Offshoring of healthcare services: the case of US-India trade in medical transcription services

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Abstract:

Purpose – The issue of offshore outsourcing of healthcare services is a critical but little-examined problem in healthcare research. The purpose of this study is to contribute to filling this void.

Design/methodology/approach – A library-based study was carried out of the development of the Indian medical transcription offshoring industry.

Findings – Cost-saving potential and the degree of outsourceability are higher for medical transcription compared with most services. Offshoring experience, typically in a low-value BPO, helps to enhance productivity and international linkages required for the success of medical transcription.

Research limitations/implications – An important area of future research concerns comparing India's factor endowments in medical transcription outsourcing with other services. Further research is also needed to examine how India differs from its regional competitors in terms of factors endowments associated with these services. Another extension would be to investigate the drivers of offshoring of higher value services such as radiological readings.

Practical implications – ICT infrastructures needed for outsourcing require much less investment compared with leading capital-intensive industries. The development patterns of the Indian medical and offshoring industries indicate that India may attract higher skilled medical functions in the future. The Indian offshoring industry is shifting its focus from BPO to knowledge process outsourcing (KPO). Developing countries need to shift to greater automation and greater levels of skill training to retain and reinforce their comparative advantages.

Originality/value – This paper's greatest value stems from the fact that it examines the drivers of a new but rapidly growing healthcare industry.

Keyword(s): Information technology; India; Outsourcing; International trade; Health services sector.

Article:

1. Introduction

In recent years, developed-world based healthcare providers are increasingly outsourcing various medical functions such as medical transcription (hereinafter: MT), billing and insurance claims to the developing world (Kshetri, 2009). Teleimaging (e.g. reading and interpreting magnetic resonance imaging (MRI), CT scan and X-ray images) and telepathology (e.g. analysis of tissue samples) are some high-profile examples of medical functions offshored by many hospitals in Industrialized countries such as Canada, the USA and Singapore (Murphy, 2008 *;* Singh and Wachter, 2008; Kshetri, 2009). In the UK, a Department of Health is reviewing about the possibility of allowing healthcare firms to process sensitive NHS patient data in foreign countries (Murphy, 2008).

In particular, MT has many characteristics of a job with a high degree of outsourceability. According to an Association for Computing Machinery Report, medical billing and MT are among works that are often offshored. As to the degree of labor-intensiveness, an important prerequisite for offshoring to developing economies, MT entails labor intensive tasks, which results in a high cost saving potential (Ghodeswar and Vaidyanathan, 2008; Garner and Schwartz, 2004).

Although reflective pieces from the popular press and some academic articles have provided insights into the rapidly growing offshoring industry, there is a dearth of theoretically oriented research on the evolution of the offshoring of healthcare services. The purpose of our study is to contribute to filling this void. We examine the contexts, mechanisms and processes associated with the offshoring of medical functions by developed-world based healthcare providers to the developing world. Specifically, we focus on the growth of the MT industry in developing economies. For empirical grounding of theoretical concepts, we provide a case study of the US-India trade in MT services.

Before proceeding, we offer some clarifying definitions. Business process outsourcing (BPO) is defined as long-term contracting of a firm's (hereafter: the client firm) non-core business processes to an external service provider (hereafter: the outsourcing firm) (Romberg, 1998). These are non-IT business processes but in most cases are IT-intensive or are facilitated by IT (Kshetri, 2007). Some examples include customer service call centers, tax preparation, MT, finance and accounting, human resources, design and engineering, etc. (*The Economist*, 2005). In offshore BPO, the outsourcing firm and the client firm are located in different nations. High-value BPO involves offshoring of sophisticated tasks requiring high skills. MT is an IT enabled service (ITES), which involves converting medical notes dictated by a physician into editable electronic documents to be added to patient records (Ghodeswar and Vaidyanathan, 2008).

The paper is organized as follows. In the next section, we develop a framework to explain the degree of offshoring in an industry from a developed economy to a developing economy. Next, we apply the framework to examine the Indian MT off shoring industry. Finally, we offer some conclusions.

