Acquisition and Deployment of Technology in Academic Library Environment: Experience in Thailand

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Abstract
Major traditional libraries particularly the academic libraries turned to electronic or digital libraries and offered information services without boundaries. The library users could access library resources from any where at any time. The changing face of the library services supported the life-long learning environment and toward developing the learning society in the country. The introduction of information technology and automated library systems to the library has made these things happened. This paper addresses the acquisition and deployment of technology affecting such development.

Keywords: Academic Libraries, Technology Infrastructure, ThaiSarn, ThaiLIS, UNINET.

Introduction
Majority of the academic libraries concentrates more on acquiring maximum information resources by purchasing textbooks, reference works, journals (both in printed as well as electronics media) which includes course materials and consortia. In this context can we presume the argument that “better library and laboratory facilitate better education”? Of late the argument was modified as “better access to resources and well informed users are life long learners” and hence creates good academic environment. Whereas, the technology based developments are pointing towards broad spectrum, i.e. from simple administrative needs to high end grid computing for e-research. Usually, in university environment, all the functional units are inter-connected, may be at an admission of a students or at the high end research activity, wherein usage is proportionate to their needs. In Thailand, information infrastructure is created as national infrastructure, optimized and deployed at university level to support all type of functional needs. The selection and deployment of infrastructure at enterprise level or the desktop applications is guided by requirements, standards, and recommendations of standard development organizations and accepted at national level.

Development of Technology Infrastructure
The major development of Information technology infrastructure in Thailand was started by the government in the year 1992 through National Information Technology Committee (NITC), with the mandate of planning, facilitating, and monitoring the implementation. The committee comprised of 22 members from leading public and private agencies chaired by the Deputy Prime Minister in charge of economic and social development. National Electronics and Computer Technology Center (NECTEC), a government statutory agency under the Ministry of Science, Technology and Environment, was recognized as the secretariat of the committee. Major activities covered were human resource development, utilization of IT in public sector, research and development promotion, legal infrastructure, public awareness programme, software industry promotion, and electronic commerce. As computer networks were becoming more and more crucial to the development of science and technology, the Thai Social, Scientific, Academic and Research Network (ThaiSARN) was established in 1992 to meet the demand for new ways of learning and research activities.

ThaiSARN was totally funded by the Thai government since its inception, and was successful in bringing more than 50 sites of government agencies, national universities, their libraries and colleges all over Thailand and thus built a good foundation in information exchange for inter-organization as well as intra-organization communications including cross-database access for the participating parties. There was an addition of a 2 Mbps to link with SINET (Scientific Information Network) of Japan under the sponsorship of the National Center for Scientific Information System (NACSIS). To supplement to ThaiSarn, the National High-Performance Computing Center (NHPCC) was established in 1994 and it was serving the needs of the Thai scientific and research communities for the supercomputing power through
ThaiSARN

Thai in its third generation having research as emphasis (a academic and research hub), connected to Asia Pacific advanced network and Internet 2 of US. Its bandwidth ranges from 64 KBPS – 155 MBPS, around 20 universities and research institutes are connected. It provides, in addition to basic services like www, email, ftp, multimedia (videoconferences and voice over IP), advance services (multicast and IPv6). Its working group includes IT for agriculture, earth monitoring and satellite services, bioinformatics and bioengineering, telemedicine and tropical medicine research and grid computing.

School net

(www.school.net.th) started as pilot project in 1995, under ThaiSARN, provided Internet connectivity to 4138 school all over Thailand, at free of charge, sponsored by Telephone authority of Thailand and Communication Authority of Thailand. Created educational web sites in Thai language for secondary school students, where materials are classified in to 7 academic subjects around 1000 lessons in computer science, mathematics, physics, biology, chemistry, environment and engineering

Internet Information Research (IIR)

Connects every ISP in the country, links include ThaiSARN and Schoolnet., which has plan to expand to Gigabyte bandwidth as backbone.

