Chapter 2: Literature Review

2.1 E-Commerce General

The World Wide Web has experienced explosive growth as a content delivery mechanism, delivering hypertext files and static media content in a standardized way. Now it has taken another major role to bring consumers closer to traders by the implementation of E-Commerce. Various organizations and individuals have already conducted many studies on e-commerce. These studies cover enormous aspects of e-commerce such as technical feasibility and reliability, security, privacy, consumer perception, social concerns, commercial impacts and laws and regulations.

Almost all institutions, all organizations, all conferences and all surveys conducted seems to have one common understanding about the most important issues of e-commerce - security and privacy. There has been significant improvement in the technology used for security purposes starting from simple password authentication and firewall to encryption, and digital certificates/signatures. But the effectiveness of these technologies is very much questionable. The issue of security breach and hacking seems to be increasing substantially. According to "The 1999 Information Security Industry Survey", published by ICSA Inc., through its Information Security Magazine, e-commerce sites are more likely to be the target of hackers and most e-commerce sites shall be effected.

The article by Loew *et al.* (International Network Conference 1998) approaches the issue of security from an organizational perspective, discussing how a combination of technologies can be utilized to secure a network externally (via firewall) and internally (using Intranet-based measures). Staying with the security theme, the paper by Gritzalis *et al.* recognizes the threat posed by downloadable executable content and examines the security features of current approaches. This is discussed in the context of Java and Safe-Tcl languages, which represent two common methods of realizing portable, platform-independent code.

Computer Technology Research Corporation (CTR) has recently released a descriptive report on the various e-commerce security strategies. "E-commerce Security Strategies: Protecting the Enterprise" examines the effectiveness of these technologies and discusses the products available for implementing virtual private networks (VPNs) and secure E-mail. Roger Clarke from Australian National University, in a paper, described the various aspects of encryption and cryptography. He also covered the many contents of privacy such as information privacy, confidentiality, surveillance, authentication, anonymity, identification and pseudonymity.

The importance of consumer confidence and consumer concern over security was the important outcome of a survey done by Rockbridge Associates Inc. The survey reveled that the success of an e-commerce site shall depend merely on how it handles this issue. It does not cover ways on how this could be done. In its "E-Commerce Roadmap- Successful strategies for e-commerce", IBM has give the strategy on how to maintain consumer confidence via public relations. Similar information on managing the regular visitors to a web site is also described in Figallo Cliff's book titled "Hosting Web Communities: Building Relationships, Increasing Customer Loyalty, and Maintaining a Competitive Edge".

According to recent views and news on the Web, the diverse growth and development of the Internet may be approaching a fulcrum; as users, technology and usability reach the obstacles of bandwidth limits. Noel Wynder, editor of Internet Research & Development Center claims that at the rate at which end user equipment performance is improving and consumer expectation is increasing, the Internet shall be reaching its bandwidth limits soon. Similarly, a study conducted by Northeast Consulting Resources, Inc. concluded that e-commerce will be substantially hindered by the fact that the Internet remains slow and will probably get slower over the next few years. In a related study, the need for high Quality of Service (QoS) from the network infrastructure point of view was discussed by Lars C. Wolf

Another issue that may hinder the growth of e-commerce is the lack of well accepted standard. Standards refer to various aspects of e-commerce like security, privacy etc., but the most important is the data transfer between systems. Initially, there was EDI, a

well accepted standard for data transfer. But however implementing EDI is extremely expensive as it requires a private network and thus is only suitable for large firms. On the other hand, researchers from IBM Watson Research Center have introduced a 'Web Based Internet EDI' solution that is more suitable for small and medium sized firms. Moreover the proposed model is better than the traditional EDI as it has wider connectivity, platform-independent and ease-of-use infrastructure.
IBM (IBM China Research Lab) has also introduced the Open Buying on the Internet (OBI), a standard more suitable for business-to-business e-commerce, the implementation of which is expected to streamline the non-mission critical procurement/purchasing processes of organizations as well as reduce the cost of establishing trading relationship and trading transactions. Despite the existence of these standards, the lack of a universal standard and the lack of integration between these various standards shall cause e-commerce to move slowly. As an example, EDI, which has been around for about 20 years has only created 2% of the transactions between business-to-business. (Fred Sollish, Editor of "Journal of Internet Purchasing", Vol. 2, No. 1, 1998).

