Global Delivery of IT Services:  
Looking beyond the Global Delivery Model

by

Binoy Cherian

Submitted to the System Design and Management Program
in Partial Fulfillment of the Requirements for the Degree of

Master of Science in Engineering and Management

at the

Massachusetts Institute of Technology

June 2007

© Binoy Cherian, 2007. All rights reserved.

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this
thesis document in whole or in part.

Signature of Author

Binoy Cherian
System Design and Management Program
June 2007

Certified by

Michael Cusumano
Thesis Supervisor
Sloan Management Review Distinguished Professor of Management

Accepted by

Patrick Hale
Director
System Design and Management Program
DISCLAIMER OF QUALITY

Due to the condition of the original material, there are unavoidable flaws in this reproduction. We have made every effort possible to provide you with the best copy available. If you are dissatisfied with this product and find it unusable, please contact Document Services as soon as possible.

Thank you.

Due to the quality of the original material there is some bleed through.
Global Delivery of IT Services: 
Looking beyond the Global Delivery Model

by

Binoy Cherian

Submitted to the System Design and Management Program in Partial Fulfillment of the Requirements for the Degree of

Master of Science in Engineering and Management

at the

Massachusetts Institute of Technology

Abstract

The objective of this thesis is to analyze the factors that create competitive advantage through global delivery of IT services. Research on this thesis consists of a review of IT services markets and globally distributed operating models for IT services. A simple framework is created to analyze global delivery models (GDM) used by IT services companies. A few companies, including Infosys, have pioneered the GDM and hence the framework created is used to analyze Infosys’ global delivery model. Finally, recommendations are made, based on this analysis, to enable firms to gain competitive advantage by looking beyond the adoption of global delivery models for IT services.

Thesis Supervisor: Michael Cusumano
Sloan Management Review Distinguished Professor of Management
ACKNOWLEDGEMENTS

I would like to thank Prof. Michael Cusumano, for supervising my thesis and providing me direction and guidance throughout this thesis work. The Software Business course taught by Prof. Michael Cusumano provided me with valuable insights about the various software business management issues.

I wish to thank the faculty, staff, and fellow students at MIT and SDM community for sharing their knowledge and expertise at various stages of the project; executives at various companies, whom I interacted with during this thesis work, for their feedback, guidance, and encouragement; Infosys, and its executives, for participating in interviews and providing insights on the GDM at Infosys.

These acknowledgements would be incomplete without giving due credit to my wife, Smitha, whose infinite patience and love made this work feasible, my daughter, Sarah, for being my source of inspiration, my parents, Punnose and Raji, for their caring support during this and many previous years.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS .................................................................................................................. 5  
TABLE OF CONTENTS .................................................................................................................... 7  
LIST OF FIGURES ............................................................................................................................ 9  
LIST OF TABLES ............................................................................................................................. 10  
1.0 INTRODUCTION ...................................................................................................................... 11  
1.1 Motivation................................................................................................................................. 11  
1.2 Thesis Purpose and Structure: ............................................................................................... 12  
2.0 CHRONOLOGICAL STUDY OF OPERATING MODELS FOR GLOBAL IT SERVICES ................................................................................................................................. 14  
2.1 Introduction: .............................................................................................................................. 14  
2.2 Evolution of operating models for global IT services ............................................................. 14  
  2.2.1 Traditional onsite model ....................................................................................................... 19  
  2.2.2 Offsite model ....................................................................................................................... 20  
  2.2.3 Offshore model ................................................................................................................... 20  
  2.2.4 Onsite/offshore model........................................................................................................... 20  
  2.2.5 Offsite/offshore model........................................................................................................... 21  
  2.2.6 Global delivery model.......................................................................................................... 21  
2.3 State of Global IT services market ......................................................................................... 23  
  2.3.1 Market Segment Analysis .................................................................................................. 23  
  2.3.2 Market analysis across geographies .................................................................................... 28  
  2.3.3 Market Players .................................................................................................................... 33  
2.4 Key drivers for global delivery of IT services ....................................................................... 35  
2.5 Key Challenges in global delivery of IT services ................................................................. 37  
2.6 Summary .................................................................................................................................. 41  
3.0 FRAMEWORK FOR EVALUATING GLOBAL OPERATING MODEL FOR IT SERVICES ................................................................................................................................. 42  
3.1 Introduction ............................................................................................................................... 42  
3.2 Stakeholder analysis of global delivery model for IT services ............................................. 42  
3.3 Framework ................................................................................................................................ 46  
  3.3.1 IT services ecosystem evaluation ....................................................................................... 48  
  3.3.2 Process efficiency evaluation .............................................................................................. 48  
  3.3.3 IT Savvy evaluation ............................................................................................................. 49  
  3.3.4 People evaluation ............................................................................................................... 51  
  3.3.5 Technology/domain competence evaluation ....................................................................... 51  
  3.3.6 Global presence evaluation ................................................................................................. 51  
  3.3.7 Organization structure and governance evaluation ............................................................ 52  
3.4 Summary .................................................................................................................................. 52
LIST OF FIGURES

Figure 1: Historical overview of focus areas in IT Organizations that led to sourcing decisions [3]...................................................................................................................... 15
Figure 2: IT Services Market Segments ........................................................................................................ 23
Figure 3: Worldwide application outsourcing forecast, 2005-2010 [9]......................................................... 24
Figure 4: Worldwide IT Infrastructure outsourcing forecast, 2005-2010 [9].................................................... 25
Figure 5: Worldwide business process outsourcing forecast, 2005-2010 [9].................................................. 26
Figure 6: Worldwide IT Services Market User Spending [10]............................................................................. 27
Figure 7: Worldwide IT Management Forecast Sub Segments [10]............................................................ 27
Figure 8: Annual GDP Growth Rates, 2006 [3] .................................................................................................... 28
Figure 9: IT Infrastructure outsourcing by region, 2005-2006 [9]..................................................................... 29
Figure 10: Application outsourcing by region 2005-2006 [9]....................................................................... 30
Figure 11: Business process outsourcing by region 2005-2006 [10]............................................................... 30
Figure 12: Growth in emerging economy workforce (percentage change 1995-2005) [12]............................. 31
Figure 13: Hourly labor costs for engineers in various countries [13]............................................................... 32
Figure 14: Evolution of service provider landscape [16]..................................................................................... 34
Figure 15: Magic Quadrant for Offshore Application Services, 2006 [17]...................................................... 35
Figure 16: Types of miscommunication across distributed software teams [18].............................................. 37
Figure 17: Sample Application Development Vendors: Numerous Tools, Not a seamless platform [18]......................... 38
Figure 18: The Centrifugal Forces of Global Software Teams [1]......................................................................... 39
Figure 19: The Centripetal Forces of Global Software Teams [1]........................................................................ 40
Figure 20: Stakeholder value flow for a global IT services company................................................................. 43
Figure 21: Selecting and integrating right IT service components in Global Operating Model for optimum value ........................................................................................................................................ 44
Figure 22: Line-of-Business Priorities in IT [1].................................................................................................. 45
Figure 23: Framework for evaluating global operating model for IT services.................................................. 47
Figure 24: Revenue by industry verticals (2000 and 2006) [6]............................................................................ 57
Figure 25: What components of Infosys' services are disruptive [9].................................................................... 59
Figure 26: Infosys Quality Systems Documentation [13]................................................................................... 62
Figure 27: Onsite-Offshore Ratio [4].................................................................................................................. 71
Figure 28: Talent Recruitment [6]................................................................................................................... 72
Figure 29: Employee growth [6]....................................................................................................................... 72
Figure 30: Employee Utilization Rates [4].......................................................................................................... 73
Figure 31: Employee Attrition Rates [6]............................................................................................................. 73
Figure 32: Revenue by Geography (FY2000 and FY2006) [6]............................................................................ 76
Figure 33: Global Delivery Model as a System of Systems.............................................................................. 84
Figure 34: Cause effect diagram of capabilities and competitiveness for global IT services................................................................. 94
LIST OF TABLES

Table 1: Evolution of Client's Offshore Mixes [6] .......................................................... 19
Table 2: Revenues based on IT service segments [4] ......................................................... 54
Table 3: Best suited locations for various types of Infosys Project Work Items [5] ........ 55
Table 4: Revenues based on industry segments [4] ........................................................... 56
Table 5: Revenue by Geography (FY2005 and FY2006) [4] ............................................. 77
1.0 INTRODUCTION

1.1 Motivation

“...the flattening of the world means ...we are now connecting all the knowledge centers on the planet together into a single global network, which ...could usher in an amazing era of prosperity and innovation.” [1]

Thomas Friedman,
The World is Flat; A brief History of the Twenty-First Century.

