

IT INITIATIVES IN THE INDIAN SERVICES SECTOR

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ABSTRACT

The Indian services sector is using Information Technology as extensively as the manufacturing sector to streamline the delivery of services and to optimize the use of the resources involved in the process. The need of the hour is to focus on quality, reliability, speed, timely delivery and optimum service levels. For this, service organizations such as banks, hospitals and logistics companies are converting loads of data collected through various sources into integrated state-of-the-art information systems to maximize customer satisfaction.

Keywords: Core Banking Systems, Electronic Health Record (EHR), Clinical Data Warehouses (CDW), Clinical Decision-Support systems (CDS), Online Analytical Processing (OLAP) and Online Transactional Processing (OLTP)), Management Information System (MIS), Hospital Information System (HIS), Picture Archiving and Communication System (PACS), MRI scans, CT scans, CATE lab images, and ultrasound images, IVR system, Weight Dimension Labelling Machines (WDL).

1. INTRODUCTION

With a Gross Domestic Product of more than US \$740 billion*, India no doubt is a key player in the world economy. The rise in the service sector's share in GDP which now accounts for more than half of India's GDP, marks a phenomenal structural shift in the Indian economy taking it closer to the fundamentals of a developed economy. The service sector's share grew from 43.69 per cent in 1990-91 to 56 percent in 2007-08. In the words of the Chairman of the Godrej Group, Adi Godrej, "India is emerging as the global knowledge hub. We have made giant strides in software, business process outsourcing and IT-enabled services. India is likely to emerge as a major low-cost, high-quality global hub for outsourced engineering services and research and development."

The timely delivery of products and services is crucial for the success of any business. In service industries, the process of 'delivering the service' is the product. Manual co-ordination of the numerous processes and business functions is a very difficult task and so there is increased dependence on automation and software. This has necessitated the

* *Source:* Central Statistical Organization (CSO), Ministry of Statistics and Programme Implementation, 2007-08

increased use of customized or automation software in the services sector. This article attempts to study the extent of the usage of information technologies in leading organizations in four industries in the Indian services sector namely *Banking, Health care, Entertainment & Media and Courier & Logistics* as follows:

2. THE BANKING INDUSTRY

Currently, India has 88 scheduled commercial banks (SCBs) - 28 public sector banks (that is with the Government of India holding a stake), 29 private banks (these do not have government stake; they may be publicly listed and traded on stock exchanges) and 31 foreign banks. They have a combined network of over 53,000 branches and 17,000 ATMs. According to a report by ICRA Limited, a rating agency, the public sector banks hold over 75 percent of total assets of the banking industry, with the private and foreign banks holding 18.2% and 6.5% respectively.

The Indian Banking Industry has witnessed a spate of IT developments in recent years in information collection, storage, processing and transmission technologies. Every bank, including public sector and co-operative banks has been waking up to the inevitability of automating their businesses and IT-enabling their processes. Nearly everyone approaches vendors and consultants to help achieve this.

IT developments affect banking in two ways: first, they contribute in the reduction of costs associated with the management of information(collection, storage, processing and transmission) by replacing paper-based and labour-intensive methods with automated processes. Secondly, they modify the ways in which customers have access to a bank's services and products, mainly through the use of automated processes such as remote banking. Remote banking includes ATM, online banking and telephone banking services.

The status of automation in the banks in the country is not uniform. The level and extent of automation in the banks in general vary because of their history, work culture and policies/strategies adopted by their management in branch expansion, and in respect of investment in technology and human resource development.

Management Information System (MIS) and the Banking Sector

The use of the term-*Management Information System (MIS)* has been prevalent in the banking sector since the early 80s. Banks have been using this terminology to refer to the process of generating various reports and analyses at the Corporate/Head offices for their decision making for own use as well as for conveyance to authorities in charge of regulation. Often, these reports are generated through computers and can be generated at any point of time. However, the usage of the terms *data warehousing* and *data mining* are relatively new. These terms have gained significance with the growing sophistication of technology and the need for predictive analysis with *What if* simulations.

As more and more data is being created and converted to digital streams, banks need a way to consolidate and harness all of it. Banks need a way to tap into it for powerful reporting and forecasting. This is where Data Warehousing and Business Intelligence come into play.

MIS in the present context of high availability of voluminous data on electronic media at diverse locations and on diverse platforms, has become more pertinent to banks' decision-making processes, due to the availability of new tools of technology such as data warehousing and data mining.

