

ICT Localization at Banasthali: Learning for Universities of NE India

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Abstract

Importance of localization of ICTs in India and the efforts are being made by the different organizations for localization of Indian Languages are highlighted. The role of the North Eastern (NE) universities in India in this regard can be significant for making ICTs useful in the local communities, especially in rural areas. Like in Rajasthan State, a women university situated in rural area, Banasthali University's effort in the localization process is creditable and may be a kind of learning for NE universities.

As India, a linguistically diversified country, the languages being the important vehicles to carry its culture and tradition for posterity and NE states, a hub of local and tribal languages, a proper use of ICTs in developmental process is possible if proper care is given to localization of ICTs. Further, a large number of local languages, especially minority languages in the NE India are at the verge of extinction, and some have already become extinct.

In the present ICT environment, enormous prospects are available to make efforts at the universities levels which will not only help in preserving these languages and literature, but also by localization of ICTs to local people will receive proper benefits from ICTs which in turn, being valuable resource, can helpful in Government's efforts and projects; e-governance, NeGP(India), etc and other development activities of the society . Similar to Banasthali, libraries of NE can initiate some efforts through projects with the help of their parent universities and institutions in ICT localization and preservation of the local languages and literature of the localities/communities.

Keywords: Banasthali University, North-Eastern Universities, Languages of North-Eastern India

1. Introduction

The Asian countries have less number of internet users as to compare to North America and Europe. Compared to 79% of the North American population and 58% of the European population, only about 24% of the Asia Pacific population accesses the Internet, even though China (36%), Japan (78%) and Korea (81%) have comparatively high Internet penetration. Because of low diffusion

of information and communication technologies (ICTs) in Asia Pacific's developing nations, it limits their potential to exploit the benefits of ICTs. Asia Pacific is lagging behind in the use of ICT not only because of the unavailability of affordable hardware and connectivity, but also because computing is still mainly in non-Asian languages. According to UNESCO the Asia Pacific region is home to about half of the world's spoken languages: more than 3,500 languages are spoken in Asia Pacific out of about 6,800 languages spoken in the entire world.



The UNDP has initiated a major global effort to provide ICT in support of national development. Local language computing development is a forerunner to bridging the continuing digital divides. Without local language solution the rural and underdeveloped populations, which don't understand English on the Internet, will remain isolated from the information available and will be unable to use ICT effectively for development. Though work is being done in local language computing, however, most of the vendors are focusing on rich markets and underdeveloped and rural area populations, like North Eastern (NE) states of India are suffering from continuous delay. Efforts at universities of this region, particularly situated in rural areas may be initiated in localizing ICTs in communities own languages and according to their needs and uses. Such initiatives will reduce gaps in digitally divided information society.

2. Process of Localization

The adaptation of ICT to local needs is called localization, which is the process of developing, tailoring and/or enhancing the capability of hardware and software to input process and output information in the language, norms and metaphors used by a community. The localization process also captures the variances in the use of a language. Localization is usually limited to interface translation and other basic changes in the computing platform. Localization has a broader scope that includes the entire range of script, speech and language technology to enable access to information for the end-user (Hussain and Ram Mohan).

Localization process requires three steps: linguistic analysis, basic localization and advanced application development. Linguistic analysis is

required to define the language conventions and norms that are to be modeled by technology. Since the basic localization caters only to the elementary needs of end-users, including input and output of text in a local language. However, to give comprehensive access to novice users and illiterate populations, or to assist in content development in a local language, more advanced applications need to be developed. Successful language computing is largely dependent on good linguistic analysis based on cultural conventions. Very precise definitions are required for all relevant linguistic phenomena. However, for many languages in India, especially NE States, linguistic details are either incomplete or unavailable. Moreover, relevant cultural conventions are rarely documented. This poses a significant obstacle to localization and requires the involvement of indigenous expertise. In addition, a detailed linguistic analysis of the script, speech and grammar of the language is required for advanced application development. The analysis encompasses the sound system of the language and its acoustic details, word and phrase structures, and the representation of meaning in the language.