Globalization of companies, markets, improvements in global telecommunications, and information technologies have led to companies utilizing globally distributed teams for delivery of software services in an effort to leverage top expertise globally, maximize cost savings, and to provide maximum satisfaction to all stakeholders in the project.

Globalization, along with rapid advances in technologies, challenges the paradigms of what, how, and where IT services are delivered and consumed. The emergence of low-cost off shoring of IT services to cheaper locations, such as countries in Asia, has created a significant and irreversible impact on the entire IT services landscape. The global delivery model (GDM) helps IT services companies to deliver value to its customers. Yet, given the scenario that all the top IT services firms are maturing in their offerings, how would they remain competitive in the next five to ten years? What do they need to do beyond the GDM to retain, or gain, the competitive advantage?
1.2 Thesis Purpose and Structure:

This thesis studies the global GDM for IT services and its markets, defines evaluation criteria for global delivery of Information Technology (IT) services, and applies those criteria to evaluate Infosys, a leading global IT services company. Based on research done in this thesis work, recommendations are developed for IT services companies to remain competitive in the next five to ten years.

Chapter 2 focuses on the chronological study of operating models for global IT services, based on geographical distribution. Sector wise, as well as region wise, analysis of the world IT services industry is done in this chapter.

A simple framework is created in Chapter 3 to critically analyze the IT service ecosystem, and the various inputs to the value chain, to ensure that the GDM is working. This chapter maps the value-flow among the various stakeholders in a global IT services company, and the relationships between them. The framework used is based on many system design and management skills that the author learned while participating in the System Design and Management (SDM) program at the Massachusetts Institute of Technology (MIT). The framework was approached from a holistic viewpoint by identifying the key elements within the system “Global delivery model for IT Services,” and defining the important relationships between those elements.

Infosys has been evaluated as a top leader in Global Delivery of IT Services in the Magic Quadrant for Application Outsourcing Services 2006, developed by Gartner Research [2]. In Chapter 4, Infosys’ GDM is evaluated using the framework developed in this thesis for analyzing competitiveness of global delivery model. Here, the GDM
adopted by Infosys in the last few years, along with the results of execution of these strategies, are analyzed.

In Chapter 5 various recommendations are provided to improve GDM for IT services based on observations from the case study and research done as part of this thesis work. This thesis concludes that the GDM is fine, as of now, but for companies to grow and remain profitable, while adding value for the customers, they need to adopt holistic, global, and systematic approaches to the design and delivery of IT services.
2.0 CHRONOLOGICAL STUDY OF OPERATING MODELS FOR GLOBAL IT SERVICES

2.1 Introduction:

Globalization and technological advancement, over the past few years, has created challenges and opportunities for companies to rethink their business strategies for IT services delivery in order to compete in the new flat world. Erran Carmel [1] explains that over the past decade there emerged two key changes in the way software was developed. The first change was the spread of software development activities from industrialized nations to developing nations. The second was the transition from the traditional, centralized form of software development to globally distributed software development with teams working on the same project across geographies, time zones, and cultures.

In this chapter, I present a historical overview of the evolution of operational models in IT services based on geographic locations. The evolution of operating models, driving factors, challenges, state of IT services market, and location preferences in the delivery of Global IT services are reviewed in this chapter.

2.2 Evolution of operating models for global IT services

Over the years, new operating models for IT services evolved with the development of new software technologies and due to the impact of globalization. According to Cusumano[2], “Because of the potential for rapid change in the marketplace, software companies must combine extraordinary levels of structure with flexibility. Companies must pay constant attention to strategies and business models as
well as continuously evolving their technical skills and core technologies”. Figure one, shows the changes in operational imperatives, business disciplines, and sourcing actions over various time periods. These changes had an impact on the evolution of IT services operating models.

The early years of the evolution of software, until the mid-1980s, was a period of technological innovation. New software technologies were born during this period, and the software industry, in this period, was nascent and immature. Most software projects ran over budget and schedule during this period. The operational imperatives were productive, but evolved to emphasize quality. The periods till the early 1980s saw companies mainly developing software in-house at a single location (now popularly known as “onsite location”).

![Figure 1: Historical overview of focus areas in IT Organizations that led to sourcing decisions [3]](image)

The mid-1980s to the mid-1990s saw an increase in software adoption in businesses. Also, the complexity of software for business usage increased during these periods. This
led to IT outsourcing and business process outsourcing by companies whose primary activity was not software development. External vendors were deployed onsite to take up software service activities for clients. This period led to the development of tools, discipline, formal methods, process, and professionalism in the IT services sector. The software outsourcing started in various forms. In his book *The Business of Software*, M. Cusumano mentions that the outsourcing of software development can come in various forms: from subcontracting only programming tasks, to relying on the supplier for a complete solution [2]. At one end of the spectrum, we have the Japanese approach, with their software factories, where clear specifications are given just to perform the coding task. At the other end, we have the IT services organization approach, where systems are customized in collaboration with the customer and supplier. A special case of a complete outsourcing solution was the black-box approach or, “the use of formal project requirements to transfer knowledge about the application problem domain from the client to the vendor organization [4].”

The 1990s decade was the period of the information superhighway, led by the growth of the Internet and communication technologies. This led software vendors to start utilizing near shore and offshore locations to outsource IT services. The economic logic to offshore IT work was to reduce costs due to labor arbitrage in a low-cost country. During the early 1990s, off shoring of low-end IT functions took place in countries such as India. By the late 1990s, abundant and cheap software engineering talent combined with a huge demand for software services led several offshore-based firms to move up the value chain to attract large scale software development projects for US based and global customers. Distributed software services teams became more attractive as off-shore
sourcing and outsourcing strategies were implemented. Globally distributed delivery
to the physical locations. Due to technological advancement, terrestrial and satellite
dedicated links, video-conferencing, online chats, e-mails, and telephones, a multi-shore
delivery system works as a single virtual unit, regardless of where people are actuallylocated. From humble beginnings as a mere cost-cutting concept, distributed delivery of
IT services has gradually moved ahead and established itself as a successful business model by rendering, not only cost-effective, but also sophisticated and highly efficient quality services. Numerous delivery models, based geographical location of teams, have evolved for IT services such as:

- Traditional onsite model
- Offsite model
- Offshore model
- Onsite/offshore model
- Offsite/offshore model
- Global delivery model

