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On

E-commerce in Nepal

By:

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ANNEX I

List of abbreviations

B-to-B	Business to Business
B-to-C	Business to Consumers
B-to-G	Business to Government
CA	Certification Authority
EC	Electronic Commerce
EDI	Electronic Data Interchange
ICANN	Internet Corporation for Assigned Numbers and Names
INGO	International Non-governmental Organisation
IP	Internet Protocol
ISP	Internet Service Provider
ITU	International Telecommunication Union
NGO	Non Governmental Organisation
NTA	Nepal Telecommunications Authority
SET	Secure Electronic Transaction
SME	Small and Medium Enterprises
TTP	Trusted Third Party
UNCITRAL	United Nations Commission of International Trade Law
UNCTAD	United Nations Centre for Trade and Development
UNESCAP	United Nations Economic and Social Council for Asia and Pacific
VORTAL	Vertical Portal
VSAT	Very Small Aperture Terminal
WIPO	World International Property Organisation
WTO	World Trade Organisation
ITC	International Trade Centre

Abstract

Technology is playing an increasingly important role in various facets of development. In an emerging world economic order characterized by pervasive use of technologies that have continually been redefining competitiveness and opening up opportunities hitherto unimagined, countries like Nepal are finding themselves at the crossroads between traditional approaches and the prospect of leapfrogging in the path of sustainable development by capitalizing on frontiers opened by technological advancements, notably, the Internet. E-commerce has been an important offshoot of the Internet and an integral part of evolving Information Economy. For a country like Nepal, the need of the hour seems to be to focus on creating a conducive environment for the proliferation of IT in general and e-commerce in particular to further augment national and international trade prospects and narrow down digital divide in the context of an economic milieu characterized by globalization and economic liberalization. This calls for coordinated government and private efforts aimed at promoting e-commerce in Nepal. While prevailing market forces in some way dictate the way in which these developments take place, the government will nevertheless have a crucial role in ensuring that developmental potentials of e-commerce are utilized to the fullest and an enabling and conducive environment is created for its development within the country. Evolving complexities that come concomitant with widespread application of IT, notably in the area of e-commerce, necessitates an initiative to work out national strategy and policy framework aimed at putting a facilitative mechanism in place based upon minimalist approach on the part of the government.

As things stand now, many challenges exist in the implementation of e-commerce in Nepal. Apart from affordability and human resources issues, there are issues that have to do with infrastructure (telephone and internet connections are still prized 'commodities' in Nepal, beyond reach and imagination of larger sections of society) and attributes that characterize it: namely bandwidth, quality of connection etc. In an e-commerce scenario where transactions transcend national boundaries, many issues come into play that need to be addressed from various levels if e-commerce is to play an important role in Nepalese economy. As such there is an invariable need to address the issues involved from International, national and business enterprise perspectives.

This paper tries to highlight the importance of e-commerce in the context of Nepal and lists various challenges that exist in the way of its successful implementation.

This paper also lists out the actions that the government as well as corporate and private sector need to take in order to make e-commerce an important part of overall trade and commerce scene. Due to the vary nature of issues involved that cut across several domains ranging from technical to regulatory, legal and financial issues, it has been assumed that these issues will be dealt with in length with committees structured along thematic lines taking into account recommendations made for appropriate policy decisions. As some degree of technical familiarity will be necessary to even from policy formulation perspective, an effort has also been made to include write-ups on technical ramification of security issues.

E-commerce in Nepal

SECTION I

1.0 Background

With annual population growth rate of 2.6% and 42% of population living below the poverty line, the development challenges of Nepal continue to be formidable. Economic concerns are assuming importance of significant proportions as political stability and achievement of sustainable development goals are becoming increasingly contingent upon how we fare on the economic front. Sitting on a foreign debt of more than US\$ 2,500 million and an annual merchandise trade deficit of US\$ 758.3 million¹ representing 15.8 percent of the GDP, Nepal is in an urgent need to intensify export and increase the volume of foreign trade if it is to move away from mounting foreign debt and ever increasing reliance on foreign aid and improve its economic situation. This should be seen in the context of the fact that trade including both exports and imports, continues to play an important role in the development of many developing economies in the Asia Pacific region.

Economic liberalisation policies followed to take advantage of the economic opportunities unleashed by globalisation has made Nepal relatively more export oriented since 1991/92. The presence of an international trade and commerce regimen characterised by globalisation and economic liberalisation is invariably affecting many aspects of economic life in the countries around the world and calling for adoption of approaches that are more responsive to the changes taking place globally. Technology, as ever, continues to play a significant role in revolutionising the trade and commerce sector. One such technological advancement that is having profound impact on this sector world-wide is widespread use of IT, particularly the Internet and its offshoot, e-commerce. The dynamism which has characterised the trade sector over the past two decades, concomitant with the increasing liberalisation of tariff and non-tariff barriers, is now being revolutionised and regenerated by the phenomenon of electronic commerce, particularly facilitated by the use of the Internet².

These new trends induced by developments in the fields of information and communication technologies are presenting both prospects and challenges for a country like Nepal. These technologies are increasingly redefining competitiveness and changing the way businesses are run thereby signalling a fundamental paradigm shift on the international trade and commerce scene. While developmental impacts and full potential of e-commerce are yet to be proven specially within the context of a developing country like Nepal, latest trends show clear pointers to a scenario where e-commerce will increasingly dominate trade and commerce sector in the years to come.

¹ Nepal's Foreign Trade, Dr. Minendra Rijal, Mirmire, a publication of NRB

² <http://unesco.org>

This invariably necessitates a proactive response from our part as a developing nation to the emerging scenario in terms of formulation of policies and development of strategies conducive to the growth of e-commerce in Nepal. E-commerce however presents a number of challenges that the policy makers have to be aware of, most conspicuous of these challenges being the speed of development in electronic commerce and its attendant financial, legal and security ramifications. This coupled with the speed of the changes that it brings strain the processes of traditional policy formulation in a country like ours.

The need to develop coherent policies and sound strategies vis-à-vis information economy and e-commerce is also more relevant given impending membership of Nepal in WTO and subsequent participation in multilateral trade negotiations of which e-commerce would be an important component.

