Bangladesh Beckons

An emerging destination for IT/ITeS outsourcing

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KPMG

Contents

About the Report

In light of the developments in global offshoring and Bangladesh's rise in IT/ITeS services - A joint team of KPMG India and KPMG Bangladesh undertook the study to explore the IT/ITeS sector in Bangladesh. A project supported by the ITC and CBI, the study included benchmarking the Bangladeshi IT/ITeS industry with the other leading offshore services destinations to ascertain the opportunity in Bangladesh as a global offshoring center. The whitepaper presented here is the output of in-person interviews with Bangladeshi IT/ITeS industry players, government functionaries, trade associations and global IT services buyer community, and supported by extensive secondary research.

About ITC

Formed in 1964, ITC has been the focal point within the United Nations system for trade related technical assistance (TRTA). In line with our joint mandate from the World Trade Organization (WTO) and the United Nations through the United Nations Conference on Trade and Development (UNCTAD), we support our parent organizations' regulatory, research and policy strategies. We focus on implementing and delivering practical TRTA projects.

The present whitepaper was produced in the framework of the Netherlands Trust Fund II (NTF II) Bangladesh project. The Netherlands Ministry for Development Cooperation finances the project through its agency the CBI, while ITC takes responsibility for the implementation.

About CBI

The CBI is the Centre for the Promotion of Imports from developing countries. It is an agency of the Ministry of Foreign Affairs of the Netherlands. The CBI's mission is to contribute to sustainable economic development in developing countries through the expansion of exports from these countries. Over the last 40 years, the CBI has opened the doors of European trade to thousands of exporters in developing countries.

About KPMG

KPMG is a global network of professional services forms providing Audit, Tax and Advisory services with an Industry focus. With more than 145,000 people worldwide, the aim of KPMG member firms is to turn knowledge into value for the benefit of clients, people and the markets.

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Executive Summary

Global IT outsourcing industry has been growing steadily in the last decade. The current global economic crisis has led to shrinking IT budgets for corporate, but there has been a continual growth in demand for global sourcing of IT services, with cost optimization being the primary driver for offshoring services. The increasing cost pressures, with new service delivery paradigms like cloud computing and multiple sourcing, is set to transform the outsourcing industry globally.

Over recent years, Bangladesh has made major strides in laying the groundwork for a diverse and successful outsourcing market. The IT services industry within Bangladesh has been growing serving international clients and domestic clients in banking and telecom sectors. The industry now employs over 20000 people, and is exporting services to European, North American and East Asian clients. Bangladesh's emerging outsourcing players already have strong credentials. Bangladeshi freelancer community has further supplemented the IT exports by close to US$7 million in 2010 - with Bangladesh appearing consistently in top freelance work locations on sites like oDesk, eLance and the likes.

Bangladesh offers a vast pool of young, trained and English speaking resources – available at costs almost 40% lower than established destinations like India and Philippines. Government authorities have demonstrated a determination to promote IT services industry in the country – providing cheaper bandwidth and alternate international cables, setting up Technology parks and providing tax holidays for export oriented industries. The "Digital Bangladesh" initiative of the government is helping setup infrastructure for enhanced connectivity, ICT based citizen service delivery and ICT based Education system. There is evidence of many global players, like Samsung, AMD, VizRT, WorldBridge Global – setting up operations in Bangladesh.

For all the progress that has been made, this report illustrates some of the key challenges that still lie ahead. Many domestic business leaders recognize that Bangladeshi outsourcing industry could better market its strengths to the international community. Negative perception about Bangladesh needs to be countered. Government needs to take a holistic approach towards promoting the IT/ITeS industry – including investment climate, taxation, remittances, legal framework and flexible working hours.

With today's challenging economic conditions, more companies are looking at effective use of external providers to help them support and expand their operations. Bangladesh has positioned itself as a key location for consideration by enhancing delivery capability and skill availability, lower costs of operations, making focused investments in telecom and IT infrastructure, and highlighting success stories.

The Current state of Global outsourcing

The global sourcing market has been growing at 16% over the last 5 years reaching a size of 1.06 trillion dollars in 2010[1]. This growth, however, tapered down last year compared to previous years owing to adverse global conditions such as slow world GDP growth, rising inflation, declining corporate profits and the near bankruptcy of a number of European countries. Global IT spend increased by a mere 5.9 per cent in 2010, with spending on IT services growing by just around 3 per cent[2].

Despite expectations of a recovery in 2011, client spending remained tepid in the first half of the year. Transaction volumes in the IT outsourcing market fell for both the IT and business process outsourcing (BPO) markets, by seven percent and 12 percent respectively during the third quarter of this year, its first substantial decline in twelve months[3]. According to Gartner, global spending for IT outsourcing services will reach $315.8 billion in 2011, a growth of 7.7% over 2010[4]. Despite the worrying economic situation, the technology research firm does not expect dramatic cuts to enterprise IT budgets in 2011 and 2012.

**Figure 1
Growth in Global
Sourcing market**
Source : NASSCOM, Everest
Research
The market size is in billion USD
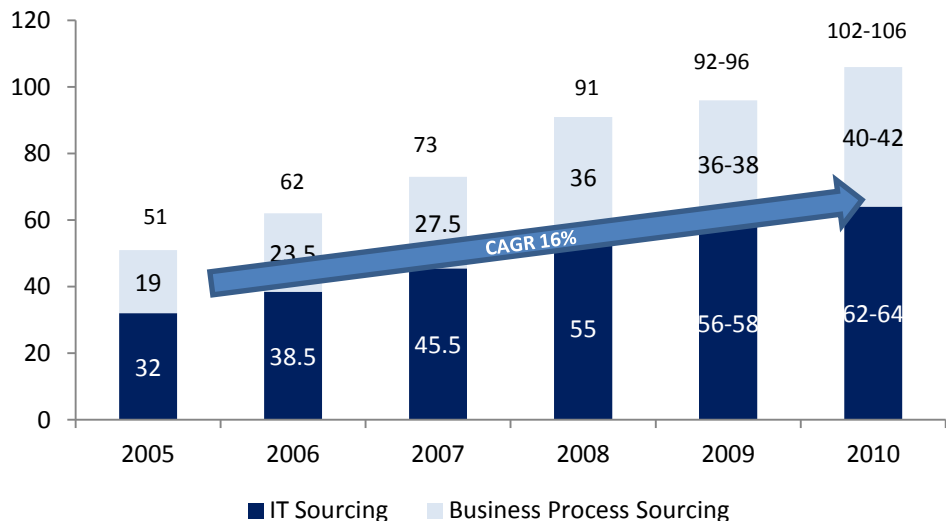
1. "The IT-BPO Sector in India", Strategic Review 2011, Strategic Review 2010, NASSCOM
2. Worldwide IT Spending Forecast, Gartner, June 2011
3. Everest Group quarterly report on global services industry, CIO.com
4. IT Outsourcing Worldwide, 2010-2015, 3Q11 Update, Gartner

Impact of the financial and sovereign crisis

The dark clouds of the global financial crisis may come with its silver lining for the outsourcing industry. Despite the stagnant growth expected in IT spending by enterprises, spending in offshoring may increase as companies are increasingly looking at means of cutting costs. As per KPMG Sourcing Advisory Global Pulse Survey 2Q11 results, there will be a continual growth in buyer demand for global sourcing with higher preference towards offshore outsourcing. Fifty-five percent of respondents indicated a significant increase in preference or demand for offshore outsourcing[1]. Cost optimization continues to be the primary driver for offshoring decisions.

While the global slowdown is no doubt a worrying situation, it has been seen that in times of financial crisis, companies typically turn to outsourcing for a faster and cost effective business option. The global economic crisis has inspired companies to explore new ways of reducing cost and bringing efficiency into their operations. This has resulted in companies looking for partnerships with service providers across a broader range of geographies and bringing innovation in outsourcing.

Future Outlook

With the current economic conditions, organizations are expected to draft their offshoring strategies proactively. As the economy stabilizes, adoption of offshoring is bound to increase. In addition to the established offshoring locations like India and Philippines, companies would look to expand to newer locations which would give them further cost advantage, efficiency and address their country risk issues.

Buyers will continue to favor offshore outsourcing as a preferred service delivery model. The adoption would be spear-headed by US and APAC markets while the growth is expected to be slower in Europe[2]. Also, Tier-II/III cities would attract a higher share of new centers especially in India and Eastern Europe, and newer geographies take deeper roots in offshoring business.

1. KPMG Sourcing Advisory 2Q11 Global Pulse Survey, EquaTerra, July 2011
2. Global IT Spending Forecast, Richard Gordon, Gartner Blog Network

Emerging global industry trends

New trends are shaping up the IT-BPO Industry, spearheading the next phase of growth.

Hybrid sourcing models – The dynamic business environment coupled with upcoming challenges is pushing vendors and the customers to have new sourcing arrangements that go beyond the traditional captive and outsourcing models such as vendor-assisted captive (where the vendor assists the parent company to build the center but the actual work is performed by the parent) and virtual JV (an agreement between two entities to jointly conduct business for their mutual benefit without the formation of a separate entity in which to conduct activities).