IT Initiatives in Some Indian Banks

2.1. State Bank of India (SBI)

State Bank of India (SBI) is a Public Sector Banking Organisation (PSB), in which the Government of India is the biggest shareholder. It is the largest bank in India and is ranked in the 380th position in 2008 Fortune Global 500 list, and ranked in the 219th position in 2008 Forbes Global 2000 list. Measured by the number of branch offices, SBI is the second largest bank in the world. SBI traces its ancestry back to the Bank of Calcutta, which was established in 1806; this makes SBI the oldest commercial bank in the Indian subcontinent. SBI provides various domestic, international and NRI products and services, through its vast network in India and overseas. With an asset base of \$126 billion and its reach, it is a regional banking behemoth.

State Bank of India has electronically networked all of its metropolitan, urban and semi-urban branches under its Core Banking System (CBS). The bank has the largest ATM network in the country having more than 8000+ ATMs. SBI is also offering telephone banking and online banking on a very large scale.

State Bank of India launched a project in 2002 to network more than 14,000 domestic and 70 foreign offices and branches. The first and the second phases of the project have already been completed and the third phase is still in progress.

State Bank of India provides trade finance services to its customers through its eTradeSBI facility in real time. eTradeSBI System is an adaptable and easy to use solution that provides extensive trade finance functions for the bank's customers including the ability to input, authorize, release, re-issue, update and amend Letters of Credit, Export Letters of Credit, Bank Guarantee, Payment instructions, Purchase Orders and Collections.

Real-time Processing

The input screens can be tailored to meet individual customer needs. There is minimal manual intervention required by banks as customers input the data, thus avoiding errors

in transcription and interpretation—all of which helps to decrease the processing time from the initial request until the valid document is in the customer's hands. Customers can model new transactions from previously released transactions to shorten the data entry process and to quickly create new documents such as Letters of Credit.

Guaranteed Security

eTradeSBI provides the highest levels of security. All users are required to log on by entering a user ID and password. The medium of communication is through Internet, where information is transmitted using Secure Socket Layer. Additional security can be easily incorporated using devices such as Smart Cards and Time based Tokens. eTradeSBI is also designed to run in environments where communication with external user population is through a firewall. The base architecture of eTradeSBI consists of MS Internet Informations Server and MS SQL.

2.2. Bank Of India (BoI)

Bank of India (BoI) is one of India's largest public sector banks with over 2600 branches across India, and a network of 21 branches at key financial centres across 10 countries. BoI has branches for Commercial & Personal Banking, Corporate Banking, Overseas Banking, Capital Market, Merchant Banking and specialised branches for asset recovery, small scale industries, hi-tech agricultural finance, rural finance, lease finance and treasury.

With branches spread across the country, a distributed database, separate LAN and no centralised system among the branches, the top level management faced several problems while taking decisions. To effectively meet the ever-growing challenges and competition, the Bank made a good headway in bringing about technological up-gradation. MIS and critical functions of controlling offices were computerised. Further, the bank wanted to move to the next level of IT enablement through the implementation of Core Banking System (CBS) thereby making a paradigm shift from branch automation to bank automation.

In its attempt to provide its existing and new customers with a Core Banking System (CBS), BoI has deployed a range of solutions from HP. It has signed a 10 year contract with HP to provide services ranging from customer service to consulting integration along with network management, disaster recovery, business continuity and availability and system integration.

A Customer-centric Approach

The primary requirement of the bank was to have a flexible, scalable and innovative technology infrastructure that would provide the business agility to respond to the changing market dynamics. With the coming up of various private banks in the banking

scenario in India, BOI wanted a customer centric, customer aware infrastructure that would enable the bank to substantially boost its existing customer service levels and attract new customers.

BoI employed the services of HP for implementing and managing a data warehousing and document imaging solution and to provide integrated channel management including Telephone Banking, Internet Banking and ATM. HP also manages IT infrastructure and networks across branches of the bank, maintains technology products including servers, desktops and peripherals across the branches and provides asset refresh and obsolescence protection for IT assets. Along with mission critical applications from HP, BoI has implemented Finacle, the financial software from Infosys.

The mission critical applications include data centre to ensure business continuity for core banking operations. For a large bank with so many branches around the country, business continuity has to be maintained at all times and downtimes can rarely be afforded. HP data centre consolidation solution helped to reduce risk, improve security and lower management and operational costs.