Technical issues could be solved, but making people buy via the Internet is going to take a long time. It involves creating confidence among consumers. This was the important finding by Ernst and Young from its Second Annual Internet Shopping Study conducted in early 1999. The level, or "amount", of trust merchants are able to deliver to their customers, and upon which a great deal of the information revolution depends, need to be increased and security solutions for PC's need to be easy to deploy, use and manage. In line with this, Trusted Computing Platform Alliance (TCPA), formed by Compaq, HP, IBM, Intel and Microsoft has initiated an open alliance to work on creating a new computing platform for the next century that will provide for improved trust in the PC platform (Hardware and Operating System).

In a different approach to achieve consumer confidence, Chris Vandenoever (Business UpShot October 1998", Ernst & Young) has proposed a 'cyber seal of approval', which would function as a confidence creator for consumers to feel that their transaction/privacy is secured. Obviously, sites that lack these importantcyber seals will be at a marked competitive disadvantage to those that do.

Everybody seems to be having big numbers for e-commerce, but how is it actually going to be measured. This is a main concern of on-line store-owners. Measuring and understanding the effectiveness of e-commerce is important to set future strategy. Members from the IBM Watson Research Center have presented tools for tracking and analyzing the effectiveness of business effort in online stores such as marketing and merchandising. The Fisher Center for Management and Information Technology, in collaboration with CommerceNet and the Journal for Internet Purchasing proposed that the most important measure of purchasing success are cost, time spent and customer satisfaction.

Pricing for network traffic is something that very few people have been working on. In a paper by Alok Gupta, Dale O. Stahl, and Andrew B. Whinston, pricing computer network traffic will be essential to manage network traffic and to control and provide differentQoS required by different applications and users. A common agreement on this is essential to ensure global growth of e-commerce.

Lack of foresight, coupled with short- term planning in current projects may result in e-commerce sites crippling their parent businesses. A report, from ICL, a computing services firm, says that, in the race to get online, many organizations have not considered how they will cope with the millions of visitors that a popular e-commerce site might attract. Proper planning is required. Julie Davis ofAon Technology describes the top areas of concern for companies conducting business through Internet include intellectual property exposures, security exposures, business interruption and reputation exposures.

2.2 E-Commerce in Malaysia

International Data Corporation (IDC) has estimated that worldwide e-commerce activity will reach the $426 billion mark by 2002 (source: IBM's e-commerce Road-Map). This figure incorporates both the business-to-business and business-to-consumer e-commerce activities. The report further states that about 90% of the revenue will be

generated from the business-to-business e-commerce activities. IDC has also estimated the Malaysian e-commerce market to be about RM175 this year.

Realizing the potential of e-commerce/e-business sector, the Malaysian Government has taken several steps to create a National E-Commerce framework and the National Electronic Commerce Committee (NECC) was formed to spearhead this effort.

Although the e-commerce/e-business phenomenon only became a popular topic of discussion in the last one to two years, the service has been made available in Malaysia much earlier than that. One of the pioneers in e-commerce/e-business sector in Malaysia is Electronic Data Interchange Malaysia Sdn. Bhd. or otherwise known as EDI (Malaysia) Sdn. Bhd. (EDIM). EDIM was instrumental in the successful implementation of the first large-scale e-commerce/e-business initiative in Malaysia at Port Klang in 1994 using the business-to-business model. The system that was implemented by EDIM, called the Port Klang Community System (PKCS), involved various organizations such as Port Klang Authority, Royal Customs department, freight forwarders and financial institutions has been able to significantly reduce the time taken to move the cargo out of the port by streamlining the movement of important documents between the various parties in an efficient manner. This includes the remittance of payment to the Royal Customs via the 15 different banks and financial institutions in a safe and secure fashion. Later, PKCS was expanded to the Internet and called DagangNet Online. This allowed users to query and track the status of their documents. In addition, it also provided the users with latest and updated related information such as shipping schedules, online booking facility, real-time stock quotes from KLSE and access to news from worldwide sources.

Some of the recent developments on regulations in e-commerce in Malaysia are described below.

The Energy, Communications and Multimedia Ministry has prepared the National E-Commerce Master Plan. The master plan, which is ready for Cabinet approval (source: In-Tech, The Star, 13-7-99) would address issues like the cost of doing E-Commerce, security, infrastructure and promotions.