Without a sound policy framework as well as experience and knowledge in the field, Nepal would risk being at the losing end in international negotiations on issues relating to e-commerce apart from being out on the prospect of its developmental potentials. Our failure to address the issues involved within the framework of our own ground realities as well as from global perspective will most likely have far reaching adverse implications on our economy.

As economies around the world continue to be driven by ideas and powered by technology, it is imperative that we too take necessary steps to create enabling environment where we find ourselves better positioned to benefit from competitive advantage offered by the information and communication technology and one of its most significant products, e-commerce. In fact the need to adapt to new technological advancement especially with regards to information and communication technologies is fast becoming an economic imperative rather than a mere question of choices and options.

2.0 The emergence of Information Economy

One of the significant technological advancement of the recent times has been the advent of Internet which is an embodiment of computer, communication and information technologies. The pace of proliferation of Internet has been more intense than that of telephone. The Internet network has increased from 213 computers and few thousand users in August 1981 to more than 43 million Internet linked computers by 1999 supporting an estimated 150 million Internet users.³

Rapid advances in Internet technologies and the subsequent proliferation of economic activity on the Internet have ushered in an information age where virtually every nation is trying to position itself to take advantage of this new phenomenon. Internet and other related technologies are fast interconnecting the world into a single virtual entity marking at times a significant departure from traditional methods of analyzing global issues and problems within geographical frame of reference specially in the areas of financial, economic and commercial activities.

³ ITU, 1999

Internet economy seems all poised to becoming one of the main components of overall economic order. The volume of Internet economy reached 77 billion US dollars in 1998⁴. Over the years, there has been significant rise in the overall level of electronic commerce or business transactions conducted via the internet and private commercial networks which is expected to reach US\$ 400 billion by 2002.⁵ Latest Forrester Research figure project B-to-B commerce to reach 1.3 trillion USD by 2003.

As mentioned earlier, one of the main components of internet economy is e-commerce (Electronic Commerce). Electronic commerce, broadly defined, is the process of using electronic methods and procedures to conduct all forms of business activities to achieve organizational goals. Electronic commerce uses different technologies and embraces a wide range of financial forms such as electronic banking, electronic trading, Electronic Data Interchange (EDI), electronic mail (E-mail) and all forms of messaging between enterprises⁶.

Since rapid expansion of electronic transactions constitute a major opportunity for trade and development, information and communication technologies and electronic commerce can be expected to drive the trade component of economic growth for many years to come. Trade transactions conducted through the Internet and the World Wide Web will have enormous implications over the next few years for Asia's international competitiveness and Nepal can not possibly afford to be left out.

Nepal needs to seriously evaluate its position vis-à-vis emergence of Information Economy worldwide in general and e-commerce in particular. The scope of this paper will be limited to examining issues related to e-commerce and its implementation in the context of Nepal.

3.0 IT and E-commerce in Nepal

Actual statistics are scarce, but application of Information Technology in Nepal had been particularly slow till the late eighties. Even though recent years have seen remarkable growth in terms of awareness and application of IT resources in a number of activities, Nepal as a whole is yet to see satisfactory pace of application of IT in education, government and corporate sectors. Private businesses, banks and financial institutions, NGO, INGOs and international agencies operating within Nepal are on the forefront of using IT resources compared to the government and small business sector. The prevailing socio-economic realities coupled with human resources limitations have, to a great extent, stunted the growth of this sector in Nepal.

Things are however changing at a relatively faster pace. There has been remarkable rise in the number of personal computers and related equipment sold and installed in Nepal specially after 1992 and of late, Nepal has seen an emergence of ISPs (Internet Service

⁴ Forrester Research

⁵ UNCTAD, 1998

⁶ <http://unescap.org>

Providers) which has resulted in increased use of Internet and World Wide Web. There are altogether 7 licensed ISPs (Internet Service Providers) including 2 V-SAT private operators in Nepal.⁷ Recently, National Telecommunications Corporation has also joined the ISP bandwagon and announced provision of Internet related services.

Internet connectivity, though increasing at a faster pace, is far from being at a satisfactory level. The number of Internet accounts in Nepal is estimated to be around 10,000 and the majority of the users are within Kathmandu valley. Since the potential for electronic commerce within and outside Nepal will also depend on the number of users who have access to the Internet, one of the priorities must obviously be in increasing this number. But this alone will not be sufficient to guarantee the development of e-commerce in the country. E-commerce development is dependant upon factors like the number of Internet users internationally who could have a prima facie interest in Nepal, quality and types of products and services offered by Nepalese companies, the skills and creativity employed in designing web sites and the bandwidth available for users and service providers. One should thus be aware of potential pitfalls resulting from lopsided view of treating e-commerce issues solely from the Information and Communication Technology perspective. These technologies no doubt enable e-commerce but there are hosts of other issues, mostly non-technical, that must be taken into account while trying to formulate policies conducive to the growth of e-commerce

Even though there have been some limited initiatives on the front of e-commerce in Nepal, the country has yet to see an organized and concerted effort towards this direction. This is mainly because e-commerce issues cut across a broad range of technical, legal, economic and institutional questions for which we are yet to come up with appropriate responses.

Apart from isolated efforts undertaken by a few Pashmina traders, the Handicraft Association of Nepal has the beginning of a vertical portal at www.nepalhandicraft.com.np. This site has links to twelve member home pages and an email ombudsman service to match suppliers with foreign distributors. But the site by and large leaves a lot of room for improvement as it is characterized by incomplete information and poor user interface. Issues like payment mechanism and export formalities also have not been addressed adequately in these sites.

With conventional economies showing signs of age especially in Asia, study of potential developmental aspect of e-commerce in the Nepalese context demands serious attention. Along these lines, it will be worthwhile first to examine as to what will be the potential benefits to Nepal obtainable through e-commerce and also how can Nepal create an enabling and conducive environment for e-commerce.