2.3. ICICI Bank

ICICI Bank is India's second-largest bank, with total assets of over US\$38 billion as of March 31st, 2008. ICICI Bank is ranked third in free float market capitalization among all the companies listed on the Indian stock exchanges. With business transactions growing exponentially, one of the key parameters for the evaluation of a solution was the scalability to support the growing data in ICICI Bank. One of the major business concerns was supporting the business if the growth in the number of users exceeded the planned number.

ICICI used the SAS Web-based solution to provide information access to all users across the bank. The SAS Data Integration application was used for the creation of data marts. Using its vast data warehouse, ICICI bank has serviced over 11 million unique customers around the country. The Teradata solution has also helped the bank optimise its delivery channels across 400 shopfronts, 1,600-plus ATMs, multiple call centres and Internet banking services. ICICI Bank is currently expanding its Teradata EDW to incorporate information from call centres and web-based transactions. Non-branch transactions have grown substantially with the use of the data warehouse.

3. THE HEALTH CARE INDUSTRY

Indian Health Care Industry is growing at 12% annually and is the fastest growing health care IT market in Asia with an expected growth rate of 22%, says a recent report by Springboard Research. Hospitals across the country are leveraging the power of IT to provide the best of healthcare services.

Indian healthcare industry has gone through a significant transformation in the past decade. Increased participation of private players (60% of health expenditure in private sector) has dramatically improved hospitals' infrastructure and patient services. Unlike earlier, when patients had to travel abroad to avail of high-end healthcare services, we now have patients coming to India for super-speciality healthcare.

The Indian healthcare sector has started focusing on serving customers better, keeping in mind the need to balance a robust and profitable business operation and meeting broader social objectives. A particular focus area has been how service to the end-customer, the patient, can improve. As has been the case with performance improvement initiatives in other verticals, IT has played a critical role in providing the bedrock of operational systems. These systems can streamline information processes of an organisation, iron out inefficiencies that grow due to lack of information, and be employed to assist the delivery of better care to patients.

A key area where IT is playing a major role is in understanding that caregivers and patients will want information to be available at their fingertips, and IT systems such as data warehousing have a key role to play in this. Hospitals are slowly moving towards clinical information systems, and those that do so will find their costs lowered, their quality raised, and their cash flow improved.

Some Emerging Technologies

The Electronic Health Record (EHR) provides doctors with a quick, reliable, secure, real-time and user-friendly source of all relevant patient data. The latest information system technologies, such as Clinical Data Warehouses (CDW), Clinical Decision-Support Systems (CDS), data-mining techniques, Online Analytical Processing (OLAP) and Online Transactional Processing (OLTP), are used to maintain and utilise patient data intelligently, based on the users' requirements. Clinical trial reports for new drug approvals are now being submitted electronically for faster and easier processing. Information systems are used in educating patients about the latest developments in medical science through the internet and specially configured kiosks in hospitals and clinics. Some Indian hospitals which have significantly improved their services due to the adoption of IT are:

3.1. Apollo Hospitals Enterprises Limited (AHEL)

AHEL has emerged as the single largest private hospital group in Asia and is a leader in the delivery of health care within the Asian subcontinent. It commands the leadership by providing health care to nations in the Asian subcontinent through 26 hospitals, 3800 hospital beds projected to expand to 47 hospitals and over 7000 hospital beds in the near future.

Apollo uses an integrated Hospital Information System (HIS) in its hospitals with a suite of modules providing computerized services booking, automated nursing documentation, integrated pharmacy, automated medication administration and billing system. The HIS is seamlessly integrated across all points of care & support functions, configurable to dynamic clinical and administrative parameters ensuring a flexible user defined solution, highly secure and protects clinically sensitive information with option to configure access depending on roles, user/group types, follows International Medical Standards for codification and scalable beyond the four walls of the healthcare entity by leveraging the power of the web.

In addition, the HIS integrates the front-office operations like Helpdesk, Registration, Appointments Scheduling, OP Clinics, and Patient Admissions to points-of-care like Wards, Day Care unit, ICU/CCU/PICUs, Operation Theatres, Laboratories, Radiology and Pharmacy. All these modules are tightly integrated with Billing, hence ensuring nil revenue leakage. HIS also supports back-office functions like Inventory administration, Payroll and MIS Reports generation.

3.2. CARE Group of Hospitals

CARE Group of Hospitals, is one of the premier private sector healthcare facilities in South India. Based in the twin cities of Hyderabad and Secunderabad, the group has 615 beds spread across three locations with super specialty facilities for cardiology, neurology and gastroenterology. With more than 200 consultants and 1800 employees, the hospital is one of the premier sites that has implemented HIS.

