

John McManus and David Floyd compare the offshore market strategies of the US, India and China.

The global software industry

Companies in the US more openly admit the growth of offshore outsourcing to countries like India and China now that the presidential election is over. The rise of India and China as potentially high technology software competitors and important participants in the world's software industry seems to have come as a surprise to foreign observers. The surprise is often accompanied either by overestimations or underestimations of these countries' actual capabilities, rather like foreign reactions to Japan in the 1980s.

While there are many important distinctions to be made between the Indian and Chinese cases, they are

similar in that the development of software and technological capabilities in both countries has long been a goal of political, administrative and industrial elites, and both countries have records of policy intent, planning, and resource commitments for meeting that goal. This paper examines some of their competitive strengths and weaknesses and the future market challenges faced by India and China in the next decade.

Global perspective

The world software industry and associated markets are estimated to be worth US\$1300 billion and 90 per cent of the world's exports in software is from the US and Europe.

Evidence also suggests that outside the US, UK, Germany and Japan, the new and emerging countries within the software industry are India and China, and to a lesser extent Singapore and Malaysia.¹ Although figures vary, these emerging markets account for around six per cent of global export markets.

While 'lower cost' is the most commonly cited reason for offshore offshoring, intense global competition in an environment of slower growth and low inflation demands constant vigilance over costs. Due to the low costs and high quality, using offshore resources in selected countries makes good economic sense. Beyond the cost incentive, global sourcing provides

several other practical benefits, including the ability of multinational organisations to efficiently stage 24/7 operations; the opportunity to customise products and services to meet local needs; and the means of geographically deploying workers and facilities to succeed in globally dispersed, highly competitive markets.²

A key driver in the US pursuit of offshoring is cost savings. For example, Global Insight predicts that total savings from the use of offshoring are estimated to grow from \$6.7 billion to \$20.9 billion between 2003 and 2008. In corporations with annual turnovers in excess of \$100 million the decision to use internal or external resources is determined by a mixture of both the hard dollar (quantitative) and the soft dollar (qualitative) costs.³ Key reasons for perusing offshoring arrangements include:

- The ability to leverage value from its IT operations and add dollars to the bottom line;
- The ability to gain access to technology, skills and knowledge not internally available;
- The ability to improve business processes and enable organisational change;
- The ability to provide needed short-term services without adding to ongoing operational costs;
- The ability to focus internal IT resources on core strategic plans and projects.

In high technology markets significant benefits can be realised from prioritisation and determination of success criteria, as the firm is able to identify a complete and comparable set of costs and benefits regarding investment choices.⁴ For example, resource limitations, in-house skill sets and knowledge, and expected performance and outcome measures are important factors that must be analysed in making the decision to offshore. Establishing and analysing quantitative and qualitative criteria provides a bottom-line total that indicates which investment decision is most effective and states the reasoning used in reaching that decision. Offshoring can be an efficient and effective alternative to using in-house resources, but a full determination of costs and benefits is required to make that decision. Successful decisions are dependent on having a clear understanding of all the options available.

USA market opportunities

In developing its offshoring strategies for the 21st century the US is gradually moving away from low cost labour strategies of the past. It is redirecting its resources to organisations that have a focus towards leading edge technology, research and development, high-quality infrastructure and clusters that can deliver value added products and services. Here Porter's⁵ concept of clusters attracting capital is pertinent. He defines a clustering model of firms working in a utilitarian manner where participants seeking to benefit from the cluster and contributing to it appeals to those corporations with liberal business values.^{5,6}

US corporations have financially benefited from offshoring. However, changes in how offshoring is defined and used have led to conflicting information on how to make an effective decision about offshoring and there seem to be conflicting opinions as to which models really represent value for money.^{7,8,9}

