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Mapping the Philippines in the Offshoring Services Global Value Chain

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This paper aims to analyse the current position and potential for upgrading of the Philippines in the global value chain of information technology offshoring services. With its rapid growth in the last decade, the Philippines is characterized as strong in voice and is expanding in the non-voice and more complex services sectors. Applying the IT offshoring services framework introduced by the Duke Center on Globalization, Governance and Competitiveness (CGGC) GVC, the analysis shows that the industry's upgrading strategy could pursue the following trajectories: first, upgrading from business process outsourcing (BPO) to knowledge process outsourcing (KPO) especially in medical, financial and legal services; second, expansion and upgrading within information technology outsourcing (ITO); and third, inter-sectoral upgrading to verticals or industry-specific activities, particularly shared services companies, game development, and engineering design in manufacturing. The results of the study indicate that human capital development will be critical in upgrading the Philippines in the information technology and business process management (IT-BPM) global value chain (GVC).

Keywords: Global Value Chains (GVCs), economic upgrading, information technology offshoring services, the Philippines.

1. Introduction

The global offshoring industry in the Philippines is one of those industries that have thrived despite the uncertain economic environment in the more recent years. The Philippines has become one of the top offshoring destinations in the world, primarily due to its large pool of college-educated and English-speaking talent. A decade ago, the industry comprised of a few sectors dominated by call centres. Today, the Philippines is the largest global provider of voice-based business process outsourcing (BPO) services. To maintain competitiveness, it is important to understand how the country can move from low-end to high-end and shift to value-driven and complex services, given the new age of global offshoring services, emerging technology, new media and vertical expansion and development.

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This paper aims to analyse the current position and potential for upgrading of the Philippines in the global value chain of information technology offshoring services. It adopts the IT offshoring services framework introduced by Gereffi, Fernandez-Stark, and Psilos (2011) (Duke CGGC GVC framework) to map the IT offshoring services for the Philippine economy. The analysis shows that the industry's upgrading strategy could pursue the following trajectories: first, upgrading from BPO to knowledge process outsourcing (KPO), especially in medical, financial and legal services; second, expansion and upgrading within information technology outsourcing (ITO); and third, inter-sectoral upgrading to verticals or industry specific activities, particularly shared services companies, game development, and engineering design in manufacturing. The results of the paper indicate that human capital development and improvement of soft and hard infrastructure will be critical factors in upgrading in the information technology and business process management (IT-BPM) global value chain (GVC) for the Philippines.

The study is organized as follows. The next section provides an overview of the Philippine services sector, including policy reforms, performance and contribution to the economy. The third section discusses the GVC framework and economic upgrading approaches for the IT offshoring services developed by the Duke Center on Globalization, Governance and Competitiveness (CGGC). The current state and performance of the Philippine IT-BPM industry is discussed in the fourth section. The subsequent section maps out the position of the industry in the offshoring services GVC, formulates potential upgrading trajectories, and presents a case study of engineering services outsourcing. The final section presents some policy implications and recommendations on how to build on and strengthen existing assets towards upgrading the industry and moving up the value chain.

2. An Overview of the Philippine Services Sector: Performance and Policy Reforms

The services sector consists of a wide diversity of industries ranging from traditional personal services like wholesale and retail trade, hotels and restaurants, education and health, transport, and government and public administration service to modern impersonal services that make intensive use of information and communications technology (ICT) like banking, insurance, communication and business-related services. Since the 1980s, the services sector has been a major source of economic growth for the Philippines, with the average share of the sector increasing from 49 per cent in the 1980s to 52 per cent in the 1990s. Its share continued to rise from an average of 53 per cent during the period from 2000 to 2005 to 57 per cent in the most recent period from 2011 to 2015 (Table 1). Trade and repair of motor vehicles, personal and household goods, with an average share of 17 per cent, constituted the bulk of the services sector, followed by real estate, renting, and business activity which accounted for an average share of 11 per cent. Transportation, communication, and storage and private services subsectors registered an average share of around 8 per cent. All services subsectors except for public administration and defence services experienced rising shares between 2000–5 and 2011–15. Meanwhile, both agriculture and manufacturing saw declining trends in their value-added shares.

In terms of average growth, services registered an increase from 5.6 per cent for the period 2001–5 to 6.4 per cent from 2011 to 2015 (Table 1). The sector has also grown much faster than the average GDP for all periods under study. Services subsectors such as trade and repair of motor vehicles, personal and household goods, final intermediation, real estate, renting and business activity, and other services witnessed noticeable increase in their average growth rates during the same periods. Meanwhile, the growth of transportation, communication and storage slowed down.

Table 2 shows that services has been the largest source of employment as its contribution continued to increase from 53 per cent in 2012 to 55 per cent in 2015, while the share of agriculture has been declining. Moreover, manufacturing has not been able to generate enough employment to absorb new entrants to the

TABLE 1
Value-Added Structure and Growth, 2000–15

	Value Added Share (in %)			*Value-Added Growth (in %)*		
Major Sector	*2000–5*	*2006–10*	*2011–15*	*2001–5*	*2006–10*	*2011–15*
Agriculture, Hunting, Fishery & Forestry Sector	13.8	12.6	10.5	3.6	2.1	1.7
Agriculture and Fishing	13.7	12.5	10.4	3.7	2.2	1.6
Forestry	0.1	0.1	0.1	3.1	–7.7	11.7
Industry Sector	33.5	32.3	32.8	3.5	5.0	6.4
Mining and Quarrying	0.8	1.0	1.1	16.6	8.9	4.2
Manufacturing	24.1	22.5	22.8	3.9	3.7	6.9
Construction	4.9	5.2	5.5	–0.5	10.5	7.0
Electricity, Gas and Water	3.7	3.5	3.3	4.2	4.9	4.0
Services Sector	52.7	55.2	56.7	5.6	5.6	6.4
Transportation, Communication and Storage	7.2	7.9	7.6	10.5	3.5	6.3
Trade & Repair of Motor Vehicles, Personal & Household Goods	16.2	16.6	16.6	5.5	5.1	6.0
Finance Intermediation	5.4	6.3	7.0	6.6	7.9	7.9
Real Estate, Renting & Business Activity	9.1	10.0	11.0	4.7	7.0	7.9
Public Admin & Defence, Compulsory Social Security	5.0	4.5	4.2	2.8	3.8	3.1
Other Services	9.8	9.8	10.3	3.8	6.4	6.0
Gross Domestic Product	100.0	100.0	100.0	4.6	5.0	5.9

SOURCE: National Income Accounts, Philippine Statistics Authority, various years.

TABLE 2
Employment Structure, 2012–15 (in %)

Major Sector	*2012*	*2013*	*2014*	*2015*
Agriculture, Hunting, Forestry, and Fishing	32.2	31.0	30.5	29.2
Industry	15.3	15.6	16.0	16.2
Services	52.6	53.4	53.5	54.7
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	18.3	18.6	18.8	18.9
Transportation and Storage	7.0	7.2	6.9	7.2
Accommodation and Food Service Activities	4.2	4.2	4.4	4.4
Information and Communication	0.9	0.9	0.9	1.0
Financial and Insurance Activities	1.2	1.2	1.3	1.3
Real Estate Activities	0.5	0.5	0.4	0.5
Professional, Scientific and Technical Activities	0.5	0.5	0.5	0.5
Administrative and Support Service Activities	2.5	2.7	2.8	2.9
Public Administration and Defence; Compulsory Social Security	5.2	5.2	5.1	5.4
Education	3.2	3.2	3.2	3.3
Human Health and Social Work Activities	1.2	1.2	1.2	1.3
Arts, Entertainment and Recreation	0.9	0.9	0.9	0.9
Other Service Activities	5.7	5.7	5.7	7.1
Activities of Households as Employers; Undifferentiated Goods and Service-producing Activities of Households for Own Use	1.5	1.4	1.3	*
Activities of Extraterritorial Organizations and Bodies	0.0	0.0	0.0	0.0
All Industries (in thousands)	37,600	38,118	38,651	38,742

NOTE: *included under Other Service Activities, various years.
SOURCE: Philippine Statistics Authority.

labour force as well as those moving out of the agricultural sector. Within the services sector, wholesale and retail trade and repair of motor vehicles and motorcycles registered the highest share of about 19 per cent in 2015 followed by transportation and storage with a share of 7 per cent, public administration and defence with a 5.4 per cent share, accommodation and food services accounted for a share of 4 per cent, while information and communication contributed a share of 1 per cent.

Based on the national balance of payments accounts, average net services trade balance increased from US$4.2 billion in 2005–10 to US$5.7 billion in 2011–15 (Table 3A). However, while trade in services surplus grew by an average of 48 per cent during the 2005–10 period, it contracted by 4 per cent in the more recent 2011–15 period. Telecommunications, computer and information services, other business services, and construction continued to register surpluses during the periods under review. Average surplus in other business services rose from US$6.1 billion to US$10.6 billion during the same time while telecommunications, computer and information services surplus went up from US$1.3 billion to US$2.7 billion.

Average services exports grew by 16 per cent during the 2005–10 period, although this slowed down to 10 per cent in 2011–2015 (Table 3B). Top exports include other business services, travel, and telecommunications, computer and information services. Note that BPO falls under other business

TABLE 3A
Trade in Services: Balance of Trade (in US$ million)

Major Sector	*Average*		*Growth rate (%)*	
	2005–10	*2011–15*	*2005–10*	*2011–15*
Services	4,203	5,715	48.2	(4.1)
Maintenance and Repair Services, n.i.e.	72	–41	34.1	175.4
Transportation	–1,595	–1,895	(10.5)	0.2
Travel	–563	–4,000	13.0	(21.2)
Construction	71	15	19.5	294.4
Insurance and Pension Services	–487	–760	(86.3)	1.6
Financial Services	–94	–147	(166.9)	4.8
Charges for the Use of Intellectual Property n.i.e.	–370	–513	(11.7)	(6.5)
Telecommunications, Computer and Information Services	1,258	2,683	34.8	6.5
Other Business Services	6,080	10,623	21.0	2.9
Personal, Cultural, and Recreational Services	0	37	(207.2)	74.7
Government Services	–169	–287	(35.1)	(1.9)

SOURCE: Bangko Sentral ng Pilipinas.