The next is to derive the relevant standards for computing and subsequently develop computer software and hardware to enable local language input and output based on these standards. At the minimum, encoding, keyboards (and input methods), fonts (and rendering engines), definition of cultural conventions (for time, calendar and numbers) and interface translation must be enabled. Once defined, the keyboard, font and locale support must be incorporated in the operating systems (for example, Linux, Sun Unix, Microsoft Windows, IBM AIX, Apple Mac OS and others) and at least the basic applications, including word processors (for example, Emacs, GEdit, KEdit,

Open Office, Word), e-mail clients (for example, Thunderbird, Outlook), Web browsers (for example, Firefox, Internet Explorer), chatting software, and the like, according to end-user requirements.

3. Localization Movement in India

Languages are the repositories of culture. The culture of languages is not merely to survive, but to flourish in this digital age. If a language is not becoming part of digital advancement then the language will become outdated and endangered and in some cases might even become extinct. End of a language means end of a culture. The open and free software movements have given a new life to many different languages to survive in the present society. Free and open source software have been contributing a lot toward facilitating local language computing and thereby accelerating the process of adoption of technologies in rural India. In this way the community of open source computing raised to the occasion by localizing the ICTs as per the needs of the society. In India, so many groups are working to have Indian languages enabled on computers. Some of the examples are (Ranjan, 2006):

IndLinux (a popular group of people who combine skills in written scripts, free/open source technologies, and technology journalism), Punlinux (this group is working for localization of the content in Punjabi, vibrant language and culture of India), Ankur (a collaborative initiative in bringing Bangla to the FLOSS (Free Libre Open Source Software) desktop and also to localize GNU/Linux OS), Utkarsh and Indian OSS (Gujarati computing), TAMIL-Linux (the development of Tamil on Linux/Unix), BharateeyaOO project, an initiative to bring Open Office to India in Indian languages by the ICT Research and Training Centre (India), is being done as part of the activities of the Development Gateway Foundation. Project Malayalam for the

Malayalam Package offers a set of macros and fonts for typesetting Malayalam, which is the primary language of an estimated 33 million people in the South Indian state of Kerala.

The Linux in Oriya project is the initiative for making Linux available in Oriya. The GNU/Linux Telugu Localization Effort aims at localizing most common applications on GNU/Linux to Telugu including GNOME, KDE, Mozilla, and Open Office. Swathantra Malayalam Computing at present is focusing on translating/localizing GNU/Linux GUI into Malayalam. Swathantra Malayalam fonts is a sub-project of Swathantra Malayalam Computing. Their aim is to make enough free (Swathantra) Malayalam fonts.

Indic Trans also works in the field of Linux localization in Indian languages.

The Indic-Computing Project is providing technical documentation for Indian language computing issues. Kannada Localization Initiative works for Kannada language. Thamiz Linux is yet another effort from the Tamil language. Free software localization in Assamese works for Assamese, MarathiOpenSource works for Marathi language, Swecha is a GNU/Linux Telugu localization effort for Telugu language, and <http://thamizha.com> encompasses multiple projects such as localization of Firefox and Open Office among others.

A project has even started for minority languages like Maithili, which is spoken in a particular part of a state of India and was incorporated in the schedule of the constitution of India in recent years. It is a fact that in some projects, the pace of work may not be as rapid, but the above examples show there is great awareness and response towards transparent and collaborative open source localization and its methodology.

The localization movement in the neighboring countries of India has also started.

The language of the mountains of Gorkhali, a.k.a. Nepali, has only 1.6 million speakers. A group working with Madan Puraskar Pustakalaya has shown a significant momentum in the field of localization in Nepali language. Dzongkha, sometimes called Bhutanese, is the national language of the Kingdom of Bhutan. The goal of Dzongkha Localization Project is to incorporate Dzongkha script into Linux to enable computing in Dzongkha to provide the benefit of information and communication technology to the Bhutanese masses. This project is implemented by the Royal Government of Bhutan and is being funded by International Development Research Center (IDRC), Canada, through its Pan Asia Networking (PAN). The Sinhala Linux Project is another project to localize Linux in Sinhala. This was started by Lanka Linux User Group (LKLUG). The PAN Localization Project has a broader reach. It is a regional initiative to develop local language capacity in Asia. This organization is working for the following languages: Bangla, Dzongkha, Khmer, Lao, Nepali, Pashto, Sinhala, and Urdu. Generally, such efforts are being appreciated by the all corners of the world; however, dominance of major languages suppresses minority languages. Some efforts therefore need to be initiated in the minority languages.