Originally, offshoring was used to contract for data centre services and facilities management, as vendors provided economies of scale for mainframe use. In the 1980s, offshoring expanded to include the goal of using only external resources and services to develop and manage all IT activities. The primary motivations were cost savings, the desire to avoid or defer high risk capital investments in new technologies, and the need to focus on the core business processes of the organisation. Now, offshoring can refer to any of the above options, as well as to highly defined contracts that 'out-source' relatively small chunks of service, and to managed service contracts in which an organisation monitors service provisions and alters its characteristics in real time. Offshoring individual business functions are now a more common activity than offshoring an organisation's entire IT infrastructure and management. Offshoring literature now places less importance on hard dollar cost savings and more importance on the business benefits, the soft dollar (or qualitative) savings, and the strategic purposes of offshoring selective pieces of the IT environment such as research and development, application development and call-centre services.

USA market threats

In formulating their offshoring policy and strategy, the US has gone to great lengths to protect its own self-

interests. For example, employment law and investment decisions are predicated on the basis of governance and federal law and, whilst the US earns billions of dollars from its exporting activities, there is strong opposition by labour groups and their political supporters to the offshore offshoring of IT goods and services. Most of IT jobs taken offshore have gone to India, China and Russia. Opposition within the US software industry has been fierce given that the US could lose up to 3.3 million jobs in the next 15 years, causing a loss of \$136 billion in wages.

Global Insight has estimated that the number of US displaced IT software and service jobs due to offshore IT offshoring, as of 2003, was around 104,000. This includes not only jobs that were eliminated by some American companies that substituted offshore resources for domestic resources, but it also includes jobs that were never created as other US companies expanded their IT activities using offshore

Offshoring individual business functions is now more common

resources without reducing their domestic resources. However, it is important to note that the total number of IT software and services jobs that have been lost since 2000, when the dot-com bubble burst, is around 372,000, but only 2.8 per cent of the total IT software and service jobs were lost because of offshore IT offshoring.

The Indian perspective

The Indian software industry is characterised by its propensity towards high skilled low cost labour (wages are approximately one-eighth those in the US). Indian firms began with a strong emphasis on 'body shopping', the transportation of software staff to work overseas at the client's site. In the late 1980s, around 75 per cent of export earnings came from this mode of operation. By late 1999, this had dropped to around 65 per cent. Today the figure is around 58 per cent,¹⁰ indicating a slow but steady trend towards offshore working.

Having sustained an annual growth of 40 per cent over the last decade, India is now looking at further opportunities within the market.

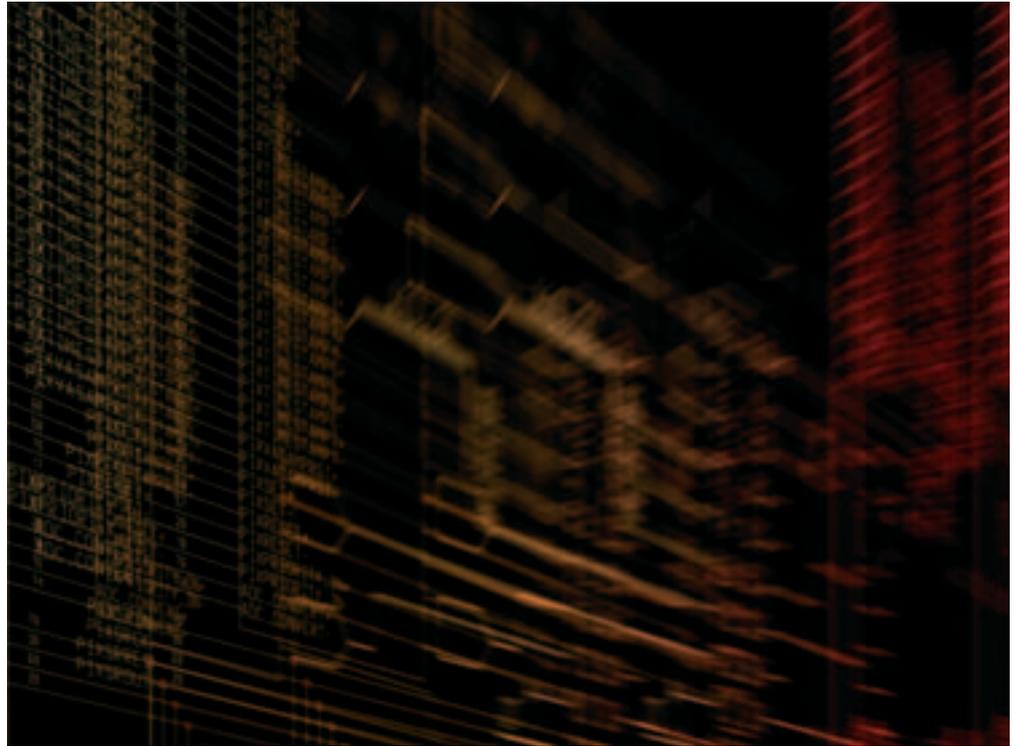
According to Heeks and Nicholson¹¹ the trend within the industry is moving towards the higher end of the value chain that comes from the supply of programming services to providing complete turnkey projects making it a direct competitor to US and European companies. India's \$50 billion export target for 2008 may be viewed as over optimistic. One of the most critical implications for the Indian software industry is that the low cost business model might lose its effectiveness if China's next generation of English-speaking computer science graduates enter the market. This in part explains why there has been a strategic shift towards the higher end of the value chain.³

