

Usability and HCI in India: cultural and technological determinants

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Abstract

This paper discusses a range of cultural and technological issues that are shaping the development and growth of usability and HCI within industry and academia in India. It outlines the role that the EU funded Indo European Systems Usability Partnership is playing in furthering usability.

1 Introduction

In comparison with developed nations India's present status as an information society is nascent. However the information revolution in India is clearly coming of age, encouraged by the declining cost of information and communication technologies world-wide, and the increased availability of high-quality and low-cost technology-enabled products and services in the country.

In May 1998, the Prime Minister of India formed a National Taskforce on Information Technology and Software Development in order to formulate a long term national IT policy. The main objective was to help India emerge as an '*IT software superpower*'. Although the industry is growing fast the penetration of IT within the whole Indian society is still very low.

According to NASSCOM (2002) - National Association of Software and Services Companies - a key strength of the Indian IT industry is a '*focus on a high value, software off-shoring model*'. However, this strength is balanced by key weaknesses such as a low presence in the global packaged software market. We believe that India will not be able to claim IT superpower status without key developments, and that usability / HCI must play a key role. High levels of usability are critical to the quality of software products in a global market. Jakob Nielsen (2002) picked up these ideas in his recent Alertbox and, somewhat exaggeratingly, calculated that India will need to train 400,000 usability professionals in the next six years.

This paper will discuss some of the prominent characteristics of the information society in India with respect to the techno-economic paradigms that have evolved within the society, the research challenges already in place, and the requirements that need to be addressed by future work.

The observations will be documented to build an underlying rationale for the design for accessibility in terms of the hugely diverse user profile and the most appropriate technology interventions that organically support the social dynamics that is prevalent in the Indian society.

2 Technological determinants; a strange ‘digital divide’

The ‘skill base and proficiency’ of the Indian IT industry provides a very interesting contrast compared to the information and communication needs of Indian society. On the one hand there are about 340,000 Indians employed by the Indian IT industry, including both hardware and software (NASSCOM, 1999). These are in addition another 180,000 people of Indian origin, now working in the US alone (March 2000). In 2002 the Economic Times reported that between years 2000 and 2002, 250,000 people migrated from India to US to work in the (then slowed down) US IT industry.

Indian IT industry is considered to be the third most significant foreign exchange earner in the country. On the other hand we have the extreme paucity of IT products and services in the Indian market (and perhaps a big hidden opportunity). There are 4.5 computers per 1000 people in India, 32 telephones and 3.5 cell phones (Bomsel and Ruet, 2000). The total annual revenue from IT exports to US is around US\$ 8.7 billion and US\$ 1.5 billion (2001/02) comes from IT enabled services, only US\$ 5.65 billion in 2000/01 came from sales within India, whereas US\$ 1.9 billion in 2000/01 came from sale of packaged software (NASSCOM, 2002).

While English is understood by less than 5% of the population, operating systems with Indian language support were launched only as late as 2000 and still have only a miniscule installed base. English continues to be the predominant language used even in products such as cell phones and ATMs. How can a country with such a large IT industry harbour such a strange digital divide? Two reasons can be attributed to this divide in India – the outsourcing based business model of the Indian IT industry and the lack of HCI education in the Indian IT education.

2.1 The outsourcing business model

In the past two decades, the Indian IT industry has relied on providing quality software services in a cost-effective manner. It has effectively leveraged the huge difference between the labour costs of equivalent skills in India and the developed part of the world. At the lowest end, this required Indian entrepreneurs to market ‘skills’ to international companies on ‘costs plus time basis’. At the highest end, companies get outsourced projects – partly to be executed off-shore in India. The larger the off-shore component, higher is the profitability. Usually the Indian IT company deals with an IT group within the outsourcing organization. The highest end Indian IT companies have developed excellent software engineering processes to manage such projects effectively – the largest number of ‘CMM level 5’ companies are from India (NASSCOM, 1999).

From the perspective of designing human-computer interaction, this had terrible consequences. By this very nature of their business, a problem typically reached a group within an Indian IT company well after it had been identified and earmarked as ‘one that needs solving’ and clear enough for outsourcing. Usually (though not always) user requirements were already specified. At times, even the design requirements were ready before an Indian company got involved. This effectively transferred the responsibility of many HCI and usability issues in the first part of the project to the client.

At the end of the development life cycle, the product was developed and evaluated for quality against requirements by the Indian IT company and sent back for ‘acceptance testing’ to the client. Formal usability evaluations were rarely done until recently. Informal usability evaluations, if at all, were usually carried out as part of acceptance tests and were managed as ‘upgrades’ or ‘change requests’ as they were deviations from the original requirements. But can this continue for ever? Trends in the

last three years already show changes to this pattern. Many of the top Indian IT companies have started incubating usability groups. Others have started hiring professional interaction designers on freelance basis for critical projects. There seem to be two reasons for this change.

Firstly, awareness about usability and HCI design has increased, not only among the Indian IT companies, but also among their international clients. Along with technical skills, clients now demand to see (though not routinely yet) proven capabilities towards usability and HCI design. Secondly, there is a growing need for Indian companies to move up the value chain – from proven provider of quality skills at highly competitive prices to providers of well-managed outsourced projects to providers of end-to-end solutions.