The distribution of activities across the various delivery models may vary from one project to another. This may be attributed to factors such as effort involved, level of interaction, cultural, and time-zone differences. Some projects, like migration and re-engineering, can be executed totally offshore, but others, like enterprise application integration-related projects, can demand almost a cent-per-cent execution on an onsite location. In this paper, I discuss the different kinds of delivery models currently used by service providers the world over.
The evolution of offshore mixes is listed in the table below:

<table>
<thead>
<tr>
<th>Service</th>
<th>Bystanders</th>
<th>Experimenters</th>
<th>Committed</th>
<th>Full exploiters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application development</td>
<td>0 %</td>
<td>60% onshore</td>
<td>50% onshore</td>
<td>30% onshore</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40% offshore</td>
<td>50% offshore</td>
<td>70% offshore</td>
</tr>
<tr>
<td>Application maintenance</td>
<td>0 %</td>
<td>0 %</td>
<td>35% onshore</td>
<td>20% onshore</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>65% offshore</td>
<td>80% offshore</td>
</tr>
<tr>
<td>Packaged application implementation</td>
<td>0 %</td>
<td>0 %</td>
<td>65% onshore</td>
<td>55% onshore</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>35% offshore</td>
<td>45% offshore</td>
</tr>
<tr>
<td>Infrastructure management</td>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
<td>50% onshore</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% offshore</td>
</tr>
<tr>
<td>BPO</td>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
<td>70% onshore</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30% offshore</td>
</tr>
</tbody>
</table>

Table 1: Evolution of Client's Offshore Mixes [6]

2.2.1 Traditional onsite model

In this model, the set of processes starting from information gathering to implementation is done at a single location. This model becomes essential and suitable if the project needs very specific post-deployment, maintenance, support, and follow-up activities. The onsite model is helpful for those projects that are mission-critical, require proper and constant attention, and also need everything to be done in the client's location.
2.2.2 Offsite model

The offsite model of IT outsourcing involves having an external office near the client location. Not only does this offsite center have the benefit of being close to the client, but it also gives support to the onsite team and the offshore development activities at the offshore center. Thus, the experts at the IT outsourcing offsite center, in tandem with the corresponding offshore center team, can ensure on time, quality service through collaborative skills across different time zones.

2.2.3 Offshore model

The offshore model entails having project-related activity, right from initial study to testing, done at the service provider's premises. The providing company will not have any presence at the client's location but, the client will interact directly with the offshore team. The offshore outsourcing model is best suited to well-defined projects with clear client requirements. The team members at the offshore location interact with the client through various communications means such as telephone, email, etc.

2.2.4 Onsite/offshore model

The onsite/offshore model, gives an opportunity to the client to make direct communication with company through the onsite center and, at the same time, gives the client the chance to enjoy the benefits of the offshore development. Ideally 20% to 30% of work is done onsite, whereas 70% to 80% is outsourced offshore [19] depending upon the criticality of the project. Usually, requirements analysis (the development of detailed specifications, critical support, and implementation) are done onsite, while development and testing are outsourced offshore.
2.2.5 Offsite/offshore model

In this model, the service provider will have its office close to the client's location, and offshore outsourcing facilities at some other geographical region, which enables seamless transition and execution of projects without compromising quality and control for client management. The offsite facility serves as a medium of communication between the client and the offshore, outsourcing development team. Both the offsite and offshore outsourcing facilities are well connected with highly secure network services for seamless communication with the respective client. This connectivity setup ensures failure-free, fast, and secure access for the client to monitor the progress of development and support activity at both the offsite and offshore outsourcing locations.

2.2.6 Global delivery model

In the GDM, the offshore development center is spread out to multiple locations across multiple regions across the globe, unlike the onsite/offshore model where the offshore development center is located at only one place. The GDM ensures a well-planned mechanism, under which the project resources are distributed physically at multiple locations, enabling the IT service provider to select the best mix of resources and expertise to execute global projects most optimally. The GDM ensures better comfort to the outsourcing client in order to address risks, and is adopted to adjust to fast delivery of client requirements. This delivery model aims to productively spread out and manage engagements, resources, and expertise across multiple global locations, allowing the service provider to better respond to dynamic client requirements around the globe at unsurpassed levels of speed, quality, and value. Moreover, if any disaster strikes in any one of the locations, the outsourcing service provider can immediately pull up resources
from other locations so that there is no interruption in business. The distribution of activities across the onsite, and various offshore, locations may vary according to the demands of the project.

Tasks generally accomplished by the onsite team are [20]:

- “Understanding the client’s requirements.
- Directly interacting with the client to get a better idea of their needs and changes in them, if any.
- Acting as a mediator between the client and the offshore development centers.
- Planning and designing the initial steps of the project.
- Allocating tasks amongst the available resources.
- Testing the outcome of the project in tandem with the client’s team.
- Executing the project successfully at the client’s place.
- Providing the required support for maintenance.”

Tasks generally accomplished at the global development centers are [20]:

- “Detailed design that will be continuation of what the onsite team designed.
- Deciding any specific technological requirements for the project.
- Development.
- Testing before handing over to onsite team.
- Continuous technical support.”

The GDM has the ability to quickly respond to changing requirements of clients, due to the multiple onsite and offshore centers. If the project, at any phase, requires immediate attention, the onsite development centers allow for close interactions with the client, and the subsequent workloads are shared or distributed among the onsite and offshore development centers.
2.3 State of Global IT services market

Gartner [7] predicts that the worldwide IT services user spending will grow from $594.6 billion in 2004 to $796.8 billion in 2009 at the compound annual growth rate (CAGR) of 6%. IDC [8] predicts that 2007, and beyond, will see global IT services markets going through intense "hyper disruption," competition, transformation, and convergence.

In the next section, first we will review the market segments for Global IT services. We will then analyze the global IT services markets across key geographies, and, finally, we will review the players in this market.

2.3.1 Market Segment Analysis

The complexity of today’s software industry makes it difficult to separate one industry segment from another without making exceptions to the rules. From study of the IT services market segmentation we can identify the following major functional segments for the IT Services outsourcing market:

![IT Services Market Segments Diagram]

Figure 2: IT Services Market Segments
1. **Application Development**: This involves a wide range of software across enterprise application areas. IT services companies take a part of the customer's software product design, development process, integration, or project management, and adopt GDM when the application development market segment is most mature and GDM appears to be a major factor for application development deals. Gartner Dataquest forecasts the global application outsourcing market to be $39 billion in 2005, growing at a five year CAGR of 7.7%, to reach $58 billion in 2010.

![Graph showing worldwide application outsourcing forecast, 2005-2010](image)

*Figure 3: Worldwide application outsourcing forecast, 2005-2010 [9]*

2. **Infrastructure Management**: This involves foundational technology elements, involving a broad category of assets and architecture, used to store and access data, and for connectivity to transport information. Though infrastructure management outsourcing has been fairly mature in US, the adoption of GDM in infrastructure services is in early cycles, not yet mature, but, presenting a significant opportunity for IT service providers to adopt more efficient GDM
models in this segment. The adoption of GDM in this segment, currently, only represents 2% of the Infrastructure Management segment. The various sub-segments in infrastructure management segments are:

a. **Operations Services**: This involves management of a part of the customer’s IS infrastructure, operations, or network.

b. **Application Management**: This involves management of a particular application onsite or offsite.

c. **Desktop Management**: This involves support and maintenance of personal computer systems.

IT infrastructure outsourcing is expected to grow at a compound annual rate of 7.4% from 2005 to 2010, and is projected to reach $234 billion by 2010.