E-commerce has the potential to provide the following benefits to Nepal:

- i) Generation of foreign exchange, resulting in increased hard currency earnings with favorable impact on balance of payments situation

⁷ Economic Survey, FY 98-99, His Majesty's Government of Nepal, pp 14

- ii) Prospect for export trade diversification both in the range of commodities and country destinations.⁸
- iii) Potentiality for further strengthening of service exports (notably, travel and tourism) which contributed to 44.1% of total foreign exchange earning in 1998/99.
- iv) Development of e-commerce expertise within the country with far reaching future implications for economic development
- v) Expansion of Information Technology skills within the country
- vi) Increased transparency
- vii) Driver for Infrastructure development in the IT domain
- viii) Improved government and business efficiency and
- ix) Enhanced social development and welfare

Notwithstanding its potentials, the question of development of e-commerce can not be addressed in isolation from other complex array of issues that provide a holistic framework for its development. This leads us to the fundamental question of as to what really entails in the creation of an enabling environment.

3.1 Towards the creation of an enabling environment for e-commerce

Before we examine issues involved in creating an enabling environment for the development of e-commerce, it is important first of all to examine the parameters that govern an internet based business model, notably e-commerce.

Conceptually, an internet based business model (see box 1 for details on e-commerce) can be divided into the following important layers:

- ? The Internet Infrastructure Layer
- ? Internet Application Layer
- ? The Internet Intermediary layer
- ? The internet commerce layer
- ? Legal and procedural infrastructure Layer
- ? Human Resources

⁸ As per the economic survey of 1998-99, the export of carpets and readymade garments constituted 81.3% of total exports to countries besides India during the first nine months of FY 1998-99

Layer 1: The Internet Infrastructure Layer

This layer includes products and services that help create an IP based network infrastructure, a prerequisite for electronic commerce. The categories in this layer include:

- Communications network
- The Internet backbone providers
- Internet Service Providers
- Networking hardware and software
- PC and servers
- Security vendors
- Line Acceleration hardware manufacturers

Layer 2: Internet Application Layer

Products and services in this layer build upon the above IP network infrastructure and make it technologically feasible to perform business activities on-line. The categories in this layer include:

- Internet Consultants
- Internet commerce applications
- Multimedia applications
- Web Development Software
- On line Training
- Web enabled Databases

Layer 3: The Internet Intermediary layer

The internet intermediaries (also infomediaries) increase the efficiency of electronic markets by facilitating the meeting and interaction of buyers and sellers over the internet. They act as catalysts in the process through which investments in the infrastructure and applications layers are transformed into business transactions.

The categories in this intermediaries layer include:

- Portals/ content providers
- Internet ad brokers
- On line advertising

BOX –1. A typology of e-commerce

At its fundamental level, e-commerce is not very different from traditional commerce. As in traditional commerce, e-commerce also always involves at least two participants and these participants can be of different nature. Some very distinct type of e-commerce will take place, depending on the pair involved (*Building Confidence, Electronic Commerce for Development, UNCTAD*).

The main three categories of agents likely to be involved in such pairings are: enterprises, individuals and governments. Much of the e-commerce observed during its first few years of existence has been between enterprises and individuals (the 'Amazo.com', 'eToys' types), and is generally known as "business-to-consumers" (B-to-C). In B-to-C situations, e-commerce transactions takes place between enterprises and consumers mostly at individual levels. Less noticed but equally significant is the type of e-commerce which has been taking place between the enterprises (e.g. among the manufacturers and their sub-contractors or between business equipment firms and their clients) which is better known as "business-to-business" (B-to-B). Last but not least, e-commerce can be performed between Governments and public entities, on the one hand, business, on the other hand, in the context of public procurement purchases; this last type can be described as "business-to-government", or B-to-G.

Even though B-to-C has attracted much attention over the last few years owing to its rapid development in advanced countries, primarily the United States, B-to-B is clearly the area from which most of the expansion in e-commerce will come in the near future, especially as far as international trade is concerned. This is therefore the area to which developing countries should devote priority attention as a possible source of integration in the emerging global information economy.

Layer 4: The Internet commerce layer

The Internet commerce involves the sales of products and services to consumers or business over the Internet. The categories in this Internet commerce layer include:

- E-tailers (eg. Amazon.com, eToys.com)
- Manufacturers selling on line (Cisco, Dell, IBM)
- Fee/subscription based companies
- Airlines selling online tickets
- On line entertainment and professional services

Layer 5: The legal and procedural infrastructure level

The creation and maintenance of a web site is only the tip of an iceberg as far as e-commerce is concerned. There are a wide range of issues concerning legal ramifications and payment mechanism (see box 2 for payment mechanisms in e-commerce). Nepal still lacks legal arrangements in the form of cyber laws that would provide a comprehensive legal framework for e-commerce transactions that would ensure protection of both vendor as well consumer rights so crucial for successful e-commerce transaction. Security and trust being key issues that underpin successful e-commerce implementation, Nepal needs to address these issues with urgency.

3.2 Strategic and policy framework for development of e-commerce in Nepal

Any strategic as well as policy framework designed to promote e-commerce within the country should essentially be premised around the e-commerce business model (see box 1), its national and international dimensions, micro and macroeconomic implications and the layers that define parameters of internet based business model. Considering its ever increasing significance, potential and scope, e-commerce deserves special attention as separate entity on its own rights and not merely as a part of a comprehensive Information and Communication Technology strategy and policy to be adopted by the government.

Given the nature, scope and anticipated future direction of e-commerce, the strategy and policy perspective needs to be addressed at 3 levels:

- International level
- National level
- Business Enterprise level

3.2.1 International level

Since most of the e-commerce activities tend to transcend local, national and regional boundaries, a number of issues come into play with regards to commercial transactions carried out electronically. Apart from technical issues concerning network and data security, the new global electronic commerce networks raise many fundamental concerns about regulation of international commerce, whether it involves trade in goods, services, currencies, information or ideas and impact of these developments in national sovereignty, political institutions, administration, financial and trade policy and the way of life.⁹ Any initiative aimed at developing e-commerce strategy and policy perspective in Nepal should take these factors into account. This is important both from the national perspective as well as from the perspective of developing strategies to be adopted in international trade deliberations and negotiations in forums like WTO.

⁹ Didar Singh, *Electronic Commerce: Issues for the South* (South Centre, 1999), pp 7

Nepal should try to address two international issues at appropriate levels in order to ensure that its position with regards to e-commerce is strengthened and its concerns are well presented. These issues are:

- i) standards and technology issues
- ii) trade policy issues and responses in international trade negotiations and deliberations

Given the nature of e-commerce and its global orientation, there are a number of new standardisation and legal issues that can only be resolved at the international level.