The capital forces behind internationalisation are also a direct threat to the products and services offered by Indian firms. As more and more global software majors set up and expand their operations in India, the demand for export products and services diminishes. Hence the strategy must be to look to other markets outside Europe and the US, perhaps China and other south east Asian countries.

To sustain its future market position, India will need to tackle a number of domestic and global issues. These include:

- Dependence on the US software markets;
- Internal markets and cultural instabilities;
- Future access to markets;
- Future access to skilled labour (migration);
- Future access to low cost working and venture capital;
- Future access to political leaders and decision makers;
- Future access to technology partners;
- Future access to research and development;

There are clearly overlaps between many of the points listed above. For example the access to technology markets is premised on having skilled labour, access to capital and research and development. With respect to research and development, India has benefited from having access to technological innovation via European, US incubation research units within India. For example, Google, the world's largest search



engine, is all set to open a research and development centre in Bangalore. Another leading web portal, Yahoo, also carries out research and development work in

the US. Its worldwide research and development head count is more than 5000, with about 900 in Bangalore, where it expects to add 1100 employees by the end of next year;

- Sun Microsystems has a research and development centre in Bangalore.

So, what is it about India that draws these major firms? There are countries like China, Singapore, and Malaysia all competing for the research and development opportunities. Yet India is emerging as a preferred destination. Evidence would suggest the lower cost of a technical workforce in India as opposed to Western firms.¹¹ Clearly there is high potential for very good technical people in India and the cost to the company is very favourable compared to Europe. Besides cost, the pool of technically qualified workforce is also a big draw.

Market capability – Some strengths and weaknesses

It is easy to argue that Indian firms will continue to gain market share, even if they have only a small share of the global market, (say six per cent). However, it is different to suggest the same if India's market share is high (say 15 per cent). India can still gain market share because of cost arbitrage. It is, however, no longer as easy because the impact of the macro environment is much higher. Given this situation the underlying market strategy seems to be to build scale to meet a rise in

Access to technology markets is premised on having skilled labour, capital access and r&d

Bangalore. Intel recently announced its plans to move into a \$41 million, 42-acre site in Bangalore next year and more than double its number of employees in India to 3000. According to the president of Intel Technology India, the cost saving is the key here, as it would cost twice as much to set up a similar operation in the US.