Innovation Network – Buyers are also expecting providers to bring innovation and look beyond cost-cutting. Most of the initiatives are driven from established offshoring locations such as India that have moved up on the sourcing value chain. Some of the new geographies are moving into low value-add work with their cost advantages while the more established outsourcing destinations are moving up the value chain, thus charging their clients higher billing rates. A number of MNCs are setting up their R&D centers in India which are playing a growing role in the organization's innovation moves.

Global Footprint - Service providers are also increasing their global footprint through inorganic route and addressing supply side challenges by establishing their delivery locations closer to their demand market. Suppliers in established offshoring locations like India are developing hub and spoke model to have flexibility in their operations. Case in point is Sutherland which acquired Indian firm Adventity to target BPO markets in Asia, Africa and the Middle East.

Increased Breadth of Services - IT-BPO vendors are expected to increase the breadth of services offered by adding on vertical-specific functions as well as moving up the value chain by offering knowledge processes. Cognizant's IT-BPO deal with UBS for UBS India Service Center includes a significant KPO piece giving the service provider access to a wide bouquet of services.

Cloud Computing - Cloud computing would be impacting all aspects of outsourcing, IT and business services. It has the potential to provide phenomenal growth to the vendors by equipping them to cater to a large customer base with low incremental costs. Also, it is reshaping the way services are developed and delivered to the end customers.

Move towards multiple sourcing locations

With the rise in attractive offshore locations, a new paradigm is emerging in which large buyers are assessing several attractive locations. A single destination may not offer all the advantages. Hence, companies are strategically evaluating the outsourcing options and combining the complementary strengths of several locations resulting in a more robust and flexible services delivery model. Strategic decisions on choosing the right mix of outsourcing destinations require a complex series of evaluations and trade-offs. These decisions are based on a host of criteria which include overall business environment, cost and quality of services, government support and initiatives, data and intellectual property security and privacy legislations. The advent of clout computing as a delivery model has further strengthened this by reducing the cost of incremental infrastructure required at every location.

Today, Bangladesh is quietly evolving from being a beginner to a serious contender in the global outsourcing market. Bangladesh's outsourcing industry has been shaped by different factors to those of India and Philippines. Its growth has been founded on the domestic market as well as overseas markets accessed by its Diasporas – the Non-resident Bangladeshis.

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The Bangladesh Story

The last 5 years have been a watershed in Bangladesh IT/ITeS industry. During this time, the internet connectivity has been enhanced vastly over the country. The successive governments have made IT as a focus area, and have extended favourable policies for the growth of the sector. Subsidies towards technology imports and tax breaks were provided to the industry. With global outsourcing industry witnessing an upward trend, and sourcing enterprises looking at lower costs for improved service delivery, the Bangladeshi IT/ITeS industry has been able to take advantage of its vast resource pool and government support to make its presence felt in Global outsourcing market. The overall size of the IT/ITeS industry in Bangladesh stood at ~250 million USD in 2010.[1] The following table summarizes the growth experienced by export oriented Bangladesh IT/ITeS industry.[2]

Table 1
Growth in IT/ITeS Export from Bangladesh
Source : EPB, Government of Bangladesh

	2008	2011	Growth
IT Services & Non Voice ITeS	24.82	45.31	22%
Voice based ITeS	NA	2	NA
Total	24.82	47.31	24%

Having gained experience and credibility in the international market for services, Bangladeshi companies are now graduating from low value added tasks to higher end engineering and product development assignments – Bangladesh based Eyeball Technologies has developed the Blackberry Playbook's Video chat for BBM, for Research in Motion (RIM) a Canadian giant. Other companies like SSD Tech have been developing mobile platforms for VAS for companies across 2 continents, while GraphicPeople has been creating promotional material in multiple languages for Dell, the technology powerhouse [3]. Global giants like Samsung and AMD have opened/in process of setting up their R&D centers in Bangladesh. [4] It is no surprise then, that global Technology research house, Gartner has included Bangladesh in its list of top 30 outsourcing destination in its 2010 report.[5]

1. Bangladesh Software and IT Service Industry - Recent Trends & Dynamics, BASIS Report (www.basis.org.bd)
2. Export Promotion Bureau, Bangladesh statistics (www.epb.gov.bd)
3. Embassy of Denmark in Dhaka - http://www.ambdhaka.um.dk/en/menu/DevelopmentIssues/Businesstobusiness(B2B)Programme/B2B+Case+Stories /Case+Story+no+1+GraphicPeople/
4. The Daily Star http://www.thedailystar.net/newDesign/news-details.php?nid=193005
5. Gartner - http://www.gartner.com/it/page.jsp?id=1500514

Even more spectacular is the growth of the freelancer community within Bangladesh. With no marketing or corporate backing, over 10,000 freelancers from Bangladesh have billed over USD 7 million over the last 1 year. This has led to Bangladesh being mentioned in top few destinations among freelance worker nations, and Dhaka- the capital city, to among the top 5 cities for freelance outsourcing work.[1]

Bangladesh – an Introduction

Situated in South Asia, Bangladesh is a young democracy with all the growth pains that that entails. Traditionally an agrarian economy, Bangladesh has established itself as the Textile and readymade Garment powerhouse of the world, with almost all major global apparel brands sourcing from Bangladesh. With a large population of over 160 million people, and an economy on growth path, Bangladesh has been listed in the "Next 11 after BRIC" in Goldman Sachs analyst reports[2], while JP Morgan has included Bangladesh in the "Frontier Five" economies.[3] Credit rating agency Standard and Poor (S&P) and Moody's have also placed Bangladesh ahead of all countries in South Asia, except India. The business climate in Bangladesh is on an upswing. The economy has been growing at ~6% for the last 5 years. The FDI into Bangladesh was 913 million USD in 2010, almost doubling in the last 7 years, and showing a robust growth from USD700 million in 2009. Bangladesh is also the world's second largest exporter of apparels and ready made garments.

The Information Economy

Bangladesh, despite being ranked among less developed countries, has been a pioneer in reaching out to the larger population through technology. Mobile phone penetration has been among one of the highest in the developing economies with a teledensity of over 40%.[5] The internet penetration rate is estimated to be at 7% - with most people using mobile internet.[6] The use of international bandwidth has risen 200% in 3 years to 2011 with capacity upgrades for international bandwidth of over 500% underway into 2012/13.[7] The "Digital Bangladesh" program of the government has initiated the process of e-services for government service delivery and capacity building for the population at large. As in December 2011 , Bangladesh had over 2.1 million Facebook users.[8]

1. oDesk oConomy Report – www.odesk.com
2. Goldman Sachs Research - http://www2.goldmansachs.com/our-thinking/global-economic-outlook/intro-growth-markets/index.html
3. JP Morgan Emerging Markets Equity Research 04 April 2007 - Launching the JPMorgan Frontier Five and EM8
4. United Nations Conference on Trade and Development(UNCTAD)Database - http://unctadstat.unctad.org/TableViewer/tableView.aspx
5. http://www.mof.gov.bd/en/budget/11_12/budget_speech/speech_en.pdf
6. http://www.mof.gov.bd/en/budget/11_12/budget_speech/speech_en.pdf
7. http://www.mof.gov.bd/en/budget/11_12/budget_speech/speech_en.pdf
8. www.facebook.com

Over 600,000 computers (including laptops) were sold in Bangladesh in 2010, with estimates of around 3 million laptops/PC being available in the country.

The IT/ITeS industry in Bangladesh

The IT/ITeS sector in Bangladesh is over three decades old and has been catering to established clients both globally and in the domestic market. Most players initially targeted the IT potential in the domestic industry. The DANIDA aid program in 2003 was a major booster to the nascent homegrown industry, and enhanced access to Scandinavian markets created the first wave of IT companies serving global markets in Bangladesh. Many of these companies have now successfully extended their geographical reach to other regions like Europe and US. During the latter half of the last decade, the services sector (primarily BFSI and Telecom) in Bangladesh grew phenomenally. This led to a robust growth in the domestic IT /ITeS services demand, and currently the industry clocks almost twice the revenue from domestic IT services sector against the IT/ITeS exports. The growth of domestic industry has spurred a growth in the functional and technical knowledge of the resources – with deep domain understanding in the BFSI and Telecom sectors. A lot of product based companies have also picked up steam to cater to the demands of the local and regional industry. Currently there are over 800 IT and Non-Voice ITeS companies in Bangladesh, out of which around 200 work on a global basis for outsourcing and project based delivery models.[1]

The availability of trained manpower at competitive prices – and well-established delivery capabilities, has led to many global players looking at Bangladesh for captive development centers in recent times. Notable among them is Samsung (having set up a 250 person R&D center with aggressive growth plans), VizRT (Acquiring product companies from Bangladesh and building scale) and media giant WPP (buying into GraphicPeople and developing it into a global delivery location).