2. Offshoring of a function in an industry between two economies

Consider two economies – the offshoring origin country (O) – a developed country and the offshoring destination country (D) – a developing country. The Ricardian theory explains comparative advantage as a function of technological differences and relative efficiency that vary across economic sectors. The Heckscher-Ohlin-Samuelson (HOS) theory argues that countries' comparative advantages are functions of their comparative factor endowments. That is, countries that are comparatively endowed with labor tend to export products that are labor intensive whereas countries that are endowed with capital tend to export capital-intensive goods. A natural question is how D improves labor productivity and comparative factor endowments for a high-value BPO industry.

Prior to discussing mechanisms associated with the inflows of jobs and investments in MT industry, it is necessary to create a theoretical framework about the internationalization of an economic sector of a developing country. Scholars have made the case that two interrelated factors – productivity and international linkages – explain the internationalization of an economic sector of a developing country.

Productivity of a function in an industry

Wages of skilled as well as unskilled laborers tend to be higher in developed countries (O) than in developing countries (D). This is not because technologies in developed countries are superior but because “enough different sectors have such superiority in a portion of the activities that they encompass” (Deardorff, 2005). Outsourcing thus combines the low-wage labor of developing countries with the high technology developed in developed countries (Van Marrewijk *et al.*, 1997). From a developing country's perspective, related to explanations based on the productivity-offshoring nexus, it can be argued that productivity is positively related to the amount of offshoring of services the country receives. Deardorff (2005) observes:

When outsourcing becomes possible, those activities that are more productive in North [developed countries] than South [developing countries] will not move, or will move only if the savings in wages is larger than their lost productivity from moving to South. But the other activities – the ones that had no superior technology but were performed in North only because previously they had to be bundled within firms – these will move to South as long as wages there are lower.

More generally, the probability of a function being offshored to a developing country increases with the developing country's increase in productivity in the function. In prior literature researchers have compared offshoring with the osmosis process. According to the Osmosis Model of offshoring, the above processes lead to an increased "osmotic pressure" of offshoring in the industry between the two economies (Kshetri and Williamson, 2004). This leads to a higher rate of offshoring of the function from O to D.

International linkages

For developing country-based firms, success in offshoring is about developing and simplifying linkages with partners (Levy, 2005). "Relational proximity" or degree of linkages between the two economies in the industry plays an important role in the knowledge flows needed for the outsourcing of functions related to the industry (Coenen *et al.*, 2004). Prior researchers have noted the important role of learning by exporting in the development of international linkages (Kraay, 1997; Clerides *et al.*, 1998; Castellani, 2001; Yasar and Morrison Paul, 2007). Exporting also helps enhance productivity by augmenting inputs such as labor force and managerial skills as well as by exposing firms to cutting-edge technology (Yasar and Morrison Paul, 2007).

Factors associated with productivity and international linkages in the MT industry

A developing economy's ability to attract jobs related to offshoring of high value functions such as MT depends on "the construction and protection of unique assets and capabilities" (Levy, 2005). This is especially important as services often need to be specialized to the requirements of the buyer. A supplier's capability to provide different varieties of services is thus crucial to succeed (Van Marrewijk *et al.*, 1997). The development of assets and capabilities and other inputs required in the offshoring of MT is associated with facilitated by the development related economic sectors (Yasar and Morrison Paul, 2007).

MT professionals' works are highly complex. David *et al.* (2009) observe that they require "complex professionally-informed interpretive acts that in turn require sustained attention to the social order properties and content of the doctor's dictation, knowledge of medical terms and procedures, and an understanding of interactional processes, conventions of dictating, and of producing monologic speech acts". The knowledge of medical terminology and the ability to dictate medical and health related reports is crucial for the MT industry (Buban, 2007). MT professionals also need to verify medical terms' spelling (David *et al.*, 2009). Up to 99.8 per cent accuracy is needed in MT.

Most offshoring works such as MT are performed by people who have English as a second language. Industrialized world-based client firms have observed that employees in their partner offshore firms face difficulty in transcribing medical terms spoken by native English-speaking physicians (Bikman and Whiting, 2007). An additional observation is that the MT professionals fail to use punctuation properly and have a tendency to drop words such as "and", "or", "the", and "so forth" (Bikman and Whiting, 2007). A 2008 US Bureau of Labor Statistics report noted:

Reports transcribed by overseas medical transcription services usually require editing for accuracy by domestic medical transcriptionists before they meet US quality standards.