![Graph showing worldwide IT infrastructure outsourcing forecast, 2005-2010](source: Gartner (November 2006))

**Figure 4**: Worldwide IT Infrastructure outsourcing forecast, 2005-2010 [9]

3. **Business Process Outsourcing (BPO)**: This involves process workflows which are designed to execute a functional set of procedures. Enterprises use technology or specialist process vendors to manage enterprise processes within the company.
The adoption of GDM in BPO is still in its infancy. Process complexity and regulatory compliance are two factors that require service providers to have high levels of maturity and expertise to seamlessly deliver the service globally. BPO is expected to grow from $128.8 billion in 2005 to 191.3 billion in 2010.

Most of the global models for IT services involved application development and management. Since early 2000, other IT services, such as BPO, contact centers, and infrastructure management have started adopting GDM. IT service companies that adopt a proactive, holistic, and global view of their opportunities will be able to support growth, through innovation and adoption, of new services. The growth in IT budgets has been low over the past few years. The various forces of technological innovation, globalization, focus on core competence, and competition will force IT services firms to transform their operating models in search of improved competitiveness. Enterprise executives will be motivated to outsource IT services using external IT service providers who are able to provide better, faster, and cheaper services.
After analyzing the worldwide IT services market, user spending by segment (figures 6 and 7), it is found that the segments with more projected growth are those that directly influence the major drivers of global delivery of IT services. Development and integration, IT management, process management, and operation services are areas where customers can potentially realize significant cost savings, adopt best practices, increase quality, and improve innovation. The segments with less potential growth are,
coincidentally, those that are more commoditized (except for consulting), and that do not solve significant problems for the customer processes from the standpoint of the drivers for global delivery.

2.3.2 Market analysis across geographies

A look at annual gross domestic product (GDP) growth rates for various regions indicate that China, India, other nations in Asia, and America lead the economic growth in 2006 [3]. This economic growth shift from industrialized nations to new emerging nations will have an impact the demand and supply of IT service globally.

![GDP Growth Rates, 2006](image)

Dataquest forecasts, for IT infrastructure outsourcing markets by region, show that the North America and Western European markets are large markets, but have lower growth rates (6.7% to 8.1%). Latin America, Asia Pacific, and Eastern Europe have higher growth rates (8.3% to 11.4%). The IT service demand for IT infrastructure management is higher for mature economies such as North America, Western Europe, and Japan. Growth rates are higher in the emerging economies.
Dataquest forecasts for application outsourcing markets, by region, show that North America and Western European markets remain the largest markets with steady growth rates varying from 6.3% to 9.8%. The emerging economies, such as Asia Pacific, Eastern Europe, and Latin America, are smaller markets for application outsourcing. But, growth rates for application outsourcing remain high at Asia Pacific (10.0% CAGR). Again, the IT service demand for application outsourcing is higher in mature economies, and growth rates are higher in emerging economies.

Dataquest forecasts, for business process outsourcing markets by region, show that the North American market remains the largest market with a growth rate of 7.7%. The emerging economies, such as Latin America, Asia Pacific, and Eastern Europe are smaller markets for business process outsourcing, but growth rates remains high, varying from 11.8% to 15.8% CAGR. Again, the demand for business process outsourcing is higher for mature economies, and growth rates are higher in emerging economies.
In search of lower cost labor, global IT services companies have started utilizing new sources of low-cost talent pools from emerging markets. The talents from emerging economies are moving up the value chain, and are no longer just sources of low-cost labor. IT service companies are looking to emerging markets for high, value-added
activities, such as business consulting, business services, and systems integration. India is now believed to have 28% of the world’s outsourced information technology workforce [11]. Also, countries such as Brazil, India, Mexico, US, and China have shown the maximum growth of workforce from 1995 to 2005 [12]. Advancement in collaborative information and communications technology, infrastructure and business environments enables distributed delivery of IT services since IT services could be carried out remotely.

![Figure 12: Growth in emerging economy workforce (percentage change 1995-2005) [12]](image)

The demand and supply for IT service talent are matched inefficiently globally, with demand exceeding supply in some locations such as Northern America, and supply exceeding demand in some locations such as Asia, Eastern Europe and South America. Wages are lower in countries such as Asian, Eastern Europe and South American countries compared to countries with mature economies such as North American and Western European countries. However there are risks associated with distributing work to countries in growing economies such as local wage inflation and higher levels of attrition among workers.
Wage growth is relative

Comparison of hourly labor costs for engineers:
index: United States = 100

<table>
<thead>
<tr>
<th>Country</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>140</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assumptions
- 596,000 young engineering professionals are hired globally in 2008
- All companies are highly conscious of costs
- Wages in low-cost countries reach level of those in Brazil, Mexico

Excludes consideration of retention, limited talent accessibility, domestic labor demand, and manager scarcity, which might inflate wages beyond these levels for at least some occupational categories.

Source: Government statistics from countries shown; interviews; Watson Wyatt, McKinsey analysis

Figure 13: Hourly labor costs for engineers in various countries [13]

Different global IT services companies operate in different markets with varying IT service offerings. Companies should do a good analysis of service needs and talent employment costs in each of the different countries considering risks and benefits associated developing a global workforce for distributed IT service teams. As per “Global Outsourcing Report 2005” by M. Minevich and F. Richter [21], India, China, and the Czech Republic ranked high on the global opportunity index for attractiveness of IT service locations during 2005. Future opportunity index (during 2015) shows that apart from China and India, countries such as USA and Brazil become attractive as IT service
locations [21]. Advantages and risks associated with delivering IT service from global locations should be considered while companies invest strategically into various counties to build up competencies.

2.3.3 Market Players

"From consulting to outsourcing, customers have more choices than ever before, and we are at an extremely exciting time in our industry when delivery models actually enable the profitable delivery of enterprise-class services and functionality to a much broader range of customers," said Rebecca Segal, vice president, IDC’s Global Services Markets and Trends group[14]. "To succeed in 2007 and beyond, service firms must be increasingly creative to grow their businesses in a profitable way" [14]

The traditional global IT services players such as IBM, Accenture, and EDS have evolved from infrastructure management services through application development. They have added new services such as BPO to provide a full set of services. Offshore IT services companies such as Infosys, TCS, and Wipro evolved from application development and have steadily added BPO and infrastructure services. The pure play and niche IT services players have focused on a specific IT service category. Gartner predicts that all global IT services companies will eventually adopt global delivery models along with automation and new services offerings. Most of the IT services players will have the following characteristics [15]:

- "Go-to-market front ends tailored by vertical processes, client culture, and regional needs."
Global delivery export locations as the engine to drive scale of resources and technology.

An integrated set of processes, methodologies, and tools that are geographically and culturally seamless.

Figure 14: Evolution of service provider landscape [16]

The distribution of IT services activities across globally distributed teams vary based on the maturity of GDM adopted by various companies. This may be attributed to factors such as effort involved, level of interaction, cultural and time-zone differences. Magic Quadrant, developed by Gartner [17], depicts their markets in the middle phases of life cycle by using a two-dimensional matrix that evaluates vendors based on their completeness of vision and ability to execute application offshore services. Inclusion criteria consist of market share, revenue, number of clients, types of products or services,
target market, and other defining characteristics that help narrow the scope of the research to those vendors that are considered to be the most important or best suited to client's needs. Figure 15 shows the Magic Quadrant for Offshore Application Services, 2006. Infosys is listed as a leader in Magic Quadrant. Hence a case study on Infosys has been developed for analysis.