4. Localization of ICT Initiatives at Banasthali University

Banasthali is a fully residential women's university, which offers an integrated education system extending from the primary education up to Ph.D. level. It was on October 6, 1935 that Smt. Ratan

Shastri and Pandit Hiralal Shastri founded Banasthali to fill up the vacuum created by the sudden death of their highly talented and promising daughter Shantabai. Banasthali aims at the synthesis of spiritual values and scientific achievements of the East and the West. Its educational programme is based on the concept of fivefold education (Punchmukhi Shikha) comprising Physical, Practical, Aesthetic, Moral and Intellectual education. Its aims at developing student's integrated and balanced personality. Emphasis on Indian culture and thought characterized by simple living and khadi wearing are hallmarks of life at Banasthali.

The Banasthali University library came into existence in 1935. Till 1939 the library procured 1700 books and a Reading Room for students. "Veerbala" a quarterly journal was also brought out for students to improve their creative ability and writing. The library collection grew to 5000 and 12,000 books in 1945 and 1955 respectively. Since then there is consistent growth of the collection of the library. Today, the library holdings exceeds 2,00,000 documents. In addition to central library there are departmental libraries viz. AIM & ACT Library, WISDOM Library & Faculty of Education Library. The AIM & ACT library is also very rich having books and electronic access to the complete spectrum of IEEE and ACM journals, select Springer, Elsevier and SIAM journals and UGC-Infonet e- journals through INFLIBNET, in addition to ready access to sufficient copies of text and reference books. Likewise other departmental libraries are also very rich and computerized.

The entire University campus is networked through optical fibers and powerful layer 3 and layer 2 (managed & unmanaged) switches. The network

is secured through a hardware firewall. Presently Banasthali has a 2 Mbps leased line Internet connectivity from BSNL, Jaipur, 4 Mbps from VSNL, 4 Mbps from Reliance Info and another 1 Gbps link to university under NMEICT project. The institute maintains its own mail server banasthali.ac.in and Lotus Domino based Internal Messaging System, which has also been installed at Jaipur Campus connected to Banasthali Domino server through web. The University is the first in Rajasthan and perhaps the few in India to provide 24 hours Network and Internet access to all its PG students in their hostel rooms. This facility is now provided in 8 hostels. In addition the institute runs a lab of 70 Internet ready nodes to provide internet access to all students, researchers and faculty of Banasthali. PC is provided with Internet in every hostel room for PG students.

Availability of world class infrastructure and committed team of faculty and technical manpower staff at Banasthali, various organizations, both national and international have assigned the projects on ICTs to the Banasthali. Many of them are on localization of ICT, and some of them are discussed below:

CoIL-Net “IT for Socioeconomic Development of Rajasthan” – a Ministry of Information Technology, GOI Project in the Department of Computer Science & Electronics, AIM & ACT (2002-2005).

Banasthali has been selected a “Content of IT Localization Network (COLL-Net)” resource centre for IT Localization in Rajasthan by the Ministry of Communication & Information technology (MCIT), Govt. of India. This three years project was aimed to address the problems and barrier in the development of IT in Hindi in the State, where in localized content and applications in the

following areas are being developed: e-health, e-tourism, e-administration, e-business, e-learning & distance education and to disseminate thus solutions developed by way of holding it localization clinic and trainers training for the people in the field of IT in the State.

‘Gyanaudyog’ - IT Culture Development & Women Empowerment through Localised Home Entrepreneurship, Ministry of Communication & Information Technology, GOI sponsored project, (2004-05) and ‘Gyanjyoti’ a similar project from DoIT& C, Government of Rajasthan in 2005.

The Main objective of the project was to promote entrepreneurial skills amongst educated unemployed women of rural India by use of knowledge based small offices/home offices (SOHO). They can provide IT enabled services:- Database maintenance, Content creation, Translation, Web site designing, Computer based designing, S/W Localization and Customer services. Implementation of the project was done by way of holding two-tier workshop.