We argue that availability of assets and capabilities and other inputs required in the offshoring of MT (Yasar and Morrison Paul, 2007) are functions of the development of the medical industry and the development of the BPO industry in general. First, the development of the medical industry would lead to increased availability of manpower with knowledge of medical terminology and the ability to dictate medical and health related reports (Buban, 2007). It is also reasonable to expect that offshoring experiences, typically in a low-value BPO, is likely to enhance productivity and international linkages required for the success of the MT industry.

The experiences discussed above are likely to generate positive externalities. The development of healthcare industry and BPO experiences may help generate externalities by making healthcare-related specialized inputs and services available, forming a specialized "labor market"; and facilitating the exchanges and spillovers of

information and technology (Marshall, 1920). One such mechanism is via mimetic isomorphism (DiMaggio and Powell, 1983). Mimetic pressure entails mimicking behaviors of actors that are perceived to be exemplar and have a higher degree of effectiveness (Dickson *et al.*, 2004; Lawrence *et al.*, 2002).

First, good work ethics and timely delivery are of paramount importance to succeed in the offshoring of MT (Rajeev and Vani, 2009). MT has more stringent requirement regarding service quality and delivery compared to other outsourced businesses. Such requirements often include a turnaround time of eight hours (two hours for emergency "stat" procedures) and imposition of stiff penalties if the accuracy and time factor clauses are not met (Dev, 2001). Externalities generated by the BPO sector may help MT firms develop such approaches.

Second, industrialized world-based client firms are concerned about security issues in healthcare offshoring (Bikman and Whiting, 2007). In 2003, a Pakistani medical transcriber working for a US based medical center threatened to post confidential voice files and patient records on the Internet if her pay was not increased (Bikman and Whiting, 2007; Kshetri, 2005). This incident created awareness of potential security breaches in call centers and drew closer scrutiny of MT services supplied by foreign vendors (GAO, 2006). Externalities generated by the BPO sector may help MT firms to be more security oriented.

Strength of network-based linkages

To understand developing world-based firms' export of MT services, it may be helpful to consider a network theory perspective, which focuses on interpersonal and social relationships (e.g. Granovetter, 1985). According to this perspective, internationalization is a result of interaction and the development of a multitude of relationships. Such relationships enhance the proximity of partners involved in businesses. Networking creates relationships that can benefit for all of the parties. Bathelt (2005, p. 209) notes:

…when firms establish production linkages in a new country, they are faced with a heterogeneous cultural and institutional environment. Firms have to bridge these differences, establish efficient communication between agents with various cultural backgrounds and adjust their organizational practices in the host country.

Chun (2007) documents the emergence of the inflows of network-based IT investment from Taiwan to China. Examining cross-border investment in Dongguan, China, others have noted that Taiwan-based firms capitalize on their social network resources, which has helped to overcome the shortage of internationalization experiences and assets (Chen and Chen, 1998; Chen, 2003). Network of contacts may also serve as "reputational intermediaries" (Arora and Gambardella, 2005), which increases the degree of linkages between economies.

3. The Indian MT offshoring industry

While hard statistics comparing India's productivity in MT and other economic sectors are scarce, a preliminary analysis indicates that production per worker in MT industry may be higher than most tradition economic sectors in India. India's relative inefficiency in the MT industry *vis-à-vis* the USA is slightly higher than in manufacturing and much lower than in the R&D industry (Tables I and II).

Compared with activities such as back-office transaction processing, which belong to the low end spectrum of BPO, MT is considered to be a high value BPO (Benner, 2006; Reich, 2005) requiring highly trained and skilled employees (*The Statesman*, 2006). MT is a complex work, which needs a "specialized" knowledge and is not normally offered by "generic" BPO (*Business Wire*, 2006; *The Statesman*, 2006). One estimate suggested that average revenue per employee per hour in India in the early 2000s was $15 in MT compared to $7 for BPO in general (Express Computer, 2003).