A set of "cyberlaws" has been created via the enactment of the Multimedia Convergence Act. These cyberlaws would provide legal foundation for conducting business transactions via electronic means. The five main high-impact cyberlaws are

1. The Multimedia Intellectual Property Cyberlaw (1998) gives multimedia developers full intellectual property protection through on-line registration of works, licensing, and royalty collection.
2. The Computer Crime Cyberlaw (1997) provides law enforcers with a framework that defines illegal access, interception, and use of computers and information; standards for service providers; and outlines potential penalties for infractions.
3. The Digital Signature Cyberlaw (1997) enables the community and businesses to use electronic signatures instead of their hand-written counterparts in legal and business transactions.
4. The Telemedicine Development Cyberlaw (1997) empowers medical practitioners to provide medical services from remote locations using electronic medical data and prescription standards.
5. The Electronic Government Cyberlaw (1998) allows politicians, public servants, and the public to communicate electronically using established security formats and standards.

Digicert Sdn. Bhd is the first Malaysian company to be awarded the operators license to be a certification authority. Digicert is a joint venture between Pos Malaysia Berhad (PMB), MIMOS and GITN Sdn Berhad. Digicert is a company offering trusted certifications services for the Internet to enable trusted commerce and communication. The company offers digital certificate for secure web server, browser, e-mail packages with a range of assurance level. Digicert uses a Public Key Infrastructure (PKI) solution that meets the requirements of the Malaysian Digital Signature Act 1997. The PKI solution will use public key digital technology to ensure authenticity and integrity of information in electronic transaction, and to enforce non repudiation in personal and private sector.

2.3 Global Happenings In E-Commerce

2.3.1 Global Business Dialogue (GBD)

This round table discussion group includes CEOs from companies in the Internet, computer, telecommunications, information technology, consumer products, banking and financial services, manufacturing etc. Initiated by Mr. MartinBangemann, Member of the European Commission, the main topics of discussion among the members were protection of personal data, consumer confidence, liability, taxation, tariffs, jurisdiction, infrastructure, intellectual property rights, authentication and security.

GBDE consists of members from companies like Fujitsu, Time Warner, IBM, America Online, Hewlett Packard, Nortel, Walt Disney, NTT, NEC, Nokia etc. The complete list of participants is available at www.gbde.org/gbde.html. Malaysian representative in it is Telekom Malaysia Bhd.

In a paper on 29th June 1998, the GBD announced that market based de facto standards are inevitable for e-commerce but these e-commerce standards should not be permitted to evolve into monopolies. In another press release on 14th January 1999, GBD announced that a global framework for Internet business is necessary and entrepreneurs with minimal government regulations should form the framework.

(http://www.gbde.org)

2.3.2 United Nations Commission on International Trade Law (UNCITRAL)

UNCITRAL has published many recommendations on computer records, fund transfer and credit transfer. In a recent development, UNCITRAL has developed a model recommendation that supports international contract in e-commerce.

(http://www.un.or.at.uncitral)

2.3.3 Organization for Economic Cooperation and Development (OECD)

OECD has examined the implication of e-commerce in many areas. It has prepared a recommendation report on "Global Information Infrastructure - Global Information Society" (GII-GIS). The report includes various aspect of transaction, measurement and possible barriers. It also includes discussion on security, privacy and cryptography.

(http://www.oecd.org)

2.3.4 World Trade Organization (WTO)

WTO made a new study on e-commerce to help countries to shape policy responses. It provided some surface level details on what could possibly be the outcome of e-commerce. On 22nd May 1998, WTO made a declaration that the 132 member nations of WTO have agreed to keep all electronic transmission duty free. This does not include goods ordered via the Internet but delivered by non-electronics means.

2.3.5 Asia-Pacific Economic Cooperation (APEC)

APEC has set up a e-commerce task force in February 1998 during a senior officials meeting in Penang. As a first step, the task force has setup a web site (www.dfat.gov.au/apec/ecom) in order to facilitate the work of the task force. The task force together with the existing work groups, has formed many guidelines on various aspect authentication and certification and has organized many surveys and seminars.
One of the major achievements by the APEC leaders in November 1998 in Kuala Lumpur was the endorsement of the 'Blueprint For Action On Electronic Commerce'. To ensure continued coordination in pursuit of the Blueprint for Action, the Ministers agreed that a Steering Group, comprising representatives from member economies would be established involving relevant working groups and sub-fora as well as business sector experts, in accordance with APEC guidelines on business/private sector participation.
Among the main issues mentioned in the Blueprint are

- The need of a root certification authority to promote inter-operability and trust and to facilitate cross-border electronic commerce.
- Develop a standard measure/indicator on the uptake, use and flows of electronic commerce.
- Minimize government rules and allow electronic commerce to grow based on competitive market based solution.

