

ants, before their statements met the requirements of the New York Stock Exchange (Sender 1992). The adoption of Western software packages for automating corporate accounting and for providing reports of financial performance would greatly improve investors' assessments of fairness and, by lowering investors' perception of market risk, could increase liquidity.

Despite the central role of computers in matching, electronic brokerage transaction systems in China are still in their infancy. This reflects the rudimentary state of telecommunications, which makes transmis-

sion of voice (let alone data and fax) difficult in much of China (out of the 800,000 recognized villages in China, 500,000 lack even one telephone). Electronic transactions systems bring reliability, increased size of the client base, and speed of access to the market. This gives liquidity and consequently the ability to pass on risk to the market rapidly. These advantages make them attractive to small institutions that interact with the market infrequently and that may be especially keen to pass on risk rapidly. Their ability to link into a settlement system reduces transaction costs.

These shortcomings currently put China's markets at a distinct disadvantage to Hong

Kong's well networked and more modern markets. In the related banking sector, banks have been undergoing a technological revolution. Electronic transfer of funds, the use of automatic tellers, the transmission of accounting records through telecommunications, and the offering of a full range of banking services are moving retail banks into the modern world. This should provide a positive impetus to the integration of China's investment banking, brokerage and market functions into global financial networks.

## Certification Authority Guidelines in Japan

by Minoru Yasuda, Electronic Commerce Promotion Council of Japan\*

### Background

The Electronic Commerce Promotion Project partially funded by the Japanese government was started in late 1995. The project consists of 19 test-bed projects which experimentally provide various kinds of electronic commerce between consumers and businesses. Currently over 350 companies participate in the projects and more than 500,000 consumers are presumed to have joined.

To foster Electronic Commerce (EC) in Japan, and also to support and coordinate these projects, the Electronic Commerce Promotion Council of Japan (ECOM) was established in early 1996. ECOM has set up 14 Working Groups to study a wide range of EC related issues. One of these Working Groups is the Certification Authority (CA) Working Group which focuses on the technology, practice, and legal environment of CA. One of objectives of this CA Working Group is to develop the CA Guidelines. The primary draft of the Guidelines was made public in December 1996.

### Objectives of the CA Guidelines

CA Guidelines provide the foundation for the operation of CAs which issue digital certificates. A digital certificate, which electronically verifies the identity of business parties during network transactions, will play an important role in electronic commerce conducted via open networks. Digital certification guarantees the security of transaction information transmitted through networks, and information transmitted between organizations, within organizations and between individuals, by eliminating problems such as wiretapping, tampering or repudiation. This fosters reliance and trust required to conduct business.

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Council of Japan (ECOM). ECOM has  
been established with the aim of  
combining distributors,  
manufacturers and  
service providers from a wide range  
of industries with computer  
vendors and information processing  
services to  
build common platforms for the use  
of electronic commerce.*

### Structure of the CA Guidelines (Alpha Version)

#### Introduction

This section first defines the basic terminology related to CAs, such as public keys, certificates, and revocation of certificates, etc. The section then deals with the following subjects concerning public key infrastructure, which can be regarded as the technological foundation of the guidelines: (1) certificate management service for issuance, publication, and storage of certificates, services relating to the registration and management of personal information, and electronic notary, etc.; (2) hierarchical structure of CAs; (3) purpose of use and format of certificates.

#### Management requirements

As management requirements are important for increasing the reliability of CAs, establishment and publication of policies relating to certification, requirements needed by organizations, operational security requirements, and information disclosure requirements are stipulated. Within the policy arena the establishment and presentation of provisions concerning the requirements for secure operation of equipment and facilities, and of provisions concerning standards for issuance of cer-

tificates are discussed. This section also stipulates that organizational requirements must specify independence, third party character and specialization.

#### Service requirements

This section specifies requirements for guaranteeing security relating to five services that constitute the certificate management service, which is the basic service of CAs: management of the keys of CAs, issuance of certificates, registration and publicizing of certificates, storage and management of certificates, and revocation of certificates. For example, in view of the serious consequences of leakage or theft, private keys of CAs must be stored in an independent special module with high storage capacity, and in an environment that does not allow illegal removal of the storage module. Auditing of certificate issuance are also discussed. The personal verification of the applicant must be divided into three levels and that personal verifications should be conducted according to these levels.

#### Facilities and system requirements

This section specifies that requirements conform to measures classified under group A of the "Information Systems Security Measures Standards", which were announced by MITI in August 1995 and the instruction manual was published by the Information Service Industry Association in October 1996. Group A requirements relate to information systems that affect people's lives, the property of others, privacy and other social elements.

#### Forthcoming Schedule

ECOM is requesting that member companies and other relevant parties offer their comments regarding this guidelines draft. At the same time, the guidelines will be applied to the electronic commerce tested projects sponsored by MITI (Ministry of International Trade & Industry), with the results of these test operations to be incorporated in the guidelines. The final version, based on opinions obtained from various sectors, is scheduled to be prepared and announced by March 1998.

## Platform to Publish and Retrieve Multilingual Information on the WWW

by Virginia Cha, Star+Globe Technologies Pte. Ltd., Singapore \*

### Abstract

Asia, today, is the fastest growing economic region in the world. With the booming economy in Asia, there is a growing demand for IT and the use of the Internet/World Wide Web in the region. Although over 80% of all content presently on the Internet and World Wide Web are western-focused, a few - but growing explosively - web sites which host native languages (Chinese, Japanese, Korean) are now emerging. As more and more end-users in this region are introduced to the Internet, inevitably there will be a stronger demand for non-English information online. Star+Globe Technologies, Pte. Ltd., is a Singapore software company with a mission to be the preferred supplier of multilingual products to information providers and consumers to enable information sharing and retrieval in a multitude of languages.

This paper will examine the technology components, the users' and the providers' needs, benefits derived from multilingual information, and the business climate which stimulates this growing segment of WWW information processing.

### Introduction

The adoption of Internet in Asia is accelerating. In a recent April '96 survey by Survey Research Singapore, 291,000 people use the Internet, and this number will double in the next 12-15 months. Similar Internet growth rates are currently in countries where Internet services are privatized, and will occur in countries as they begin to offer Internet to the masses.

The explosive growth of World Wide Web from both information providers and users has created a new means of disseminating and acquiring information from all corners of the world in a highly efficient way. It also represents a new way for peo-

ple to communicate with one another using many different languages, though English is still the main language used. The Internet is virtually a global village where distance is no longer an issue, and people all over the world are interacting with one another. Today, any single home page may be viewed by an American, a Chinese, a Japanese, a Korean, a Thai, a French, an Italian, an Indian, etc. While it is not practical to provide a same piece of information in hundreds of languages, it is desirable to address an audience with his preferred languages. Thus, it is the desire of information providers to deliver information in as many languages as possible to appeal to a larger audience on the Internet.

Of course, in Singapore and in Hong Kong, the Chinese language is very relevant. In just the ASEAN region, there are over 49.3 Million Chinese speakers in this region. That's a big number, by anybody's standards. This number is even more impressive if we add in the Chinese speakers in PRC, in Europe, and in the U.S. Publishing and retrieving Chinese information on the WWW is possible, but there are a number of challenges related to the display, inputs, and the character set support of the publishing platform and the retrieval platform. Challenges in dealing with both the simplified and traditional written scripts and the efficient delivery of this information to reach the greatest number of audiences must be addressed. How do people retrieve information off the network in their native language?

One solution, of course, is to use the localized version of the Operating System. Microsoft and other system vendors release special language-specific versions of their operating system software for native markets to enable processing of information in that native language. These re-