In the recent years, Voice based BPO services are also evolving in Bangladesh. Bangladesh Call Center and Outsourcing (BACCO) – an association with over 70 members- claims over 15000 agents are working in the sector. Though small in comparison to IT services, these BPO services have clocked over 2 million USD in revenue in 2010, and are growing fast.[2] WorldBridge Global- a US based outsourcer has expressed interest in setting up BPO operations with around 10000 seats in Bangladesh with a proposed investment of USD 150 million.[3]

1. Bangladesh Software and IT Service Industry - Recent Trends & Dynamics, BASIS Report (www.basis.org.bd)
2. Bangladesh Association of Call Center & Outsourcing (BACCO) www.bacco.org.bd
3. Presentation by WorldBridge Global at eAsia – December 2, 2011, Dhaka

Outsourcing the Bangladesh way

The development of Bangladesh's outsourcing business has important implications for global customers seeking to explore it as a new destination for outsourcing work. Decision makers primarily judge outsourcing locations by cost, availability of skills and manpower, both current and future, and across all these areas, Bangladesh scores well.

Most of the work done by the Bangladeshi outsourcing pioneers comprises low-value add jobs such as graphics design and website development. Some companies also work on product development, mobile application development and software development. However, today many global companies – once clients of these pioneers, have bought into them, and are using them for mid range software and IT outsourcing projects. Companies like VizRT (Norway), Bording Data (Denmark) and WPP (Graphicpeople) are examples. The Bangladeshi companies provide the parents with a range of services from back office administrative work, graphic designing, DTP and customer service requests, to high-end IT, product development and enhancement jobs. In recent years there has been a move towards Business Process Outsourcing also – a trend which will further strengthen with enhanced connectivity and bandwidth.

"Hardworking resources, not shy to learn - at a fraction of European costs, there is huge talent pool in Bangladesh- they just need the opportunity " says Hasan Fatheme, Executive Director of Nordic Chamber of Commerce and Industry in Bangladesh – the industry body of Nordic Businesses in Bangladesh which includes 11 IT/ITeS companies as its members.

Quality improvements in skill levels and delivery capabilities have been steady. Many of Bangladeshi outsourcing vendors have got certifications in CMM level 3 or higher over the last 3 years. Also, a few companies got themselves certified to robust information security processes by getting ISO:27001 certified.

Owing to a huge domestic market in BFSI and telecom sectors, Bangladeshi vendors have also advanced to offering specific business knowledge in areas such as Core Banking solutions, Micro credit solutions, Islamic Banking and Mobile application development and deployment. Such insights create closer links between vendor and client, resulting in higher productivity and profitability for both. In addition, Bangladeshi companies are working extensively on Desktop Publishing, Graphic design and content development for web applications.

Bangladesh at present is more suited for less complex projects such as website development, mobile content development, back office software development, 2D/3D animation, desktop publications and call centers.

Case Study - Freelance Outsourcing in Bangladesh

21 year old Mahmud Hasan (name changed on request) wanted to become an entrepreneur some day. A student of Dhaka University, and hailing from a working class family – this always seemed to be a distant dream. In the third year of engineering, his seniors told him about the phenomenon of freelance outsourcing on the University Campus. A profile of his on one of the freelance sites, and Mahmud was in Business – the first project for website design took 3 days and fetched a neat USD100 (Close to BDT 7000 – almost one fourth of his University fee for a year!) The year later, he declined a lucrative campus placement offer, and instead decided to go full time into freelancing. Today, after 3 years, Mahmud has hired 4 college students working part time out of flat in Tejgaon in Dhaka, bidding for work on freelance websites like oDesk, eLance, Guru and others – clocking upwards of USD 20000 a year. He intends to scale this up further, planning to hire fresh engineers in the coming year on full time basis. "Getting money from clients is a difficulty and takes time, retail internet connection is unreliable, and a lot of software is pirated" quips Mahmud "but now I plan to get a business internet connection which will cost more but more reliable, and I will get more billing with licensed software since I have many referencible clients on freelance websites"
What started as a quest for extra money and gaining work experience, freelancing by students and professionals has turned into a fledgling industry in Dhaka and elsewhere in Bangladesh. In the absence of any large software companies in Bangladesh, skilled young professionals are seeking out alternative methods to leverage their proficiency in order to make some money. This has led to a thriving software freelancing community in Bangladesh. Even without any marketing or corporate backing, nearly 10,000 freelancers from Bangladesh billed over USD 7 million in 2010, catapulting the country to the seventh position among freelance worker nations, and Dhaka- the capital city, to the top 5 cities for freelance outsourcing work.
The rapid growth in Bangladesh's freelancing community can be attributed to ease of setting up operations – limited infrastructure needs and an internet connection. A combination of good English skills and low labour

costs has made Dhaka a top destination for freelance outsourcing jobs, which typically include editing, proof reading, translation, data entry, web research, virtual assistance, web design and software programming. Many of the workers are students of Engineering and Technology Universities supplementing their allowances. Many non-engineering students are employed in data entry projects, earning close to USD1000 per month depending on the complexity of the assignment and experience levels. Although the contribution from freelancers may seem small in isolation, their aggregated contribution in employment generation and export income are not insignificant.

Despite the stronghold of freelancing in Bangladesh, challenges remain in terms of high-speed internet facilities, cheap bandwidth, newly introduced taxation and online payment facilities. Paypal, for instance, is not supported in Bangladesh. In addition, these young IT professionals/entrepreneurs need to be guided in terms of business development, investment planning and organizational capability to contribute more meaningfully to the country's software industry. But despite these challenges, in a world grappling with global recession, freelancing is increasingly being considered a viable alternative to traditional modes of outsourcing by clients keen on cutting costs. If the recent reports from oDesk and eLance are any indication - Bangladesh seems well poised to make the best of this opportunity.

## Bangladesh – A less tapped Outsourcing Destination

The global economic downturn is pushing companies worldwide to find new ways of cutting costs, and this in turn will provide the much needed impetus to Bangladesh's budding software outsourcing industry. Bangladesh has, in the past, faced challenges with its marketing, negative perception and wanting infrastructure. However with government focus on infrastructure development and with wages and operating costs rising in traditional outsourcing favorites such as India and Philippines, Bangladesh emerges as a rapidly growing destination which offers several competitive advantages. Bangladesh offers an attractive business opportunity for multinationals interested in outsourcing or offshoring. This value proposition is drawn from the following strengths

- Labour availability and scalability : Bangladesh demographics may provide a constant supply of resources at extremely competitive costs.
- Language Skills : Bangladesh offers a ready pool of English speaking resources, with limited accent neutralization needs
- Growing Education -Industry linkages : Bangladesh based companies- both domestic and multinationals, have build strong relationships with various Universities in the country to tap and train talent at the sources. Finishing schools to bridge the skill gaps between academia and industry are also coming up, allowing ready resources availability.
- Low Total Cost of Operations : Real estate, resources and attractive taxation policies help lower the total cost of operations compared to the other outsourcing destinations.

Attractive Demographics
Bangladesh has one of the most attractive population demography in the world – relatively high young population base as over 34% are in age group of 15-34 years; which is favorable for IT-BPO industry. Analyst projections reveal that this number is further slated to go up. This corresponds to a young working population of over 53 million people[1] – large enough to man the fledging IT/ITeS industry for years while keeping the costs low.

1. United Nations Population Database - http://esa.un.org/unpd/wpp/population-pyramids/population-pyramids_absolute.htm

Figure 2
Population Pyramid
for Bangladesh
Source : UN Database
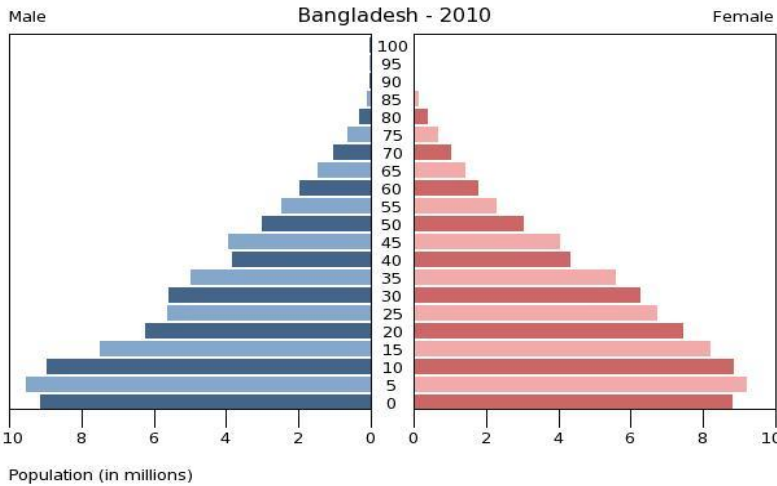
With nearly two-thirds of the population under the age of 34, the vast educated youth pool with the ability to read and write English can be trained in the required skills for making the country a potential offshore source of Software and Data Processing Services.