![Magic Quadrant for Offshore Application Services, 2006](image)

**Figure 15: Magic Quadrant for Offshore Application Services, 2006 [17]**

2.4 Key drivers for global delivery of IT services

Globally distributed IT services models enable a well-planned mechanism under which the resources and expertise are distributed physically at multiple locations and leveraged for projects globally. The GDM ensures the following key benefits [1]:

35 of 99
• **Lower Costs:** This is generally the key driver for global delivery. Most globally distributed projects are usually projected to reduce costs due to low labor and infrastructure costs in developing countries.

• **Speed to market:** Globally dispersed teams can gain advantage from time zone differences and can ideally be productive around-the-clock. Communication overhead generally does not allow full utilization, however, in spite of the best management efforts.

• **Competition:** Competition has become one of the key drivers in IT services sector. If the competitor is able to drive cost structure down and still provide good value to customer, it becomes difficult for the incumbent to have even competitive parity, let alone a competitive edge. The waves of software outsourcing and successful cases have forced other companies to seriously think about new services models even if earlier it was not on their radar.

• **Development rigor:** Distributed teams require formal processes for software development to reduce delivery risks. More emphasis on development methodologies and quality process in global delivery results in better quality controls across development sites.

• **Global presence:** Global presence enables global IT services companies to foster relations and develop opportunities in local markets. The presence of global teams enable better access to local markets and enables the IT services company to scale up new business in local markets faster.

• **Specialized talent and expertise:** Establishing presence in best global locations ensures better access to specialized talent. Global delivery enables companies to
retain talent at any one location and utilize their expertise for projects globally. Also, global delivery models ensure that company expertise developed and retained at one location is efficiently leveraged by all teams globally.

2.5 Key Challenges in global delivery of IT services

Though global delivery of IT services provides several advantages, there are several challenges that arise due to geographical, time-zone, and cultural differences between teams spread across various locations.

![Diagram showing types of miscommunication across distributed software teams](image)

Figure 16: Types of miscommunication across distributed software teams [18]

Globally distributed application development introduces serious complexities. As shown in figure 16, two types of miscommunication exist along globally distributed application development lifecycle.

1. Onsite and offsite miscommunication: due to geographical, time zone, and cultural barriers.
2. Inter-professional miscommunication: due to the lack of integrated processes and tools for each phase of software development.

The traditional way of application development, with teams located at a single location, has been a complex process with several types of professional communication involved. The global distribution of the team has added the onsite/offsite miscommunication. Global delivery methodologies need to be developed to ensure that services are delivered efficiently through distributed teams.

![Diagram of application development vendors and methodologies](image)

**Figure 17: Sample Application Development Vendors: Numerous Tools, Not a seamless platform [18]**

As shown in figure 17, several tools are developed by various vendors for different phases of application development; however, they are not part of a seamless platform that can be used across all phases of software development.
Erran Carmel [3] explains his model of global software team phenomena consisting of centrifugal forces and centripetal forces of Global Software Teams as shown in Figure 18 and Figure 19.

![Figure 18: The Centrifugal Forces of Global Software Teams](image)

The centrifugal forces are the new forces that arise due to distribution of IT service teams globally and need to be tackled to reduce the risks of global delivery. The various centrifugal forces that impact global delivery of IT services are [1]:

1. Geographic dispersion
2. Loss of communication richness
3. Coordination “breakdown”
4. Loss of “team-ness”
5. Cultural differences
Centripetal forces are those capabilities that companies need to develop in order to ensure that IT services can be seamlessly provided from various locations. The various centripetal forces that impact Global delivery of IT services are [1]:

1. Telecom Infrastructure
2. Product and service architecture
3. Team building
4. Development methodology
5. Managerial techniques
6. Collaborative technologies
2.6 Summary

It is evident from the study of operating models and market analysis that there is a convergence in the use of global delivery models by most of the global IT services companies. This convergence creates challenges and opportunities for companies. Global IT services firms can differentiate and reposition their services for sustainable competitive advantage through innovative design of their global delivery models. In the next chapter, I create a simple framework to analyze the GDM of IT service firms. A case study on Infosys is made in Chapter 4 to test the capability framework and to analyze factors that impact global delivery of software services. In Chapter 5, recommendations are based on study and analysis of this model for IT services.
3.0 FRAMEWORK FOR EVALUATING GLOBAL OPERATING MODEL FOR IT SERVICES

3.1 Introduction

The analysis in Chapter 2 indicates that during the next five years, the IT services market will be highly disruptive, and this industry will go through convergence with increased adoption of global delivery models for IT services. The current trend is that most of the IT services firms are adopting global models for IT service delivery, and this model is maturing. This creates new opportunities and challenges for firms to be competitive in order to be able to adapt to the new emerging markets. The law of competitive advantage will prevail, and this will enable companies with better operating models for global IT services to create better value and to develop their market share. This chapter focuses on the creation of a simple framework to analyze the competitiveness of GDM of IT service firms. Stakeholder analysis is done to understand the factors that create value in global IT services. Based on the study of global delivery models, stakeholder analysis of global delivery of IT services, and looking at global delivery of IT services from a holistic, global systems perspective, a simple framework is developed in this chapter to evaluate competitiveness of global delivery model. This framework will be used in next chapter to evaluate the operating model of Infosys and compare it with emerging trends and competitors.

3.2 Stakeholder analysis of global delivery model for IT services

Stakeholder analysis of GDM for IT services is done to understand the model and to develop a framework for evaluating competitiveness of global delivery models for IT
services. Figure 20 shows analysis of stakeholder value flow for distributed IT services by showing two teams providing software services from two different locations. This model can be extended to teams working from several locations. The value flow involves timely flow of required knowledge, information and software codes across the various globally distributed teams and stakeholders to enable efficient delivery of IT services that meets all stakeholders’ expectations. The stakeholder value flow diagram (figure 20) for global IT services shows that a number of entities, apart from the globally distributed IT teams, are involved in the delivery of IT services. The value flows between the various entities are represented by arrows between the various elements.

Figure 20: Stakeholder value flow for a global IT services company
The inner, large circle represents the internal environment within the globally distributed IT organization. The region between the inner and outer circle represents the environment external to the organization that impacts global delivery of IT services. The various elements internal to IT organization that influence operations of globally distributed IT services are:

- **Stakeholders**: include leadership, customers, employees, and shareholders.
- **Core Processes**: include key processes that deliver IT services to customers, such as software development by distributed teams.
- **Enabling Process**: include processes that enable core processes such as infrastructure, IT support, HR, IP, Finance, Centers of Excellence.

Even factors external to the organization such as governments, society, organizations, competitors, etc., impact IT service delivery. Value flows occur not just between the distributed software teams, but between all elements of this global delivery ecosystem, which impacts delivery of global IT services. Hence, GDMs should enable the globally distributed teams to take the best advantage of value flow between all resources and to provide the best IT service to its clients, globally.

![Figure 21: Selecting and integrating right IT service components in Global Operating Model for optimum value](image-url)
In order to leverage competitive advantage, it is essential to develop services based on customer needs and develop capabilities that enable best available globally distributed resources to work seamlessly together to provide the best IT service to clients. As shown in figure 21, the goal of GDM is to provide the best IT service by selecting the best customized components globally and seamlessly integrating them to create the best value for customers across market segments and geographies. The results of a survey conducted by IDC (figure 22), studying IT services priorities during 2006, show that management priorities that drive business value outrank IT cost reduction priorities. Hence, the operating models should look beyond cost arbitrage, utilizing teams from low-cost countries, and focus on value creation by leveraging global resources to deliver IT services in a faster, better, and cheaper way.

**Figure 22: Line-of-Business Priorities in IT** [1]
Based on analysis of various GDMs used by several companies listed in Gartner’s magic quadrant for offshore services [2], the author has developed a simple framework (figure 23) to evaluate the competency of GDM of IT services firms.