Development of Library System in Thailand

National Information Policy of Thailand, perceived from the survey by Nick Moore Information works that library and information network had progressed into the age of Internet and knowledge-based society. Nick Moore used the term “information policy” to mean ICT while National Information Policy broadened the meaning to include library and information services. As in majority of the countries, libraries in universities, schools, public, national libraries including special libraries have established the policy according to the overall policy of their parent organizations. The 9th National Plan of Thailand included the needs of library and information service and it was based more on the National Education Act (NEA) 1999, whereas the 10th Plan focuses as a knowledge-based society. National information policy, implemented in 1986, was to deliver the information to all citizens regardless of locations, religions and races. In 1992 Thai libraries were enabled with digital information, including online databases, later all universities were networked using UNINET.

Inter-University Network (UniNet)

The Thai government has a policy to provide more opportunities for education to local people in all regions of the country with equal opportunity to study and use local wisdom as a human resource to develop their own community. The Commission on Higher Education has studied the requirements for higher education in regional areas, particularly the

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Cray YMP EL/8 and SGI Power Challenge. The success of this non-profit activity in information technology has created a demand and set the stage for marketing commercial Internet service providers. There were two commercial Internet Service Providers (ISP) and in later 1995 ten more ISP providers were added. The market demand for Internet has been rising at the rate of twenty-three percent per month.

The 10th National Plan has further emphasized the need for Information and Communication Technology (ICT) in education. The government policies have focused on improving ICT infrastructure, developing educational curriculum content, and enabling universal access to the internet. ICT has been used to deliver high-standard curricula from privileged schools in Bangkok to schools throughout the country by allowing teachers to access the same curricular contents. This was the shift in e-learning courses for distance learning from television broadcasts to digital access for elementary education in Thailand. To enable teachers and students, in recipient schools, to effectively use the e-learning, teachers of best-practice schools organized a variety of instructional activities and integrated knowledge in many subjects so as to encourage students to think and apply knowledge. There were many problems in primary education in under funded schools, in remote areas, which did not have appropriate expertise in subject matter or teaching methodologies to teach the assigned courses. There were many schools having limited numbers of teacher and they have to teach several subjects. The e-learning facilities have facilitate the teachers from best-practice schools to share expertise, knowledge, and teaching methods of other under facilitated schools both in teaching and students in teaching and learning activities from different educational innovations. E-learning was very helpful to widen access to training for the teaching professionals and better curricula for students.

The national budget to the education sector has remained fairly constant at the average of 3.9% of gross domestic product, or 23 per cent of the national budget, during 1997–2007. Although this is a generous portion of the budget, it was not enough to improve the quality of teaching and learning for over 30,000 public primary schools throughout the country. Internet-based e-learning could serve as a low-cost solution to improve the quality of learning and teaching, as schools need only computers and internet access to hook up with an e-learning system². Internet connectivity in Thailand (1) was (as per 2002 report) divided in to three categories

a) Education and Research network – which connects universities, schools and research institute
b) Commercial networks - are Internet Service Providers (ISP)
c) Government Networks links Governments organizations and agencies
management of quality distance learning utilizing information technology (IT). The Inter-University Network (UniNet) as started under the supervision of the Office of Information Technology Administration for Educational Development and the Office of the Commission on Higher Education, part of the Ministry of Education. It has the aim to provide highest preference to higher education. It has the objectives:

- To employ IT for learning resources development, that will enhance self-study leading to a society of life long learners.
- To develop human resources for the use and application of IT, for educational development.
- To promote the utilization of IT for the cooperation of educational research and development, both domestically and internationally.
- To create and develop a high-speed IT network, connecting UniNet throughout the nation and to international education & research networks.

###UniNet Member List.