TABLE 3B
Trade in Services: Exports (in US$ million)

Major Sector	*Average*		*Growth rate (%)*	
	2005–10	*2011–15*	*2005–10*	*2011–15*
Services	13,016	23,264	16.3	9.7
Maintenance & Repair Services	79	85	36.4	1.5
Transportation	1097	1691	9.0	7.5
Travel	3061	4451	10.1	15.1
Construction	92	71	16.5	2.3
Insurance and Pension Services	50	99	26.1	13.2
Financial Services	116	178	16.0	42.3
Charges for the Use of Intellectual Property n.i.e.	4	7	2.0	53.2
Telecommunications, Computer & Information	1,461	3,208	28.7	9.4
Other Business Services	7,024	13,349	20.1	8.7
Personal, Cultural, and Recreational	28	110	17.3	30.8
Government Services	2	14	—	4.8

SOURCE: Bangko Sentral ng Pilipinas.

services. On the average, services imports increased from US$8.8 billion to US$17.5 billion during the same periods. Average growth was maintained at 15 per cent.

The first wave of services liberalization took place in 1987 with the opening up of generation under the power sector. This abolished the monopoly of the government-owned National Power Corporation by allowing private sector to invest and participate in augmenting generation capacity. In 1990, the first build-

operate-transfer (BOT) in Asia was passed. In 2001, the Electric Power Industry Reform Act (EPIRA) was legislated, which restructured the industry by permitting competition in generation and supply and regulating transmission and distribution.

Another wave of reforms occurred in the early 1990s with the liberalization of the telecommunications industry that was dominated by a private monopoly for more than half a century. Likewise, the shipping industry was also opened up with the deregulation of first- and second-class passage rates. Subsequently, surcharges for insurance premiums were abolished while freight rates for cargoes were deregulated.

In the mid-1990s, the air transport industry was also deregulated, thus challenging the supremacy of the country's only designated flag carrier, Philippine Airlines. Restrictions on domestic routes and frequencies and government control on rates and charges were eliminated. In the late 1990s, the water sector, too, was privatized through competitive bidding won by two firms that were granted concessions to bill and collect water and sewerage services in two separate areas for twenty-five years. As early as the 1980s, the financial sector was undergoing reforms through the liberalization of interest rates and easing of restrictions on the operations of financial institutions. In 2000, the General Banking Law was enacted to allow a seven-year window for foreign banks to own up to 100 per cent of one locally incorporated commercial or thrift bank.

To reduce shipping costs in the country, the cabotage law was amended in July 2015, allowing foreign vessels to transport and co-load foreign cargoes for domestic transshipment. This liberalized the operations of foreign shipping companies in the domestic market. Foreign shipping lines can now dock at multiple Philippine ports and co-load import and export cargoes. The Philippine Competition Act was also legislated in 2015 creating the Philippine Competition Commission tasked to promote competition policy and prohibiting anti-competitive agreements, abuse of dominant position and anti-competitive mergers and acquisitions. Also, since 2014, foreigners have been allowed to own 100 per cent of Philippine domestic banks.

In general, the reforms were crucial in introducing competition in the above-mentioned sectors as well as in disciplining incumbent monopolies. Note that the liberalization of the telecommunications sector was crucial to the growth and development of the IT-BPO sector. However, there are still remaining entry barriers in the services industry due to constitutional restrictions limiting foreign equity participation to 40 per cent in certain sectors like telecommunications, maritime, air transport, road, electricity, water, and health services. For instance, foreigners are not allowed to own land but can lease for a maximum of seventy-five years. In wholesale and retail trade, foreign investment is not allowed in particular categories such as retail enterprises with paid-up capital of less than US$2.5 million or less than US$250,000 for retailers of luxury goods. Full foreign participation is allowed only for retail trade enterprises with paid-up capital above these levels.

3. Information Technology Offshoring Services GVC: Analytical Framework

In assessing the position of the IT-BPM industry in the global value chain, the IT offshoring services framework introduced by the Duke CGGC GVC is applied. The Duke CGGC framework presents various upgrading trajectories that can be used as guides to analyse the current position of the industry and how it can upgrade and move up along the global value chain. The offshore services industry refers to trade of services conducted in one country and consumed in another and encompasses firms' decisions to perform functions or activities anywhere in the world (McKinsey Global Institute 2005). The major industry players consist of the industry's lead firms—multinational companies (MNCs like General Electric, one of the first MNCs to provide offshore services), third-party service firms from developed countries (IBM and HP), and third-party service firms from India (Infosys and Wipro). There are also a number of third-party providers from other developing countries, but they still do not

have sufficient competency, scale, or global market presence to compete with established Indian and developed-market providers.

In general, business services consist of three segments:

- *Information Technology Outsourcing (ITO):* The basic building block for the offshore services value chain that is centred on the production and use of software and encompasses services such as network management, applications development, IT consulting and software research and development (R&D). ITO services span the low-mid- and high-value segments of the chain.
- *Business Process Outsourcing (BPO):* A highly diverse category that contains activities related to the management of enterprise resources (ERM), human resources (HRM), and customer relationships (CRM). Specific BPO services include call centres, payroll, finance and accounting. Human resources (HR) activities are present in the low and mid segments.
- *Knowledge Process Outsourcing (KPO):* Specialized activities that often require professional licensing (such as in medical, legal and accounting fields) and include market intelligence, business analytics and legal services, which are the high value-added general segment of the chain.

There are industry-specific services that include offshoring of activities that are not related to general business functions and require specific industry knowledge. These might include other advanced activities like R&D for pharmaceutical, industrial engineering and medical transcription.

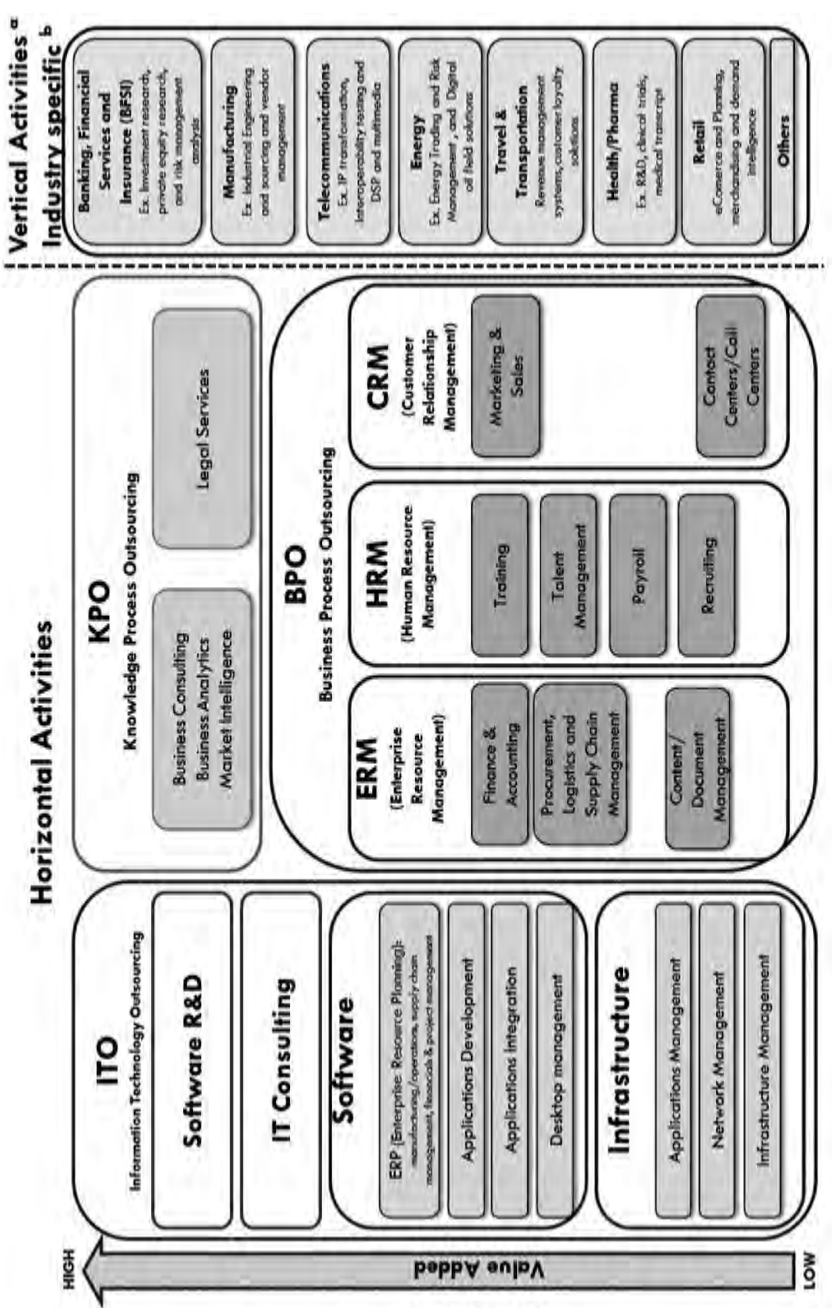
Figure 1 presents the offshore services industry value chain that divides the industry into two main parts: horizontal services and vertical services. Horizontal services are provided across all industries and are needed by any type of company such as IT services (software R&D, IT consulting), knowledge process outsourcing (market intelligence, legal services), and BPO services (accounting services, human resource management, supply chain management). Vertical activities correspond to services that are part of a specific value chain in the manufacturing sector (clinical trials in the pharmaceuticals value chain) or in another services industry (private equity research, risk management analysis or cheques processing in the banking and insurance industries, and transcription services in the medical sector).

Human capital explains much of the difference in the value of business services. Horizontal services support generic business functions and rely on process expertise. Vertical services, meanwhile, require specific industry knowledge. High value-added activities like KPO services are provided by highly educated individuals while routine BPO activities such as recruitment or data management are carried out by employees with lower degrees of education (De Backer and Miroudot 2013).