- ❖ **Level 1:** Developing computer based skills, introducing entrepreneurship and project conceptualization and design.
- ❖ **Level 2:** Introducing various schemes of financial assistance for establishing small office / home office, project design and budgeting.
- ❖ **IT Essential:** PC hardware and software V 4.0 Curriculum of CISCO networking Academy Course Translation in Hindi, 2007, CISCO, USA.

On demand of students, mainly in Hindi language, all part of world, the CISCO, USA has given this project to Banasthali for the translation of their online courses ware. Banasthali successfully

translated the contents of the course of 100 hours hundered and handed over to CISCO USA for further their curriculum.

Microsoft India sponsored students project: Microsoft India has given the consultancy tasks to Banasthali for the making of the software projects in five categories under institutional development.

❖ **Project 1:** Online English to Hindi dictionary for blind:- the main motive of the project was to develop the different types of software with the help of students and faculty members of the AIM & ACT Department. The projects were mainly focused on the blind persons. Banasthali has developed online English to Hindi talking dictionary for them. All the interfaces were designed as hearing interfaces for them.

❖ **Project 2:**A multilingual Authoring System for learning Hindi:-

❖ **Project 3:** Akanksha: A web based visual environment in Hindi for children:

❖ This is web based visual-environment project in Hindi and English for children of class 1st to 4th. The student can easily understand the script of Hindi and English with pictorial and sound effect. Students can also understand numeric with the help of audio visual display. Students can also understand the Geometrical shapes like triangle, rectangle etc. with the help of drawing objects. This project mainly helps for those children who do not know Hindi as well as English mainly.

❖ **Project 4:** The database translation system

❖ **Project 5:** A health directory for Rajasthan:- with the help of this software, one can easily search the nearby location of govt. hospital nearby village and city. One can also search the particular doctors

for particular diseases. With the help of this software any one can find out the medical tests available with nearby laboratories and their rates. The details about the qualification, experience and specialization of doctors are also available through this Software.

Rajasthan Heritage: digitization of Rare Books, (DIT, MCIT, Govt. of India) (1st and 2nd phase completed and 3rd phase on-going): Under the Digital Library of India (DLI) initiatives, a project entitled as Digitization of Rare Books on Rajasthan Heritage with the aim to digitized the rare books of copyright free from the different libraries and institutions of Rajasthan was entrusted to the university. After digitization of rare book collection, scanned pages will be uploaded on the website of DLI (IISc, Bangalore). The rare collection may be of any languages like Hindi, Sanskrit, Arabic, Guajarati, English, etc. Each and every book has assigned suitable metadata using metadata standard (Dublin Core) to make it searchable, so that anybody can search and access these scan pages or books free of cost on the DIL web site. The search can be made by the name of contributors, keywords, titles, etc. In the first phase 80 lakhs pages (more than 40,000 books) were scanned and uploaded on websites of DIL and Banasthali. After successful completion of first phase, the second phase of the digitization of rare books of 120 lakhs pages (60,000 books) was given to the university. The duration of the second phase of the project was for 2 years from 2010-12. However, the Banasthali has completed the second phase just in one year duration. Now, the third phase of 280 lakhs of pages has been sectioned, which will also cover Gujarat state along with Rajasthan State and will be completed by 2 may 2014.

Vigyan Shabd Mala” A Bilingual Electronic Dictionary for Nuclear Science, Computer Science & Electronics, 2 years (1998-99), BRNS, Dept. of Atomic Energy, Govt. of India: The project was given by BARC, Dept. of Atomic Energy, Govt. of India, Mumbai. The aim of this project was to make a nuclear science dictionary for the use of research students of physics departments. Banasthali successfully completed this project. The output of the project is also available in the audio form.

Development of Courseware in Hindi for DOEACC ‘O’ Level Courses, Computer Science & Electronics, 18 Months (1999-2000), Govt. of India Dept. of Electronics, New Delhi: The project Courseware in Hindi for the DOEACC ‘O’ level course in computer science and electronics was given to Banasthali by Department of Electronics, Govt. of India in the year 1999. The time period was 18 months. The aim of the project was to develop or translate the course ware of DOEACC in Hindi language. In this project Banasthali translated O level Books of C language, COBOL language and computer fundamentals in Hindi.