Realizing this, several intergovernmental organisations have established or are working on international instruments, standards or benchmarks aimed at simplifying documentation and information on exporting and importing and facilitating the development of electronic commerce. Along these lines, apart from UNCTAD, the work of UNESCAP (United Nations Economic and Social Commission for Asia and Pacific) has also been significant in the regional level.

Given the fact that most of the technological advancements take place in the developed countries and also owing to intensified e-commerce implementation in those countries, a country like Nepal appear to have almost no say in the area of standard setting. Efforts, however should be made in exploring the prospect of working out a common stand in conjunction with other developing countries even in the areas of standard setting so that virtual monopoly of developed and industrialized economies is challenged to some extent for the benefit of countries like Nepal. Along these lines, Nepal could benefit by working together with International bodies/ associations (The Internet Corporation for Assigned Names and Numbers-ICANN and World Intellectual Property Organization - WIPO for example.) Other UN agencies like UNESCAP and UNCTAD can also be of significant help for countries like Nepal in articulating issues concerning standards and developing appropriate responses.

This could be significant as issues concerning domain names, address management and digital certification have direct bearing on the success of e-commerce. Technology is also a prime issue for a developing country like Nepal as new technologies are constantly evolving and keeping pace with them will require substantial resource commitments and careful planning.

3.2.2 National level

There are a range of national issues with regards to e-commerce that must be addressed from strategy and policy perspectives. They are:

- i) National e-commerce policy and strategy
- ii) Infrastructure and technology issues
- iii) Government initiative to promote e-commerce

i) *National e-commerce policy and strategy*

Nepal must have a national e-commerce policy and strategy in place if it is to promote e-commerce and benefit from its developmental potentials. Ideally, *as in more traditional commerce, the private sector will provide the leadership for the growth and development of electronic commerce, including the establishment of reliable and trusted business practices for conducting commercial activities in the digital age.* The government nevertheless does have a very crucial role to play. There are a number of issues that include, among others, legal, financial and taxation issues that must be seriously dealt with while trying to promote e-commerce. Nepal might need to amend existing economic and fiscal policy in order to promote e-commerce in the country. Existing foreign exchange and export regulations and formalities must be reviewed with a view to examining their worthiness in e-commerce transactions. Banking and financial sector must also be geared towards providing requisite services to facilitate and promote e-commerce.

Nepal Rastra Bank should take a leading role by playing a facilitative role in addressing financial issues and developing and implementing proper payment mechanism for e-commerce transactions.

ii) *Infrastructure and Technology issues*

This is undoubtedly one of the critical areas that could really be detrimental to our efforts aimed at being an active player in the creation of knowledge society as well as mainstreaming e-commerce into our overall trade and commerce scene. The basic and unifying infrastructure that enables Internet and e-commerce namely telecommunication network is still in short supply in Nepal. Operating through nearly 100 exchange offices, the NTC has been able to provide only 271,553 telephone connections including mobile telephone connections.

Even though recent years have seen extension of telecommunication services to 1,676 VDC's of 75 districts of Nepal¹⁰, there is still a lot to be achieved in terms of quality and outreach. Relatively high communication tariffs, shortage of bandwidth coupled with the added difficulty in securing telephone connection present a disappointing picture.

The number of ISP and VSAT service providers are also in short supply and the cost of Internet connection and usage is still beyond reach of SMEs¹¹ and individuals even though past two years have seen tariffs go down slowly. This could in part be due to relatively high initial investment costs on part of ISPs on computer hardware including routers, switches and high-speed modems as tariff on these items are still higher than other countries in the region. Nepal is yet to take concrete steps in terms of further lowering the tariffs on IT tools and promoting its use as vehicle for sustainable development.

¹⁰ Figures until the first nine months of FY1998/99, Economic Survey

¹¹ Small and Medium Enterprises

iii) Government initiatives to promote e-commerce

Given the scenario where there is marked degree of reluctance largely owing to ignorance about the potentials of e-commerce coupled with resource limitations on part of SME's, it is important that government should take facilitative role by embarking on activities like creation of web sites on some niche-product areas (VORTALS), improvement of trade logistics, human resources development and introducing a system for electronic public procurement (B-to-G e-commerce) etc. Along these lines institutions like Ministry of Commerce and Industry and related outfits like Trade Promotion Center (TPC – www.tpcnepal.com) of HMG should be strengthened in order for it to be able to respond well to emerging trade and commerce regimen characterized by increasingly pervasive application of e-commerce. Along these lines, a dedicated e-commerce cell should also be opened in the Ministry of Commerce and Industry to monitor and facilitate private as well as public sector initiatives in the area. Concerted efforts aimed at introducing electronic governance will also yield good dividends as far as e-commerce is concerned. This should however be stressed that the government role should largely be facilitative with minimal interference.

3.2.3 Business enterprises level

From the perspective of business enterprises and business community at large, issues at this level in connection with e-commerce include matters relating to access, trust, fraud, digital contracts and guarantees.¹² While even developed countries are finding it a challenging task in coming to grips with these issues, country like Nepal must therefore be prepared for even greater challenges in trying to address them. There are some fundamental questions involved as to how these issues should be tackled in the context of Nepal. To what extent can the government intervene? Given the technical feasibility of advertising and setting-up of data bases, virtual shopping malls¹³, common platforms and supply chains, what could be the trade-off between individual versus collective efforts while trying address the issues involved?

SME's in Nepal will find themselves confronting with these issues since it is expected that 80% of growth in e-commerce will come from business-to-business transactions¹⁴ where SME's will have crucial roles.

Viewed from above policy and strategic framework, Nepal should undertake the following steps in order to promote e-commerce in the country:

3.3 Recommendations

3.3.1 Focussed government initiatives to promote e-commerce

As issues involved clearly cut across a number of distinct technical, procedural, legal and financial considerations, the government should form an Inter-Agency Task Force on

¹² Didar Singh, Electronic Commerce: Issues for the South, pp 9

¹³ Electronic equivalent of real shopping complexes

¹⁴ Didar Singh, Electronic Commerce:Issues for the South, pp10

electronic commerce to formulate a National Strategic Action Plan. This task force will have representation from Ministry of Commerce and Industries, Ministry of Finance, Ministry of Science and Technology and Nepalese business sector represented by FNCCI. The Ministry of Commerce will be a nodal agency for promotion, co-ordination and monitoring of activities related to e-commerce. The role of the nodal agency will largely be facilitative guided by a minimalist approach. This task force will in essence map the steps that need to be undertaken in order for Nepal to participate successfully in the emerging global electronic commerce. Some of important issues that need to be addressed are:

3.3.1.1 Issues pertaining to Customs and Taxation, Electronic Payments, Commercial Code, Intellectual Property, Privacy, Security, Infrastructure, Contents and Technical Standards.