On the policy front, in India, call centers and MT centers are service tax-exempted (Mukherjee and Gupta, 2007). Capital cost to create a MT job is estimated in the $400-$750 range (Chowdhury, 2002). A 2006 survey

found that all large and some smaller US-based MT Service Organizations (MTSOs) had plans to set up or build on expand offshore centers in India (FinancialWire, 2006).

About 80 per cent of MT jobs in India come from the USA (Hallinan, 2006). In 2003, the US-India trade in MT and billing was estimated at $340 million (McLean, 2006). One estimate suggests that about 47 per cent of US hospitals outsourced MT to India in 2006 (*The Hindu Businessline*, 2006). India is also the most popular destination for offshore outsourcing of services involving health information for federal contractors and state medicaid agencies in the USA (GAO, 2006).

	The USA	India	US-India ratio
Manufacturing industry [a]			
GDP ($ million)	1,741,185	80,236	
Paid employment ('000)	15,356.9	6,451.54	
Output per worker ($)	113,381	12,436	9.1
Output per worker (purchasing power parity (PPP), $)	113,381	63,768	1.8
MT industry			
GDP ($ million)	15,000[b]	110[c]	
Paid employment ('000)	101,000 [d]	10[e]	
Output per worker ($)	148,500	11,000	13.5
Output per worker (purchasing power parity (PPP), $)	148,500	56,404	2.6
R&D industry [f]			
Researchers in R&D per million people (1990-2003)	4,526	120	
Receipts of royalties and license fees ($ million 2003)	48,922.72	~0	
Royalties and license fees per R&D worker ($)	36,942.11	~0	→ ∞

Source: [a] Euromonitor International; [b] Future MT, 2003; [c] Hussain (2005); [d] US Department of Labor cited in Conn (2005); [e] Estimate by Hindu Business Line, www.thehindubusinessline.com/2004/08/07/stories/2004080702540300.htm; [f] UNDP (2005)

Table I.
A comparison of manufacturing, MT, and R&D industries in India and the USA

Occupation	India	The USA	Remarks
MT	US$ 2,000-3,000	US$ 24,000-38,000 (entry level) US$ 60,000-80,000 (some experience).	
Chip design engineer [a]	US$ 30,000	US$ 300,000	The figures include salary, benefits, equipment, office space and other infrastructures

Note: [a] Ernst (2005)

Table II.
A comparison of cost of employing an MT and other selected occupations in India and the USA

3.1 The US demand for MT services

Compared with other advanced countries, the USA has more rigid requirements to maintain medical records in a proper manner. The concept of requiring accurate MT is taking off. A legal factor affecting outsourcing of MT is the Health Insurance Portability and Accountability Act (HIPAA) of 1996. HIPAA covers a number of important areas in the regulation of healthcare, from the portability of health benefits and claims fraud and abuse penalties, to electronic health benefits claims processing. HIPAA has created stringent regulations for the privacy of information about individuals, and the security of information systems used by healthcare professionals and organizations. As of 2004, over 6,700 hospitals had not met Federal certification requirements (*The Hindu Businessline*, 2004). In addition, digitization and better documentation provide a better defense. According to IDC, the USA was expected to spend $4.2 billion in MT outsourcing in 2008.

Estimates suggest that the MT business in the USA is worth between US$10-25 billion and would grow at 21-35 per cent per year during 2002-2012 (Conn, 2005). Of the MT work, 47 per cent is outsourced while the rest is done in-house. A large proportion of the services is outsourced to domestic firms. Estimates suggest that 8-10 per cent of US MT took place overseas in 2004 (Swartz, 2004).

The shift in the labor market in the US MT industry powerfully illustrates the decreasing attractiveness of jobs in the country in this industry. An estimate suggested that the availability of US transcribers is falling by 10 per cent per year in recent years. The US Department of Labor suggests that the US healthcare industry will need 90,000 additional medical records professionals by 2012.