This vast talent pool is going to expand further as Bangladesh's population is projected to grow at an annual average rate of 1.7 percent during 2008-20, reaching 194.8 million by 2013. The relevant population(15-34) is projected to grow to over 63 million by 2020.[1]

Figure 3
Population in the age group 16-34 in various countries
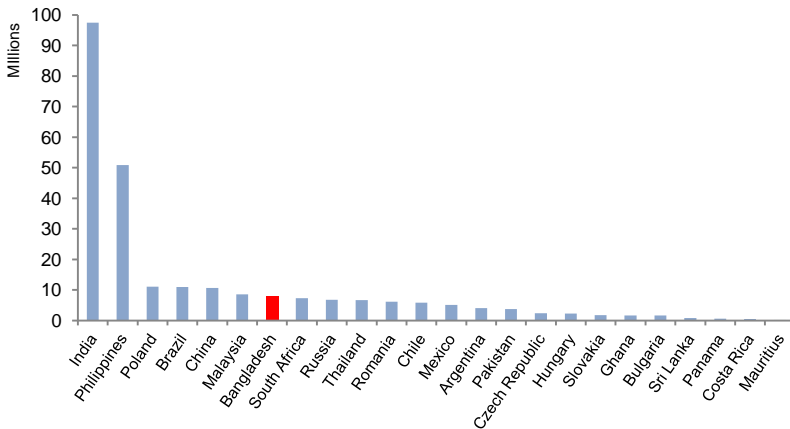Source : UN Database
All numbers are in millions
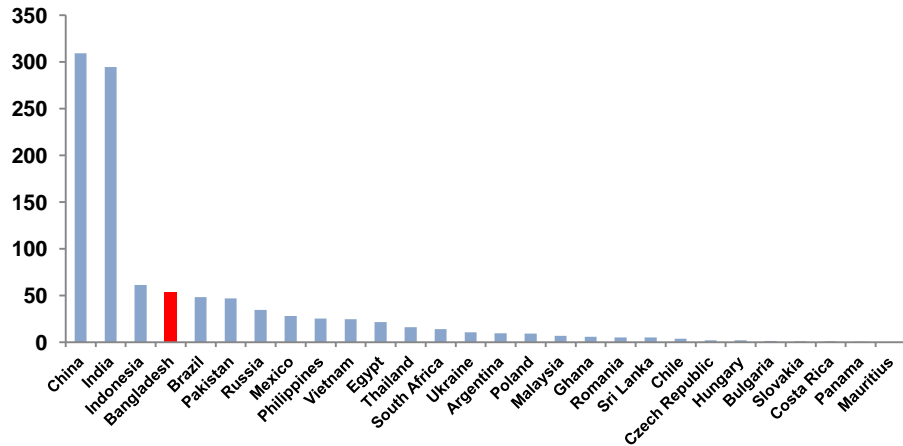
Bangladesh's Pool of Skilled Workforce
Bangladesh has over 80 universities that produce over 185,000 graduates a year including more than 14,500 graduates and post graduates in IT-related areas.[2] Over 5,000 of these students specialize in software engineering. Bangladeshi

1. United Nations Population Database - http://esa.un.org/unpd/wpp/population-pyramids/population-pyramids_absolute.htm
2. Ministry of Finance, Bangladesh http://www.mof.gov.bd/en/budget/11_12/digital_bd/digital_bangladesh_en.pdf

students have proved their potentials in the international competitions by winning a number of programming contests.

Almost 5% of the population[1] - almost 7 million people in the country know English as the second language, and over 2.4 million graduates (1.5% of the population)[2] - this is a ready labor pool to supply quality resources to the industry.

Figure 4
Population with English as the first or second language
Source : Cambridge Encyclopedia of English Language, KPMG Analysis

The quality of engineers and scientists produced by the Bangladeshi Universities is at par with most developing countries – in fact some of the global publications rate Bangladeshi graduates better than many of the developing countries.[3] "The specialized service offerings for our clients allow us to do high-end product and engineering projects, and we hire the best talent from Bangladeshi Universities for that" says S M Mahabub Alam, Director Engineering of Relisource – one of the largest niche engineering services company in Bangladesh.

Figure 5
Quality of Education System in the country
Source : INSEAD WEF Global IT Report 2010-11 Represented as a perception index Out of a 1–7 (best) scale
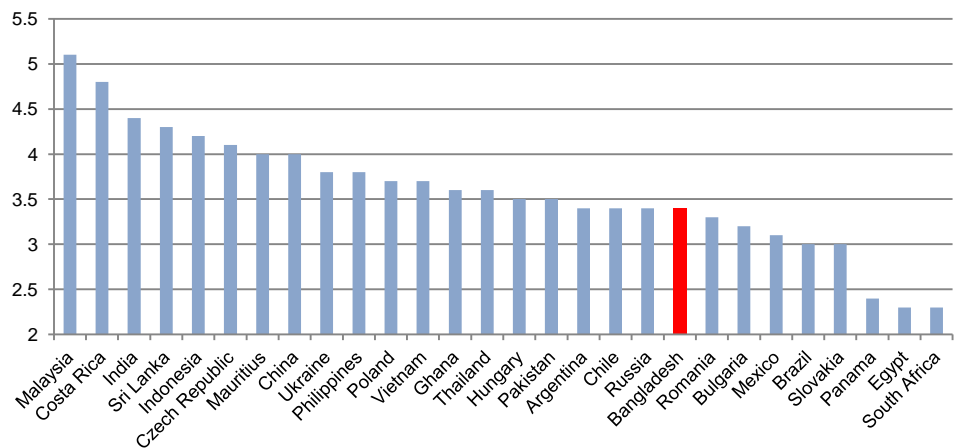
The global IT training giant NIIT has reentered the Bangladeshi market recently. Such niche training providers would help in developing job ready resources for the IT

1. David Crystal, Cambridge Encyclopedia of the English Language
2. Industry and Labour Wing , Bangladesh Bureau of Statistics - Report on the Bangladesh Literacy Survey, 2010 ,Published - June 2011
3. World Economic Forum/INSEAD , The Global Information Technology Report 2010–2011

Case Study - Samsung R&D Center, Bangladesh

Samsung is the global leader in Consumer Electronics, mobile phones and imaging technologies. With over 220 billion USD of sales in 2010 and 344,000 employees globally – Samsung is the 2nd most admired electronics company on the planet.

Samsung has a strong local presence in Bangladesh in the mobile phones and consumer electronics space. With a strong market knowledge and local expertise - Samsung decided to set up a global software R&D center in Dhaka, Bangladesh in early 2010. This was one of the 3 new R&D centers opened by it globally in the year– the other 2 being in China. The centre started operations in August 2010 – and delivered its first projects beginning 2011. Focusing on mobile phone technologies and feature phones, the center has scaled up to a headcount of over 250 engineers in less than a year. "The cost of hiring an experienced IT engineer in Bangladesh is around one tenth of that in a developed country like US" said Joseph Seungbyoung Oh, VP at Samsung Bangladesh R&D Center. Many engineers have been to the parent plant at Korea for training, and are successfully working on projects in Bangladesh now.

"Most hires are technically sound, we have to invest in bringing them to speed on corporate work culture." quips Joseph Oh. Big enterprise experience is something new for local resources – as a result - attrition, too, is much lower in Dhaka than other centers. Having delivered projects successfully, Samsung R&D Bangladesh is aiming to scale up further to over 1000+ resources, to serve the African and Mid-east markets.

and ITeS sectors. BASIS also runs specialized finishing schools for technology graduates to provide qualified job ready pool of resources.

According to BASIS and BACCO estimates, the country has close to 35,000 professionals working in the IT and BPO industry. In addition, there are over 5000 freelancers who together clock over USD 7 million in revenues – the 4h highest among all countries in the world.

"The strength of our resources lies in their eagerness to work and learn – focusing on better service to delight customers" says Mahbubul Matin, President of SSD-tech – a Bangladeshi homegrown company now serving global telecom and FMCG players.

Language Capability

English is used as a second language primarily for business and education, though Bangla is the official language. A vast majority of the population, can read, write and speak in English owing to their Western-style education, a legacy of the British rule. Bangladesh currently has nearly 7 million English speaking residents, higher than its LatAm and East European counterparts. Also, most Bangladeshi private school students learn English from primary school level which enables them to produce almost all phonetics used in English, and reduces the time for accent neutralization.
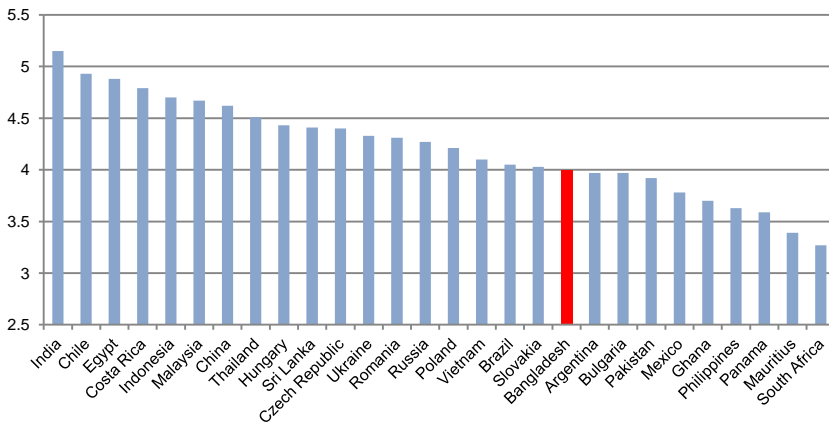
Figure 6
Quality of Education System in the country
Source : INSEAD WEF Global IT Report 2010-11 Represented as a perception index Out of a 1–7 (best) scale
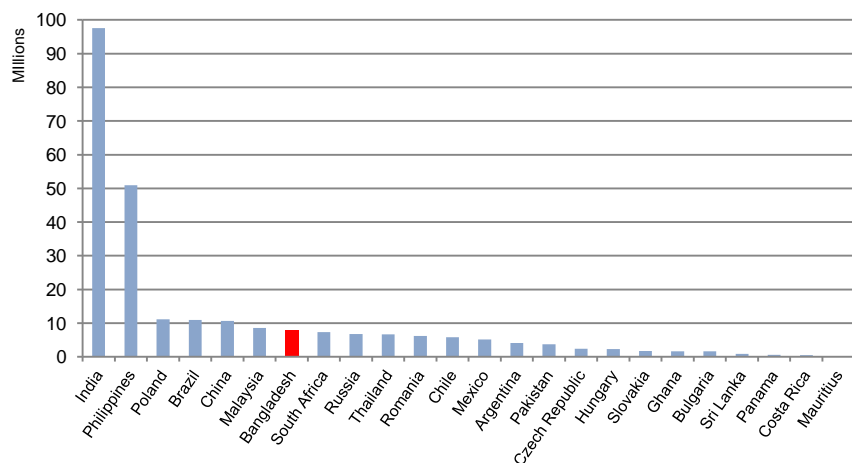
Quality of Education