A practical first level legal guide to the electronic commerce in the APEC member economies, contributed by Baker & McKenzie (www.bakerinfo.com/apec/) and other leading law firms in the region was developed. The guide is intended for use by both

government and industry to understand their rights, responsibilities and exposure when conducting on-line business in the APEC economies. It is especially designed to assist small and medium enterprises (SMEs).

2.3.6 Open Buying on the Internet (OBI) Consortium

The Open Buying on the Internet (OBI) Consortium was formed out of a roundtable of a number of Fortune 500 buying and selling companies who met to create an open, vendor-neutral, scaleable, interoperable and secure standard for conducting business-to-business electronic commerce in October, 1996.

These companies had a shared vision to facilitate the rapid implementation of electronic commerce solutions utilizing interoperable, standards-based Internet purchasing systems that are characterized by universal, high-speed access, inexpensive and paperless information and transactions, platform-independent software and services.

The very first version of the OBI standards (Version 1.0) was completed in March 1997. The latest version (released in August 1999) is Version 2.0.

The consortium, which is managed by CommerceNet, has over 60 members - including firms like 3M, Microsoft, American Express, IBM, BASF, Xerox, Commerce One, Netscape, NTT, General Electric, Ford, Dun and Bradstreet etc.

The OBI standard consists of a common set of business requirements, supporting architecture, technical specifications and guidelines. The OBI architecture is built on existing standards in order to maximize interoperability and decrease implementation costs. For example, OBI specifies HTTP 1.0 using SSL as a standard for Order Transmission, X12 850 EDI standard for order request and SSL V3 for Secure Internet Communication.

The goal for OBI-compliant applications is to increase efficiency, reduce costs, improve overall buy/sell processes, and increase service levels to customers and end-users. Adoption of the standard provides companies with a secure, common method for conducting business online, enabling them to realize the full potential of the Internet as a platform for business-to-business commerce.

2.4 E-Commerce - The Social and Cultural Aspect.

As organizations continue to rush headlong into this new age of information and communications, they are starting to take heed of the changes taking place in the ways people interact with each other and with their information sources. Interestingly enough, there seems to be an increasing interest that deals with the impact of the Internet on society and organizations.

Sociologists and anthropologists have long used cultural classifiers and different social measures in the quest to understand and compare societies. As the communicative distance between societies shrinks owing to Internet technologies, new social forms and interactions emerge. New norms are being established in individual interactions and in corporate or inter-organizational interactions as well. As social interactions change, so do roles and responsibilities in an Internet-savvy organization.

The physical barrier of intercultural communication is the language. The Internet has the potential to facilitate understanding across cultures and languages by removing this physical barrier. One possible contributor to this development has been the recent release of freely-available automated direct machine translation systems, such as AltaVista with SYSTRAN, which translates from English to five other European languages (French, German, Italian, Spanish and Portuguese), and vice versa. However, concerns have recently been raised over the performance of these systems, and the potential for confusion that can be created when the intended meaning of sentences is not correctly translated (i.e. semantic processing errors). Paul A. Watters in his paper has pointed out the need for the development of Web-based translation systems, which have an explicit cross-linguistic representation of meaning for successful intercultural communication.

Harry Bruce, who edits the Internet Research Journal's Dynamic Research and Reviews section, takes social Internet research in a different direction with his study on "what people think when they search the Internet for information". The most important finding from this study was that Internet business should be based on users' mental representations and users' most effective interaction mechanism.

2.5 How does E-Commerce Work

The consumer moves through the Internet to the merchant's web site. From there, he decides that he wants to purchase something, so he is moved to the online transaction server, where all of the information he gives is encrypted. Once he has placed his order, the information moves through a private gateway to a Processing Network, where the issuing and acquiring banks complete or deny the transaction. This generally takes place in no more than 5-7 seconds.