3.3.1.2 Fiscal, financial and legal framework to facilitate e-commerce on the basis of which an E-commerce Act should be developed and implemented

- Work out issues relating to export regulations and taxation
- Work out issues concerning IP (Intellectual Property Rights)
- Review existing fiscal regulatory provisions with a view to creating a conducive environment for e-commerce
- Mobilize banks to institute proper payment mechanism for e-commerce transactions (see Section II for details on payment mechanism)

3.3.1.3 Work out legal provisions (in the form of IT Bill or Cyber laws) on digital signature (See annex I) and digital certificate issues.

3.3.1.3.1 Major legal barrier to EC implementation is considered as the admissibility of digitally generated (EDI) contracts/documents and acceptability in court. In order to overcome these problems as well as to recommend other facilitative legal and procedural measures, it would be appropriate to constitute an inter-departmental E-commerce Legal Committee, with participation from trade and industry sector, for recommending the legal requirements needed for the admissibility of EDI contracts and commercial transactions. The main objectives of this committee will be:

- a) To decide the legal requirements needed for the admissibility of EDI contracts and commercial transactions.
- (b) Review the current laws in Nepal that have a bearing on evidential (admissibility and authentication), contractual and liability issue for the implementation of Electronic Commerce in general and EDI in particular.

- (c) Identify any legislative policies, procedures (both legislative and administrative) that may have to be amended to tackle evidential, contractual and liability issues for EDI contracts/transactions.
- (d) Recommend legal policies, amendments and administrative regulations that may be required to legalise transactions derived from EDI in trade, and
- (e) To consider any other related issues of EC and EDI.

The composition of the Legal Committee is recommended to be as follows:

- ? Department Chief, E-Commerce Department (proposed), Ministry of Commerce and Industry
- ? Nominee, Ministry of Law and parliamentary affairs
- ? Nominee, Ministry of Foreign Affairs
- ? Nominee, Nepal Bankers Association
- ? Nominee, Customs Department
- ? Nominee, Nepal Rastra Bank
- ? Nominee, Ministry of Science and Technology
- ? Nominee, Nepal Telecommunications Authority
- ? Nominee, Federation of Nepalese Chamber of Commerce and Industries

This committee may in turn engage a group of foreign and Nepalese legal consultants to prepare and submit to the Government a report on the legal and legislative aspects of EC/EDI in the Nepalese context. It could be necessary to study similar initiatives taken by other countries and international organisations. Along these lines UNCITRAL initiative to develop an international model-law approach to electronic commerce would be an important reference point. There have also been numerous private initiatives aimed at reaching consensus on the general principles that should be applied to electronic signatures in a cross-border environment.

3.3.2 Work out national e-commerce perspective for articulating Nepal's stand in multi-lateral negotiations specially in view of impending WTO membership and ensuing negotiations.

3.3.3 Strengthen communications infrastructure and promote use of Internet.

- Provision of infrastructure that allow high bandwidth data communication.
- Make telephone connections easily available.
- Review current tariff structure with regards to telephone connection and usage with a view to promoting use of internet and thereby facilitating increased use of e-commerce all throughout Nepal.

- Take appropriate steps to promote introduction and increased use of internet all throughout the country by creating an environment for promotive pricing of internet services. This could be done through a joint effort of ISP's and Nepal Telecommunication Authority (NTA).
- Establish telecentres in rural and semi-urban areas with a view facilitating access to IT facilities and services as well as introducing e-commerce facilities in those areas.

3.3.4 Create awareness on e-commerce by creating and maintaining web sites on niche product areas. This can be done through related government agencies in consultation with the stakeholders.

In doing so identify areas where Nepal has definite comparative advantage and which could be further strengthened by introducing e-commerce. The entry points could be the businesses that have proven export potentialities but are less organized, lack resources and e-commerce related expertise and operate largely through informal arrangements or co-operatives. A perfect example would be handicrafts. This could also help in building national experience in e-commerce which could be the basis for sound policy decisions on sustained basis.

3.3.5 Introduce electronic public procurements (B-G e-commerce). This could involve on-line announcement of public procurements notices involving solicitation of bids and quotations, on-line publication of tender documents and specifications etc. This could prove significant in promoting the use of internet and e-commerce.

3.3.6 Promote e-governance. This is an important step having direct bearing on the success of e-commerce. Despite perceived independence of internet as a global medium of communication, e-commerce activities, on the practical level, will have ramifications that will by and large fall under the purview of certain government activities. As such IT led strengthening of governance will help e-commerce to a great extent. Specific e-governance initiatives aimed at facilitating e-commerce will be the ability to complete export formalities electronically, among others.

3.3.7 Take necessary steps to create conducive environment for FDI (Foreign Direct Investment) and venture capital initiatives.

3.3.8 Lower tariff on computing resources including PCs, routers, switches and high speed modems.

3.3.9 Develop human resources. In trying to make successful forays into areas like e-commerce, the challenges will be enormous from the human resources perspective as well. Being a technology intensive intervention, sustained and growing use of e-commerce needs a pool of human resources adequately

- qualified and experienced in the areas of internet technologies, web designing, experts in web enabled databases, payment gateways and mechanisms and security systems, etc. The role of both government and non-government training and academic institutions becomes crucial in this regard
- 3.3.10 Strengthen trade and commerce related government outfits with a view to enabling them to take proactive roles in the development and promotion of e-commerce in the country
- 3.3.11 Strengthen Ministry of Commerce and Ministry of Industry to take proactive role in the development of e-commerce on a sustained basis. This could involve setting up a dedicated e-commerce cell within the Ministry of Commerce with the main task of facilitating the promotion of e-commerce within the country and ensuring inter-agency co-ordination. As a promotive measure, the government could also look into the possibilities of allowing some tax deductions on investments made by commercial entities on procuring e-commerce solutions and services.
- 3.3.12 Mobilize government institutions like *Trade Promotion Center* to take appropriate steps for the promotion of e-commerce. This could involve providing support for setting-up vertical portals for less organized but potential sectors like handicrafts.
- 3.3.13 Mobilize postal institutions, private courier services and freight forwarders to institute proper delivery mechanism to facilitate e-commerce. This will include strengthening and reviewing current postal delivery systems, equipping them with IT resources - both human and material and introducing special incentive schemes for private courier services and freight forwarders for example, by allowing tax deductions in investments made in making themselves e-commerce ready.