To propel its growth plans and to integrate all the functionalities in the hospitals, Quality Care India Ltd, the corporate entity of CARE Group has implemented an online Healthcare Information System and customized it to meet its needs. Over the years, all the units have been integrated with consolidation of functions like accounts, purchase and human resource management.

The hospital has a Management Information System for patient management, hospital resources, clinical works, revenues/expenditures, and a Laboratory Information System for admissions and discharge of patients.

3.3. Wockhardt Hospitals

Wockhardt Hospitals, a part of the \$300 million Wockhardt Group has always spearheaded innovative IT solutions to enhance the patient care delivery.

Wockhardt has created a high-end Hospital Information System (HIS) that has been standardised across the entire chain of hospitals. HIS takes care of the administrative and clinical processes inside the hospitals. Wockhardt has also incorporated PACS (Picture

archiving and communication system) at all the hospitals, which helps in routing of several kinds of images like MRI scans, CT scans, CATE lab images, and ultrasound images. Wockhardt was the first hospital group to employ the concept of 'Virtual Family Visit', which allowed the relatives of patients to check a patient's condition right after a major surgery, through a recorded message on the hospital's website. Apart from this, Wockhardt has online billing systems and 24/7 contact centre for their international clients.

Wockhardt has used IT in every core discipline of the hospital. The entire chain of hospitals is well connected through efficient networks. Data storage and data mining is also being used by the hospital. The hospital has high-end and back up servers to ensure that only critical information is available on the main server, which also ensures least redundancy and breakdown times. Wockhardt is now creating very high-end hospitals even in remote regions, where super-speciality healthcare was never thought of.

4. ENTERTAINMENT AND MEDIA INDUSTRY

The Indian Entertainment and Media (E&M) industry is poised to grow at 18% compound annual growth rate (CAGR) between 2008-12 to touch Rs 1,15,700 crore by 2012 from its estimated size of Rs 51,300 crore in 2007, according to a latest report by FICCI and PricewaterhouseCoopers. Economic growth, rising income levels, consumerism, coupled with technological advancements and policy initiatives taken by the Indian government that are encouraging the inflow of investment, will prove to be the key drivers for the entertainment and media industry.

4.1. Adlabs Cinemas

With one IMAX theatre, 33 properties and 106 screens, Adlabs Cinemas is arguably the largest cinema chain in India. With plans to expand to over 300 screens by 2008, Adlabs is looking to IT to be the driving factor behind this growth.

Information Technology is the backbone of operations at Adlabs-part of Reliance ADAG. All the systems, operational services and back-end operations that include ticketing and retail stalls operate on an IT backbone. At Adlabs, the focus is to enable consumers to book tickets easily, from the comfort of their homes. Thus from an operational services standpoint, Adlabs is completely IT dependent.

The IVR system

Adlabs Cinemas has implemented an Integrated Voice Recognition (IVR) system to achieve maximum consumer convenience in booking movie tickets. The primary challenge that Adlabs faces is with connectivity in tier II and tier III cities. As it is a part of Reliance ADAG, Reliance Broadband is responsible for providing Adlabs the network infrastructure.

After extensive project planning, a three-phase implementation was decided upon. The first phase involved deploying the IVR solution sans the pre-payment option. This was for customers who used the telebooking facility, but did not want to make a financial commitment. These customers would be given an identity number during booking and have to collect the ticket from the respective cinema an hour before the scheduled show time.

The recently concluded second phase involved automating the payment gateway. This was achieved through a tie-up with HDFC bank. This will allow people to pay for tickets in advance through the IVR, cutting out the need to come an hour early to collect tickets.

The third phase will involve implementation of speech recognition in the IVR system. Consumers will then be able to book tickets by mentioning the name of the movie, day and show time. This will allow customers to cut down call timings by avoiding listening to the entire list of movies and timings available.

This IVR implementation has reaped multiple benefits to both Adlabs Cinemas and moviegoers around India. It has allowed Adlabs to streamline operations by cutting down on call turn-around times. In addition to this, the IVR has aided in cutting costs reducing the load on contact centres, at the same time quadrupling the number of calls that can be handled simultaneously.