There are many different payment systems available to accommodate the varied processing needs of merchants, from those who have a few orders a day to those who process thousands of transactions daily. With the addition of Secure Socket Layer technology, eCommerce is expected to be a very safe way to complete transactions.

2.6 Setting Up E-Commerce

There are a few basic steps involved in becoming a e-commerce enabled firm. The first step is to get an Internet Merchant Bank Account. This is necessary in order to be able to accept credit cards over the Internet. Web hosting is the second important step in the process. Web hosting is how a merchant gains presence in the Internet. It is necessary to assure a good uptime, good technical support and fast connection to the site.

Obtaining a Digital Certificate is necessary to perform SSL encryption of data. SSL is the most accepted security system for transactions currently. Finding a Provider of Online Transactions is the next step. Prior to this, merchants should have estimated the amount of business they expect to do via e-commerce. Based on this, merchants shall be able to select a suitable service provider.

The merchant should get a 'shopping cart' software. Shopping cart software is a easy-to-use program that can be used to allow people to purchase items, keep track of accounts, and tie together all of the aspects of e-commerce site into one cohesive whole.

Finally, the merchant should market the web page by submitting the site to various search engines, create links from as many related sites as possible, send regular updates of products and services, and keep up with the competitors contents of web page.

2.7 Standardization of Web Page

2.7.1 The Concept of Standardization

Standards are documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose.

For example, the format of the credit cards, phone cards, and "smart" cards that have become commonplace is derived from an ISO International Standard. Adhering to the standard, which defines such features as an optimal thickness (0,76 mm), means that the cards can be used worldwide.

Similarly, the specification of the Global System of Mobile Communication (GSM) Standards by European Telecommunications Standards Institute (ETSI) has enabled various businesses and technologies to grow independently and converge together to achieve an ultimate mobile network throughout the world.

ITU (International Telecommunication Union) defines international standards, particularly communications protocols for transmitting data over telephone lines.

IEEE (Institute of Electrical and Electronic Engineers) sets standards for most types of electrical interfaces where as ANSI (American National Standards Institute) defines standards for a number of programming languages, including C, COBOL, and FORTRAN.

In addition to standards approved by organizations, there are also de facto standards. These are formats that have become standard simply because a large number of companies have agreed to use them. They have not been formally approved as standards, but they are standards nonetheless. PostScript page description language and Hewlett-Packard Printer Control Language (PCL) for laser printers are good examples of de facto standards.

The existence of non-harmonized standards for similar technologies in different countries or regions can contribute to a so-called "barriers to trade". Export-minded industries have long sensed the need to agree on world standards to help rationalize the international trading process. International standardization is well established for many technologies in such diverse fields as information processing and communications,

textiles, packaging, distribution of goods, energy production and utilization, shipbuilding, banking and financial services.

2.7.2 Why Would Web Pages Need Standardization?

Customer Satisfaction and Confidence.

The very first reason would be to increase customer satisfaction and confidence in doing business on the Internet. This is crucial because the success of e-commerce depends heavily on consumer's perception of doing business/transaction on the Internet. Standardization will serve to increase confidence level among consumers who intend to do business on-line by assuring them that the merchants they are dealing with has policies to ensure high level if service, privacy and security. This, as suggested earlier, might basically be visualized via electronic certification. When consumers see a digital certificate stating that the web page they are referring to has been certified to comply with a widely accepted standard, then they may have better confidence to do on-line business.

Minimize Complexity

Standardization would help consumers and merchants to select a suitable (and probably the most appropriate) means of doing business over the net. From consumers' point of view, they would have a better (and an easier) way of selecting their merchants. They would not have to deal with those heavy IT jargons which does nothing more than confuse them. For example, table 2.1 lists some of the most commonly used cryptographic algorithms.

The terms in the table does not give a good selection criterion for a non-technical person. This is when the standard comes into the picture - to group and rate the range of products into certain categories based on the type of on-line business that is involved and make recommendations.

Public Key Algorithms	Uses a different key for encryption and decryption and the decryption key cannot (practically) be derived from the encryption key. RSA (Rivest-Shamir-Adelman), Diffie-Hellman, and DSS (Digital Signature Standard) are some of the commonly used Public Key Algorithms.
Secret Key Algorithms	Uses the same key for both encryption and decryption (or one is easily derivable from the other). DES, 3-DES, BlowFish and IDEA (International Data Encryption Algorithm) are some samples of Secret Key Algorithms.
Cryptographic Hash Functions	A way to hash an arbitrary length string into a certain bit value. MD5 (by RSA Data Security Inc.), SHA (Secure Hash Algorithm, published by the US government) and TIGER (by Anderson and Biham) are some samples in this category.