Economic upgrading is defined as economic players moving to higher value activities in GVCs in order to increase benefits from GVC participation. Some possible upgrading trajectories are described below (Figure 2); these are not mutually exclusive and some of them can be carried out simultaneously:

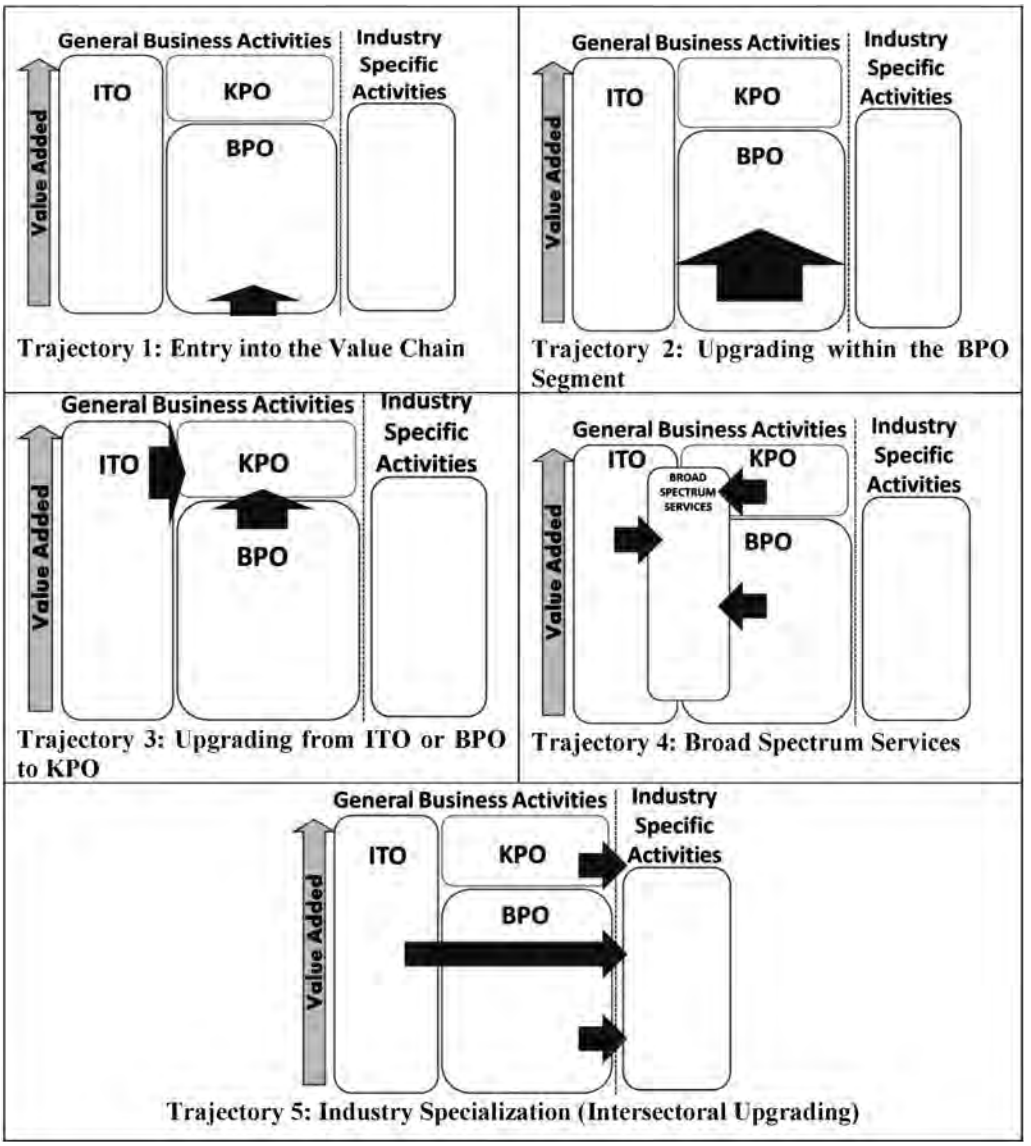
- *Trajectory 1:* Entry into the Value Chain: Provision of call centre services.
  This is best suited for developing countries with large populations. The provision of call centre services draws on previously marginalized labour markets particularly youth and female labour pools, hiring a large number of young workers with high school diplomas and in some cases basic tertiary education. Hiring practices in the segment do not discriminate between educational or technical disciplines, facilitating access to a deeper labour pool in smaller labour markets. However, these operations rely on scale to drive profitability.
- *Trajectory 2:* Upgrading within the BPO Segment: Provision of higher value-added services within BPO beyond call and contact centres.
  Higher value BPO activities rely on similar repetitive functions as with call centres, although they draw on a slightly more educated labour force. Limited direct interaction between clients and agents

FIGURE 1
Offshore Services Global Value Chain



NOTE: Vertical Activities, Industry Specific: a. Each industry has its own value chain. Within each of these chains, there are associated services that can be offshored. This diagram captures the industries with the highest demand for offshore services. b. The graphical representation of vertical activities does not imply value levels. Each industry may include ITO, BPO, and advanced activities.
SOURCE: Duke CGGC as cited in Fernandez-Stark, Bamber, and Gereffi (2013).

FIGURE 2
Upgrading Approaches



SOURCE: Fernandez-Stark, Bamber, and Gereffi (2013).

facilitates growth of these functions as they do not depend on language fluency, in turn allowing access to a broad base of potential employees.

- *Trajectory 3:* Upgrading from ITO or BPO to KPO: Provision of knowledge activities that require a considerable degree of analysis, adding data and market analysis to ITO or BPO activities.
  BPO and ITO firms seeking to offer more sophisticated solutions to their clients start adding data and market analysis in addition to other transactional activities.

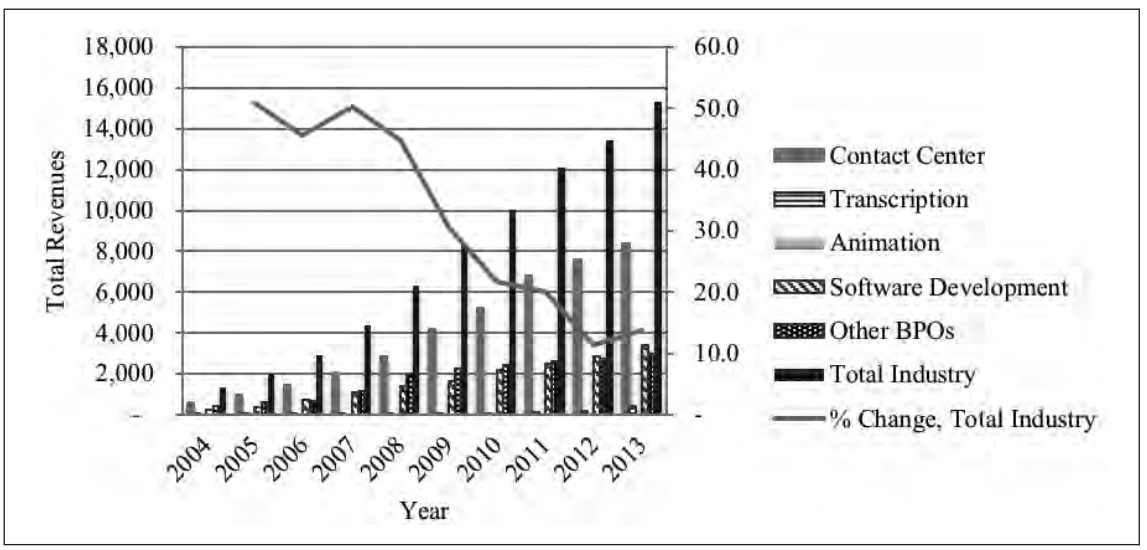
- *Trajectory 4:* Broad Spectrum Services: Functional upgrading, a one-stop shop offering a large spectrum of services from low value-added to high-value services.
  This trajectory offers all services in the ITO, BPO and KPO segments. Maintaining the provision of low and high valued services simultaneously would require a large but versatile low-cost labour supply. A large country with a significant proportion of the population earning low salaries can successfully upgrade into higher value services and at the same time remain competitive in basic services.
- *Trajectory 5:* Industry Specialization: Intersectoral upgrading, movement to niche activities for specific industries.
  Companies offering some ITO, BPO and KPO services for a wide range of industries often specialize and focus on key industries in which to develop expertise. This trajectory is closely correlated with leading productive industries in the host country.

4. Philippine IT-BPM: Current State and Performance

The business process outsourcing industry in the Philippines started as early as the 1980s through SPi Global, which provided data entry services to Fortune 500 companies like Boeing and Sony.[1] This was followed by the establishment of animation companies like Burbank Animation Inc., Optiflex Animation and Fil-Cartoons (a fully owned subsidiary of Hanna Barbera). In 1985, Andersen Consulting (now Accenture) created the first systems and application software development centre in the country that catered to internal business requirements. After the liberalization of the telecommunications industry in 1995 along with the granting of fiscal incentives by the government in 1994, call centre services started to grow with the entry of Sykes Enterprises and America Online (AOL) in 1997 and 1998, respectively. E-Telecare Global Solutions and PeopleSupport were the other pioneers that were set up in 2000.

After 2000, the number of business process outsourcers, call centres in particular, increased rapidly. By 2004, total revenues reached US$1.324 billion (Figure 3), the bulk of which was accounted for by

FIGURE 3
Total Revenues, 2004–13 (in US$ million)



SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

contact centres. Employment was 94,488 workers during the same year (Figure 4) while foreign direct investments (Figure 5) totalled US$329 million in 2005, of which about 65 per cent went to contact centres.