Other examples include:

- US-based chipmaker Intersil is setting up a design centre in Bangalore;
- IBM has set up a research laboratory in Delhi to tap Indian scientific talent, one of the eight such laboratories in the world. It has 70 researchers in India;
- Mobile phone giant, Nokia, is to set up a research and development hub in India;
- Intel conducts 15-25 per cent of its research and development outside

PEST	Overview of strengths
<i>Political Climate</i>	<i>Strong tax incentives for inward investors Strong political motivation for globalisation Strong reputation and trust Adaptive legislative framework</i>
<i>Economic climate</i>	<i>Strong technical skills Strong export base Strong infrastructure links Competitive labour cost model Adaptive investment regime to technological investments Adaptive and highly mobile work force</i>
<i>Societal climate</i>	<i>Strong science and educational culture Strong management culture Adaptive English speaking population</i>
<i>Technological climate</i>	<i>Strong research and development culture Strong ties with western technology companies Adaptive to new technologies</i>

outsourcing in the long term, primarily from global telecoms which have yet to fully embrace the Indian offshore model.

Evidence would also suggest that many large Indian companies are developing expertise in the so-called vertical domain areas because they offer a rise up the value chain into areas of work that are longer-term and more lucrative than traditional code programming.¹² In addition, aggressive attempts have been made by a small number of Indian companies to globalise, through acquisition by setting up overseas development sites, or by acquiring a front-end marketing capability.

One challenge of acquisition is managing the process of absorption. This is a useful cultural test for Indian companies whose takeovers and mergers have typically been confined to targets owned by fellow Indians, albeit living in the US. Reasons for acquisitions, beyond getting a toe-hold in the market, include ready resources, clients and revenues. We should also add access to new sets of skills or domain and process expertise in the target market, access to a new technology or intellectual property and also greater credibility with target clients, by having a strong local presence beyond just a sales office.¹

The Chinese perspective

China is emerging as a major market of software outsourcing services. According to the latest survey report released by Gartner, Chinese software outsourcing earnings is expected to catch up with that of India in 2006 with the export of software development service to \$27 billion.¹⁰

If this trend continues, China will become a major competitor in the global outsourcing market. Besides this, China is also a software consuming market with a population of 1.1 billion and more than 15,000 middle-size and small-size domestic firms, which are adapting to the world market, particularly since China became a member of the World Trade Organisation (WTO).

Comparing India with China, as an outsourcing destination, one of the important strengths of China is its

Table 1: India's software capability in 2004.

China will have to consider its position in vertical markets such as telecommunications and microelectronics

huge domestic software market that attracts domestic software firms as well as foreign software firms. China is starting to promote social and economic development through the wider use of information technology. China has also absorbed foreign direct investment (FDI) many times than that by India. Now, owing to its huge domestic market, sustained economic growth and political stability, and the new membership of WTO, China is becoming the hottest spot for FDI, even more than the US.¹³

Research by McManus and Floyd¹ highlights the challenges that China faces in serving the global market. China has been increasingly focusing on expanding and diversifying their

presence into Western markets, such as Europe and America and if China is to take advantage of its emerging position and move up the value chain, it will need to consider its position in a number of vertical markets such as telecommunications and microelectronics. It will also have to rethink its strategy in respect of the technical barriers it faces. Regarding China's policy on intellectual property, it is argued that China should strengthen its laws and regulations to protect itself and its partners against piracy and illegal transfer of software on the internet.¹⁴ China's market size and increasingly capable technical community give it unique advantages for challenging the established technological markets found in the international economy. At the same time, however, our analysis indicates that China cannot do this alone. There is substantial foreign participation in the technological development underlying the strategy and multiple interests are at stake.

There is also evidence to suggest that China would benefit enormously from instigating preferential policies for technical business. Removing operational tax for technical development, technical consultation and services would make Chinese firms highly competitive.¹

Market capability – Some strengths and weaknesses

The Chinese software industry is perceived by many observers, including the national government, to consist of too many (undesirably) small companies. In part, the smaller size of Chinese software firms is due to their early stage of growth and the fact that they have not yet mastered the art of managing growth in technical capability, process, project size and numbers of projects. The conventional belief suggests that many smaller firms are not growing. In part, this small size may be due to the industry's only recent development.