3 Educational determinants: HCI in Indian education

One strength of the Indian IT community as a whole is a strong educational orientation that produces high-class engineering graduates skilled in computer science. Currently however, very few universities address HCI in their curricula. An exception is the Industrial Design Centre (IDC) at the Indian Institute of Technology, Mumbai which offers formal courses in Human-Computer Interaction to students from both design and engineering backgrounds. Another exception is the Postgraduate Diploma in Design with a specialization in New Media offered by the National Institute of Design, Ahmedabad.

In fact these programs illustrate a common characteristic of the relatively few usability / HCI academics in India. It is also a reflection of the realities in the Indian industry. A large percentage of HCI / usability professionals working in the field in India originally come from the fields of design (particularly visual communication design or industrial design). A smaller percentage comes from a computer science background, and smaller still from cognitive psychology or usability.

Of course HCI is multi-disciplinary and involves individuals with backgrounds in a range of non-computing disciplines. However we believe that the lack of HCI within the computer science curriculum is a problem that needs addressing in order both to support the growth of the IT industry, and to facilitate India's integration into the global information society. We believe that by highlighting aspects of HCI and interaction design within the Indian computer science curriculum the next generation of systems developers will be more aware of the need for effective interaction design across the whole spectrum of interactive applications.

4 Cultural determinants: ICT of the people, by the people, for the people

In the very recent years, there has been a visible momentum towards building a national agenda for addressing the issues concerning user demographics, the digital divide and the emerging information society in India. India faces monumental social challenges and is hampered by bureaucracy, political strife and the legacies of a controlled economy. Yet the nation is endowed with so many highly trained, ICT savvy workers that many believe technology will launch India into the developed world.

In the emerging Information Society 'design for all' is the conscious and systematic effort to apply principles, methods and tools, in order to develop information technology and communications

(ITC) products and services which are accessible and usable by all citizens. This requires a democratised design framework to accommodate diversity of the possible users to avoid the need for a posteriori adaptation or specialised / segment specific design.

In spite of the bearings of a weak information infrastructure, high communication cost and poor service, the condition is improving everyday through private participation and state level initiatives. Break through enterprise initiatives are being taken in setting up a high bandwidth national backbone and a substantial amount of it has been made wireless, thus realising a huge potential of low-cost ICT products and services including rural mobile telephony. Other initiatives include ICT in education, health, digital trading platforms for local economic processes, localized software applications, software systems for illiterate users and Indian language related developments along with many more infrastructural as well as cultural issues that are critical to build an appropriate intervention of ICT in the Indian subcontinent.

As the majority of the Indian population live in villages that are completely beyond the reach of urban infrastructural facilities. Bridging the digital divide in India calls for radically innovative ideas that can be implemented in a sustainable manner at a low cost. Laying the ground work has already started. Rural Internet Access Centres are being set up in the villages of India that will serve as global information access points and e-commerce channels for about 100 villages. Another project, Computers on Wheels is a mobile ISP service that uses motorcycles to bring wireless Internet access to residents in remote villages that typically have no telecommunications infrastructure. Low cost handheld client devices based on smart cards are being developed for remote location computing.

NASSCOM recently conducted research on the domestic market for free software applications in India. The main highlights of the study are:

- A number of e-governance projects under implementation are either experiencing or intending free software usage.
- Virtually all leading IT vendors in India have developed products on the free software platform that they are actively marketing.
- Low cost applications can be used to the advantage by the fast growing SME sector.
- Lack of local language applications has been one of the major impediments to the growth of the Indian domestic market. The openness and customizability of free software platform is helping to take a major stride in this regard.

5 Indo European Systems Usability Partnership (IESUP)

Starting in October 2002 the Computer Society of India (CSI) joined in partnership with the British Computer Society (BCS) / British HCI Group and three European Universities in further developing usability and human-computer interaction in India. Sponsorship from the European Commission's ASIA IT&C Programme will fund a two-year project to support links between key experts in Usability and HCI throughout Europe and their counterparts in India.

Overall the aim is to support the integration of HCI and usability into both Indian IT education programmes, and software development projects, mirroring that which occurs in Europe and the USA. Activities will include seminars / workshops in India, visits from India to Europe, together with virtual communities and other methods of larger scale communication.

By facilitating discussions and debate in India and elsewhere, and establishing networks between groups of individuals in focused aspects of usability, IESUP will seek to promote HCI within academia and industry, develop methods for software localisation in the Indian context and foster greater awareness of the role of interaction design in the development of the next generation of online systems and interactive devices.

6 The scope of HCI in India

We believe that providing services to the developed part of world is only the ‘tip’ of the proverbial iceberg of the potential that usability professionals and HCI designers have in India. The market of the western or westernised, urban, office going, predominantly English-speaking, predominantly male (the market of the first billion, as it is sometimes referred to) will saturate out eventually, and as India emerges out of its status of a ‘developing country’, the attractiveness of the business model described above will decrease. On the other hand, India itself represents a huge, un-served market of ICT products and services. We believe that such products and services will go a long way in solving the problems and improving efficiencies in the resource starved developing countries of the world. There are many huge challenges of bringing about change in conditions here, but so are the opportunities.

The designers here will have every opportunity to exercise their skills. There will be no ready design specifications to follow, no specified user requirements to meet. There will be more freedom in the process – there will not be many legacy systems to take care of. The designers will have to bear the brunt of sceptics and pessimists. They will have to prove their concepts in the field several times and develop new techniques and processes to design. Every design idea will have to compete tooth and nail for limited resources, and only the best will survive. Those which do, will define the future.

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