More than 1.3 million students enroll every year in the 80 private and public universities in Bangladesh.[1] The education system in the country is ranked at par with other tier II & III countries of the world. Joseph Seungbyoung Oh, VP at Samsung Bangladesh R&D Center says "Most hires are technically sound, we have to invest in bringing them to speed on corporate work culture."

Figure 7
Availability of Scientists and Engineers in the country
Source : INSEAD WEF Global IT Report 2010-11
Represented as a perception index Out of a 1–7 (best) scale

The country's National Education Policy 2010 has provision for introducing ICT studies in primary and secondary levels and setting up of technical education institutions. The government proposes to enhance the use of IT enabled pedagogy in school education, and has already trained over 40000 teachers as a part of this initiative.

Presence of technology education institutes such as those run by BASIS and NIIT provide training in IT and IT related skills necessary for the industry.
In the Global Competitiveness Report 2011-12 published by World Economic forum,[2] Bangladesh ranks 85, 90 and 108 respectively for Quality of the higher education system, Quality of Management Education and Quality of Science & Math Education, higher than most of the other competing offshoring locations.

Cost Attractiveness – Labour Cost

The ability to operate at low cost is one of the prime value propositions for outsourcing, a major advantage possessed by Bangladesh. The country scores high in both labour and infrastructure costs, edging out comfortably over other Asian countries.

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1. Ministry of Education, Government of the People's Republic of Bangladesh – Database at http://www.moedu.gov.bd/index.php?option=com_content &task=view&id=300&Itemid=301
2. The Global Competitiveness Report 2011– 2012 , published by the World Economic Forum

The significant pool of young and entrepreneurial work force is available at a much lower wage other major outsourcing countries. Entry level wages in Bangladesh's IT industry, are over 50% cheaper than other countries in Asia-Pacific like India, Philippines, Malaysia, Sri Lanka, Thailand and Vietnam. When compared to Eastern European countries like Poland, Hungary, Russia, Ukraine, Czech, Romania and Latin American countries like Brazil, Chile, Mexico, it is significantly cheaper by over 75-80%.

Figure 8
Average salary cost of IT resources at entry level and 5 year experience
Source : Payscale database, Sourcing Line, KPMG Analysis
All values in '000 USD
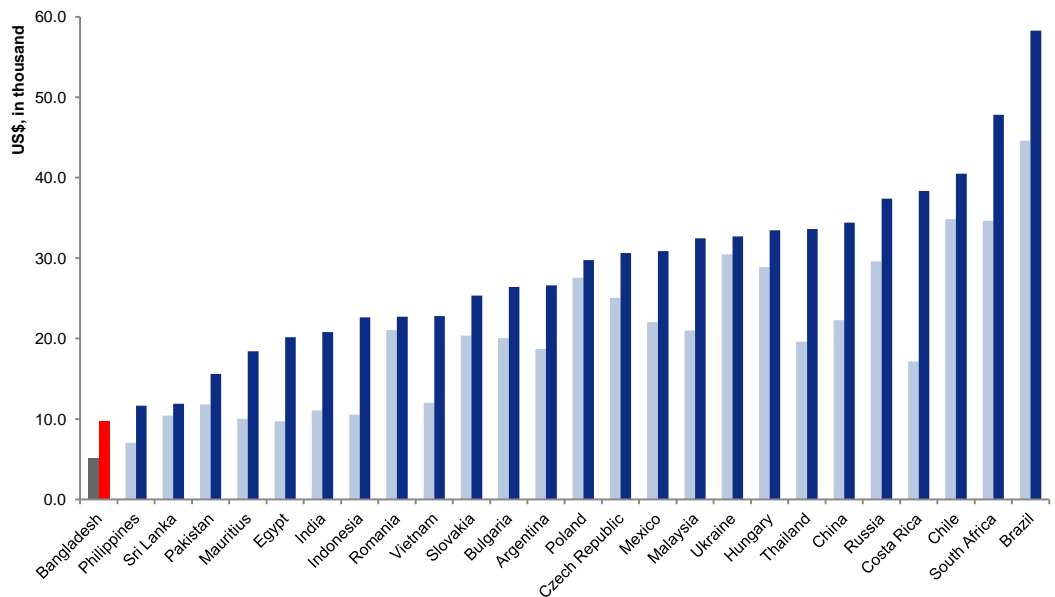
"The cost of hiring an experienced IT engineer in Bangladesh is around one tenth of that in a developed country like US" said Joseph Seungbyoung Oh, VP at Samsung Bangladesh R&D Center

On the wage inflation front, Bangladesh is significantly advantageous as it boasts of a relatively lower increase in annual wages compared to other destinations.

Cost Attractiveness – Infrastructure Cost

In addition to the low wages, costs in Bangladesh are fairly low compared to destinations in Asia, particularly in terms of office spaces. The Rental for office space in Central Business Districts(CBD) of Dhaka – Gulshan and Motijheel is
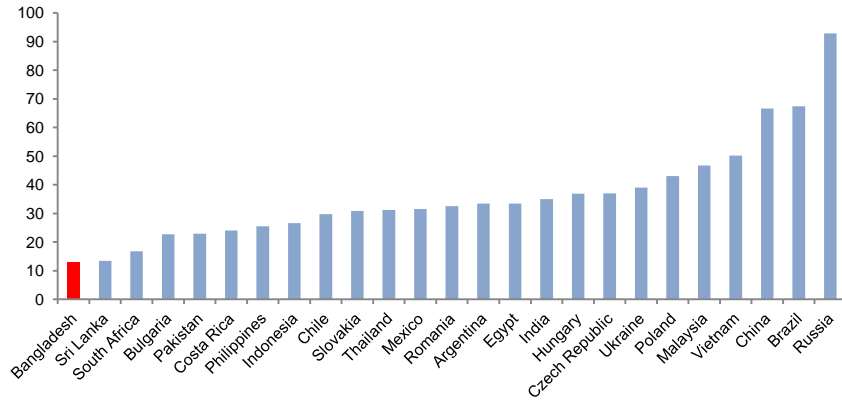
Figure 9
Average office rental cost in CBD
Source : Cushman & Wakefield Research, Office Space around the world 2011, KPMG Analysis
All values in USD/sq ft per annum

less than 20% of that in Delhi CBD and 40% of Manila CBD. [1] In addition, there are plans develop dedicated technology parks, where the total cost of business would reduce further, as most IT infrastructure would be readily available.

Internet bandwidth costs have come down significantly in Bangladesh. From over 75000 BDT per MBPS in 2007 (over USD1000), the costs are down to around BDT 6000 per MBPS now (under USD 80).[2] Though high by developed world standards, the costs are comparable with the offshoring destinations in Africa, and are further poised to come down with enhanced competition with more terrestrial links opening up in the next 3-6 months.[3]

"The cost of bandwidth is high compared to other competing locations, especially considering the VSAT backup, but this would drastically reduce once the backup terrestrial and sub-sea lines are in place" says Imtiaz Ilahi, Managing Director of Graphicpeople – one of the largest ITeS services exporter in Bangladesh.

Telecom Infrastructure

Extensive fiber optics network spans across the country providing robust network infrastructure, and connectivity to the second tier cities within Bangladesh.

In 2006 Bangladesh got connected to the SEA-ME-WE 4 Submarine cable. The capacity of 7.5 GBPS (Early 2008) was augmented to over 142 GBPS in late 2011.[4] The inland connectivity between Cox's Bazaar and Dhaka and onwards has been developed along multiple links to foster redundancies.

