Standardization of Information Technology: Experience of Thailand

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Introduction

This paper describes the experience of Thailand in developing her own IT standards. Major emphasis were mainly placed on character coding initially. Recent development, however, is shifted towards the facilitation of trade (EDI), information security (PKI and smart card) and electronic commerce. There are many more IT-related standards in the area of electronic industry and the Internet which may be the focus of future development.

Early Works

The need for Thai IT standard was identified since early 1970's when main frame computers were employed in many government agencies. IBM-029 keypunch machines and line printers were localized to accommodate Thai characters. De-facto standard for EBCDIC character code for Thai language has been in used since the seventies.

The first formal recognition for Thai IT standard was in 1984, after my publication on the numerous Thai Character codes [1] was reported in the press. The Thai Industry Standards Institute (TISI) later appointed a technical committee to look after the IT standards development. [2]. The very first standard produced by this committee was the TIS 620-2529 (1986): The Character Codes for Thai languages [3]. The standard character chde sets were made into two categories: one for use with the ISO-620 standard (widely known as ASCII and one for use with EBCDIC.

The committee subsequently produced a number of standards which are summarised in the website of NECTEC (see Figure 1) [4].

List of existing standards

- TIS 620-2533 (1990) Standard for Thai Character Codes for Computers
- TIS 988-2533 (1990) Recommendation for Thai Combined Character Codes and Symbols for Line Graphics for Dot-Matrix Printers
- TIS 1074-2535 (1992) Standard for 6-Bit Teletype Codes
- TIS 1075-2535 (1992) Standard for Conversion Between Computer Codes and 6-Bit Teletype Codes
- TIS 1099-2535 (1992) Standard for Province Identification Codes for Data Interchange
- TIS 1111-2535 (1992) Standard for Representation of Dates and Times
- TIS 820-2538 (1995) Layout of Thai Character Keys on Computer Keyboards
- WTT 2.0 (1992) Standard Input and Output Method for Thai language. [5]

Figure 1. IT-Standard web page at http://www.nectec.or.th/it-standards/

Recent Developments

The implementation of TIS 620 standard codes for global information interchange is not yet completed. There are several activities which enabled this standard code usable with the global standards. Our recent experience is mainly on the real implementation of the standard code in real systems such as MIME (over the Internet), UNIX Locale (Linux and all other UNIX systems), X-Window, GTK+ and Qt Toolkits.

Other line of developments are dealing with application of IT in business and government. I will cover this in the section "IT Standards for the New Economy".

Using Thai language on Computer Systems in Year 2000

The use of TIS-620 as an 8-bit character set coexisting with the ASCII code have been in used in Windows 95. This is known as Code-page 874. The code was also registered with the IANA (Internet Assigned Number Authority) to gain universal use in the MIME (Multipurpose [Multimedia] Internet Mail Extension) standard, according to RFC2278 standard for the Internet. Similar implementation of TIS 620 on the MaOS platform was also established since 1992, this is knoen as MacThai code.

In September1998, Trin Tantsetthi successfully registered TIS 620 as "tis-620" encoding with the IANA for Thailand [5]. As a result, the non-standard declaration for character encoding names such as "windows-874" or "cp-874" can all be supported by just one declaration "tis-620". New versions of Internet applications such as Mozilla (web browser), Internet Explorer (web browser) and Outlook (email client) now recognize "tis-620" character set.

Some further works are still required in making TIS 620 a usable standard. Certain legacy data have to make do with something else in order to convey Thai messages due to limitation of software features. For example, with Netscape Navigator up to version 4.7, the only way to display character in Thai language is to define fonts with "ISO 8859-1" encoding or "User-defined" encoding. Of course, the end result depends on the information receipient to set up the browser with a proper set of fonts to view Thai messages.

At the time of this article, the attempt of Thailand to implement the TIS 620 standard under the ISO 8859 framework is not yet succesful. Throught several negotiations, the ISO 8859-11 is now schedule for standardization process. It is now at the stage of FDIS.

UCS

Due to Microsoft's initiative to implement UCS in its Office-97 products on the Windows platform, Thai standard codes are made available widely across the world through UCS. The actual Microsoft implementation, however, added some

character codes such as Em dash, En dash, ellipses, etc. in the code table. The code is supported natively in text editors and Internet applications.

Public-domain Thai fonts

In 1999, NECTEC released three public-domain Thai fonts. The work is part of its effort to globalize the Thai language on computers. The three fonts are made to display and print Thai texts to match the Roman serif and sans serif styles. Through the public-domain approach, users of freeware and open-source operating systems can now enjoy high-quality display and print out.