<table>
<thead>
<tr>
<th>University/institute</th>
<th>Number</th>
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<tbody>
<tr>
<td>Rajabhat Universities</td>
<td>38</td>
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<tr>
<td>Rajamangala Technology Universities</td>
<td>9</td>
</tr>
<tr>
<td>Monk University</td>
<td>2</td>
</tr>
<tr>
<td>Private Universities</td>
<td>8</td>
</tr>
<tr>
<td>Non-CHE Universities</td>
<td>2</td>
</tr>
<tr>
<td>Other Sectors</td>
<td>12</td>
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</tbody>
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###Library Automation System

With the advent of modern technologies, the academic libraries are among the first group that adopted the ICT in the library. Computer applications can be seen in all university libraries and some college libraries. Automated library systems such as INNOPAC, DYNIX, VTLS, and TINLIB are used. Due to the application of computers and communication technology, library information networks and websites are created. Examples of the networks are Pulinet, Thailinet(M), Uni-Net, and ThaiLIS. The library
networks allow the academic libraries to have closer links among themselves with the aim of sharing their resources through their inter-library loan services and the Internet.

Most academic libraries have created their own databases. They have also created their own web sites, which assist users to gain access to their in-house databases, library information, and to be able to link to web-based information nationally and internationally. Commercial electronic resources such as e-books, e-journals, and online databases have been purchased in order to increase their service quality. The Thai University E-Books Consortium has also been established recently.

**Digital archive**

Digitization of articles, images for education including the development of tools was undertaken. Anyone participate in hosting the materials where indexing is provided supported by good search engines for easy access of students and teachers. ISP hub and Government hub also are provided with very good internet bandwidth.

**Thailis Union Catalog Database Profile**

Thailis Union Catalog solutions are designed to support a physical union catalog implementation using the Virtual Library Automation System. The system design is based on a three-tier architecture, where the processing is intelligently distributed between the client and the server software. Application software may be on the same or different server. While developing the database, a Working Committee of representatives from member libraries carefully considered the different requirements of Librarians and Patrons, to strike the right balance during duplicate control. The objective was to provide a quality record with links to holdings in local libraries. The patron can then follow these links to see the status and for further transactions in the local system. The intelligent design of Virtual Library Automation System allows the system to be distributed to multiple servers that can be platform independent, an ideal feature for very large databases or situations where future growth is to be accommodated.

**Access to Union Catalog Database**

Each member library has a different interface for all search and retrieval functions, which can be further customized to their requirements. Even in a multi vendor environment, the system is able to link and allow users to view holdings information at local system by searching the Union Catalog using Virtual iPortal. This permits a seamless integration between the features and facilities like circulation, requests etc., offered by the two disparate systems. Records contributed by 26 members have reached 3443920.

**Records of Union Catalog of member libraries as of May 11, 2009**

![Records in Union Catalog by Member Library as of May 11, 2009](http://uc.thailis.or.th/sysreport/union.html)
Conclusion

Ever changing technology and componential development demands life long and continual learning to gain new skills and knowledge. Even now, universities have two gates – a) print collection and b) digital library, each one is supplementing other or duplicating the other. The Digital library is evolving into library portal acquiring/providing access to growing digital content. The effort is to make available sophisticated tools that make it easy to find the best information resources, delivering them to their desktop or mobile computing device. In Thailand the digital library projects in 1992 were largely experimental, and the efforts have continued to develop viable technology solutions which has become somewhat stable now. As a fully developed digital library environment involves the following elements:

a) Initial conversion of content from physical to digital form.

b) The extraction or creation of metadata or indexing information describing the content to facilitate searching and discovery, as well as administrative and structural metadata to assist in object viewing, management, and preservation.

c) Storage of digital content and metadata in an appropriate multimedia repository. The repository will include rights management capabilities to enforce intellectual property rights, if required. E-commerce functionality may also be present if needed to handle accounting and billing.

d) Client services for the browser, including repository querying and workflow.

e) Content delivery via file transfer or streaming media.

f) Patron access through a browser or dedicated client.

g) A private or public network.

It is necessary for the participating libraries to have maintain usage statistics from the access log as well as systematic study from time to time to submit the feedback to strengthen the system. The usage feedback and the information literacy for making users effectively participate and use the resources. The flexibility valued by students, commitment from academics, importance of core materials do value and use an open environment if the facility driven courses are oriented towards their use. It is imperative now to develop multi-dimensional systems which bridge geographical and transactional distance and increase accessibility and participation in learning.

References