3.4 Business community initiatives

- 3.4.1 Undertake coordinated and collective activities in conjunction with banks and other stakeholders in building trust across the whole spectrum of users and providers of goods and services.
- 3.4.2 Embark on concerted efforts in promoting local content.
- 3.4.3 ISP's should also consider playing the role of CSP's (Commerce Service Providers) providing e-commerce solutions.
- 3.4.4 Mobilize Federation of Nepal Chambers of Commerce and Industries to take facilitative role in addressing digital certification and digital signature issues, among others. For example, FNCCI can work out arrangements with international

certification authorities and agencies on behalf of Nepalese e-commerce merchants.

FNCCI could also consider creating a dedicated e-commerce cell which could coordinate all e-commerce related activities. Along these lines FNCCI could take initiatives in forming an alliance with international Trusted Third Parties (TTP) and leading provider of trust services like VeriSign Inc of USA (www.verisign.com).

3.5 Possible areas of e-commerce applications in Nepal

Given inherent resource limitations and a scenario where developmental prospects of e-commerce are yet to be proven in the Nepalese context, an effort should be made to identify areas that stand to benefit more from e-commerce as an immediate strategy both (B-to-B and B-to-C) e-commerce. These could be the areas where Nepal has relative competitive advantage or the ones that could cash on prima facie interest that quite a number of people have in Nepal. Some of the such areas could be:

- 3.5.1 Handicrafts, carpets and readymade garments
- 3.5.2 Digital products like Nepalese music
- 3.5.3 Services : computer programming and other IT related services
- 3.5.4 Food products, spices and herbal products
- 3.5.5 Hotels and tourism related services

It should however be borne in mind that e-commerce is not only about creating web sites. With millions of web pages vying for attention among relatively limited potential customer population, the biggest challenge is to ensure steady flow of visitors. Creating web sites is however only one part of this story. In order for people to visit such web sites, these sites must show up in a key word search of web data bases maintained at several sites such as YAHOO. On top of that it also important to bear on mind that traditional values like quality of product, customer satisfaction and efficient delivery system associated with successful commercial activity remain unchanged even after the introduction of e-commerce.

SECTION II

4.0 Addressing security issues

One of the most important prerequisites of e-commerce is the presence of a solid foundation of trust and security. These are crucial key elements of successful e-commerce implementation. While transformation of regulatory and legal environment is crucial, issues relating to security and trust play equally important roles and any initiative aimed at promoting e-commerce should address these issues adequately.

Along these lines, it is important to understand technological ramifications of such an initiative as these issues get ultimately manifested in technological domain.

4.1 The ramifications of security issues

The future of electronic commerce ultimately rests on the trust that the transacting parties place in the security of the transmission and content of their communications¹⁵. It should be further reinforced by their faith that that these communications will be granted adequate recognition to assure their legality and enforceability in any domestic or foreign jurisdiction. Apart from security in physical terms involving computer hardware and actual information stored on the hardware, the security issue should, most importantly, concern the creation of electronic data messages, data protection techniques applied to the data message, and its transmission to the recipient. Security issues must be handled in 'scalable' fashion meaning that different levels of security have to be selected between different trading partners according to the vulnerability of their business processes. Security with regard to Internet concern primarily with the content or information rather than expensive and at times impracticable option of securing the medium. In order for Internet to serve the purposes as a vehicle for legally binding transactions, efforts must be directed at securing the message itself, as opposed to the transport mechanism. As far as security with regards to messaging is concerned there are six important potential threats:

- a message may be duplicated, lost or replayed
- a message may be intercepted and modified
- a third party may pretend to be a valid message sender
- a sender may claim he never sent a particular message¹⁶
- a recipient may claim he never received a particular message
- a message may be read by third party

¹⁵ www.unescap.org

¹⁶ Referred to as non-repudiation, this requires some way to ensure that the sender cannot falsely deny sending the message, nor falsely deny the contents of the message

It should however be borne in mind that secure electronic communication entails a considerable commitment in terms of effort, money and transaction time. The use of Internet for e-commerce raises the following security concerns:

- no assured delivery (this is rare but nevertheless an inherent weakness of the Internet as it consists of a vast number of connected networks, and the path through the networks is not predictable);
- confidentiality (intermediaries can listen in on private communications);
- integrity or alteration of the message;
- impersonation of the sender or recipient;
- as per prevailing legal provisions certain signature formalities must be also satisfied.
- and availability (for example, a hacker taking up all resources on a server and preventing access by genuine users).

Solutions are being developed. Together with GTE, IBM, Microsoft and other companies, Visa and MasterCard developed Secure Electronic Transaction (SET) which will serve as a standard protocol for secure credit card transactions on the Internet. It uses complex cryptography to transmit credit card information and digital signatures to ensure that both buyers and merchants are authentic.

In a country like Nepal where Internet usage is just gaining momentum and e-commerce is almost non-existent, neither the technical infrastructure nor the legal framework necessary to deal with these security concerns exist at present.

If we are to promote e-commerce in the country and give Internet the value it deserves as the medium for communication among business organisations, firms and also the government have to 'opt for an individual enhanced security architecture'¹⁷. There are a number of systems available that help in putting a 'Trust infrastructure' in place.

4.1.1 Building Trust Infrastructure

From systems perspective, available security products fall into two main categories: point tools, and trust management products and services.

Point tools include control, confidentiality and integrity, audit and monitoring. The usefulness of these tools are limited to addressing security issues at enterprise level only. Given the scope and reach of e-commerce, however, this is not enough. From the policy perspective, the overriding concern is the availability of products and services that will provide the crucial foundation for trust for sustained use of the Internet for e-commerce. Of late, the international market has seen an emergence of a number of third party products and services¹⁸ delivering technical solutions in trust management. These products have three components:

¹⁷ Ibid.