Tai Script Study Group

The work on development on Tai script was also on the way. NECTEC set up a joint meeting among Tai script specialists in April 2000. The aim of the meeting was to gather the baseline information about the Tai scripts. The detailed update on this work is reported fully in the companion paper for AFSIT [6].
The study group planned for the following work in the years to come:

1. writing system (consonants, vowels, tones, digits, direction, syllable composition)
2. encoding (alphabetic elements, interchange vs. presentation, composing marks)
3. input method (key availability, input sequence, keyboard layout)
4. output method (display levels, glyph design, combining characters, shaping, font encoding)
5. sorting order (alphabetic order, classes of character weights)
6. word boundary (word/phrase/sentence delimiters, requirements of word boundary analysis)

IT Standards for the New Economy

In addition to the character coding and input/output systems for computers, several new areas in IT standardization took place in Thailand in 1999 and 2000. These activities are:

1. The draft Smart Card standards (volume 1: reference applications, volume 2: PKI applications). The document was produced by Thailand Smart Card Working Group during 1997 and 1998. The working group consisted of more than 70 organizations with more than 150 people attending the series of committee meetings hosted by NECTEC.
2. IT-Model Office Interoperability Specifications (1999). This document was produced by the Government Information Technology Service Program (http://www.gits.net.th/). It describes a number of government applications which are required to adhere to some reference standards in order to be compatible with the emerging GINet (Government Information Networkl) to support e-Government plan of Thailand.
3. The EDI Messaging Working Groups. So far,a number of standard EDIFACT messages are adopted by Thailand though three working groups: EDI Purchasing WG, EDI Customs WG, and EDI Financial WG. At this stage, the Security WG for EDI is in the development stage.

Not only industrial standards for the New Economy are emerging, new laws for IT are also being developed in order to push Thailand into the new millennium. In the year 2000, three laws have been drafted:

- Electronic Transactions Law
- Electronic Signature Law
- National Information Infrastructure Development Law.

The first two laws have been merged into one and is now awaiting for the Senate to consider. The third item is near approval by the cabinet. Three other laws which are being drafted consist of:

- Computer Crime Law
- Private Data Protection Law
- Electronic Funds Transfer Law.

These laws are expected to be sent for the cabinet by early next year.

Conclusion

The struggle to standardize the usage of Thai character code is not yet over. We still have a few important tasks to do. The tasks of developing code-points for Tai scripts of various parts of Asia has been started. We found that there are many other standards required by the IT industry in Thailand and some of them are being developed. These include: EDI standards, smart-card, PKI and e-Government interoperability Guide. The need for governing IT laws are also required by the society.

References

[1] Thaweesak Koanantakool, “Thai Character Codes in Current Use” (in Thai), *Microcomputer Magazine*, No.9, August 1984.
[2] Thaweesak Koanantakool and the Thai API Consortium, “Computer ans the Thai Language” (in Thai), National Electronics and Computer Technology Center, Bangkok, ISBN 974-7570-66-1, October 1991.
[3] Thai Industry Standards Institute: TIS 620-2529 and TIS 620-2530 (1980), ISBN 974-606-153-4, available at http://www.nectec.or.th/it-standards/std620/std620.htm (in Thai).
[4] Thaweesak Koanantakool and Adshariya Agsorn-intara, Character Codes and Input/Output Method for the Thai language, http://thaigate.rd.nacsis.ac.jp/refer/thaiconf/ (in English).
[5] Trin Tantsetthi, “Legitimate Thai Charset on the Internet”, http://software.thai.net/alerts/tis-20/index.html, Last update: September 1998.

[6] Theppitak Karoonboonyanan and Thaweesak Koanantakool, "Status of IT Standardization in Thailand (2000)", AFSIT 14, Jahore Baruh, November 2000.

Thaweesak Koanantakool received his Bachelor and Ph.D. degrees in Electronical Engineering from Imperial College of Science and Technology, London University. He had a number of industrial constructs in UK before he came back to Thailand to start his government service career in 1981. He taught in Electronical Engineering with the Faculty of Engineering, Prince of Songkla University. In 1985, he moved to Bangkok, Thammasart University, and was appointed Associate Director of the Information Processing Institute for Education and Development. Since 1994, he became Deputy Director of NECTEC as well as leading the Network/Software Technology labs. Thaweesak introduced the Internet into Thailand and set up the largest academic and research network known as ThaiSarn under NECTEC. He later co-founded the first Internet Service Provider (ISP) owned by Thai government in 1995. The ISP in Thailand Company Limited, at present in the largest ISP in Thailand, has 45% market share (by IP numbers managed). In 1996-1997, Thaweesak led Thailand's Information Superhighway test bed Project funded by NECTEC. The project was a major test bed in Thailand using ATM switches for both local area and wide-areas. In August 1998, Thaweesak was appointed the Director of NECTEC.