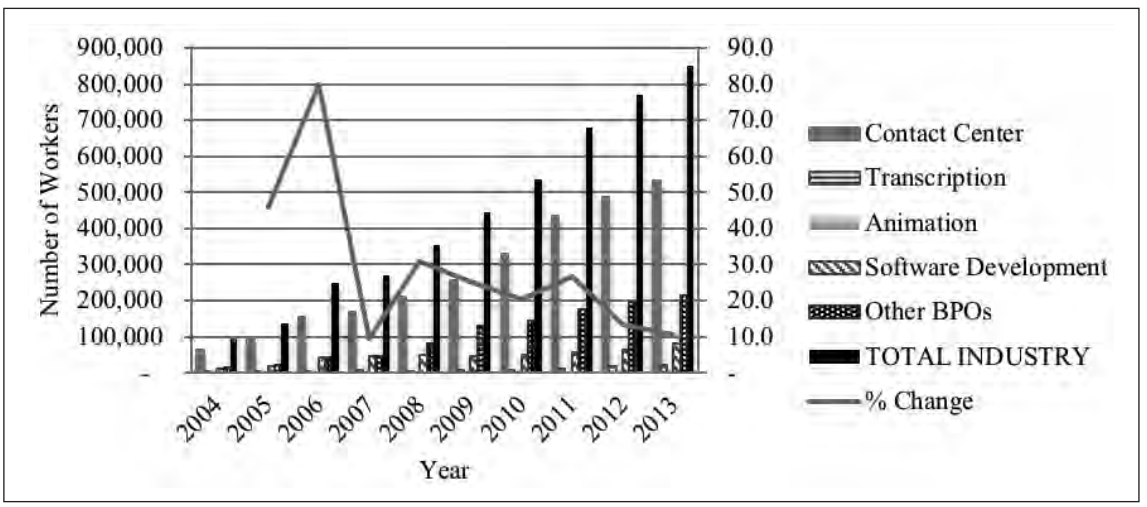
The expansion of the industry continued and, on average, percentage change in total revenues was about 44 per cent for the years 2005–9. This slowed down in the succeeding years from 2010 to 2013, registering an average percentage change of around 17 per cent. For 2013, total revenues amounted to US$15.31 billion, with contact centres representing 55 per cent valued at US$8.4 billion (Figure 6). In 2010, the Philippines emerged as the number one provider of voice business process management services in the world.[2]

Figure 7 shows that, in terms of percentage change in revenues for the more recent years 2009–13, transcription, software development and contact centres posted higher average change than the average for the whole industry. In 2013, contact centres' total revenue reached US$8.4 billion, software development totalled US$3.43 billion and US$423 million for transcription (Figure 3), indicating that although the Philippines continues to take the lead in voice-based process services, industry players are shifting to more high-value business process operations.

In the healthcare information management industry, the Philippines' initial operations were focused on medical transcription services. Currently, as reported by the industry, these are now expanding on wider range of services such as clinical data management, telemedicine, revenue cycle management, pharmacy benefits management, electronic medical records, medical claims recovery, utilization review, patient education, insurance processing, and quality assurance.

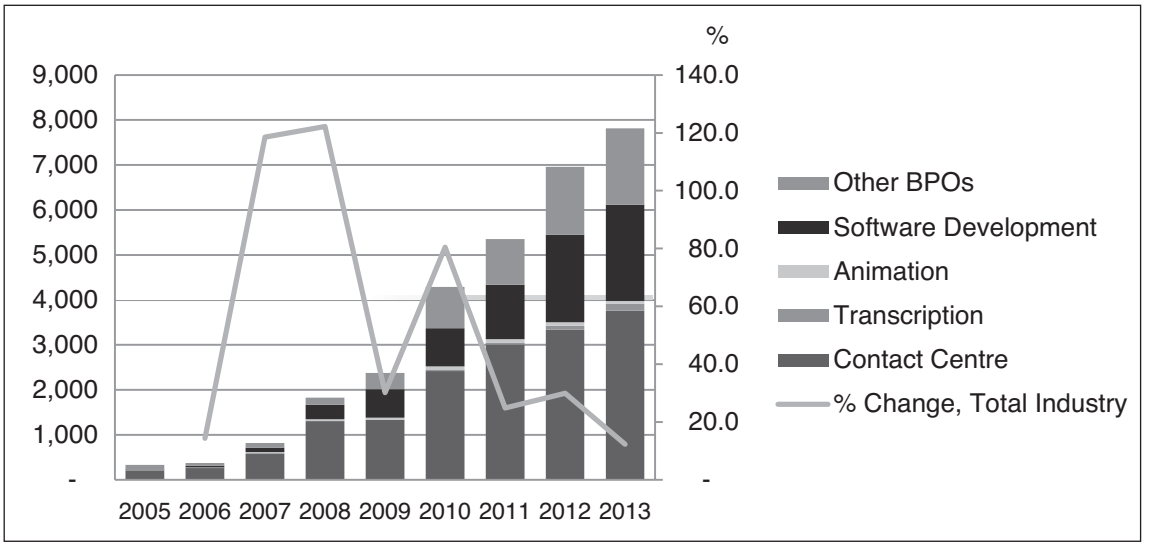
In animation, revenues amounted to US$88 million in 2013 (Figure 3). Key clients include Disney, Toei and Marvel, among others. Philippine animators contributed to popular cartoons and animated films like *Scooby Doo, Tom & Jerry, Addams Family, The Mask, The Jetsons, Dragon Ball Z, Captain Planet, Finding Nemo* and *The Incredibles*. Filipino animators also render graphics in different platforms for the gaming industry (Nintendo, Sega, Game Boy and PlayStation). Currently, however, the animation industry is experiencing talent shortage as many Filipino artists have been going abroad to work.

FIGURE 4
Total Employment, 2004–13



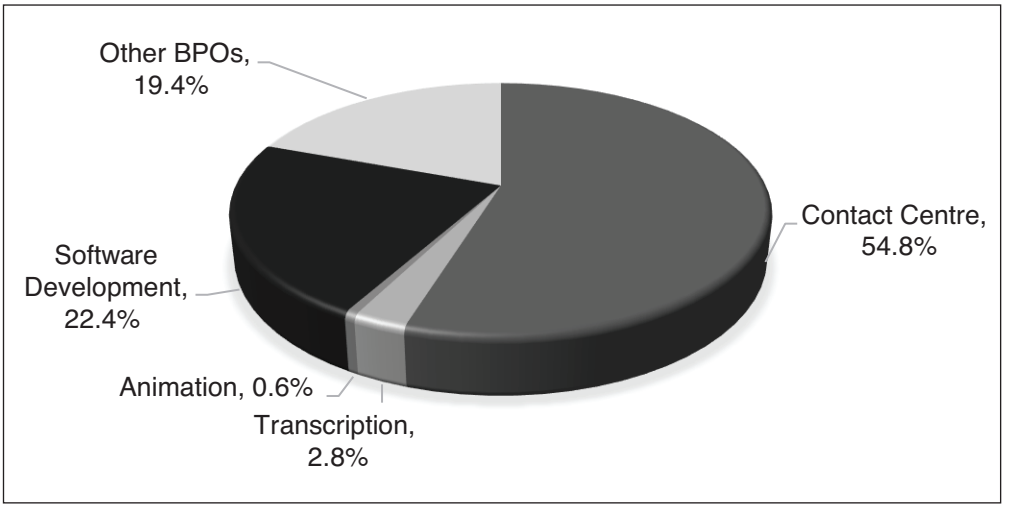
SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 5
Foreign Direct Investment (in US$ million)



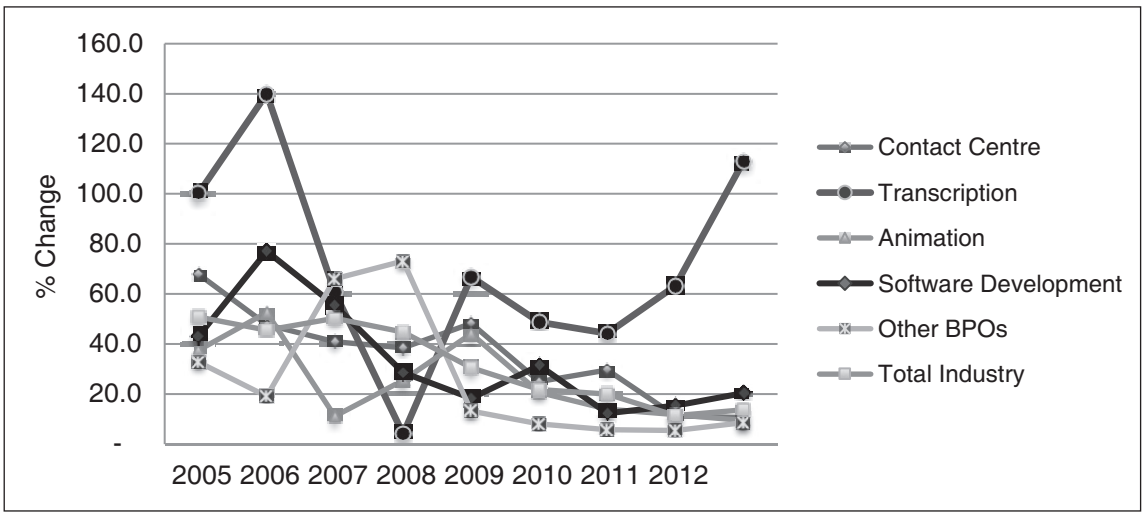
SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 6
Revenue Structure, 2013



SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 7
Annual Percentage Change in Total Revenue, 2005–13



SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

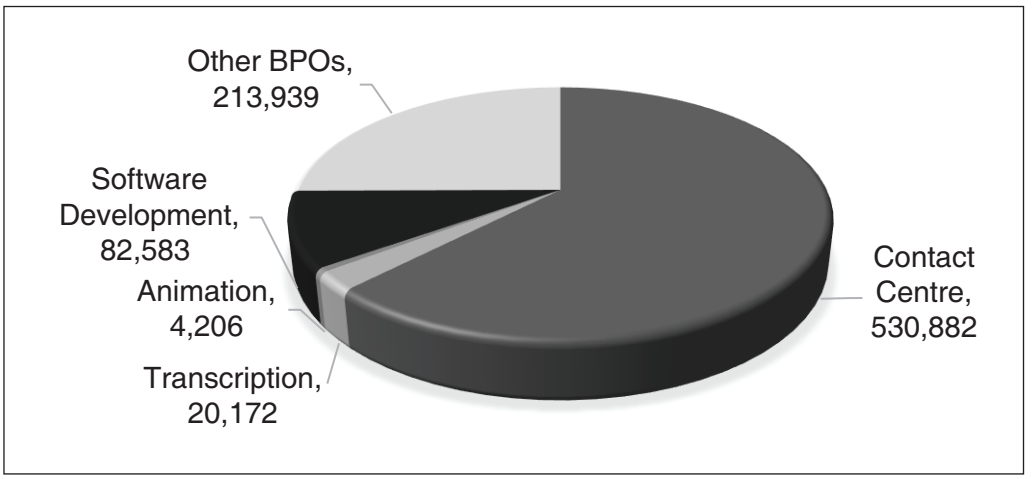
In terms of the distribution of workers, Figure 8 shows that contact centres represented the largest share (62.3 per cent) followed by other BPOs (25 per cent). Software development comprised around 10 per cent, while transcription and animation accounted for 2.4 per cent and 0.4 per cent of the total, respectively.