As manpower forecasting and workflow management are other areas of concern, the company is in the process of deploying a workflow management solution to streamline processes. Adlabs is also planning a SAP ERP implementation. The company is conducting a feasibility study for two modules, Financials and HR. The Reliance Energy SAP team will support this SAP implementation.

To utilise the next major channel after voice and the web, Adlabs is in the process of launching a mobile application, which moviegoers can download off their website and use to book tickets. Adding to this, they also plan to set up a secured SMS payment facility by December.

Adlabs now has brought 6D cinema to India through a technology tie-up with Israel-based cinema Park Networks (CPN). The technology-driven visual effects and acoustics of 6D combine strikingly real three-dimensional images with the senses of smell, sound, touch, motion and interactivity. For instance, the chair on which the viewer sits can swivel a full 360 degrees, shake or swing gently, depending on what the plot demands. The new technology allows an individual to smell a flower, or feel the touch of a character shown on the screen. Besides special viewing glasses for viewers, 6D cinema, which has no print and is played on a computer, calls for a digital projector. 6D cinema's 'Smart Seats' supplied by Israel-based Simnoa, have features such as 'movement', 'water jet', 'tickler' and 'air and fragrance nozzles'.

4.2. Doordarshan

Doordarshan, the Indian national television network devoted to public service broadcasting, is one of the largest terrestrial broadcasting networks in the world, with 49 studio centers, 21 channels broadcast through a network of 1,150 transmitters reaching 87.9% of the country's 950 million people. Doordarshan output includes 1,485 hours of programming each week. Doordarshan uses a large number of transponders on the INSAT and other satellites to network its terrestrial transmitters and also to provide additional satellite channels. Doordarshan has established programme production facilities in 47 cities across the country.

India's national public service broadcaster, has deployed NDS Open VideoGuard (TM) digital conditional access to create a platform for its next generation of digital entertainment and interactive TV services. The NDS Open VideoGuard conditional access system is integrated at Doordarshan's broadcast center in New Delhi, and the broadcast signal is delivered to authorized set-top boxes located in cable headends nationwide.

5. THE COURIER AND LOGISTICS INDUSTRY

Growing business requirement for time-bound and reliable delivery of documents and parcels has fuelled the growth of the courier industry in India. According to a market study conducted by the Express Industry Council of India, the size of the organized courier industry in the country is estimated at around Rs 3,600 crores.

Not so long ago, most of the courier companies in India had only limited package-tracking systems in place. Today, courier companies are moving towards implementing complete workflow automation systems.

Making the supply chain more efficient and driving down inventory is becoming a necessity to cut down costs in depressed markets. To deliver on this front, logistics and transportation companies are investing in technology that will allow them to manage information on consignment movement, billing, auditing and payment efficiently.

Most logistics companies have also realised that they need to move beyond shipment tracking and integrate all their activities like supply chain, sales force and warehouse management. Some companies in India which have taken initiatives in that direction are:

5.1. Blue Dart Express Limited

As a technology leader in the business of supply-chain management in the country, Blue Dart Express Limited recognised the far-reaching scope of the internet in 1996, and has been exploring web-based solutions to extend the range of services available to its customers and integrate them into its core products.

Blue Dart has evolved an e-strategy which encompasses e-solutions to deliver additional process efficiencies to business by allowing them access to Blue Dart's e-shipping tools and integration with its e-business tools. An individual solution is available for each business, big or small, transacting off the internet or on the internet, and ranging from a stand-alone to a fully integrated one.

The basic tracking solution will enable Blue Dart's customers to track their shipments, through single or multiple waybills, on-line. Customers can check the status of their shipments using a waybill number or a reference number. A mail-based solution will allow the customers to query status of their shipments using e-mail. Registered customers of Blue Dart can make advanced queries on the status of their shipments, and can keep track of them for up to 45 days on-line. They can filter their queries by date, range, origin, destination and service, and sort the results on-line. Registered customers can download the entire waybill tracking data - schedule the download, and select the frequency and the data to be downloaded. These customers can also generate and download various reports customised to meet their individual needs.

Bluedart puts all its points of tracking into a centralised database. The company's shipments are tracked at 17 points across the country. Bluedart has a distributed database structure on Oracle 8i and Sun Solaris in all the metro cities. These databases are connected with its networks across India — the company today has information of all 11,900 locations in its database. This structure has helped the company generate information on the delivery status with 97 per cent accuracy.

Blue Dart does its customisation and maintenance in-house. However, it has partners like Netcraft for Web-based applications, Wipro for Oracle and Sun integration and Microland for security. Blue Dart has connected most of its offices and every office has a person responsible for IT implementation.