Development of web based learning systems in Indian languages, Computer science & Electronics, 2 years (2000-2002) Govt. of India, Ministry of info. Tech, TDIL:- The project Development of web based learning systems in Indian languages, Computer science & Electronics, was given to Banasthali by Govt. of India, Ministry of info &Tech, TDIL in the year 2000. The time period of the project was 24 month with the aim to .develop the books on Computer Science and Electronics. Books were also converted into hypertext for uploading on the website of TDIL

Gyan-Jyoti - IT Skill up gradation of women entrepreneurs, DoIT & C, Govt. of Rajasthan,

Jaipur. The project was given with the objectives to train women of Rajasthan to: enable them to take up entrepreneurial projects on ITs, thus empowering them; and also develop the skill required for successful development of e-governance projects. Evaluation of trainees for their capacity building skills so that the successful one could be entrusted responsibility of IT Kiosks running e- Mitra in their own village / town. Under this project, training programs were conducted on the various aspects, like-: Introduction to Computer; General office applications (Word processor, Spreadsheet); Internet & web applications; e- governance applications (e-Mitra); Introduction to Entrepreneurship; Business establishment (Feasibility analysis, planning & management); and IT enabled Enterprise establishment.

The projects and initiatives taken by the Banasthali on the localisation of ICT and diffusion of technology through localisation, right from content creation to tailoring hardware and software as per the needs of local community for their empowerment and use of ICT for their livelihoods. Banasthali is one of the best examples for the other universities, how ICT localisation can be done through projects and other initiatives for the society and also to fulfil the inherent mandate of university; empowering local community, especially women.

5. Need for ICTs Localisation in North-Eastern India

The concept of digital divide originally targeted the issues to physical access and unequal access to computers, the internet, and other on-line information, but now it has incorporated the related issues; whether people have the skills and knowledge to make effective use of digital media

and information. Among the barriers in bridging the digital divide in India are infrastructural, literacy and skill, economic, content, language, etc and programmes for rural and remote locations. Although India has made encouraging efforts to bridge the gap by initiating a number of projects, but still a long way to go to bring people into the knowledge society. Though the efforts are being made in all areas by the Govt of India, however in NE India, the situation is not changing so fast in the context of ICTs, despite a lot of money is being surged by Govt of India. To supplement efforts made by Govt., some demanding efforts by the higher institutions definitely would change the situation, particularly in localisation of ICTs in the region.

An estimated 60-80% of all the websites in the world are in English while the rest are in one of the major Northern languages like Japanese, German, French, Spanish, Portuguese, and increasingly Chinese and very few in other languages. In India and the rest of South Asia, mostly speak other languages whereas only an estimated 2-10% of the population speaks fluent English. In India, 50 million people speak English, which is very less of the total population. Moreover, English as a 'lingua franca' belongs to mostly elite, who are prosperous, urban, and highly educated. Thus, for the greater majority of Indians, however, computers are linguistically inaccessible and no proper use.

The North-Eastern region is one of the most linguistically diverse regions in India. According to the 1971 census there are about 220 languages spoken in these states, belonging mainly to three language families, namely Indo-Aryan, Sino-Tibetan and Austric. Most of them are considered as minority languages, as speakers from these

languages ranging from 10,000 to one million. A language when it no longer has any speakers leads to language death. Language death leads to linguistic extinction. Researchers seek general attributes of dying languages, but realize that the circumstances that lead to language death may vary considerably from community to community and from speaker to speaker. According to them the types of language death include- sudden death, because of its speakers suddenly die or are killed; radical death, where speakers out of self defense stop speaking the language or rapid population collapse due to destruction of culture, epidemics, etc; bottom to top death, here the language is lost first in contexts of domestic intimacy and lingers on only in elevated ritual contexts; gradual death, due to an intermediate stage of bilingualism, mostly due to younger generation starts adopting and speaking the dominant language. These situations are not mutual exclusive and may overlap. Thus, unless minority languages are brought into mainstream, there is every chance of these languages to lose their existence and die during the present transformation of ICT through languages to electronic form of communicating languages, especially the languages fall under gradual death category.