Figure 9 shows that, as of 2013, Europe (the United Kingdom, Netherlands, Germany, Austria and France) was the country's largest source of foreign direct investment with a share of 49 per cent, followed by the United States with a share of 31 per cent. Japan was next with a share of 10 per cent, while Asia (Singapore, Hong Kong and Korea) registered a share of 4.2 per cent. Though historically the United States was the industry's largest foreign investor, its share has been declining from about 72 per cent in 2006 to 54 per cent in 2008 and to 39 per cent in 2011. The share of Europe has been rising from 6 per cent in 2006 to 19 per cent in 2008 and to 46 per cent in 2011. Total cumulative FDI from 2005 to 2013 is valued at approximately US$29.3 billion, with the United States accounting for 45 per cent, closely followed by Europe with a share of 35 per cent of the total (Figure 10).

In terms of export destination, the United States still remains as the biggest market with a share of 73 per cent of the market in 2013 (Figure 11). This has been attributed to the country's strong cultural affinity with the United States, which has made it easier for the Filipino pool talent to relate with American customers.[3] Far second is Europe with a share of 13 per cent, followed by Australia and New Zealand, which captured a combined share of 4.5 per cent and Japan with a share of around 4 per cent. In 2013, exports to the United States amounted to US$10.3 billion and largely dominated by contact centres, accounting for 65 per cent of the total.

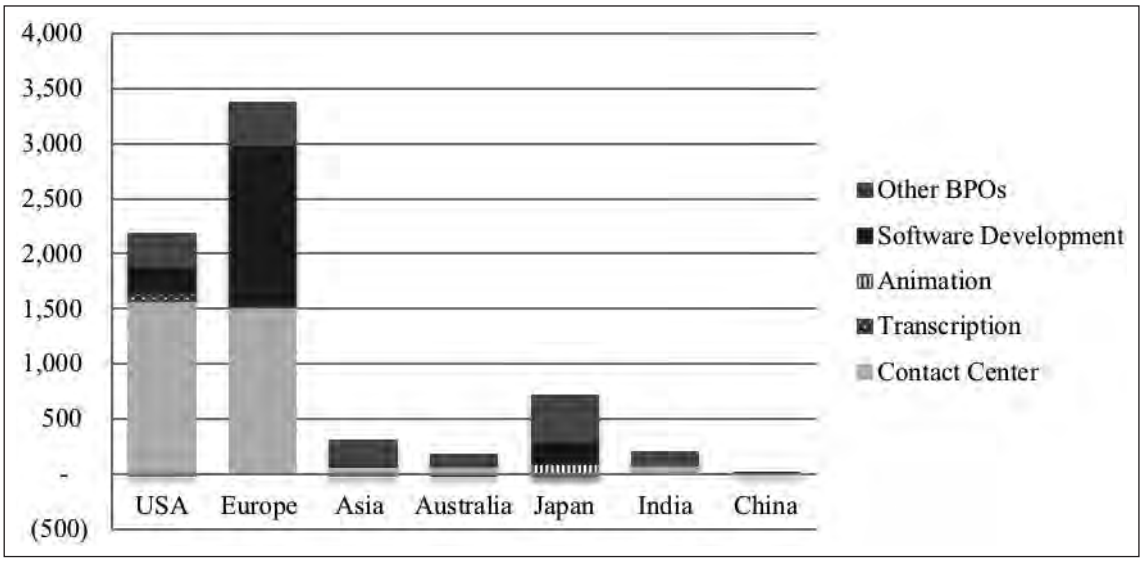
To see how the Philippine's international specialization has evolved over time, Table 4 presents measures of revealed comparative advantage (RCA)[4] for computer and information and other business services covering the years from 2000 to 2013. Based on Balassa's (1986) concept of RCA, these measures

FIGURE 8
Distribution of Workers, 2013



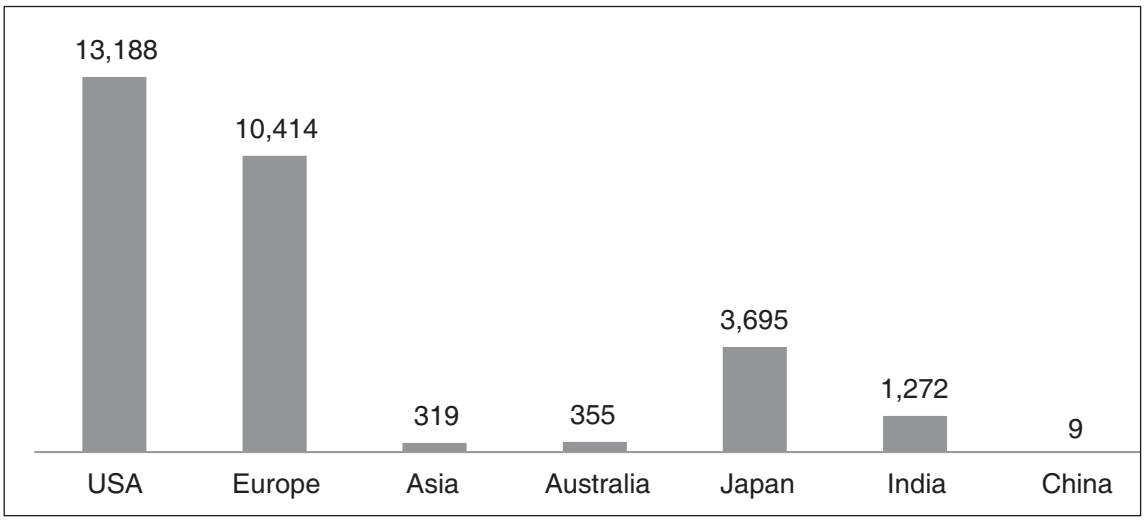
SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 9
FDI by Country of Investor, 2013 (in US$ million)



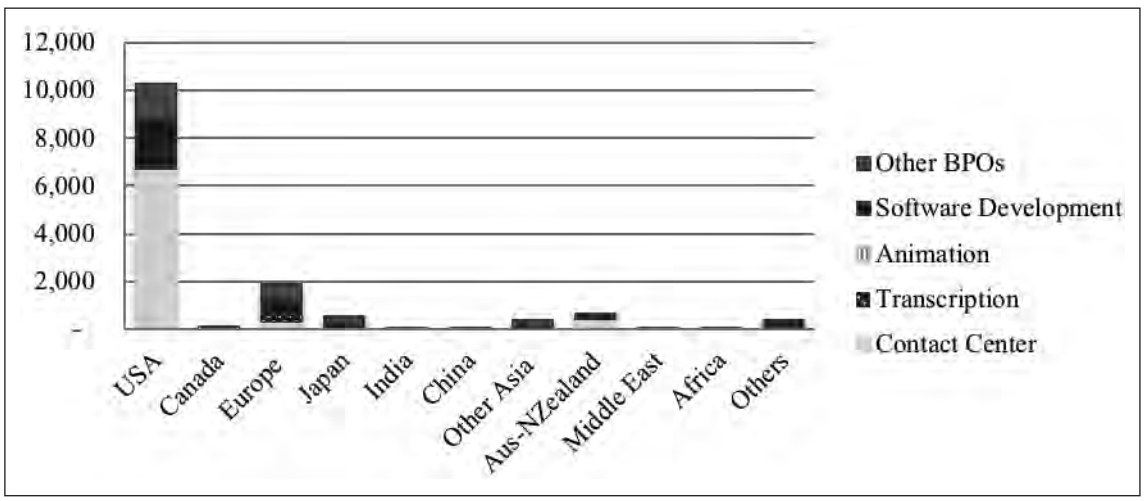
SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 10
Cumulative FDI, 2005–13 (in US$ million)



SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

FIGURE 11
Export Revenue by Country of Destination, 2013 (in US$ million)



SOURCE: 2013 Survey of IT-BPO Services Report, Bangko Sentral ng Pilipinas.

TABLE 4
Revealed Comparative Advantage in the
IT-BPM Services Industry, 2000–13

Year	*Computer and Information*	*Other Business Services*
2000	0.75	0.39
2001	0.21	0.38
2002	0.30	0.38
2003	0.21	0.41
2004	0.20	0.39
2005	0.49	0.49
2006	0.34	0.58
2007	0.70	1.03
2008	2.37	1.78
2009	2.09	2.38
2010	2.00	2.50
2011	2.23	2.30
2012	2.11	2.13
2013	2.12	2.06

SOURCE OF BASIC DATA: UN Services Trade Data.

give an indication of those industries in which a country may have a comparative advantage. The RCA compares how much a country is exporting a given product relative to its total trade, in comparison to the share of that product in world trade. A country is said to have a revealed comparative advantage when its share of export of a given product exceeds the equivalent share of export of the world. This is captured when the RCA is above 1. An RCA below 1 suggests that the country does not have a revealed comparative advantage in a given product.

Using the United Nations International Trade in Services Database,[5] the RCA indices indicate that from 2007–08, the country has been competitive in computer and information services as well as in other business services. Computer and information services sector includes computer services consisting of hardware- and software-related services and data-processing services and other information provision services including database services. Other business services include: legal services; accounting, auditing, bookkeeping and tax consulting services; business and management consulting and public relations services; advertising, market research and public opinion polling services; research and development services; and architectural, engineering and other technical services.

