasonable degree of legal certainty with electronic transactions.[35] The absence of regulations in this regard makes parties baulk at electronic transacting.

Legal uncertainties are problematic for parties in developed countries as they are for developing countries. The difference, however, is that developed countries have implemented some regulatory frameworks while developing countries have done nothing. Government and business in developed countries have formulated nationwide, industry-wide, or specific EDI agreements while legislative frameworks are being considered.[36] Most developed countries are gradually enacting laws to

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33 See various news items at Ghana Home Page, such as, 'Electricity Company Cuts Power by 30%' (20 January 1998) <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/search.php3?ID=338>; 'Akosombo Dam to Shut Down by April' (23 February 1998) <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/search.php3?ID=349>; 'Electricity Rationing Goes on 12-hour Cycle' (9 March 1998) <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/search.php3?ID=356>; 'Electricity Company Announces New Power Cut Cycle' (31 March 1998) <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/search.php3?ID=365>.

34 See, for instance, 'Energy Crises Hits 6th Ghana International Trade Fair Opening' (28 February 1998) <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/search.php3?ID=353>, reporting that unexpected power outages caused serious interruptions, including damage to electronic equipment, at an international trade fair in Ghana.

35 Chandler, above n 18, 577.

36 *See*, for example, *Model Electronic Data Interchange Agreement and Commentary*, prepared by the Legal Sub-Committee advising the EDI Council

facilitate paperless transacting.[37] Although legal impediments to paperless transacting remain in most developed countries, steps are being taken to remove such impediments.

Developing countries on the other hand have taken, and are taking, no steps to secure EDI agreements or legislate to facilitate paperless transacting. The reason may be that electronic transacting is not common in those countries so the need for electronic data regulations or facilitative laws has not arisen, and governments may be willing to legislate to facilitate electronic transacting when it becomes common. The fact remains, however, that legal uncertainty in electronic transacting and the absence of government leadership in electronic transacting militate against the adoption of electronic contracting systems.[38]

Business often defies legal uncertainties for commercial expediency and experiments with new methods and systems.[39] However, the problems of business in developing countries relating to electronic contracting are complicated. The lack of a critical mass, IT personnel, support services

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of Australia (version 1, October 1990), *EDICA Model EDI Trading Agreement (Short Form)*, prepared by a Subcommittee of the Legal and Audit Committee of the EDI Council of Australia (1991); *EDI Association Standard Electronic Data Interchange Agreement,* prepared by the EDI Association of the United Kingdom (2nd ed, August 1990); *Model Form of Electronic Data Interchange Trading Partner Agreement and Commentary,* prepared by the Legal and Audit Issues Committee of the EDI Council of Canada (Canada 1990); *Standard EDI Agreement,* prepared by the New Zealand Electronic Data Interchange Association (New Zealand, October 1990); *Model Electronic Data Interchange Trading Partner Agreement and Commentary,* prepared by the American Bar Association (1990), published along with *The Commercial Use of Electronic Data Interchange – A Report and Model Trading Partner Agreement,* in (1990) 45 *Business Lawyer* 1645.

37 See, for example, the Australian *Electronic Transactions Act* 1999 (Cth); the Singaporean *Electronic Transactions Act* 1998 (Singapore); the UK's *Electronic Commerce Bill* (1999) in parliament (the content of the draft bill can be accessed at <http://www.dti.gov.uk/cii/elec/ecbill_1.html>); and electronic commerce laws in the various states of the USA.

38 Chandler, above n 18, 577.

39 The development of commercial paper by the custom of merchants, and of course the Law merchant, is a classic example, and the explosion of internet transactions despite legal uncertainties of internet contracting is a modern example.

and basic national technical infrastructure compound in a manner that makes them difficult to surmount.

Attention Needed

Whatever the level of technological inadequacy of countries and traders therein, some form of accommodation is needed while they remain unable to trade electronically. The hi-tech world cannot ignore the contribution of developing countries in international trade. In a world of economic interdependence, trade must continue between developed and developing countries.[40] Developing countries consume a substantial part of products of developed countries and are essential participants in the global economy.[41] On the other hand, developed countries rely on raw materials from developing countries for their products.[42] This international economic linkage is a central, defining feature of the world economic system.[43]

Most developing countries have virtually no IT infrastructure, so building a system for international contracting will take several years. There are no quick-fix solutions. The development of wireless application protocols (WAP) and satellite transmission systems, as opposed to cable and fibre optics, may hasten their infrastructure development. However, global use of WAPs for commercial transactions is itself some years away in developed countries,[44] let alone in developing countries. Moreover, WAP technology is expensive and requires massive investment.[45] Most developing countries are heavily indebted and may not be able to harness the resources to build the needed IT infrastructure.

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40 Huq AM, *The Global Economy* (1988) Oryx Press, New York, ix-x; Root FR, *International Trade and Investment* (1990) South-Werstern Publishing Co, Cincinnati, 1; Cooper RN, *Economic Policy in an Interdependent World: Essays in World Economics*, (1986) MIT Press, Cambridge Mass, 289-331.

41 Huq, ibid, ix.

42 Huq, ibid.

43 Pollins BM and Brecke PK, 'International Economic Processes' in Bremer SA (ed), *The Globus Model: Computer Simulations of worldwide Political and Economic Developments* (1987) Westview Press, Colorado, 459.

44 See Lynch A, 'Mobile Data Still Too 'Shaky'' [4 April 2000] *The Australian* 64.

45 See Johnson G, 'Preparing a Strategy for m-Commerce', [4 April 2000] *The Australian* (Cutting Edge insert) 2; ibid.

Even when the infrastructure is built in developing countries, concerns about their ability to ensure adequate security and control over the systems may delay wide acceptance and use of dematerialised documentation.[46] Both domestic and international parties will have security concerns.

Conclusion

A gap exists between the information technology capabilities of developed and developing countries, which means that whereas developed countries can transact electronically, developing countries cannot. The causes of the IT gap are numerous and the level of inadequacy vary greatly among countries and between parties in the same country. Nevertheless, they all need accommodation in paperless international trade. For most, the need will persist for several years. It is not an option to exclude them from international trade, as they are essential participants in the global economy. The international business community has either overlooked or not appreciated the low-tech problems of developing countries in global paperless trade and therefore done nothing to alleviate them. It is time the international business community awakes to these problems.

46 Lack of confidence in the security and safety of information in an electronic system could be a major barrier to use and patronage of that system. Ibid.