3.2 India's success in lower-value BPOs and its impact on the offshoring of MT

Indian IT industry's revenue was $47.8 billion in 2006-07, which employed 1.6 million people in 2007 (Ribeiro, 2007). One estimate suggests that India captured two-thirds of the global market for offshored IT services and about half of the global market for offshored BPO (Chakrabarty *et al.*, 2006). BPO industries' effects related to externalities (Marshall, 1920; DiMaggio and Powell, 1983) are prevalent in the MT sector. For instance, India's management style is highly traditional (Heller, 1995), "process-driven and detail-oriented approaches" are absent, turning up at work on time is not considered to be important and Indians have more flexible approach to deadlines (*The Economist*, 2006; Slater, 2003). The development of the BPO industry has led to the formation of a number of professionally run companies. Firms in the offshoring sector have improved work ethics. Indian offshoring companies provide training on the Western approach to time and related concepts. For instance, OfficeTiger, an Indian outsourcing firm, explains its employees that "five minutes really means five minutes" (Slater, 2003). Unlike in the traditional economy, the offshoring sector workforce cannot skip work for religious or family functions (Kalita, 2005).

On the security front, Indian firms have enhanced technological and behavioral measures. Call center employees need to undergo security checks. Firms have established biometric authentication controls for workers and banned cell phones, pens, paper and Internet/e-mail access for employees (Fest, 2005). Similarly, computer terminals at some BPO companies lack hard drives, e-mail, CD-ROM drives, or other ways to store, copy, or forward data. Likewise, Indian outsourcing firms extensively monitor and analyze employee logs (Fest, 2005). Indian MT offshoring firms have also employed sophisticated encryption technologies in communication processes.

In sum, offshoring experiences have helped Indian firms enhance services related to MT. Industrialized world-based client firms in the healthcare sector have observed that their Indian offshoring partners overcome problems such as language barrier over time (Bikman and Whiting, 2007).

3.3 Economic sectors related to MT in India and the impact on the inflow of MT-related jobs to India

India's economic sectors related to MT are also developing rapidly (Gillard *et al.*, 2008), which have generate positive externalities for the growth of the MT industry (Marshall, 1920; DiMaggio and Powell, 1983). Telemedical technology has already allowed India to capture 2 per cent of the US health care market (McLean, 2006). In 2005, India's medical centers attracted 120,000 overseas patients, mainly from industrialized countries, and the number is rising at 30 per cent annually. India's Apollo Hospitals annually provides cares for 10 million patients from 55 countries (Pafford, 2009). Modern facilities created by healthcare providers such as Apollo Hospitals have attracted Western-trained doctors. There doctors have brought skills that have helped improve the Indian healthcare system (Pafford, 2009).

Some Indian MT professionals are also physicians. Looking at the MT industry in the USA and India, it is apparent that this industry is more attractive relative to other sectors in India. An MT professional in the US earns 80 per cent as much as the median production worker (Chowdhury, 2002). Since MT is a high value BPO (Benner, 2006; Reich, 2005) complex work and requiring highly trained and skilled employees, MT professionals are likely to be paid higher salaries than most call center employees.

3.4 The strength of network-based linkages between India and the USA in the medical industry

In India, while there are some large MTSOs (e.g. CBay, Spheris, Spryance, Acusis and Heartland), a large proportion of MTSOs are mid-sized (<500 employees) and smaller players (<50 employees). Mid-sized MTSOs tend to work as franchisees or vendors of larger players and have limited marketing presence in the West. Smaller players, on the other hand, are mainly subcontractors to large and mid-sized MTSOs. The large players account for about 70 per cent of Indian MT offshoring revenues (*Business Wire*, 2006).

Prior researchers have noted that managers of SMEs extensively rely on networks at the early phase of the internationalization process (Lindqvist, 1997; Spence and Crick, 2006). Network theory thus is of special interest to explain the US-India trade in MT services, especially for mid-sized and smaller MTSOs. Business and personal networks have provided Indian MT firms with various competitive advantages in the form of social capital.