5. Mapping the Philippines in the Offshoring Services GVC and Identifying Future Trajectories

5.1 Current Position of the Philippines

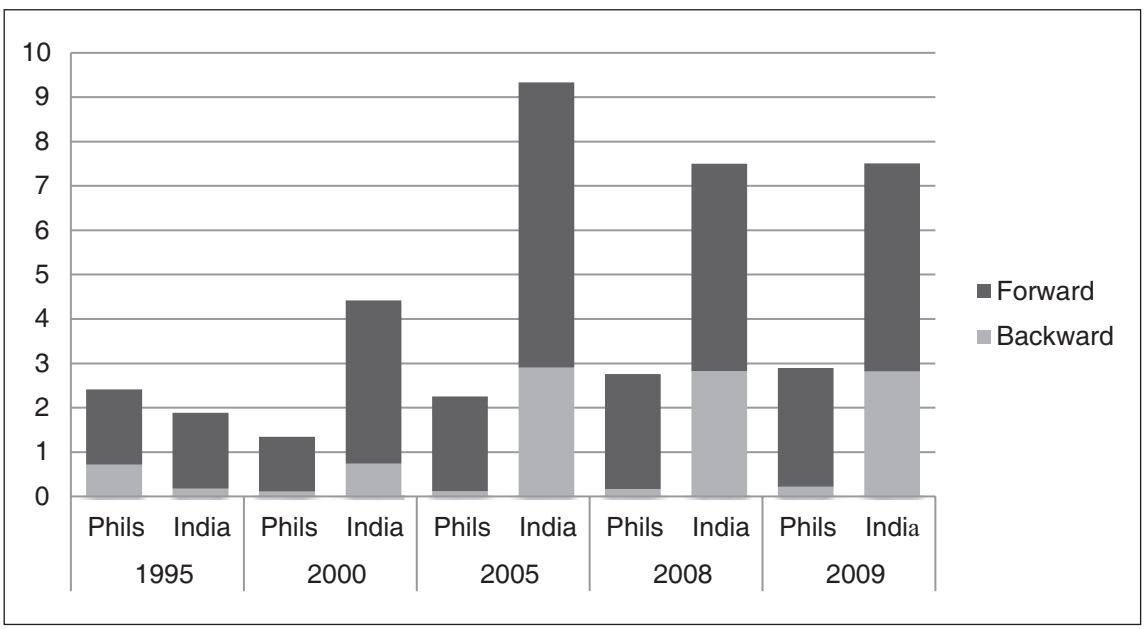
The OECD-WTO Trade in Value Added (TiVA) Database links national Input-Output (I-O) tables with bilateral trade data to develop inter-country I-O tables that provide a wide range of indicators on GVCs. Using this database, De Backer and Miradout (2013) developed the "GVC Participation Index" to measure the depth of a country's participation in the GVC indicated by the share of foreign inputs (backward participation) and domestically produced inputs used in third countries' exports (forward participation) expressed as percentage of gross exports.

Figure 12 shows that the share of foreign inputs in Philippine business services exports (looking backward along the value chain) declined from 0.7 per cent in 1995 to 0.11 per cent in 2000, although this increased slightly to 0.17 per cent in 2008 and 0.22 per cent in 2009. The share of domestically produced inputs used in third countries' exports (looking forward along the value chain) rose from 1.7 per cent in 1995 to 2.1 per cent in 2005 to 2.67 per cent in 2009. The level of Philippine participation in the business services GVC increased from 2.4 per cent in 1995 to 2.76 per cent in 2008 to 2.89 per cent in 2009. In the case of India, its participation index increased substantially from 1.89 per cent in 1995 to 4.4 per cent in 2000 and to 9.3 per cent in 2005. However, this declined to 7.5 per cent in 2008 and 2009.

Given the high level of industry aggregation of the TiVA statistics and limited number of years covered, the above analysis is supplemented with more detailed and specific activities in the Philippine IT-BPM services sector. There are currently seven industry associations covering the different segments of the industry: IT and business process; animation; contact centre; game development; global in-house centre; healthcare information management outsourcing; and software. Association directories containing the names of member companies, employment, revenues and specific activities were gathered from the different industry groups. Interviews were also conducted with the top officials of the associations.

Table 5 contains a list of the different activities being carried out by the industry and classified into three groups: IT application services; business process services; and engineering services. Though contact centres remain the bulk of the industry, other IT and business process services have emerged in the country consisting of animation, transcription activities (medical, legal, etc.), software development/ publishing, and other business processing outsourcing (including backroom operations and shared financial and accounting services, outsourcing for research and public opinion polling, outsourcing for business and

FIGURE 12
Business Services GVC Participation Index



SOURCE: OECD-WTO Trade in Value Added (TiVA) Database.

TABLE 5
IT Application, Business Process, and Engineering Services in the Philippines

IT Application Services	*Business Process Services*	*Engineering Services*
Application development & maintenance	Horizontal processes	Manufacturing engineering
• Application development	• Contact centres	Upstream product engineering
• AD integration & testing	• Human resources	• Concept design
• Application maintenance	• Finance & accounting	• Simulation
System integration	• Supply chain: procurement logistics management	• Design engineering
• Analysis, Design	Industry/vertical processes	Downstream product engineering
• Development	• Banking & insurance	• CAD/CAM/CAE
• Integration & testing	• Telecom	• Embedded software
• Package implementation	• Public sector, Utilities	• Localization
IT Infrastructure Services	• Health care, High-tech	• Plan & process engineering
• Help desk, Desktop support	• Oil & Gas Consumer products	Architecture design
• Data centre services	Knowledge Process Outsourcing	• Design process
• Mainframe	• Business research, financial research	• Building Management models
• Network operations	• Animation	
• IT consulting	• Data analytics	
Software product development	• Legal process & patent research	
• New product development	• Other high-end processes	
• System testing		
• Localization/Support		
• Gaming		

management consultancy activities, data processing, database activities, hardware consultancy, outsourcing for architectural and engineering services, and other IT enabled services).

Based on the associations' directories, there are currently 337 firms under the IT-BPM offshoring and outsourcing industry, with each firm offering a variety of IT-BPM activities (Table 6). For instance, Accenture operates mainly in Customer Contact Centres (CCC) but also offers services in the following segments: Marketing and Sales (M&S); Accounting and Finance (A&F); Human Resource (HR); Logistics (Lo); Software Development (SD); IT Support Services (ITSS); and BPO Support Services (BSS).

In terms of revenues, most of the IT-BPM firms or a total of 131 generated revenues of less than US$10 million (Table 7). Firms with revenues of more than US$100 million in the last fiscal year were companies that offer BPO support services, IT support services, software development firms and customer contact centres.

In terms of capitalization, 34 per cent of the firms have equity of up to US$200,000 while 33 per cent have equity ranging from US$0.2 million to US$1 million. The remaining 33 per cent of the firms have equity of US$1 million and above. In terms of employment, ninety-eight firms had employees ranging from 1–100 while eighty-eight fell in the range 101–500 employees. The customer contact centre segment had the most number of firms with more than 15,000 employees followed by BPO support services.

5.2 Possible Upgrading Trajectories

Figure 13 traces the evolution of the industry from the 1980s until the 2000s. A total of eighteen business process outsourcing firms operated in the industry during 1980–90. There were three in animation, graphics, and publishing, three in customer contact centre, three in accounting and finance, and three in software development. From 1991 to 2000, fifty-eight IT and BPO firms entered with nine in the animation, graphics, and publishing, six in customer contact centre, and twelve in software development. The BPO segment started to grow as new firms entered other BPO segments; six firms entered the human resources segment, three accounting and finance, and two marketing and sales. During this period, seven shared services companies entered the industry.

The next period from 2001 to 2014 witnessed a heavy influx of BPO companies as forty-five new firms entered the animation, graphics, and publishing segment; fifty-three firms in the customer contact centre, eight health information management, twelve accounting and finance, ten in human resources, and three in marketing and sales. At the same time, in the IT outsourcing segment, twenty new firms entered software development and twenty-five in shared services companies.

With the rapid growth of the industry in the last decade, the Philippines is characterized as strong in the voice sector but as Figure 14 illustrates, it is also quickly expanding in the non-voice and complex services sectors in advertising, animation and graphics, back-office KPO, customer care and services (non-voice), engineering services, financial KPO, legal KPO services, medical KPO, and software development.

Based on the IT-BPM Roadmap, the industry is projected to earn US$25 billion in revenues and generate 1.3 million jobs by 2016, provided this is accompanied by a nurturing investment environment and improved educational support from both the government and the private sector. The Roadmap aims to shift from voice to non-voice complex BPM services particularly in industry verticals covering banking and financial services, insurance, health care, media, engineering, and creative services.

The industry's upgrading strategy as shown in Figure 14 suggests: (1) upgrading from BPO to KPO especially in medical, financial and legal; (2) expansion and upgrading within ITO; and (3) inter-sectoral upgrading to verticals or industry-specific activities particularly shared services companies, game development, and engineering design in manufacturing.

TABLE 6
Industry Profile

IT-BPM Segment	*No. of firms by major classification*	*No. of firms by segment*[a]	*Services Offered*
Animation, Graphics & Publishing (AGP)	65	66	Graphic and art design, Web design, Flash, 2D & 3D key animation, animation, character & production design, compositing & editing, page composition & editorial services, clean-up & in-betweening
Customer Contact Centres (CCC)	77	103	Customer service, Technical support, E-mail support, Sales, Inquiries, Chat support, Order raking & fulfilment, Billing, Telemarketing, Complaints & disputes
Engineering Design (ED)	5	20	CAD/CAM, Architectural drawings, Engineering drafting, Civil engineering design, Electronic components, Geographic information systems, Digital mapping, Display technology, Printed circuit design, wireless devices
Healthcare Information Management Outsourcing (HIM)	10	38	Clinical notes, Patient assessment, Consultation reports, History and physical reports, Diagnosis, progress notes, discharge summaries, office visits, emergency notes, operative reports
Information Processing Management (i) Marketing & Sales (MS)	12	62	Business intelligence, Market research, Sales and business promotion activities, Distribution, Strategic Research, Analytics, analytics services for credit & lending decisions, BPO sector analysis, business analytics, business case
(ii) Legal (L)	3	26	Legal data analysis, Litigation coding, Contract management and review, Due diligence, E-discovery, Advisory and compliance services, Business incorporation, compliance, consulting, contract drafting & review
(iii) Accounting & Finance (AF)	18	79	Accounting and bookkeeping, Payroll, Accounts payable administration, Accounts receivable collection, Account maintenance, Financial reporting, Expense and revenue reporting, tax reporting, Financial analysis and auditing, inventory control & purchasing
(iv) Human Resources (HR)	23	87	Recruitment and staffing, Employee benefits, Compensation, Training and development, Talent management, employee relations, Payroll, HR consulting/outsourcing, executive search & recruitment service