### 3.3 Framework

The seven pillars of this framework developed for evaluating GDM adopted by global IT services firms are:

- IT Services ecosystem evaluation
- Process efficiency evaluation
- IT savvy evaluation
- People evaluation
- Technology and domain competence evaluation
- Global presence evaluation
- Organization structure and governance evaluation

Analysis of these elements of the framework enables one to understand the competence of GDM of IT services firms operating globally. As a case study, this framework is used in the next chapter to evaluate the GDM used by Infosys, comparing them with general trends and competitors in the industry.

Appendix A (figure 34) shows how the various pillars of this framework impact the competitiveness of global IT services firm. The various elements considered in this framework positively impact quality, scalability, and time to market for IT services. It also reduces the cost of IT services. It improves market share, IT service attractiveness, and profitability.
Figure 23: Framework for evaluating global operating model for IT services
3.3.1 IT services ecosystem evaluation

GDMs enable companies to provide a range of vertical or horizontal solutions by bringing together the right mix of resources from across the globe, based on the precise business need of the customer. Business value from IT service is created by achieving a good balance of quality, cost savings, and localization by distributing various IT service components across global locations for execution. The services ecosystem evaluation focuses on analyzing the range of services provided by the firm leveraging global delivery model across horizontal and vertical segments. An evaluation is made on the firm’s ability to develop and commercialize new services using global models. Is the firm an innovator, early adopter, early majority, late majority, or a laggard of emerging services using global operating models [3]? Is the firm a leader or follower in adoption of new services based on global operating models? How does the firm manage the global delivery-based services ecosystem to generate long term revenues by leveraging the relationships within the services ecosystem elements?

3.3.2 Process efficiency evaluation

Software development processes across various distributed locations can be complex. The ability of the firm to adopt processes that enable teams to work efficiently will reduce complexity of distributed software development. The firm’s ability to innovate and institutionalize best practices suited to its own needs contributes to the efficiency of its services. GDMs in IT services evolved from off shoring of software development to low-cost countries such as India during the 1990s. According to a report by Dataquest India, published in October 2003 [4], 75% of the world’s SEI-CMM level 5- assessed development centers were located in India. This is not surprising, since for
more than a decade companies with offshore IT centers based in India had to deliver software projects to clients based in developed locations such as US, Europe, and Asia-Pacific. The distribution of teams across various locations required firms to develop strong processes in order to reduce quality and productivity risks associated with software development or other IT services delivery. Most of the companies espousing GDM provide high emphasis on adopting global quality standards, such as CMM, to reduce quality risks due to global delivery of IT services. The goal of this evaluation is to understand the processes adopted by the firm to manage globally distributed IT services.

Since a wide range of processes are involved in delivery of software services, the process efficiencies depend on standardization and simplification of processes across the firm. Are the processes standardized globally? What standards are adopted by the firm for benchmarking? What methodologies are used to develop software and other IT services globally? How is knowledge managed within the firm? How scalable are the firm’s processes? The process evaluation focuses on evaluating the process and quality standards adopted by the firm and its impact on global delivery of IT services. Process effectiveness is evaluated by comparing the firm’s process metrics with the standards in the industry and the competitors.

**3.3.3 IT Savvy evaluation**

Globally distributed teams need robust global delivery platform; integrated application lifecycle management (ALM) solutions; knowledge management solutions; and support solutions that are designed for wide area network to facilitate seamless delivery of IT solutions. Integrated solutions are key factors to software development, team productivity, and reducing costs. With the emergence of new technologies and an
expanding global economy, IT services firms need to redesign constantly and upgrade their infrastructure, systems, and core processes in order to take advantage of reduced IT operating costs for greater strategic agility and seamless delivery of solutions to clients. The infrastructure architecture adoption by IT services companies can be divided into four stages [5] based on the architecture maturity of the firm:

1. "Business Silos Architecture: where companies look to maximize individual business unit needs or functional needs.

2. Standardized Technology Architecture: providing IT efficiency through technology standardization and, in most cases, increased centralization of technology management.

3. Optimized Core architecture: this provides companywide data and process standardization as appropriate for the operating model.

4. Business Modularity architecture: where companies manage and reuse loosely coupled IT-enabled business process components to preserve global standards while enabling local differences"

Along with the transitioning the operating model, from a traditional onsite model to global delivery model, IT services companies have gradually matured through stage one and two. The majority of the IT services companies are in stage three or four. Many IT services firms that have organization structures based on geographies, and are late adopters of GDM, are still transitioning from stages one or two and attempt to reduce operating costs and improve the firm’s performance.
The seamless delivery architecture evaluation focuses on IT infrastructure architecture of the firm and its impact on global delivery of IT services. How integrated are the various tools, applications, and infrastructure used to enable enabling seamless delivery?

3.3.4 People evaluation

The goal of this evaluation is to study how people are recruited, developed, and trained to fit into the GDM. What are the mechanisms to ensure that people needs are met by the firm to create high performance teams working on globally distributed projects? What are the barriers to change to adopt GDM? What are the initiatives for people to achieve excellence? How culturally diverse is the firm? Does the firm have one company culture, or localized culture, throughout the firm? And, what is its impact of global delivery?

3.3.5 Technology/domain competence evaluation

The goal is to evaluate how firm’s expertise across technologies and domains are utilized globally. What are the initiatives by the firm to achieve knowledge competence? What are firm’s IP assets? How is the knowledge leveraged across the organization globally?

3.3.6 Global presence evaluation

The goal of this evaluation is to evaluate the firm’s presence globally. How is the firm developing new capacities in various regions to be competitive? What are the human supply challenges? What are the employee growth strategies adopted by firms in the various regions? What are infrastructure investments and client bases in the various global regions? Is the firm able to grow, based on early-mover advantage, and being close
to client bases? How is the global IT services supply chain designed and managed by the firm?

3.3.7 Organization structure and governance evaluation

The goal of this evaluation is to evaluate how the organization structure is aligned to global delivery models. How does organization governance impact global delivery of IT services? What processes are used in governance to sustain competitive advantage in global operating models?

3.4 Summary

A simple framework to analyze the operating model of global IT service firms is developed in this chapter. In the next chapter we evaluate Infosys' operating model using this framework and compare its operating model with general industry trends and competitors.
4.0 INFOSYS CASE STUDY

4.1 Introduction

Infosys Technologies, Ltd. (NASDAQ:INFY) provides consulting and IT services to clients globally and develops products and services for today’s dynamic global environment. Infosys, as one of the pioneers in offshore outsourcing of software services, has led the GDM for Software Services, which today is a critical aspect for sustainable competitive advantage in IT industry.

As per Nandan Nilekani [1], Managing Director and CEO of Infosys “What we have brought to the table is not just the fact that we have a bunch of people in India, but we have brought (GDM) into the whole IT services industry, a better, cheaper, faster business model for delivery of IT services...I think that the fact that we built a very robust GDM, a fact that we brought in the best processes, the best students, the best management, the best management of global delivery etc., not only allowed us to be cheaper but actually allowed us to create a better value proposition surely in terms of the quality and the kind of outcomes that we were able to give to our customers.”

With its strategy to leverage GDM as competitive differentiator, providing better value to customers with better operational efficiencies and profitability, Infosys was able to grow at 30 to 40% [2], when the legacy players in the industry were growing at 4% to 5% or less. Infosys has shown growth from $100 million in revenues in 1999 to $2 billion in revenues for 2006 [2]. Execution excellence drove more than 95% [3] of repeat business to Infosys in FY06.
4.2 Framework evaluation

In this chapter we use the framework developed in the Chapter 3 to evaluate the GDM used by Infosys, comparing it with the trends in the industry and with its competitors.