Being unique and found perfect linguistic heterogeneity, NE region consists of the largest number of languages amongst languages that exist in the country. Each state in NE India is multilingual with the minority language speakers varying from 4% to 30%. The states of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland are mostly inhabited by a number of native tribes with their own languages. Moreover, Nagaland and Arunachal Pradesh do not have a majority language

at all. Moreover, the languages of the tribes scheduled by the Govt. of India are called 'tribal languages'. However, their speakers constitute 4% of the total population, though the tribal population is 7.8%, suggesting language shift among the tribes. Since most of the languages of NE states are not properly documented and researched, so some of them even fall into linguistic minority, they can be classified as endangered languages.

The languages of NE can be classified as: the Indo-Aryan represented mainly by Asomiya and Bangla, Austro-Asiatic represented mainly by Khasi and the Sino-Tibetan family of languages is represented by the Tibeto-Burman and the Siamese-chinese sub families also there are languages of the Tea-Tribes. However the majority of languages spoken here belong to the former and latter is represented by a few Thai languages like Khamyang, Khamti, Aiton, Phakyal and Turung. It is worthwhile to mention here that Ahom a language belonging to this Thai group has over the years merged with Asomiya. However, most of these minority languages can also be considered as endangered languages (Pandey, 2011).

In view of the diversity of languages, particularly minority and tribal languages available in NE, localization of ICTs for constructing electronic dictionaries, machine translation systems, and digitization of rare literature for content creation would be an apt solution to preserve these languages from shift and death and also in bringing them to mainstream of the nation and create e-language.

6. Conclusion

Finally, we may conclude that:

6.1 The linguistic diversity in India presents a considerable social barrier in the use of ICTs in

present knowledge based society. Thus, ICT must be enabled in local languages. Localization of ICT will not only offer local communities the opportunity to use it, but they can also take hold of maximum benefits out of ICT revolution. Since most of local communities neither have capability nor having sufficient financial encouragements from private investment in localization, therefore, considerable and coordinated efforts at national, regional and international levels need to be required.

6.2 The localization should not be looked at as an obstacle; rather it should be considered as an opening for developing knowledge economy. So, focusing on sustainable human resource and technology development support for localization through funding and creating enough demand for local language computing, proper planning and then execution can turn these challenges into opportunities. Like Banasthali, NE universities being situated in local areas can take leading role on these issues and processes.

6.3 The developing world, the Asian countries in particular, today is entirely different from the thirty years back as far as use ICT is concerned. As this world has proved to be a melting pot for production of hardware and software and the outsourcing of IT services and programming (Avgerou, 2004), yet more can be achieved by involving more local manpower from NE India, which is only possible, if the contents of ICT developed in the languages known to them. If universities of NE India region keep the localization of ICTs in their agenda, more self-motivated buildup and transfer of Knowledge from older to younger generations would take place and give impetus to the issue in the society. It will

also help in maintaining the awareness and inclusion of activity-centric computing.

6.4 Keeping the balance between tradition and change, the universities can be handy and will play more active role in creating model of knowledge-as-relation, by having a close collaboration between researchers and practitioners of IT and local knowledge in the emerging knowledge society. By developing ICTs as per local needs and languages will help in transferring the tacit knowledge to explicit knowledge, the universities can do this through project modes and by engaging students through dissertations at degree level courses, can contribute a lot to bank the traditional knowledge, otherwise becoming extinct with shift and death of languages, minority languages in particular.

6.5 Though localization efforts in some of the major Indian languages have been taking place, but due to low awareness level of availability of content in local languages, and lack of supporting hardware and contextual delivery of content, along with limited returns from advertisement, such efforts are not making great penetration in the use of ICTs in Indian languages. The universities can support in making awareness through the learners in the society. Even there is very low demand of such of the languages, particularly minority languages but still for the survival of culture, efforts need to be carried out by the universities and libraries as being custodian of Indian culture and beliefs for posterity.

6.6 Lastly, like the Library in collaboration with the Computer Science Department of Banasthali University is doing a mega digitization effort for preservation of the rare books in Indian languages

available in Rajasthan and Gujarat under the DIT, MCIT, Govt. of India's sponsored project, likewise efforts need to be required from NE states.

Lastly, some action oriented approach is needed before situation gets vanquished; may be too late to react.

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