(v) Logistics (Lo)		30	Sourcing and procurement, Supply chain management, Warehouse and inventory management, Logistics advisory and consultancy, BPO vendor selection, Global supply chain management, Global supply chain management, Logistics, print fulfilment, procurement operations, shipment track & trace
Software Development (SD)	48	128	Custom application development, IT consulting services, Web development, Mobile application development, Application maintenance, Product engineering/ software product development, software as a service (SaaS) development, software testing, systems integration services, online business & e-commerce development
Game Development (GD)	1	28	2D and 3D game art, Game programming and support, Game quality assurance, game community support, game design, game animation production, game development, game development consultancy, iPad & Android, iPhone
IT Support Services (ITS)	7	115	Software support services, System infrastructure support services, Database management, Network management, Cloud-based services, Hosting, consulting, data & network consultancy, data centre services, IT infrastructure services
BPO Support Services (BSS)	31	111	Digital marketing, Sourcing solutions, property & estate management, Telecommunications infrastructure and services, staffing & executive search, technology solutions, education & training, missed use development real estate services, grounds care & landscaping, plant operations & maintenance
Shared Service Companies (SSC)	37	37	Customer service, Technical support, Complaints and disputes, E-mail support, Web development, Accounts receivable collection, application maintenance, billing, inquiries
Other Services		61	Analytics, social media, business process management & development, project management & implementation, virtual assistant, big data, business registration, consultancy, online marketing, search engine optimization
Total	337	991	

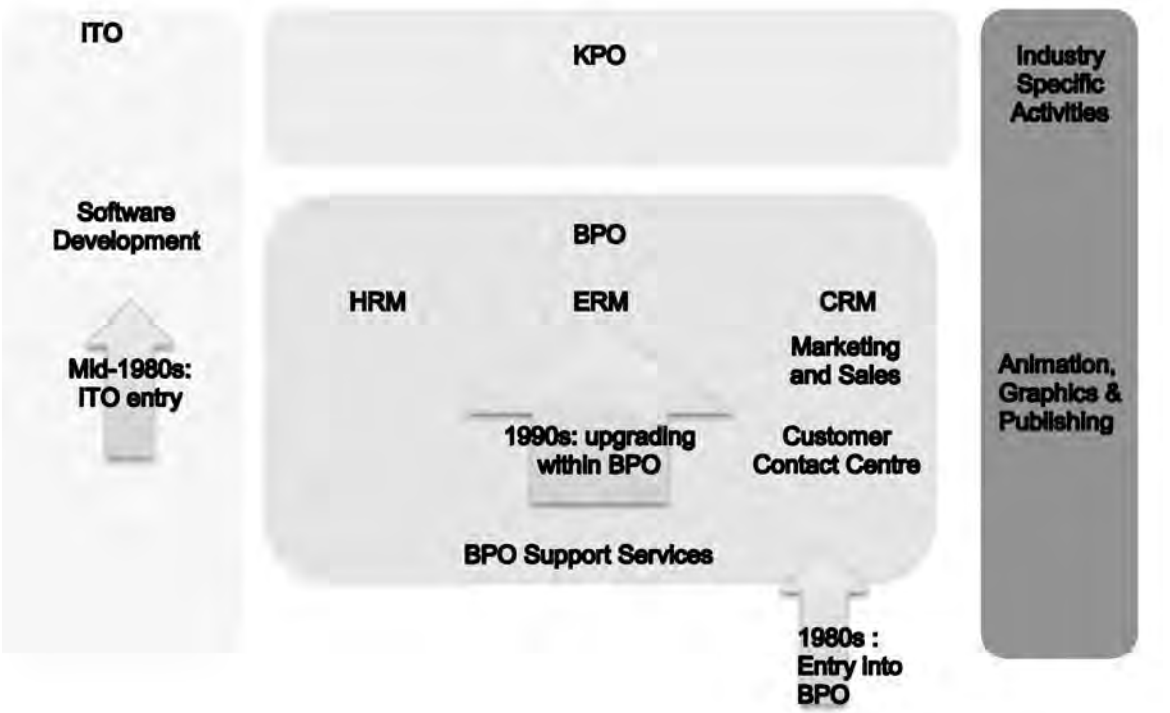
NOTE: a. A firm offers various services across segments.
SOURCE: Tabulated based on information from the IT and Business Process Management in the Philippines 2016 Directory.

TABLE 7
Industry Performance and Structure

Employment	*No. of Firms*	*% Share*	*Capital (in US$)*	*No. of Firms*	*% Share*	*Revenues (in US$)*	*No. of Firms*	*% Share*
1–100	98	37	Below 25,000	12	6	Below 1 mn	60	33
101–500	88	34	25,000–200 mn	54	28	1 mn–9.9 mn	71	39
501–1,000	25	10	0.2 mn–1 mn	64	33	10–49.9 mn	27	15
1,001–1,500	20	8	1 mn & up	65	33	50–99.9 mn	10	5
2,501–5,000	11	4		195	100	100 mn & up	16	9
5,001–1,0000	9	3					184	100
10,001–15,000	3	1						
15,000 & up	8	3						
	262	100						

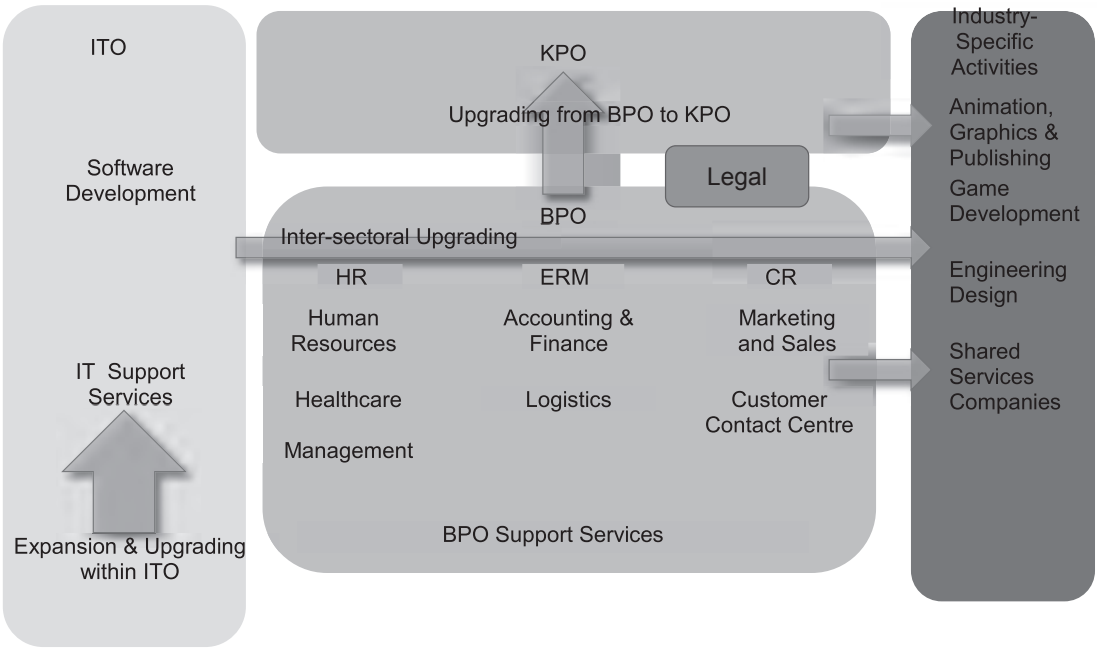
SOURCE: Tabulated based on information from the IT and Business Process Management in the Philippines 2016 Directory.

FIGURE 13
IT-BPM Industry, 1980s–2000s



SOURCE: Author's interpretation of the industry configuration using the earlier framework explained in Figures 1 and 2.

FIGURE 14
Current Configuration and Potential Trajectories



SOURCE: Author's interpretation of the industry configuration using the earlier framework explained in Figures 1 and 2.

5.3 Engineering Services Outsourcing (ESO): A Closer Look

5.3.1 Definition, Coverage and Performance. Engineering services entail the creation of new products or processes covering designing equipment, infrastructure and processes that are needed in producing these products or services (Tholons 2007). The International Standard Industrial Classification (ISIC) of all economic activities by the United Nations refers to it as "architectural and engineering activities and related technical consultancy". The US Census Bureau defines engineering services as comprising of establishments engaged primarily in applying physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems. The assignments carried out by these establishments may involve any of the following: provision of advice; preparation of feasibility studies; preparation of preliminary and final plans and designs; provision of technical services during the construction or installation phase; inspection and evaluation of engineering projects; and related services.

Fernandez-Stark, Bamber and Gereffi (2012) identified six phases in the engineering service project value chain: conceptual design; feasibility; engineering; procurement; construction; and operations and maintenance. Activities provided by engineering companies are mostly carried out by large firms handling projects related to infrastructure, including: energy; transportation; communications and water; forestry; mining and oil and gas. Engineering research and development refers to processes and activities involved in the creation and development of new products (hardware or software). Software-related services include developing all commercially off the shelf (COTS) products while hardware includes all physical components including tools, computer hardware, electronic hardware, networking hardware, and other

similar physical products or product components. The engineering R&D consists of various methods and processes from product design to creating prototypes for mass production. Industry users are classified into three major groups: software; mechanical; and hi-tech products (Table 8). Table 9 describes the engineering R&D services value chain and the different activities covered by each stage in the value chain.

Like other types of IT business process outsourcing services, engineering services outsourcing has emerged due to increased global competition and the development of information and communication technology. In more recent years, companies began to employ engineering services outsourcing not only for cost reduction by offshoring lower value business services, but also for these companies to increase their competitiveness. Locating engineering services in emerging markets allow companies to access growing markets and an expanded pool of skilled labour.

5.3.2 Philippine ESO Participation. Based on the database of the Philippine Economic Zone Authority and IT Business Process Association of the Philippines, there are sixty-two companies offering engineering services. The number of firms increased from twenty-four in 2006 to sixty-two in 2016. Mostly, engineering activities in the country are focused on providing computer aided design (CAD) services for the industrial/construction sector but also for hi-tech/telecom, automotive, and marine sectors. To better understand the activities, challenges faced and support needed by the industry, a focus group discussion (FGD) was

TABLE 8
Engineering Services Markets

Market	*Engineering Services Applications*
Automotive	Designing, manufacturing, operation and maintenance of automobiles, buses and trucks and their respective engineering subsystems.
Aerospace	Research, design, production, manufacturing and operation of aircraft, spacecraft, aerospace equipment, satellites and missiles; the sector is further sub-divided into defence, engine avionics and structure.
Naval	Conception, designing and construction of ships, offshore structures, and other marine vehicles.
Hi-tech/Telecom	One of the sectors leading the growth of engineering spending driven by the high pace of new product introduction and global nature of their products; hi-tech or electrical engineering is the application of laws of physics governing electricity, magnetism and light to develop new technologies which are then used to create computer technology and software, neon lights, cordless telephones and refrigerators.
Utilities	Design, construction and operation of power plants, engines and machines which can be divided into heat utilization (generation, distribution, use of heat for boilers, heat engines, air conditioning and refrigeration) and machine design (hardware including use of heat processes).
Industrial/ Construction	Engineering covers the planning and management for construction of structures like highways, bridges, airports, railroads, buildings, dams and reservoirs; involves design of structures, temporary cost estimation, planning and scheduling, procuring materials, selecting equipment and cost control.

