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Localising software: some experiences from Nepal

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Background: computer use in Nepal

Efforts towards localising software in Nepal face multiple challenges. Nepal does not have a long history of computing, and it is only in recent years that the dramatic drop in hardware prices—caused partly by a rapid upsurge in the local assembly of cheap PCs—has brought the possibility of home and business computing to users beyond a small, privileged elite circle. Yet in some respects the very newness of mass computing opens up opportunities to shape the development of ICT and to tailor its potentials to the needs of a new generation of users. This paper offers a brief description of some experiences in building the infrastructure for software localisation and some indications as to paths that are currently being explored for further development, as well as suggestions for interested parties in the commercial and non-profit sectors.

At the outset, it is worth noting that we have trouble even quantifying computer use in Nepal, let alone in providing any more than an impressionistic and subjective picture of the range and backgrounds of users. There are no reliable statistics on computer ownership and there has been no government survey of usage. Instead, we must rely on the results of the informal surveys undertaken by the Computer Association of Nepal (CAN) since 2000. Their estimate of total PC sales in Nepal for 2002 was approximately 33,000 a ten per cent increase on 2001. (Data for 2003 will not be available until January 2004 although CAN's survey is underway.) The total number of operational computers in Nepal at the end of 2002 was estimated at 150,000. The vast majority of these are unbranded, locally assembled PCs: in total, CAN has recorded sales of only about 500 Apple Macintoshes. Of PCs, almost all are running versions of Microsoft Windows, although the high prevalence of software piracy means that only an estimated 12,000 PCs actually have licensed software.

Meanwhile, the recent boom in computer use has been accompanied by what is surely a much wider expansion in the number of users, at least in urban and semi-urban areas. Probably the majority of computers have multiple users, and a significant proportion are in use in internet cafes, computer training institutes, businesses and schools. Numerous factors affect access to computing. Primary among these are location (Nepal's many remote districts will often only have one or two computers in district administration offices), socio-economic status (the ability to purchase a computer remains limited to a small, albeit rapidly expanding, middle class), and language competence (almost all users have to be able to cope with English operating systems and software packages).

It is difficult accurately to predict the shape of computing developments in coming years but certain trends seem likely to continue. First, computers will become increasingly affordable for a wider home and business market. Second, penetration in the educational sector will remain dominated by relatively well off fee-paying (and generally English medium) private schools. Third, computer knowledge will become more important in both the domestic job market and for access to higher paying jobs overseas. Fourth, the ability to make use of computers will remain dependent on competence in English. These trends imply that the societal divisions that already condition computing in Nepal will continue and perhaps be exacerbated. But is it possible to shape the patterns of usage and to address the problems of the digital divide partly through local software production? The Madan Puraskar Pustakalaya (MPP), a Kathmandu-based non-profit library trust, is undertaking a number of linked projects that seek positive answers to this question.

Unicode: a platform for development

Fundamental to MPP's vision is the realisation that wider and more equitable access to ICT will depend on the availability of technology in the Nepali language. English usage in Nepal—despite appearances in Kathmandu—is both very low and limited to an already comparatively privileged class. While Nepal is a highly multilingual country, Nepali is the national language and primary medium of education and, as such, has come to be understood almost universally. It is also the primary language of transaction and correspondence in both the government and private sectors. The restrictions of solely English language computing are obvious.

It is true that there are ways in which Nepali has been integrated into various areas of computerised work, for example in journalism and publishing, and in the creation of certain custom-designed catalogues and databases. However, like other languages, the wider deployment of Nepali language computing has long been hampered by the lack of a standard for its script (Devanagari, which—with certain modifications—it shares with other languages such as Hindi). The need for a single standard has long been felt but attempts to define and implement such a standard have faced many problems, the most significant of these being that both institutions and commercial software developers have become tied to individual systems and standards and have not felt a compelling need to adapt to a universal standard.