There is also evidence to suggest that China's markets for software in different provinces are quite fragmented and difficult to break into, given the different standards across provinces (and even across industrial sectors).¹⁵ Existing relationships between firms local to those provinces and their customers or institutions may also form barriers to entry for other firms. In order to market and expand nationally, software firms have had to adopt different techniques in these

PEST	Overview of strengths
Political climate	Strong government focus for the software industry Strong political support for domestic firms Strong financial incentives for start up firms Commitment to an adaptable tax regime
Economic climate	Strong and expanding industrial sector Strong export focus Quality of infrastructure Adaptable labour force Adapting technical skills
Societal climate	Strong social identity Strong education sector Strong local brand loyalty Commitment to training in scientific disciplines
Technological	Strong linkages between universities climate and firms Strong support for incubation units Commitment to protecting intellectual property Long term commitment to research and development

Table 2: China's software capability in 2004.

conditions. There appear to be at least two ways to market products in China: through product branding, and through relationship sales (sales through affiliates, agents or even systems integrators). Some Chinese product firms have managed to establish themselves with strong domestic brands in specific sectors. Those that have not rely mainly on the latter marketing method.

The implications of the key characteristics for countries like India can range quite widely. At one level, India can see China as a competitor, and at another, as a partner. This is made more complicated when it is realised that the relative competitive advantages of the two countries' industries may change over time. Thus, cooperative or competitive situations may remain as such, or a cooperative situation can turn competitive. Whatever the case, the chances are that India will have to partner with Chinese firms in order to get access to the Chinese market.

Future challenges (India v China)

■ **India**

The strategies for both India and China have emerged over a generation and have been undoubtedly iterative. The strength of knowledge of the West is

undoubtedly in India's favour. However, in some respects India has been rather less successful at strategically addressing its dependence on the US and managing its national and regional political climates that have generally worsened since 2001.

A survey undertaken by the World Bank suggests that on the most important measures India was still a far costlier and less efficient place to do business than China, in spite of the gains India has made in recent years. For example, it still takes twice as long to set up a business in India compared to China.¹⁶ At present India lags behind China on labour productivity. Although average wages are roughly 25 per cent below those of China, output per worker is 50 per cent below that of China. In contrast, India, in the last four decades, has managed to create many firms that can compete globally. This is despite the fact that India's record in attracting FDI is very poor compared to China's. See Table 3.

India has previously benefited from exchange rate fluctuations, a major factor in why they have remained competitive in the offshore labour market. Whether India retains this competitive element depends on two

factors – the continuation of advantage exchange surpluses, which are determined by complex market forces, influenced by macroeconomic factors as well as market conditions, and wage increases. Indian IT and software engineers have benefited from cost push market rates in the last five years – in the next decade it is likely that IT workers will seek comparable salaries to their western counterparts. This will diminish India's cost advantage so that the value proposition will no longer be as persuasive.

■ **China**

With all its challenges, India still holds a powerful position in the offshore outsourcing market and will continue to do so for some considerable time. Although the Chinese are incrementally climbing the technology maturity ladder, their software products lack the competitive edge in the global market due to the absence of operating experience and experienced professionals. China needs to work on this technology gap in the next decade certainly if it wants to penetrate the growing global digital markets.