4.2.1 IT Services ecosystem evaluation

Infosys has a well integrated GDM that seamlessly delivers a wide range of services and solutions, creating better value for customers. The tightly integrated set of solutions put together by Infosys to address a specific client’s problem cuts across many of its service offerings, delivering high value and low cost to clients. Infosys’ IT services offerings, along with revenue breakdown, are shown in table 2.

<table>
<thead>
<tr>
<th>Service offerings</th>
<th>FY 2004</th>
<th>FY 2005</th>
<th>FY 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>25.7%</td>
<td>23.2%</td>
<td>20.2%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>30.1%</td>
<td>29.9%</td>
<td>30.2%</td>
</tr>
<tr>
<td>Package Implementation</td>
<td>14.5%</td>
<td>15.2%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Testing</td>
<td>5.3%</td>
<td>5.8%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Re-engineering</td>
<td>6.0%</td>
<td>6.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Consulting</td>
<td>3.7%</td>
<td>3.6%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Business Process Management</td>
<td>1.6%</td>
<td>2.7%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Engineering Services</td>
<td>2.2%</td>
<td>2.0%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Other services</td>
<td>8.1%</td>
<td>8.4%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Products</td>
<td>2.8%</td>
<td>3.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Table 2: Revenues based on IT service segments [4]

Work on the various projects irrespective of the client location is split into various modules that are cohesive internally, but need to interface as little as possible with other modules. Then, the various work modules are executed at various global locations that may be onsite, near-shore, or offshore locations. Typically, approximately 30% of the
work is done onsite, whereas 70% of the work is done at various global delivery centers at lower-cost locations (mainly in India) [1]. The distribution of various kinds of work for Infosys projects executed globally is mapped in table 3.

<table>
<thead>
<tr>
<th>Services</th>
<th>Client Site Locations</th>
<th>Near-site Locations</th>
<th>Offshore Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and Roadmap definition</td>
<td>Client interaction, Interviews, Reviews, Program Leadership, &amp; Goal-Setting</td>
<td>Analysis and synthesis</td>
<td>Background research, thought leadership, &amp; information support.</td>
</tr>
<tr>
<td>Development &amp; Integration</td>
<td>Architecture, Requirements, Change Mgmt, &amp; Implementation</td>
<td>Requirements analysis, High level Design, &amp; Prototype building, &amp; Implementation support</td>
<td>Detailed design, Code Development, Testing &amp; Integration</td>
</tr>
<tr>
<td>ITO, BPO, &amp; AMO</td>
<td>First-level support, Facilities support, &amp; Program Mgmt</td>
<td>Near-site support centers, Service Redundancy</td>
<td>Large Offshore Centers, Core Service Delivery</td>
</tr>
</tbody>
</table>

Table 3: Best suited locations for various types of Infosys Project Work Items [5]

Infosys has been able to create globally distributed, modular-based, robust execution platform for delivery of IT services globally, which enables it to improve time to market, quality, scalability, and reduce development costs for IT services. Infosys' service offerings across industry segments are shown in figure 24. Infosys' largest revenue share was from Insurance, Banking, and Financial Services segments which grew from 30% (in 2000) to 37% (in 2006) of its revenues. Since 2001, Infosys has created and scaled up new services, such as business process management, infrastructure
management, testing services, and consulting services based on GDM. In the application
development segments, the new growth areas were package implementation and testing
services. Package implementation revenues grew from 14.5% in FY2004 to 16.2% in
FY2006. Revenues from testing services grew from 5.3% in FY2004 to 5.9% in FY2006.
The Business process management segment grew from 1.6% in FY2004 to 4.0% in
FY2006. Revenues from other services, which include Infrastructure management, grew
from 8.1% in FY2004 to 9.7% in FY2006. Also, revenues from Products, which mainly
includes “Finacle Retail Banking” software, grew from 2.8% in FY2004 to 3.8% in
FY2006. Finacle has been rated as a leader in Gartner’s Magic Quadrant for international
core banking [16], based on analysis on 32 major vendors in core banking segment.
Infosys has moved fast in creating value from new services that adapted GDM, cross
selling, and delivering integrated IT services seamlessly to customers globally, at a
cheaper, faster, and better way compared to its competitors.

<table>
<thead>
<tr>
<th>Industries</th>
<th>FY 2004</th>
<th>FY 2005</th>
<th>FY 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>14.8%</td>
<td>14.4%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Insurance, Banking &amp; Financial Services</td>
<td>36.6%</td>
<td>34.6%</td>
<td>36.0%</td>
</tr>
<tr>
<td>Banking &amp; Financial Services</td>
<td>23.7%</td>
<td>25.2%</td>
<td>28.5%</td>
</tr>
<tr>
<td>Insurance</td>
<td>12.9%</td>
<td>9.4%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Telecom</td>
<td>16.6%</td>
<td>18.5%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Retail</td>
<td>11.6%</td>
<td>9.8%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Energy &amp; Utilities</td>
<td>3.0%</td>
<td>3.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Transportation</td>
<td>7.1%</td>
<td>7.6%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Others</td>
<td>10.3%</td>
<td>11.9%</td>
<td>13.7%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4: Revenues based on industry segments [4]
Infosys, along with other tier-1 pure-play Indian IT services vendors, have been early adopters and leaders in using GDM in various IT service categories. Since the competition from pure-play Indian vendors began to affect Global IT services vendors’ bottom line, the global players like IBM, Accenture, and EDS have responded to the changing IT landscape by adopting GDM based on their needs. Infosys, along with other firms in Gartner’s leader’s quadrant, have been able to rapidly cross the chasm [7] from early adapter to early majority phase adopting Global delivery models in IT services.

Infosys differentiates from most of the pure play Indian IT services players by providing high quality, diversified IT services portfolios across vertical, horizontal, and geographical dimensions. Some of the other top tier pure play Indian IT services companies such as Wipro and TCS also have diversified IT Services portfolios in various segments, however the second tier and other pure play Indian IT services companies lack diversified IT services portfolios across vertical, horizontal, and geographical dimensions. A NASSCOM survey [8] shows that, 45% of IT services market in offshore delivery based out of India belongs to the top 3 Indian IT services companies (including Infosys). Also, from a profit margin perspective, the large companies have better results.
This can be attributed to the scale, depth, and breadth of service offerings of the large IT services firms that enables them to keep the costs down.

Infosys differentiates with other global IT majors by providing equivalent service portfolios, but having better execution capabilities for global delivery, enabling it to keep the costs down and passing back the advantages to the customer, leading to greater satisfaction and more business. The global IT majors have a more mature and diversified portfolio in the consulting segment than Infosys. Infosys has been focusing to build up its capabilities in this space and, at the same time, trying to differentiate by introducing GDM as a disruptive model in this segment. Figure 25 shows Infosys’ service components and the extent of disruption the various service components create due to global delivery capability. The various segments where Infosys is using GDM are:

1. Application development and maintenance (ADM)
2. Enterprise Solution (ES)
3. Systems integration (SI)
4. Infrastructure management services (IMS)
5. Business process management (BPM)
6. Business process outsourcing (BPO)
7. Consulting

Most of the competitors have adopted GDMs in application development, maintenance, business process outsourcing, and business process management segments. Infosys’ ability to perform well in these segments is due to improved operational efficiency, reliability, and value it provides to its customers. Infosys had been a leader in adoption of GDMs in other segments, such as infrastructure management services,
systems integration, enterprise solutions, and consulting. Infosys has been successful in moving significant portion of high-end consulting work offshore. Those include research, analysis, and documentation amongst other tasks. This has not only proved to be a cost effective solution to clients, but also enabled deliverables to be much quicker, while executing mission critical strategic engagements. Also, high-end consulting work is seldom standalone. Almost all of them result in significant downstream opportunities, which are delivered through GDM.