The first step towards providing a solid basis for localised software production has to be the adoption of a universal standard that will enable unproblematic cross-platform use of Nepali. At the moment, even reading different Nepali newspapers on the internet requires the downloading of separate fonts. MPP moved away from earlier efforts to produce a new Nepali encoding standard and focused instead on testing and implementing Unicode Devanagari for Nepali. The advantages of Unicode do not need to be reiterated here, but some of the problems in promoting its adoption are worth pointing out. First, Unicode's inclusion of the Devanagari script is not in itself sufficient for Nepali, as Nepali has some particular orthographic conventions that have to be incorporated. Second, the traditional Nepali typewriter keyboard (which has been adopted as the basis for almost all locally produced fonts) is different from that used by Hindi and other Devanagari-based languages. Third, Unicode support is only gradually being built into newer operating systems which tend to require more powerful hardware to function adequately. Fourth, unless and until Nepali language

options are included in basic OS distributions (as, for example, Hindi now is) there will be difficulty in encouraging user take-up.

Nevertheless, MPP's Nepali Font Standardisation Project has made some inroads with these problems. It has created a range of Nepali keyboard layouts alongside other utilities such as a sorting facility (according to the Nepali standard ordering of Devanagari) and a number of converters to transfer material in some of the more popular pre-existing Nepali fonts. As well as trying to encourage immediate take-up of Unicode among current users (through, for example, publicity campaigns involving the free distribution of the necessary software) we are now working to ensure that Nepali language options will be included in future OS distributions. More importantly, we are trying to promote the use of Nepali Unicode by local commercial software developers, and in general to encourage the development of more local language software (as detailed below). In this work, we recognise the importance of establishing a foothold for Unicode and aggressively promoting its widespread adoption.

Sectors, partnerships and profits

Software localisation must address the different sectors in which software is created and used. Among the larger user categories whom we are targeting are: government (currently the largest user of Nepali in computing), education (school and higher), private sector (from small businesses using accounting software on stand-alone machines to large organisations with sizeable networks), (I)NGOs, household/family users. The question of current and potential software developers is also complex. The main groups with whom MPP would like to work, and to help to adapt software into Nepali or design new packages from scratch, include private companies, not-for-profit organisations (locally based, such as MPP itself, or INGOs with larger requirements and budgets), corporations or organisations who commission dedicated systems from private contractors, and—last but not least—individual enthusiasts or communities of volunteer programmers who wish to develop software according to their particular interests.

It should be emphasised that MPP's role is to act as a catalyst and facilitator, recognising that as a non-profit foundation we can make contributions in areas which would not be commercially attractive for private sector developers. However, we see it as vital to the future of Nepali computing that profit incentives can be highlighted and increased in the local software sector. We hope to promote the idea that localisation in the long run will widen Nepal's ICT market. A significant expansion into the Nepali-speaking market would bring a large increase in computer users which would in turn spur more demand for software as well as, crucially, demand for support and maintenance service provision.

However, there are problems to be overcome. First and foremost, the main disincentive for developing software in an environment such as Nepal is that the high prevalence of piracy makes it impossible to recoup costs from authorised software sales alone. This is one of the major reasons why commercial developers have not been tempted to produce Nepali language programs, nor even to join in collaborative standardisation efforts. Meanwhile, not-for-profit organisations such as MPP may produce software for free distribution but need to find funding to pay for the development costs (and maybe even distribution and promotion costs). Commercial

developers, on the other hand, face least financial risks by working on contract to larger organisations with guaranteed income. The type of projects thus engaged in are not, however, likely to lead to any increase in Nepali-language computing nor the more widespread take-up of localised software.

MPP's aim is to encourage partnerships that may be profitable both for private sector developers and bring major public benefits. We currently identify the two most promising areas for bringing commercial developers to work on public-interest projects as (i) offering not only software design but also packages of installation, maintenance and ongoing training to users, and (ii) contracting the necessary technical expertise to major government-backed projects (which will similarly require follow-up training, etc.). In the first area there will obviously be opportunities for small entrepreneurs: for example, providing training in typing requires little infrastructure and will find a ready market. The second area is dependent on awakening government interest in pursuing the ambitious deployment of Unicode-based Nepali computing and funding its implementation. This is an area on which much of MPP's lobbying is focused.