¹⁸ For example www.digsig.com

- cryptographic tool kits;
- other trust management products;
- and trust management services.

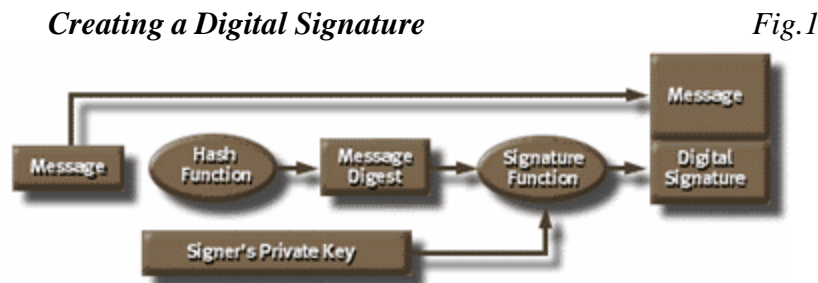
4.1.1.1 Cryptographic Tool Kits and digital signatures

Cryptography in essence is a data encryption technique designed primarily to provide message protection. With the ever increasing use of Internet and electronic commerce the use of cryptographic tool kits, based particularly on Public Key Cryptography are finding wide spread applications. Cryptographic tool kits provide the essential building blocks for trust.

Cryptography is basically applied in digital signatures and encryption. There are various ways of signing a document electronically; electronic signatures based on public-key cryptography¹⁹ or dual-key cryptography are known as digital signatures. Digital signature is an actual transformation of an electronic message using public key or dual key cryptography. Through this process, the digital signature is tied to the document being signed, as well as to the signer, and therefore cannot be reproduced.

Digital signatures are important as they provide a mechanism for authentication (origin of a data message) and integrity (verify whether a data message has been altered). Digital signatures rely on an algorithm using two different but mathematically related keys: Private and Public keys. The "private key" is used only by the person doing the signing, the signer, to create a digital signature, and the "public key" can verify the digital signatures created by the private key.

Fig 1²⁰ below is the graphical representation of digital signing process:



The public key, as its name suggests, may be freely disseminated to those who need to verify the signer's digital signature. This key does not need to be kept confidential, whereas the private key is known only to the signer and must be kept secret. There are

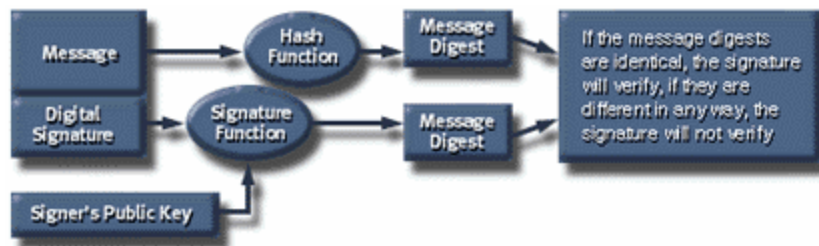
¹⁹ Originally recognized within the context of electronic funds transfer, digital signatures - which are based on public key cryptography - have been thrust into the legal limelight as the solution to the problem of guaranteeing secure electronic commerce.

²⁰ www.digitrust.com

several important characteristics of these key pairs. First, while they are mathematically related to each other, it is impossible to calculate one key from the other. Therefore, the knowledge of associated public key alone can not compromise the private key. Second, each key in the key pair performs the inverse function of the other. What one key does, only the other can undo. Fig 2 below is graphical representation of digital signature verification process.

Verifying a digital signature

Fig. 2

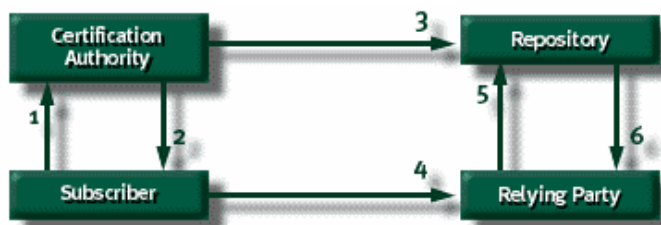


4.1.1.2 Public Key Infrastructure and the role of certifying authorities

Digital signature software are now widely available for even individual users. They can either purchase it or even download it from a browser for a fee. This means that anyone can generate a key pair and release his or her public key to the public domain, using any identity he or she chooses, with no guarantee that the identity is authentic. This obvious leaves the security picture incomplete and calls for some type of entity to serve as trusted third party (TTP) to vouch for individuals' or the firm's identities and their relationship to their public keys. This entity is referred to as Certification Authority (CA). The Certifying Authority is a trusted third party that issues digital certificates to its subscribers, binding their identities to the key pairs they use to digitally sign electronic communications. The contents of Digital certificates are the name of the subscriber, the subscriber's public key, the digital signature of the issuing CA, the issuing CA's public key, and other pertinent information about the subscriber and his organization, such as his authority to conduct certain transactions, etc. These certificates are usually time bound with a fixed expiry date and can also be revoked upon private key compromise, separation from an organisation, etc. These certificates are stored in an on-line, publicly accessible repository.

PKI Process Flow

Fig.3



Since trust is perhaps the most crucial element in the success of electronic commerce, a country like Nepal should take all necessary steps to address the related issues that run the gamut from procedural and legal issues to issues relating to digital signatures and digital certificates.

Over time, we must work out security and trust building strategies that are more suited to our requirements and also are robust enough to facilitate e-commerce globally. In the meantime, what we need to do perhaps is to start building relationship with reputed international Certifying Authorities in the U.S. or elsewhere. Along these lines, the government as well as organisations like Nepal Chambers of Commerce and Industries should be mobilised so that they could play important roles of *infomediaries* in ensuring trust and legality required in international electronic commerce transactions. In the absence of a comprehensive legal framework in the form of either Information Technology Bill or Cyber Laws, the immediate step that the government could embark upon is to identify and recognize foreign certifying authorities and start building relationships with them.