SOURCE: Tholons (2007).

TABLE 9
Engineering R&D Services Value Chain

Product Conceptualization	*Product Design*	*Product Development*	*Product Testing*	*Product Manufacturing*	*Product Maintenance*
• Core product ideation support • Support for R&D strategy	• 3D modelling & CAD/CAM* design • Product design • Design validation & engineering • Certification for products	• Software development • Embedded & hardware engineering support • Product localization	• Software & hardware testing services • Product performance & safety testing • Product/ software debugging	• Technical documentation • Production manufacturing support	• Operations & maintenance engineering support • Product portfolio optimization • After sales
Project management					
Product lifecycle management					
Process improvement					

NOTE: * CAD: Computer Aided Manufacturing; CAD: Computer Aided Design
SOURCE: Everest Group.

organized where five engineering services companies attended. The companies were also requested to fill up a survey questionnaire. However, only three firms replied to the questionnaire. Table 10 summarizes the profile of the participating companies along with the highlights of the discussions and their survey responses.

The FGD participants are all registered under the Philippine Economic Zone Authority and are exporting their services. The companies are mainly Japanese owned with revenues ranging from PhP38.78 million to PhP760 million. They are also mostly large companies with over 200 workers. In terms of major engineering services provided, the companies are primarily engaged in CAD as well as software and hardware development for auto and auto electronics. Labour comprised the bulk of the companies' total costs. In terms of type of workers, the companies require mostly engineers with engineering and drafting skills, CAD drafters, as well as software quality assurance and software development skills.

The FGD participants indicated that the Philippines has locational advantages such as lower operational costs, English-speaking workforce, and geographically, the country is considered a hub between Asian and Western economies. The most binding constraints to the growth of the industry include lack of high-speed Internet connectivity, insufficient number of experienced and technically skilled workers, and complex permit and regulatory systems. The participants, however, pointed out that the engineering services sector in the country has been expanding, but advanced technologies pose a challenge and hence the need for the industry to formulate catch-up strategies and policies. Some policy recommendations include addressing high-speed Internet at reasonable cost and introducing reforms to upgrade the education curriculum and align it with emerging technologies.

6. Conclusion and Policy Implications

The Philippines has become one of the top offshoring destinations in the world primarily due to its large pool of college-educated and English-speaking talent. A decade ago, the industry comprised of

TABLE 10
Engineering Services Outsourcing Survey Highlights

General Profile		
Year established	1999–2012	
Operating in an economic zone	Philippine Economic Zone Authority	
% Foreign Equity	80–100% Japan; 100% Qatar	
Annual Revenues	PhP38.78 million–PhP706 million	
Exports as % of revenues	97%–100%	
Total number of employees	40–425 direct workers	
Value Adding Activities and Products		
Main services offered	Software development, evaluation & systems integration; quality assurance & testing; AutoCAD engineering system; detailed engineering support to parent company; development of software & hardware design for car audio & auto electronics; fully integrated support services, CAD, plans & project data base for architectural, electrical, civil, & air-conditioning, industrial & mechanical engineering & allied structures.	
How IT-BPM processes in the Philippines have changed	Industry process & services are increasing but rapid developments in technology pose a challenge for the industry to catch-up; IT services now gearing towards data analytics.	
Primary export destinations	Japan, parent company, US, UK, Hong Kong, Singapore, Qatar	
Main inputs	Labour: 55%–77% of total costs	
Workforce Characteristics		
Type of Worker	*Main Tasks*	*Skills Needed*
Firm 1		
Engineers	Prepare CAD engineering design work	Engineering/drafting
CAD Drafters	Prepare CAD engineering design work	CAD skills
Supervisors	Supervise engineering, CAD engineering, design work	Engineering/drafting
Administrative Staff	Administrative & IT support	Office management
Management	Managerial	Office management
Firm 2		
Engineers	Software quality assurance & software developers	IT & computer engineering
Supervisors	Software quality assurance & software developers	IT & computer engineering

Administrative Staff	Human resource, finance	Accounting
Management	President & managers	Computer & engineering, Accounting
Firm 3		
Engineers	Develops software & hardware for car electronics & for business applications of subsidiaries	Electronics and computer engineering, mechanical engineering, computer science, IT
Supervisors	Supervises group of engineers & staff	Electronics and computer engineering, mechanical engineering, computer science, IT
Administrative, Management	General administrative & managerial tasks	College graduates
Others	Tests/evaluates equipment, system & tools	College graduates
Opportunities & Challenges		
Advantages of locating in the Philippines	Lower operational costs, English speaking, flexibility of staff, Philippines is considered as hub between Asian & Western markets, closeness to clients' countries.	
Greatest needs and challenges	High speed Internet connectivity, lack of experienced and technically skilled staff, peace and order, IT security, income tax rate, permits, business security, labour laws & employment conditions.	
Government policy support	High speed Internet connectivity at reduced prices, upgrade education curricula taking into account current & emerging technologies, reduce income tax to ensure that high-skilled people will not leave the country, marketing & promotion.	

a few sectors dominated by call centres. Today, the Philippines is the largest global provider of voice-based business process outsourcing services. To maintain industry competitiveness, it is important for the country to upgrade from low-end to high-end and shift to value-driven and complex services, given the new age of global offshoring services, emerging technology, new media and vertical expansion and development.

The analysis suggests the following upgrading strategy for the industry: first, upgrading from contact centre and low-value transactional BPO services to higher earning, more specialized and more complex non-voice BPO and KPO segments especially in medical, financial and legal services; second, expansion and upgrading within ITO; and third, inter-sectoral upgrading to verticals or industry specific activities particularly shared services companies, engineering design in manufacturing, and game development.

With disruptive technologies such as 3-D printing, big data, artificial intelligence, robotics, and other forms of automation and the Internet of Things and Industry 4.0, tremendous opportunities for new types of R&D, prototyping services, and engineering and design processes and services have emerged. The

upgrading approaches have significant implications for workforce development along with the creation of other necessary conditions to deepen their participation in GVCs. This involves government and private sector cooperation, particularly in providing industry development support measures, talent development, marketing, access to capital, enabling legislations and an investment friendly environment to promote the growth and global competitiveness of the Philippine IT-BPM industry.

In a survey of IT-BPM companies conducted by Francisco and Parlade (2013) on significant factors that influenced company decision to locate or expand in the Philippines, 54 per cent of the respondents indicated that the availability of English-proficient and skilled labour had a major impact on their decision, followed by legal and regulatory framework and policies. The results illustrate the importance of human capital as a critical factor for GVC upgrading in the IT-BPM industry. Expanding into more knowledge-intensive BPO segments would require skills and workforce development covering not only good communication skills but also specialized qualifications in areas such as IT, engineering, finance and design. Thus, it is important to identify the skills gap by analysing and taking stock of the skills currently available and those needed for industry upgrading.

A related challenge that the Philippines faces is the lack of adequate size and quality of the country's pool of professionals and graduates in business-related fields, medical and allied fields, social sciences and engineering. Compounding the problem is that Filipino engineers and IT graduates are heavily demanded throughout the Gulf as well as in Singapore and Malaysia, leading to a brain drain of the country's technical talent (Oxford Business Group 2015). Currently, the Philippines produces 550,000 graduates annually compared to China and India that churn out 7.5 million and 5.5 million graduates, respectively.

Realizing the looming talent supply gap, the government, together with industry associations, has introduced the following talent development initiatives and programmes to bridge the gap between total talent demand and supply (IT Business Process Association of the Philippines 2012):

- Global Competitiveness Assessment Tool: an industry-developed test to assess competencies in basic skills for employment in IT-BPM;
- Advance English Pre-Employment Training; and
- Technical Education and Skills Development Authority (TESDA) Industry Training for Work Scholarship Programme.

Enhancing the capabilities of the labour force is a monumental task; this becomes even more urgent as the country must integrate and upgrade successfully in the global value chain. The government has an important role to play in industry upgrading by acting as facilitator and providing financial support and regulatory action (Fernandez, Bamber, and Gereffi 2012). Working closely with the industry associations, the Department of Science and Technology (DOST)—Information Communications and Technology Office performs the role of a facilitator as it coordinates the different needs of the IT-BPM industry with other state agencies, industry associations, academe, and other industry stakeholders.

In terms of financing support, the government can provide fiscal incentives to firms and workers to invest in skill development. Scholarships can be granted not only for specific trainings but also for further education abroad, both in tertiary education programmes and internships in key industries. Tax incentives for trainings can also be used. In terms of regulatory action, the government can play an important role by ensuring the quality of training through accreditation of universities and technical institutions and establishment and monitoring of national certification programmes. It is important for the DOST to coordinate these needs of the industry with other government agencies such as the Department of Finance for fiscal support and the Commission of Higher Education and TESDA for accreditation and certification initiatives. Apart from workforce development, other important industry concerns where government intervention is needed include: strengthening infrastructure support particularly broadband infrastructure,

high-speed Internet connectivity and the availability of power at reasonable costs; continuous improvement of the regulatory environment and ease of doing business to reduce transactions costs; and effective implementation of the intellectual property law.

NOTES

1. Lee Kuan Yew School of Public Policy-Microsoft (2014).
2. 2012–2016 IT-BPM and GIC Road Map.
3. Ibid.
4. RCAs relative to the world were calculated as follows:

$$RCA_{ij} = \frac{\frac{X_{ij}}{\sum_i X_{ij}}}{\frac{\sum_i X_{ij}}{\sum_i \sum_j X_{ij}}}$$

   where X_{ij} represents country i's export of product j. $RCA_{ij}>1$ means that country i has a comparative advantage in the production of j. The greater the index, the stronger the advantage. $RCA_{ij} < 1$ indicates that country i has a comparative disadvantage in the production of j. The smaller the index, the greater the disadvantage.
5. Services are classified based on the Extended Balance of Payments Services Classification (EBOPS), http://unstats.un.org/unsd/ServiceTrade/.

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