Social networks created in Silicon Valley have been an important factor in the internationalization of Indian IT industry (Saxenian, 2002). A similar point can be made about the MT industry. Physicians of Indian origin working in the industrialized world have played important roles in the growth of the Indian MT industry. Among foreign-born physicians practicing in the USA and the UK, the highest proportions are from India. Indian physicians accounted for 4.9 per cent and 10.9 per cent of the workforce in the USA and the UK respectively. The number of Indian doctors practicing in the USA was estimated at 50,000 in 2002 (Chowdhury, 2002). These doctors have created a network of contacts for India-based medical-transcription services and served as "reputational intermediaries" (Arora and Gambardella, 2005). It is estimated that one MT professional can transcribe one to two doctors' dictations (Chowdhury, 2002). US-based physicians of Indian origin alone could thus support about 30,000 MT professionals. In 1992, non-resident Indian physicians established one of the first MTSOs in the USA to capitalize on offshore labor for MT (Chowdhury, 2002).

Indian MT industry has benefited from networks of various types. For instance, Mahabharat (2001) reports that an elderly Indian couple started learning about the Internet to keep in touch with their son in the USA. Their correspondence turned into a MT venture.

Offshoring of services involving consumer information faces resistance from patients. Indian physician' "relational proximity" with India-based firms plays a significant role in reducing this barrier and facilitating the knowledge flow needed for outsourcing of MT (Coenen *et al.*, 2004).

4. Discussion, conclusion and implications

This paper provided insights into how firms in the MT sector of developing countries are taking measures to increase the quality and productivity of services. In developing economies, offshoring experience, typically in a low-value BPO, is enhancing productivity and international linkages required for the success of high-value BPO such as MT.

Based on the above analysis, we can draw a number of implications. First, ICT infrastructures needed for outsourcing require much less investment compared to leading capital intensive industries of the past such as steel, chemicals, and heavy machinery (Steinmueller, 2001). As noted above, Indian MT firms are employing state-of-the-art technologies and many of them have been established by US-based firms indicate that the technologies used in transcription in India and the US are essentially on par. The development patterns of the Indian medical and offshoring industries indicate that India may attract higher skilled medical functions in the future. The Indian offshoring industry is shifting its focus from BPO to knowledge process outsourcing (KPO).

Second, the increasing sophistication of speech recognition and spelling and grammar checking software, however, offers stronger future capital-for-labor factor substitution prospects in MT services. Different phases of MT services, however, differ in terms of the elasticity of substitution of labor with respect to capital – raw transcription having the highest elasticity and editing the lowest. Declining labor intensiveness – due to voice recognition technology, for instance – of MT services is, thus, likely to erode the strategic positioning of developing countries as determined by the factor endowment structure. This means that developing countries may have to shift to greater automation and greater levels of skill training (e.g. focusing on editing instead of raw transcription) to retain and reinforce their comparative advantages.

As Table I indicates, compared to the USA, relative inefficiency of the Indian MT industry is slightly higher than the manufacturing industry and much lower than the R&D industry. MT services are, however,

characterized by a higher degree of outsourceability than manufacturing, which indicates India's potential to attract more MT jobs.

An important area of future research concerns comparing how India's factor endowments in MT outsourcing differ from that of other services such as customer service call centers, tax preparation, finance and accounting, human resources, and design and engineering, etc. Further research is also needed to examine how India differs from its regional competitors in terms of factors endowments associated with these services.

One extension of the present work is to investigate the drivers of offshoring of higher value healthcare services such as radiological readings. Industrialized world-based healthcare providers are increasingly offshoring services related to teleimaging (e.g. reading and interpreting magnetic resonance imaging (MRI), CT scan and x-ray images) and telepathology (e.g. analysis of tissue samples) (Lee, 2009; Singh and Wachter, 2008). However, we know very little about the offshoring of these high-profile medical functions.

From industrialized world-based healthcare providers' standpoint, most offshoring decisions are driven by cost saving potential and the need to address the shortage of healthcare professionals. However, gaining legitimacy from various institutional actors such as the state, professional associations and consumers is of equal importance in the success of an offshoring project. Medical outsourcing is substantially affected by regulatory initiatives, activist communities' philosophical opposition, professional associations' standard setting and patients' concerns for quality, safety and privacy of information (Singh and Wachter, 2008). In this regard, research on medical outsourcing would benefit from a focus on institutional theory (e.g. Scott *et al.*, 2000).

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