5.0 Payment Mechanism

It has been often said that had payment system be more streamlined and effective, electronics commerce would have made more significant headway than what it is today. Even though a number of modes of payments have been introduced (see Box 3), the e-commerce community has yet to see a solution that is fast, safe, reliable and workable. In the case of Nepal, the challenges are even more formidable given rigorous foreign exchange regulations and export formalities that are far from being conducive for the development of e-commerce in the country.

Credit card is still one of the most popular international payment mechanism for transactions carried out electronically. Some of the other popular payment mechanism also center around credit card ownership (see box for details on how a credit card transaction works).

How does a credit card transaction work?

The moment a card transaction is initiated, it goes through a host of interfaces, usually in less than 15 seconds. First the transaction details - *buyer's card number, merchant number (the one who has subscribed to a particular CSP), and the amount of the transaction* - travel to the processor that holds the merchant's bank account. That processor reads the numbers, and calls the processor that holds buyer's account. The second processor tells the merchant processor if the card number is valid, and if the buyer has enough credit. Then it passes an approval code to the merchant processor, which credits the seller and passes the approval code back to the merchant's terminal. (The two processors settle up later, usually in a batch mode, usually overnight.) Traditional credit card transactions are authenticated by the signature of the buyer which is missing from credit card transactions carried out electronically, which the bankers term as 'card not present transactions'. You need two things to enable transaction processing on a merchant's Web site,

? software to handle the interfaces (**payment gateway**) and

? a banking relationship linked to a processor

?

Some of the companies in the US provide services to e-merchants in the form of payment gateways and switches. One such firm is CyberCash (www.cybercash.com).

This poses a major challenge for a country like Nepal where credit card ownership and usage is negligibly low. As such it is important that banks and business community should get together and try to introduce most appropriate payment mechanism for e-commerce. Nepal Rastra Bank should take a leading role in coordinating the implementation of appropriate payment mechanism for e-commerce transactions. A sustained effort aimed at promoting the use of credit cards will also yield good dividends to all the stakeholders of e-commerce. This seems to be slowly taking place largely at the initiatives of private commercial banks. Apart from this, a host of other popular payment mechanism should also be thoroughly studied and the ones that are best suited to Nepalese business environment should be introduced. Given the complex fiscal regulatory provisions, payment mechanism, specially in the context of e-commerce transactions carried out internationally, demands a dedicated study and recommendations based on existing macro-economic realities.

6.0 Conclusion

It is evident that e-commerce will increasingly mark a major paradigm shift in international trade and commerce domain. Developing country like Nepal must therefore be prepared to take advantage of the potentials of e-commerce if it is to improve its economic situation and energise its economy. Even though a number challenges do exist in making full fledged e-commerce a reality in a country like ours, a concerted effort must be made to facilitate the growth and development of e-commerce in Nepal. The government in conjunction with the private sector can and should play crucial roles in this regard. Private sector should take a leading role and government should facilitate.

Things have to be started from the basics: extending scope, outreach and quality of telecommunications infrastructure and making it more affordable. Promoting internet connectivity and usage. The prevailing legal system as well as regulatory measures have to be adjusted and reformed to accommodate electronic commerce. Existing financial and export regulations must be revised and improved upon to facilitate e-commerce on a sustained basis. Trust being one of the crucial elements, it must be addressed adequately by all the actors.

Nepal Rastra Bank should take a leading role in implementing proper payment mechanisms for purchases made electronically specially by international buyers. The establishment of telecentres could also play an important role. Human resources being another key element, concerted efforts must be made to develop the same.

ANNEX I

Commonly Used Payment Mechanisms

Box 2

Credit Cards	Credit Cards are still the most popular way for paying for goods and services on the Net. The more card types you can accept, the better your sales will be. Credit cards are not that popular in Nepal and Nepali nationals can not normally own international credit cards. Most of the international credit cards are accepted by the commercial banks but small and medium sized businesses however do not accept them. There is still a long way to go before the usage of credit card becomes the primary means of collecting payments for a products/service offered through the web.
ATM/Debit Cards	These cards are used widely in Europe and are increasing in importance in the U.S, with CardData reporting a 42% growth rate last year as opposed to 15% for credit cards. The major advantage for the merchants is that they can significantly lower transaction costs than checks.
Digital Cash	To use digital cash, both the customer and the merchant need to have an account with the bank that issues it. The bank provides the customer with "purse" software for managing and transferring their digital cash. Customers convert funds from the from their regular accounts into digital cash and then transfer it to purse software, which stores it to their hard drives in encoded form until it is spent.
Micropayments	The major advantage of digital cash are the relatively low transaction costs and the fact that it can be divided into smaller denominations than are used in the real world. This makes it suitable for use in low value transactions such as paying for stock quote or news article. The small denomination tokens are known as microcash and transaction with them are called micro-transactions or micropayments.
Electronic Checks	In virtually all aspects, an electronic check has the same feature as paper check. Indeed, in its simplest form some system merely require the customer to fill out a form in the web store. This data is then transferred to the merchant where it is converted into paper check form using a blank check form in a office printer. A further level of security can be obtained by utilizing third part inputs for additional services such as verification.
Virtual PIN	For consumers who are not keen to transmit their credit card numbers across the net, First Virtual's VirtualPIN (www.fv.com) service provides an additional level of security. First Virtual issues a VirtualPIN to the customer, after they have provided their card number over a voice telephone. Customers can then use their VirtualPIN in lieu of Credit card number. For each purchase, First Virtual sends the user an e-mail message asking them to confirm the transaction. Once Virtual receives the confirmation back, the credit card transaction is processed off the Internet and an e-mail is sent to the merchant authorising him to ship the goods.
Digital Wallets	Other ways of increasing credit card safety have come from CyberCash and Verifone, both of who provide consumers with a helper application called Wallet. In the process of setting up the Wallet, the consumer provides his/her credit card information and receives an encrypted code that refers to the credit card in return. When making a purchase at participating web-store, the Wallet passes the code to the merchant. The merchant then hands over that code, along with the purchase price, to the Wallet issuer who verifies the transaction with the credit card company and transfers the funds to the merchant along with an authorisation to ship the product.
eCharge	The eCharge system allows customers to charge web purchases to their normal telephone bills. It is currently only available to the merchants in the U.S. and Canada and to some countries in Europe.
Traditional payment Methods	Electronic payment via web is still in its infancy and as such many customers would still prefer by paying by check, demand draft or cash on delivery