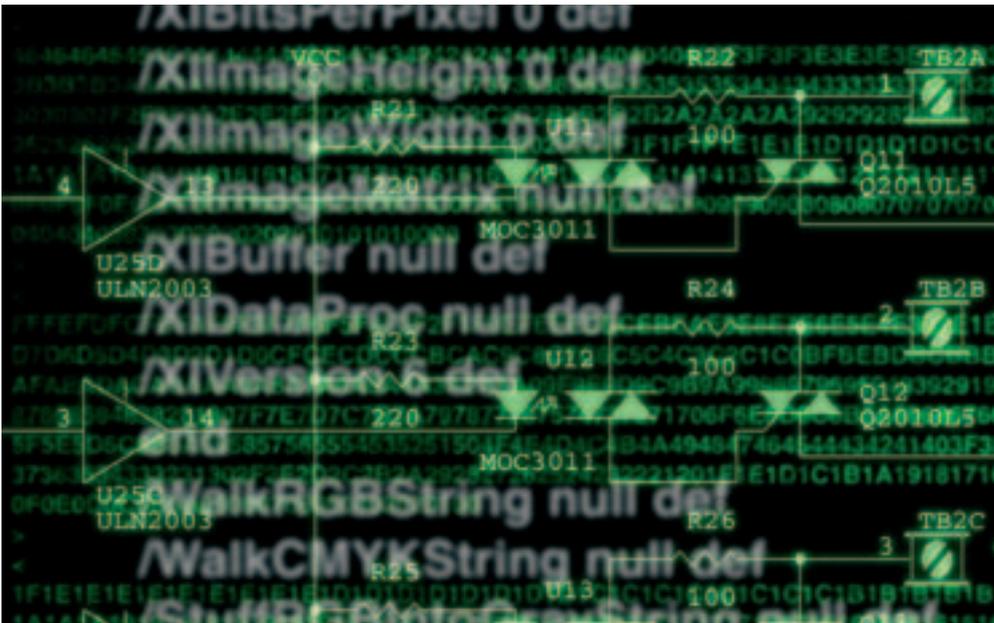
In terms of inward investment and export success, China's main advantage for the future is the presence of a clear government strategy for its software industry. However, the geographic dispersion of inward investment is something that many people do not understand, including Chinese officials and Western economists. For example, in a presentation at a National Bureau of Economic Research conference, Zhang Shengman, a Chinese Ministry of Finance official and a managing director at the World Bank, argued that China "must strive for a more desirable distribution of capital flows, both geographically (more to the interior) and sectorally (more to some service sectors, retailing, banking, insurance, etc)."

Researchers Edward Graham and Erika Wada, in a study on FDI in China, make the observation that vast areas of China, including ones where much state-owned industry is located, have not been touched by FDI.¹⁷ In recent years, the Chinese government has made FDI promotion a prominent component of its development strategy for the central and western provinces.

Although China has a strong and flourishing domestic software market built largely by private entrepreneurs, they are generally

Table 3: FDI inward investment India v China. [Source: UNCTAD, World Investment Report 2003]

(Millions of US Dollars)					
Year	1998	1999	2000	2001	2002
India	2633	2168	2319	3403	3449
China	43,751	40,319	40,772	46,846	52,700



regarded as social and political enemies, even though they are very successful in generating income, employment and taxes. Although China has sufficient invested resources, the funds go largely to government-run companies or are invested abroad by the government. The typical SME in China gets about 10 per cent of its working capital financing from banks. China's legal and political structures makes it difficult for private businesses to flourish and even though China has a huge banking sector, private firms in China were among the most dependent in the world on internally generated capital. China's partial reforms, while successful in increasing the scope of the market, have so far failed to address much inefficiency in the Chinese economy. If Chinese firms are to compete with the best Indian and western firms they need to improve their financial strength by exporting less of its capital reserves abroad and by investing more in start-up firms and research and development.

Conclusion

Both India and China will continue to grow their respective markets and, in years to come, will be serious competitors to the US. Although they are different in political ideology, India and China have similar aims and objectives in perusing western technology, markets and capital. However, irrespective of ideology, strategy and markets need government and government needs markets. Government action is crucial to the ability of India and China to participate in future economic opportunities. This must be an active regime that fosters an environment

where contracts and markets can function, basic infrastructure works, and there is legal and social protection.

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