Table 2.1 - Commonly used Cryptographic Algorithms

Increase Competitiveness

Increase competitiveness among technology providers and reduce the possible evolution of a monopoly by one or two big players like IBM or Microsoft. The most common agreement about electronic commerce is that it should be market led and not based on government rules. In such a situation, big players are of advantageous because they have a bigger market and better trust. They may even be able to provide low priced solution in order to capture and lock the electronic commerce market.

On the other hand, if there is a specific standard which says this is how a solution should work, then it gives equal opportunity for big and small players to compete and develop their solution based on the set standards. There will be a variety of solution providers for merchants to choose from. This will also lead to the growth of healthy competition.

Avoid Incompatibility

Avoid any incompatibility issues that may rise due to the use of different technology or procedure. This is an important aspect because one consumer shall most definitely be trading with multiple merchants. If these merchants do not follow a standardized encryption mechanism (for example), then we will have a situation where consumers have to install certain software on their computers just in order to be able to trade with one merchant and a different software in order to trade with another merchant. Similarly there may be a need to upgrade software on consumers' computers when the solution providers upgrade their e-commerce software on the merchants' servers.

The need for compatibility does not stop there. Let us take a situation where a solution provider goes bankrupt. Merchants using his software and solution shall be stranded without any support. In such a situation, the merchants need to be able to convert their existing on-line business into another solution provider's infrastructure easily and at a low cost. In order to achieve this, there should be a standard arrangement among solution providers.

Quicker Decision Making

An easier way of collecting and comparing data/facts of products/services by consumers. Different merchants may sell their products in their own styles. Some merchants might bundle up things and charge a high price and some merchants might give huge discounts on the basic pricing but charge differently for additional services. The reasons that they may give to justify their pricing might be of quality, service, support, delivery etc. When it comes to information about the product, merchants have different ways of putting up their specification or description. From a consumer's point of view, it is very difficult to make a sort of an 'apple-to-apple' comparison of products.

Now let's say there is a standard that says how a basic product should be described and priced. For example, when selling a computer, the product description should include details of each component, their respective manufactures and pricing. This would enable consumers get similar details from a few merchants, compare the findings and

make wise and quick decisions. This would increase the efficiency of doing business on-line.

As a measurement tool.

As a means of measuring the growth of e-commerce. The absence of international guidelines and measurement standards would result in widely varying estimates of the size and impact of e-commerce. What is the best way to estimate the value of e-commerce to a country generally and to a merchant specifically? How should the on-line sales be measured? Should it be based on number of real transaction, or should it be based on the actual amount of the sale, or should it be based on the cost of products sold?

We need a standard term or rating capability so that when someone comments regarding e-commerce' success, then we know that it could only mean one thing. The other need for this is to track the actual profit made by firms for tax justification. The taxation law is discussed in more details in the later portion of the study.

2.7.3 Characteristics of The Standard

ISO/IEC Guide 2:1996 defines a standard as a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. Similarly the Standard for E-Commerce is a model that defines certain aspects of performing on-line business and thus should be set as basic guidelines to be met.

Generally the standards should be open and applicable to all types of on-line business. Neither the size of a business nor the nature of its business should be an issue in adopting to the standard.

The standards should cover several disciplines: dealing with all technical, economic and social aspects of human activity.

Reference should be made to existing standards that could be to mention a portion of the E-Commerce Standard in order to avoid work repeatability.

The standards should be coherent and consistent and thus standards which are developed by technical committees and coordinated by a specialized body, need to ensure that barriers between different areas of activity and different trades are overcome.

Standards need to be reviewed periodically and has to be updated to ensure their currency, and therefore evolve together with technological and social progress.

Standards should have a reference status in commercial contracts and in court in the event of a dispute.

National and/or International recognition should be given to standards in order to meet its objectives.

There should be no discrimination on who should and who should not use the standards. It should be available to everyone.

The elements of the standard should be verifiable and measurable.

As a general rule, standards are not mandatory, but are for voluntary application. Standards compliance should not be a part of the law or regulation but however certain laws and regulations may be adopted as a part of the standards.