Bangladesh has over 82 million telecom service subscribers[5] (the teledensity of

1. Cushman & Wakefield Research, Office Spaces around the world, 2011
2. Bangladesh Telecom Regulatory Authority (BTRC), http://www.btrc.gov.bd/tariffs/call_centre_bandwidth_tariff_reduction.pdf
3. Ministry of Finance, Bangladesh - http://www.mof.gov.bd/en/budget/11_12/digital_bd/digital_bangladesh_en.pdf
4. http://www.mof.gov.bd/en/budget/11_12/digital_bd/digital_bangladesh_en.pdf
5. BTRC Statistics , October 2011 - http://www.btrc.gov.bd/newsandevents/mobile_phone_subscribers/mobile_phone_subscribers_october_2011.php

almost 50% is much higher than other developing countries). Also, there are over 10 million internet users.[1] A population of over 750,000 computer savvy users is a big plus for Bangladesh IT/ITeS industry. As on October 2011, there are 2 Nationwide telecom transmission provider (providing inland redundancy), 29 IP Telephony providers and 46 Internet service providers licensed to operate within Bangladesh.[2] These numbers reflect a growing and matured market for telecom services within Bangladesh.
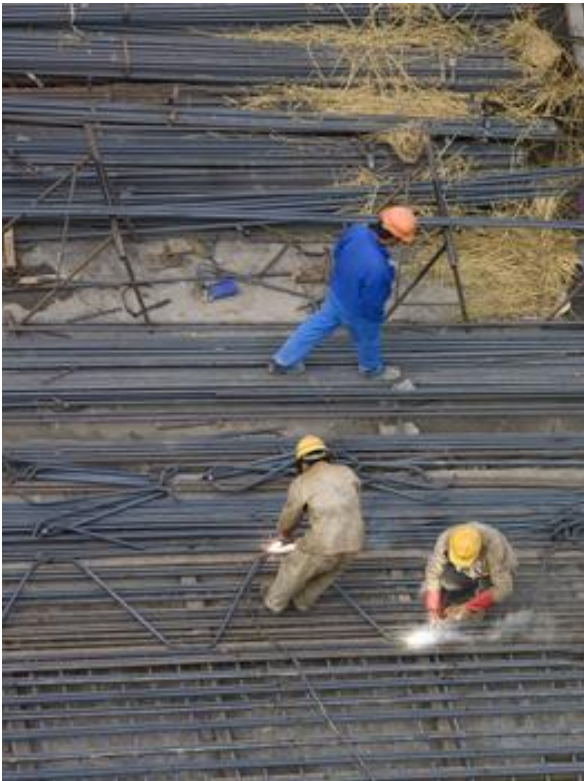
The growth of IT/ITeS industry within Bangladesh has led to development of Technology parks within Dhaka and surrounding areas. These technology parks provide a ready infrastructure for an IT/ITeS enterprise to start operations with minimum setup time. The IT infrastructure including network, connectivity, telecom and power backups are provided here.
The IT park at Janata Tower at Central Dhaka is already operational, while a larger High-Tech Park is under development by global infrastructure players in Kaliakoir, Gazipur – a short distance away from Dhaka.[3]

1. Budget Speech by Finance Minister (2011) http://www.mof.gov.bd/en/budget/11_12/budget_speech/speech_en.pdf
2. Bangladesh Telecom Regulatory Authority (BTRC), http://www.btrc.gov.bd/licensing/operators/summary_of_licenses.pdf
3. Budget Speech by Finance Minister (2011) http://www.mof.gov.bd/en/budget/11_12/budget_speech/speech_en.pdf

Case Study - GraphicPeople

Bengali people lay a lot of emphasis on arts. Graphic people – a 160 people company – in Banani in Dhaka has combined this penchant for arts with IT skills to build one of the largest IT/ITeS outsourcer (by revenue) in Bangladesh. GraphicPeople is growing fast due to the outsourcing of graphical assignments. Offering services from Dhaka, Bangladesh for one-fifth of the European market price - Revenue, the client portfolio, and the number of employees have been rising steadily.

GraphicPeople was founded in collaboration with DANIDA in 2004, which has supported the project through the B2B program. The goals of the B2B program include ensuring that knowledge, know-how, and technology are transferred to the developing country's private companies through partnerships with Danish companies. With demonstrated success, it is now part of the world's largest agency network WPP.

GraphicPeople collaborates with large, international companies such as Dell, INTERSPORT and Flügger concerning desk top publishing and development of web/digital contents of commercials, product catalogues and packing-related materials. Graphic People receive the text, photos and instructions for the catalogues from its clients and then fit the text and photos into a template. The template has been developed to cope with the different European languages, so the fact that the DTP artist cannot understand the text is not important.

"The cost of bandwidth is high compared to other competing locations, especially considering the VSAT backup, but this would drastically reduce once the backup terrestrial and sub-sea lines are in place" says Imtiaz Ilahi, Managing Director of Graphicpeople. Imtiaz points to failures in infrastructure as a major hurdle, be it unreliable internet connections or power supplies. These mean his company has to pay heavily to provide backup solutions. "Our basic advantage is cost. Desktop publishing is very man hour intensive and it was becoming increasingly expensive to do in Europe. To do the work in Bangladesh costs less than 20 percent of the price in Europe, and we are around 30 percent cheaper than India," Imtiaz said "But it is not just price that keeps the clients happy, it's also about quality – and we have been able to demonstrate the results". A walk around the Graphic people office – and one sees the glimpses of a European corporate setup – complete with enthusiastic staff and cabin less office. The print and digital production company was also adjudged the best IT employer in Bangladesh in 2010.

The Government Support – Digital Bangladesh

As part of ICT development, the current government has taken an initiative to make 'Digital Bangladesh' by 2021 in which Bangladesh will reach a trajectory of high-performing growth supported by technology . In response to the initiative, Information technology usage for governmental reform and citizen centric service delivery in Bangladesh has been growing in recent years.

ICT Capacity Building

The government is promoting the use of ICT enabled education and has invested a lot in training over 50,000 school teachers, who then use ICT in their pedagogical methods. English resource centres have been set up with the support of the British Council to hone the language skills of the population. Over 100 of these centres are being set up in the first stage.

The government has established an ICT incubator in Dhaka to patronise activities of the software and ICT based industries. As many as 48 different organisations are presently developing and exporting software at this incubator where it has received about USD 5 million of investment and generated employment for 1700 IT professionals. The first software technology park at Karwan Bazar, Dhaka is already operational. In addition, the government has a plan to establish High-Tech Park at Kaliakoir, Gazipur – a short distance away from capital Dhaka - for establishing ICT, engineering, electronics, telecommunication, biotechnology and other related knowledge based industry.

As an initiative to develop human resource in ICT sector, the government was undertaken a programme name National ICT Internship which is still continuing. The goal of this programme is to develop professional capability of computer workers in ICT. This programme was undertaken, basically, to provide support

and employment to software and ITES industry. 60 percent of salary costs of the interns is paid by the Government. The rest 40 percent is borne by the respective agencies. Also steps have been taken to impart extensive training to government officials, teachers and others in 6 divisional regional training centres of Bangladesh Computer Council. One of the key initiatives run in the country is 'Own your Laptop' scheme – where university students are supported to undertake freelance projects to pay for the laptops loaned by the government.

Enhanced Connectivity

As connectivity is the single most important facility among all the infrastructures needed for ICT development, the government has taken a range of actions to achieve certain specific objectives. The internet has grown quickly in Bangladesh in the last few years. Broadband internet is in its infancy, but the country has started moving into WiMAX services in a significant fashion and all the upazillas are now under mobile internet coverage. To promote ICT usage in everyday service delivery - the government is looking at providing banking services and micro insurance solutions through mobile phones. Broadband internet costs have come down by over 70% in the past 3 years. Over 4000 km of OFC network has been laid to create the 'National Transmission Network' . At present, Bangladesh only has a single submarine cable. In view of the future bandwidth demand and uninterrupted international communication, steps have been taken to connect Bangladesh to the second submarine cable, and 3-6 terrestrial links through neighbouring countries, the first of which would be commercially available during first half of 2012.

Taxation Support

Bangladesh offers one of the most liberal tax policy regime for IT/ITeS exporters – currently, all income from IT/ITeS is tax exempted. For tax exemption purpose ITES means Digital Content Development & Management, GIS, IT Support & Software Maintenance Services, Web Site Services, BPO, Data Entry, Data Processing, Call Centre, Graphics Design, Search Engine Optimization, Web Listing, E-Commerce & Online Shopping and Document Conversion, Imaging & Archiving.

Legal Framework for ICT Development

The IT Act in Bangladesh was modified to accommodate more stringent recourse for IPR protection and curbing software piracy. The government has taken several initiatives on e-Commerce to create an environment for ICT based trade and commerce. Controller of Certifying Authority (CCA) has started functioning for the purpose of introducing digital signature with a view to introducing e-Transaction, e-Commerce and e-Procurement. So far six organisations have been authorised for this purpose. Automated Clearing House has been introduced in Bangladesh Bank- resulting in quick clearing of the checks. Bangladesh Bank has given permission for mobile banking and making credit card based online transactions.