A new basis for development

MPP is trying to bring attention to the benefits of a Unicode development environment and the opportunities it offers for localised software production. Unicode-based operating systems provide, for the first time, a solid basis for developing local language software that is guaranteed not to become rapidly obsolete. Cross-platform compatibility enables widescale projects such as making large databases available to users through a common web interface (MPP's pilot project for Nepali Unicode, which has proved a successful publicity and demonstration tool, was to computerise the catalogue of the Madan Puraskar library and to make the searchable catalogue available online).

A potentially significant development is the development of a Nepali Unicode Linux distribution, which is currently underway at MPP. The completion of a fully Nepali operating system will mean that local language software can be used within a local language OS for the first time in Nepal. (Our Linux distribution will also be available in English for those who wish to use Nepali applications but retain operating-system notices, etc. in English.) Linux-based systems are at first likely to prove particularly attractive to the government and education sectors but through these could quickly build a large base of functionally capable users, especially among those who would be put off by an English-language environment. As in other parts of the world, there is a great potential to use Linux systems in commercial environments, not least because of their ability to run on machines which could not cope with the processor and memory demands of recent Windows editions. For example, Linux-based cybercafes may well prove attractive to small operators, especially once the stability and usability of the system is established and publicised.

Problems in moving forward

Nevertheless, the development of local language software in Nepal still faces many hurdles. We must still convince developers that in practical terms Nepali is the only language in the country likely to prove useful to large-scale projects (e.g. governmental, educational) and the only language which is likely to offer significant

profits to private sector outfits involved in new software development. There remain several specific problems facing developers and users trained exclusively in the English environment: for example, even the translation of basic system messages into clear and readily intelligible Nepali is problematic and will no doubt require a co-operative approach to arrive at universally acceptable basic standards.

Meanwhile, for larger private sector companies and INGOs English still offers many attractions, not least that many staff may not be as competent in written Nepali as in English and certain work may, for purposes of international communication, have to be carried out in English. Here we envisage opportunities for parallel systems according to convenience: for example, producing a payroll database in Nepali but managing central budgetary information in English. It will, of course, be almost impossible for Nepali-based software to 'keep up' with English programs and for many specialised applications there will be little incentive to reinvent the wheel by making or adapting local software. Our challenge is to identify those areas where local software is likely to generate both widescale usage and the potential for profitable private involvement or government/(I)NGO financial support.

Steps towards development

The immediate future for locally produced local-language software in Nepal will depend on three major factors (beyond the development of basic technical infrastructure):

(i) the growth of a cadre of local software designers and programmers who can work comfortably and effectively in Nepali, as well as providers of support, training and maintenance across the country;

(ii) the growth of the market for local-language software products;

(iii) the targeting of particular niche markets or functional areas where opportunities for specific viable local-language software packages are identified

In all of the three areas listed above there can be roles for not-for-profit organisations in promoting, assisting and helping to plan for future developments. Ideally an organisation such as MPP should be able to work alongside official bodies, academic experts, private sector companies and grass-roots users and amateur enthusiasts.

Alongside the actual development of software ourselves (as described above), the areas that we are currently targeting are promotion and outreach, in an attempt to build the infrastructure for local software production in terms of both developers and market. For example, as well as suggesting potentially profitable projects for commercial involvement, we are working to convince the general public across the country that English need not be a prerequisite for computer use. In order to facilitate the transition to using Nepali software we are proposing to hold workshops for computer assemblers, sellers and technicians to encourage them to preload the necessary Unicode software in all new PCs. Finally, we are continuing efforts to work with high level civil servants, especially in the Ministry of Science and Technology, to implement Nepali Unicode use throughout government offices. We look forward to learning from other participants in the conference who have been engaged in similar efforts.