Blue Dart is making every effort for its customers to track their packages, through either the Internet or telephone. Blue Dart allows for both SMS and online tracking.

5.2. DHL

DHL Express is a global leader of the international air express industry, accounting for a market share in excess of 37%. In India, as the industry leader, it enjoys a market share of 60% and an extensive history of nearly 30 years in the country.

DHL Express provides customers with courier, express and parcel services (CEP) in three product lines, differentiated between national and cross-border deliveries. DHL operates a network for intercontinental transport and cross-border transport within continents, via road, rail and air, providing both standard products and tailored solutions to customers in over 220 countries and territories. The network covers over 4,000 offices and more than 120,000 destinations worldwide.

DHL Express is the result of the consolidation of the former DHL Worldwide Express business and the Deutsche Post Euro Express parcels business and offers worldwide express delivery of documents and parcels, time-certain delivery, a range of e-commerce tools, an express logistics network and a Strategic Parts Centre, as well as technology for the electronic tracking of shipments.

DHL's international expertise is reflected in effective all-round CCTV monitoring, enhanced safety and security procedures, weight dimension labelling machines (WDL) for accurate weighing, radio frequency scanners, powered conveyor belts, power stackers to handle heavy loads, Piece ID to uniquely identify each shipment, Next Generation Scanners for data transfer from anywhere in Kolkata, and Access Controlled Movement amongst others that bring global standards to India thereby setting new benchmarks in the Logistics industry.

The company has separate modules for shipment tracking and customer service. For ground operations, it has shipment control libraries that assimilate information on consignment tracking at different stages. DHL uses scanners at various points of movement that scan the goods and send across details to the servers. DHL is looking at next-generation scanners that can be connected to the GSM network. Currently, the company relies on a distributed architecture of HP Unix with HP servers in metros.

DHL now has a Web Application for Sales Performance that processes information on sales call planning, feedback, reports analysis, customer interests and contact database of customers — records information of customers logging into DHL services and builds a database. This software detects the market for DHL and helps the sales group direct the services arm to open centres in those areas. DHL delivers within 24 hours of a purchase order. DHL customers can get an instant SMS message on the status of their packages by dialling a phone number and putting in the air bill number. The customer can also track the consignment by logging on to track@dhl.com. Most companies believe that Net-based tracking is an ideal option. To provide this, the entire process of tracking goods is automated, from booking to delivery.

5.3. Gati Limited

Gati Limited is a leader in the Indian express cargo delivery sector. To Gati goes the credit of pioneering distribution and supply chain management solutions in the country. It started off in the cargo management business in 1989 and today employs 6400 people. The company has 2000 vehicles on road. Its clients include large corporates, small and medium enterprises, units in cluster markets, wholesalers and individuals. Brands of the company are Gati Express, Gati Priority, Gati Coast to Coast, Zipp and GatiSaver.

Gati uses IT solutions for most of their activities. Gati Cargo, for example, is implementing an enterprise resource planning (ERP) package from Oracle Finance to

make its supply chain more manageable. It has tied up with Satyam Computers to deploy new technologies-Oracle CRM, Oracle Finance and related customised software at a cost of Rs 7 crore.

The company is also putting in place a collaborative warehouse and transport management system. For pickup and delivery, it uses a logistics management system solution designed and developed by iPlanet.

6. SUMMARY

In a dynamic world powered by IT, any hitch means losing out on precious time, setting back of deadlines and thereby affecting bottomlines. Timely adoption of technological innovation and initiatives, regulatory and infrastructural reforms are therefore key drivers of service organizations and overall economic growth. With an average growth rate of 8.6 per cent over the past three years, India became a trillion-dollar economy by 2007 and according to PricewaterhouseCoopers report, it might become the largest economy by the middle of the century. In Finance Minister Mr. P. Chidambaram's words, the drivers of growth seem to have moved from the developed world to the developing world.

Impending issues that need attention and government intervention are the losses incurred by the services sector along with the manufacturing and agricultural sectors due to a steady appreciation of the rupee. Besides the required regulatory reforms, lack of adequate infrastructure is being seen as a major stumbling block in the creation of centres of excellence in services within the country and especially in rural India. The government and corporates alike need to address these issues, understand the changing demographics and tap the enormous potential of existing information technologies in the field of services. They should also look for avenues to import and implement new and improved Information Technologies and set the stage for service sector progress.

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