ICT enabled Citizen service delivery

The government has also taken several initiatives on e-Citizen process so that majority of the people can obtain information and services related to their lives and livelihood by using technology. With a view to ensuring delivery of e-services at the Union level, as many as 4501 Union Information and Service Centres (UISC) have started functioning in coordination with Local Government Division. UISC is able to bring various types of information to the doorstep of citizens in rural areas. It helps service providers and users to save time, cost and has made operations hassle free. Recently, the government has also introduced District e-Service Centre (DESC) to improve the accessibility and transparency of public service delivery system at the district (administrative unit) level.

The government is attempting to provide the right institutional and development support to make the Bangladesh IT/ITeS industry more competitive, and the incumbent players in the IT industry in Bangladesh are poised to build upon this in the coming times.

Challenges to Tapping the Potential

As one of the most populous young nations, Bangladesh has made great strides in laying the groundwork for a successful outsourcing market. However, there is still a perception in many overseas markets that Bangladesh remains a risky place to do business and that Bangladeshi companies may struggle with sophisticated offshoring tasks.

It is important to recognize and understand the risks that accompany different outsourcing choices and put measures in place to mitigate the threats they pose. If Bangladesh has to leverage its strength to the fullest to become a larger player in the offshoring industry, there are a number of factors that need to be considered

Intellectual Property Rights

IPR protection is a particularly important issue in outsourcing where vendors have access to sensitive data. Vendors in Bangladesh have adopted strict security measures to prevent customers' intellectual property from falling into wrong hands.

Due to numerous incidences of software piracy in Bangladesh, there is still a negative image of the treatment of IPR. Government efforts to resolve the problem, such as the measures enacted in the new IT Act, would go a long way to reduce piracy. It is also worth noticing that there have been no untoward data or information breach incidents reported from Bangladeshi vendors in the last decade of working with global corporations.

Scale of Offerings

For a client planning to test Bangladesh's capabilities, the task of identifying the right vendors could be daunting. Currently, the market is highly fragmented with hundreds of small vendors vying for market. Opportunities exist for these players to consolidate and gain economies of scale and service expertise to compete for larger contracts. The current market is geared towards small projects with niche offerings, which may not be enough to fulfill the government's vision for a services economy. For commoditized services in BPO and IT outsourcing, the

goal of getting big is highly important, but it is less critical in niche areas like Graphic Design and DTP, where many small players vie for work in the global space.

There are multiple small to medium size companies offering services to global clients. These companies however need to scale up to compete for larger offshoring opportunities globally. The government of Bangladesh is proposing to invest a lot in scaling up the IT infrastructure by targeting a 'Digital Bangladesh', which would allow these incumbent players to gain expertise and scale – of operations and executing large projects . In recent times, GrameenPhone IT , Samsung R&D and SouthTech have grown larger in numbers and scale of operations, and there is a need for more companies to grow – organically or inorganically.

This scale, however, also makes the Bangladeshi companies more nimble and flexible to adapt to newer service delivery paradigms like Cloud Computing and VoIP based offerings – and also offer deep domain expertise unlike larger companies with generalist offerings. This scale also offers a more competitive service delivery capability for SME in the developed countries, both from pricing and access to top management perspective.

Infrastructure
Dhaka has the perception of being a city not meant for business – infrastructure is overburdened, and power and bandwidth outside of Dhaka is unreliable. Most of the existing companies have set up their own power backup units; this leaves a lot to be desired.

The government has taken up a slew of measures to decongest Dhaka city, including flyovers, Metro and Monorail projects. Additional power plants are also under construction. These steps would start to fructify in the coming years making Dhaka's infrastructure more IT savvy. In the meantime, the government's steps towards dedicated IT Parks in and around Dhaka would provide the necessary workspaces for the expanding IT/ITeS industry.

Lack of marketing prowess
One of the major reasons for the IT/ITeS vendors having limited growth is the lack of branding and marketing. Most vendors have grown in the existing client contracts, but have shown limited success in signing up new clients.
It is thus difficult for a multinational sourcing manager to find many Bangladeshi

vendors offering services readily. The marketing function of most Bangladeshi enterprises is handled by NRB(Nonresident Bangladeshis) or the parent company of the captive. Limited market presence has overshadowed the advantages that the Bangladeshi vendors have to offer in terms of skills and costs.

Bangladesh also has a gap in middle management knowledge which is perceived to be growing, and is also at the root of limited scale. Bangladesh would have to fill in this management skill gap by keeping management roles with European or North American partners or clients, or bringing in Specialist expertise from overseas – including among the Diaspora. This has implications for cost, however these skills are required to make Bangladesh outsourcing industry a success.

Negative Perception and the role of the government

Bangladesh suffers from a negative perception regarding poverty , corruption and being prone to natural disasters. While it is impossible to ignore the history of natural disasters, it may be noted that IT/ITeS industry in Bangladesh is clustered around the capital Dhaka, which is an inland city and where 'Business as usual' prevails. There are also doubts regarding the business climate and infrastructure in Bangladesh.

The IT/ITeS industry may work towards alleviating these perceptions, however the government needs to step in here. Brand Bangladesh needs to be promoted. There is a case for the government to take a holistic approach to developing the IT/ITeS industry. Some of the successful cases are India, where IT/ITeS services are offered market friendly labour laws, and single window clearances for investments; and Egypt – where the government promoted '1 vision, 1 Ministry, 1 Industry focal point'. China also worked on a centrally monitored '1000-100-10' plan to set up 10 cities with over 1000 companies for IT/ITeS by offering them incentives. Bangladesh too needs to look at simplifying the legal framework to complement an 'outsourced' industry – right from investment climate, taxations, investments, remittances and flexible working hours.

Conclusion

The enterprises evaluating outsourcing destinations base their decisions on a number of factors – specially across quality of services and cost of services. The emphasis on one of these factors, as also a subhead of these factors (availability of language skills being important for voice based process, while technical skills are important for software based tasks) allows a buyer to evaluate across destinations.

Bangladesh has abundant supply of qualified manpower at significantly low costs. The quality of physical infrastructure is poor compared to some other destinations but the significantly low cost of infrastructure makes it attractive for operations. Internet costs are higher compared to many countries, but the cost of internet and a backup through VSAT (the cost may reduce greatly after the alternate lines are in place, and competition is fostered) is far offsetted by the cost of resources. As the scale of operations increases, Bangladesh's competitive cost advantage gets further enhanced. The graphic below indicates the cost arbitrage Bangladesh offers for a small software development center with 25 people.
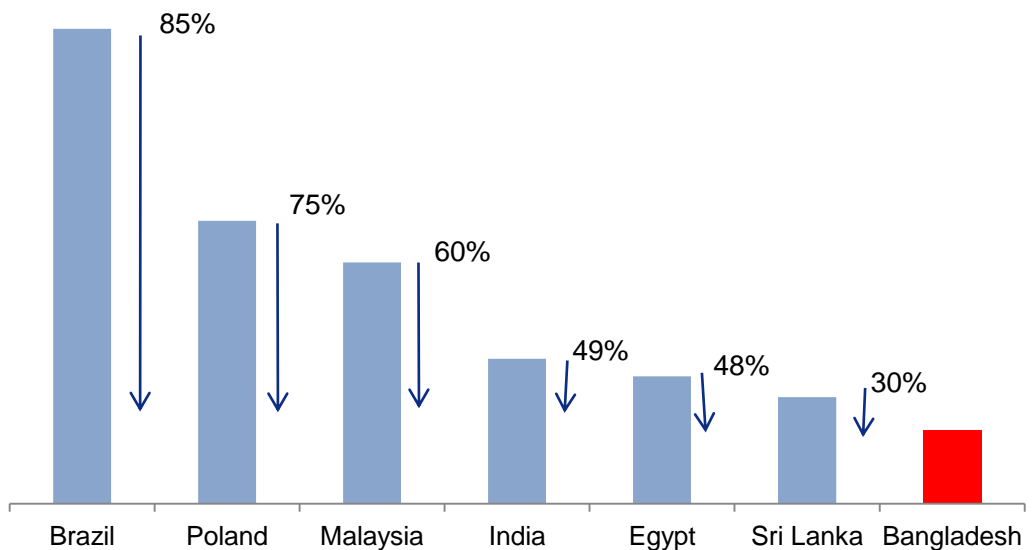
Figure 10
Savings on Illustrative cost of a 25 center development center
Source : Payscale Database, Sourcing line Database, ITU Database, Cushman & Wakefield Research, Office Space around the world 2011, KPMG Analysis Costs include salary cost, internet costs, office rentals and SGA costs

| Brazil | Poland | Malaysia | India | Egypt | Sri Lanka | Bangladesh |
| 85% | 75% | 60% | 49% | 48% | 30% | |

