# Indian Software - Trading Through Telecommunications

**India's software exports rose 51% in the year to March 1994 to CHF 430 million as the industry maintained the fast pace of growth of recent years. Increasingly Indian software companies carry out their work in India communicating with their clients and delivering their work over data communication lines. To do this successfully requires the development of deep long term rather than promiscuous relationships with their customers. Their costs are about 70% to 90% less than their Western competitors and their quality appears comparable or better.**

In June 1994 I spent two weeks in Bangalore, India, on a software research project for the Thomas J. Watson Research Center, New York. I was based in

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one of IBM's software subsidiaries called Tata Information Systems Ltd (TISL). I also visited the software development facilities in Bangalore of Texas Instruments India and Siemens Information Systems Ltd. These meetings combined with reading the Indian computer journals has provided me with some insight into the threats and opportunities provided by the Indian software industry.

India has a population of 860 million people of which about 50 million speak English. A typical wage for a labourer is about CHF 1 per day. I experienced a considerable culture shock from the presence of sacred cows wandering freely across busy roads, the constant requests for money from beggars of all ages, rickshaws propelled by scooter engines and the inevitable consequences of the lack of public toilet facilities. There is a need to avoid the local water and to take constant precautions to protect from mosquitoes.

## Islands of Software Sophistication

In sharp contrast to the medieval squalor of most of the country was the software industry. The three companies I visited were sited in purpose built office blocks which were beautifully furnished and full of the latest UNIX, local area network and microcomputer hardware. The other companies developing software in India include Motorola, Hewlett Packard, Citicorp and Digital. Both Microsoft and Oracle also have a presence there. The dominant pattern was for a major US company to use Indian nationals educated in the States to set up and run these companies sometimes with an equity stake from a local Indian company. They used satellite links, fax and telephone to communicate. The attraction was that salaries as a rule are 10% of those in the UK. This means an experienced graduate in India would earn about SFr 4'000 per annum.

The Indians speak and write excellent English, have a strong work ethic and have a great respect and desire for education. They seemed patient, methodical and receptive to new ideas.

## World Class Quality

The influence of the blue chip parent companies meant that the quality of work was high. Virtually all their software was for export and they were therefore aiming at international levels of quality from the start. While software quality comparisons between companies are difficult, my opinion is that the IBM and Siemens companies were Level 2 on the Software Engineering Institute's (SEI) scale. Both are prepared for ISO 9000 accreditation within the next few months. The Texas Instrument operation has been judged as Level 3 on the SEI's scale and is expected to reach Level 4 by the end of the year. From the metrics data I was shown and the sophistication of the software engineers I met, they were clearly ahead of the vast majority of Western software organisations. The languages used included C, C++ and Visual Basic. The 3 companies I visited had 150 to 300 employees each in Bangalore.

## Weak Areas in the Indian Software Industry

The weaknesses the Indian's perceive of themselves are that their international marketing is poor and they need better project management skills. The key constraint to their current growth rate of 51% per annum is the shortage of well educated people being produced by their universities. They are making great efforts to increase their education and training provision and also have the foundations for connection to the Internet in place. There have been concerns expressed about the illegal copying of software in India, but it is hard to evaluate their validity.

## How to Compete?

I would anticipate that within the next two years, companies in the West will find themselves competing more often with developers based in the Indian cities of Delhi, Bombay and Bangalore. If our costs are not to be reduced by shrinking salaries then the only option seems to be to provide higher quality products which can be priced at a premium. We do have advantages of being closer in culture and geography to the main software markets, but we do not appear to have a significant quality lead and are more expensive. One way forward is to form closer and more focused relationships between suppliers, customers, government and universities to aggressively improve the quality of software produced. An alternative would be to form alliances with the Indian software companies to manage and market their low cost services internationally. It was a fascinating trip which showed that in a global economy ideas and technology can transfer remarkably fast and that the capabilities of competitors need to be constantly monitored.

## Electronic Markets?

In India (as elsewhere) there is no electronic market for bespoke software - the initial contacts would be made through references from other customers or through a trade directory. The important point is how complex products are being specified and delivered over e-mail networks. This is definitely electronic trading and it has great potential because of the ease of delivery over e-mail. This particular market place is characterised by long-term deep relationships between customer and supplier - therefore a relatively inefficient initial market may be acceptable. But if India wishes to grow this industry even faster then being able to set up contracts more quickly would be invaluable. It is interesting that they are adopting ISO 9000 very rapidly to enable them to compete internationaly more easily.

The development of an electronic market in bespoke software development is likely because of cheap networks, video conferencing and the adoption of global quality and technical standards. This market is probably going to consist of very specialist producers who can make money by selling world wide. If they can harness reuse these specialists will have even greater cost advantages. At present, sourcing bespoke software internationally requires deep long-term relationships. To change the supplier-customer relationship to the more short term one implied by an efficient global electronic market place will need a standard way of specifying and managing bespoke software development. This will be the problem to be resolved to unlock this market. ∎

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