The lack of scale of operations significantly reduces the ability of Bangladesh IT/ITeS sector to target large deals. Also, with the more mature outsourcing destinations offering more than just BPO operations –providing transformation and optimization of operations in long duration deals, the current industry in Bangladesh could be evaluated for outsourcing of jobs with low value add in the near future, till the industry and its players mature. Graphic design, Desktop publishing and mobile/web development tasks have a relatively mature market in Bangladesh, and given the high cost arbitrage – could be outsourced with relative ease. Bangladesh may also be a strong competitor in the voice based processes – subject to the redundant bandwidth becoming a reality in near future.
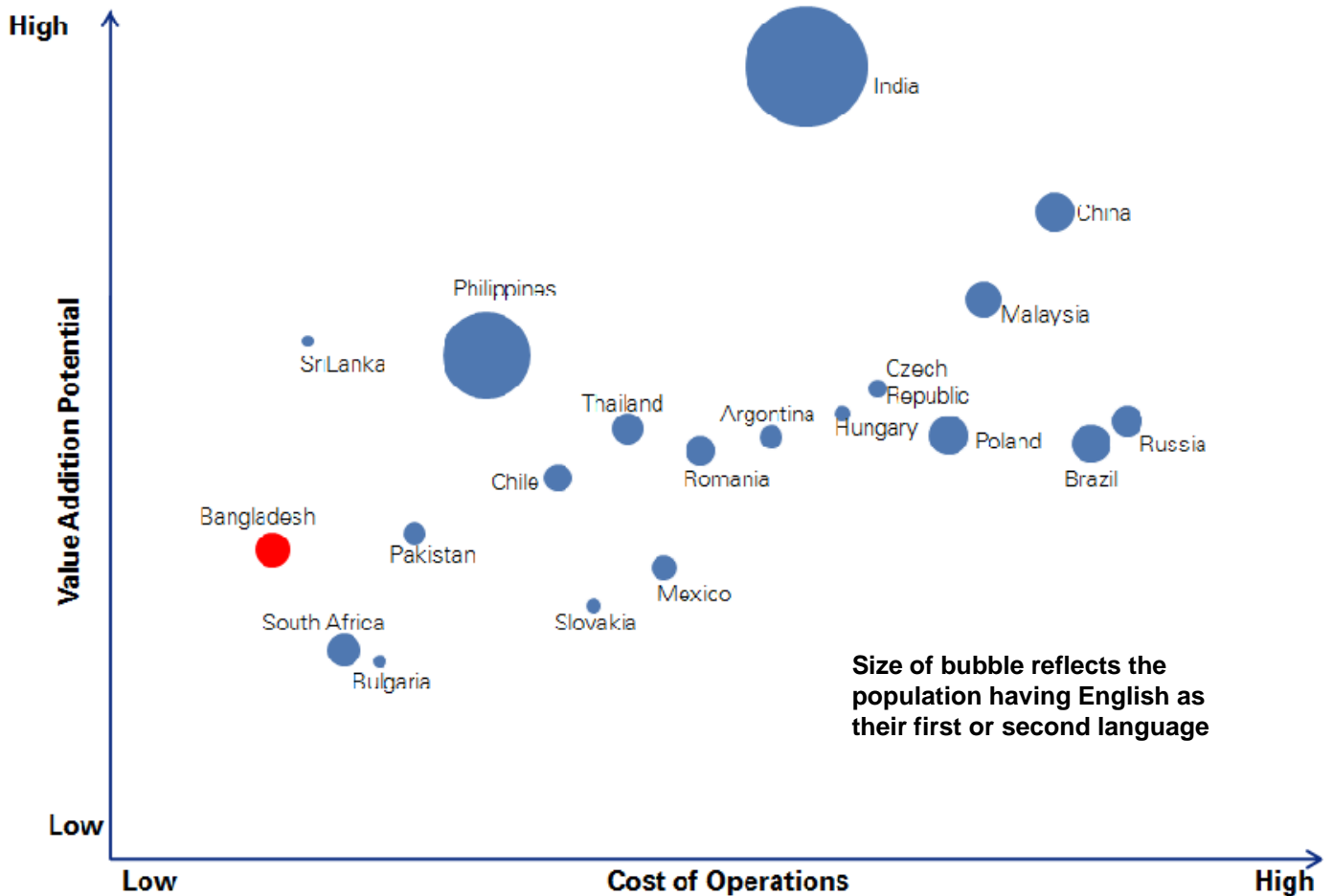

Figure 11
Comparing Global outsourcing destinations
Source : Payscale Database, Sourcing line Database, ITU Database, WEF Global Competitiveness Report, 2011-12 Cushman & Wakefield Research, Office Space around the world 2011, KPMG Analysis

A 'Cloud Computing' paradigm is emerging - with applications being developed and distributed over a cloud for Smartphone and tablets. The low unit cost of such products is leading to development of low cost service factories, and is also reshaping the way trade in IT services is being happening globally. As a result, the global outsourcing marketplace is suddenly more accessible to smaller enterprise and the freelancer. Dhaka's freelancers and SME players have been creating applications and providing support and modifications for vendors listed on Apple iApps and Android Marketplace. This is set to grow further as SME in Bangladesh venture globally to serve global clients using the cloud environment over data networks with lower infrastructure requirements.

Bangladesh has been slowly marking its presence in global outsourcing marketplace. With focused investments from government in enabling business environment and developing an IT economy, Bangladesh would continue to emerge as a favorable destination for information technology and business process outsourcing.

A nascent industry driven by entrepreneurial youth make the most of government initiatives aimed at promoting a 'Digital Bangladesh'. As its vision for Digital Bangladesh, the government plans to develop a robust IT enabled economy with technology enabled service delivery systems and a population which is technology savvy.

Bangladesh currently is digging its heels in the low value addition IT outsourcing space by serving companies in Europe, US and South East Asia. The domestic market is poised for growth to support the government initiative of a digital economy, allowing the existing companies to gain scale and expertise in large project execution and services delivery. This would allow Bangladeshi companies to move up the value chain, offering the benefit of operating cost arbitrage to a broader set of services and clients. In the global marketplace for outsourcing destinations, Bangladesh has positioned itself as a key location for consideration, by enhancing skill availability, investments in infrastructure development , making focused investments, attempting to address IPR concerns and creating success stories.

Future success comes with its own challenges and risks. This paper outlines many of these risks, and also makes clear that a sustainable competitive advantage could be achieved by those who understand and manage those risks effectively.

All of these factors combine to make Bangladesh an interesting place to watch in the global outsourcing market.

A. Glossary

Definitions

Captive units	Captive units include both MNC-owned units that undertake work for parents' global operations and the company owned units of domestic companies
Cloud computing	The delivery of computing as a service, whereby shared resources, software, and information are provided to computers as a utility (like the electricity grid) over a network (typically the Internet)
Digital signature	Electronic signature - An electronic signature is any electronic means that indicates that a person adopts the contents of an electronic message. The US Code defines an electronic signature for the purpose of US law as 'an electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record'
e-Commerce	Buying and selling of products or services over electronic systems
e-Governance	Technology driven governance
Freelance	Self-employed with no long term commitment to an employer
Hub and spoke model	Used in the context of multi-sourcing wherein some part of work is completed at main centers called 'hub' while the remaining part is sent to the other locations called 'spokes' for cost and operational efficiency
Information Communication Technology	Information Communication Technology (ICT) is often used as a synonym for information technology (IT) but is usually a more general term that stresses the role of telecommunications (telephone lines and wireless signals) in modern information technology
Incubator	Programs designed to support entrepreneurial companies
IT Consulting	IT consulting includes IS strategy, IT and network planning, architectural assessments, IS operational analysis, technical system and network designs, product specific consulting, supplier assessment and maintenance planning
Multimedia	Combined use of several media i.e. audio, video, and animation
Pedagogy	Study of being a teacher or the process of teaching
Phonetics	The study of the sounds of language
Piracy	Unauthorized duplication of an original software for commercial gain
Redundancy	Duplication of critical components or functions of a system
Tele-density	Number of telephones in use for every 100 individuals living within an area
Telemedicine	Use of telecommunication and information technologies in order to provide clinical health care at a distance
Upazillas	Sub-districts of Bangladesh, also called Thana

Abbreviations

APAC	Asia-Pacific
BASIS	Bangladesh Association of Software & Information Services
BDT	Bangladeshi Taka
BFSI	Banking, Financial Services and Insurance
BPO	Business Process Outsourcing
CAGR	Compounded Annual Growth Rate
Captive	Wholly owned subsidiary
CBD	Central Business District
CMM	Capability Maturity Model
CRM	Customer Relationship Management
DANIDA	Danish International Development Agency
DTP	Desktop Publishing
ERP	Enterprise Resource Planning
FDI	Foreign Direct Investment
FMCG	Fast Moving Consumer Goods
GBPS	Rate of data transfer expressed as gigabit per second
GDP	Gross Domestic Product
HSC	Higher School Certificate
ICT	Information and Communications Technology
IPR	Intellectual Property Rights
IP Telephony	Internet Protocol Telephony
IT	Information Technology
ITeS	Information Technology Enabled Services
JV	Joint Venture
MBPS	Rate of data transfer expressed as megabit per second
NIIT	National institute of information technology, India based IT training institute
NRB	Non Resident Bangladeshis
R&D	Research and Development

Abbreviations

SEA-ME-WE 4	South East Asia Middle West Europe 4
SMS	Short Messaging Service
SSC	Secondary School Certificate
US	United States
VAS	Value Added Services
VSAT	Very Small Aperture Terminal
WiMAx	Worldwide Interoperability for Microwave Access

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