The GDM-based service ecosystem, with highly modular and integrated processes, enables Infosys to deliver various services to clients, irrespective of service category, ensuring constant revenue streams and growth during good and bad times of
economic growth. Only a few other global firms, such as IBM, Wipro, Cognizant, have developed capabilities in developing a highly modular and integrated service ecosystem, and are able to differentiate themselves compared to competitors. Infosys was able to maintain a balance between profitability and growth by providing a balanced mix of its various range of services, like Application development, maintenance, IMS, BPO, SI and consulting, along with varying the mix ratios of onsite and low-cost offshore resources. Infosys derives 41.7% of its revenue from new services based on GDM introduced during the last 5 years [9]. Through Domain Competency Group and Software Engineering and Technology Labs, Infosys researches and engineers developed new solutions tailored for their clients and respective industries. This enabled them to scale up the scope of client engagements by enlarging the breadth of service offering, based on the evolving needs of the global marketplace. Gartner’s magic quadrant for offshore services [10] shows that Infosys, along with other firms in leaders quadrant (TCS, Wipro, Cognizant, Accenture, IBM), are among those firms that execute well today and are well positioned for tomorrow. The firms in Challengers quadrant (such as Satyam, HCL, Patni, EDS, CSC, Capgemni, CGI, Keane) are those firms that offer a range of services or execution capability today, but are not well positioned for tomorrow.

4.2.2 Process efficiency evaluation

The ability to modularize IT service components and processes has enabled Infosys to adopt GDM to derive better value for its clients. At Infosys, processes provide a repeatable and consistent means of executing system engineering activities across the organization globally enabling control, increased productivity, increased quality, and
improved customer satisfaction. Infosys has been able to institutionalize processes that work the same way and gain process-efficiency, higher productivity, and higher quality. The ways in which strong process enable global delivery at Infosys [11] are:

- ‘Strong quality and project management processes ensure excellence in delivery.
- World class processes for knowledge management and sharing encourage cross-pollination among teams.
- Processes for managing talent ensure that a project gets the best and most motivated people.
- Processes for interaction and communication within teams make it possible for globally distributed groups to interface and collaborate seamlessly, delivering excellence.”

The advantages Infosys derives by being process focused are [11]:

- “Quicker, seamless transitions, and early ownership
- Optimum onsite and offshore mixes through intelligent allocation of resources
- High degree of predictability through processes and reuse
- A strong relationship approach to ensure continuity and business-level focus
- Sharing of best practices and tools
- Depth and quality of resources, continuously retrained to suit project needs
- Adherence to SLA based pricing models to ensure ROI and drive customer satisfaction”
Infosys started its process excellence journey in the early 1990s by systematizing processes, and looking at effectiveness of processes, resulting in ISO 9000 certification in 1993 when Infosys had about 1000 employees. In 1993, Infosys achieved CMM level 5 certification, when it had about 4000 employees. Infosys’ software project management processes are aided by practices that are in line with the SEI CMM level 5. Infosys’ project management and project quality processes use a variety of custom-built, as well as, third party tools. These processes address every key aspect of globally-distributed project tasks across the project lifecycle. The processes are developed to reduce risks, such as inter-professional miscommunication or onsite/offsite communication, which arise due to lack of integrated tools for each phase of software development, or due to geographical, time zone, or cultural barriers.

**Figure 26: Infosys Quality Systems Documentation [13]**
Figure 26 shows Infosys Quality Systems Documentation, which is a collection of Infosys generic best practices in the form of processes. This provides global teams with a vast repository of detailed procedures, templates, standards, guidelines, and checklists. This also enables teams globally to follow standardized best process that are simplified, enabled, and automated through Web-enabled systems.

In 2000, Infosys launched an umbrella initiative called Infosys Excellence Initiative, with the focus to look at their strengths in terms of services, products, infrastructure, and global presence, and leverage this to ensure an effective and superior value proposition to its customers in terms of their market, time to market, predictability, and reduced cost of ownership. As part of this initiative, Infosys started looking at organizational excellence, not just software engineering excellence alone. It used a six sigma suite of tools called cross-functional process mapping to improve productivity across the organization. For management processes within the company, it uses Malcolm Baldridge framework for organizational excellence. Infosys’ focus since early 2000 was to look at organization level as well as project level, identify defect types, prioritize them, find solutions, improve processes, and implement them across organizational and project levels leading to constant improvement-in-processes across all spectrums of the organization suitable for GDM. Infosys has been able to institutionalize these best processes through:

1. **Structural response**: The ownership of deployment of best process is owned by all groups across the organization, globally. Software delivery managers work with quality teams in defining what is right process for the organization, which
adds to the business benefit, as well as the customer benefit, and leads the deployment. The processes are constantly refined based on the changes in market conditions and technology.

2. **System response:** With distributed teams deployed across the globe it becomes extremely difficult to sustain deployment across the organization, unless the best processes are embedded into systems solution and available to all employees globally. This deployment of the best process into a Web-based solution, called Integrated Project Management System, enables all Infosys employees across the globe to follow a similar set of best process for all projects and services, enabling better productivity.

3. **Business Metrics:** Several IT services firms have attained various process certifications, such as CMM level 5, but ultimately, what matters to the customers is the ability to execute global projects efficiently. At Infosys, business metrics remain the main drivers for ensuring best processes that yield better customer satisfaction and productivity. Some of the metrics related to these process initiatives, at Infosys during 2003 [14], that translate into increased customer satisfaction rates, predictability, and reduced cost of ownership were:

   - On-time completion rate of 89% against the industry benchmark of 66%.
   - Average defect delivery of 0.015 against 0.105 for all level 5 organizations.
   - 17% improvement in productivity during past 12 months.
   - 24% reduction in delivered defects.
   - 28% reduction in defect injection rate
The findings of process effectiveness evaluation based on the framework developed are as follows:

1. **Institutionalization of best practices:** At Infosys, the ownership of deployment of best process is owned by all groups across the organization, globally. In order to sustain deployment of best processes across Infosys, best processes are embedded into systems solution and available to all employees globally via the Web. At many competing firms that use GDM but do not perform well, institutionalization of best practices are not done globally.

2. **Modularity and integration:** At Infosys, the processes are developed to provide tight integration of all activities across all business units and geographies globally. A web based solution called Integrated Project Management System, enables all teams distributed across locations to effectively work on any project virtually from any location. At many competing firms that use GDM but do not perform well, processes are not well integrated across all locations globally.

3. **Standardization:** At Infosys, all teams across the globe work similarly, resulting in easier communication between teams and better productivity. This also enables teams to work on new projects easily. At many competing firms that use GDM but do not perform well, processes are not consistent across various locations.

4. **Simplification:** At Infosys, all processes are simplified and customized based on business benefit as well as customer benefit. Best processes are embedded into systems and available to all employees globally.

5. **Metrics and benchmarking:** At Infosys, business metrics remain the main drivers for ensuring best processes, yield better customer satisfaction, and
productivity. Metrics and dashboards are standardized and available via Web-based systems across all teams globally. The processes are benchmarked against global standards to ensure that all activities are tracked against the best in the world. Infosys’ software processes are aided by practices inline with the SEI CMM Level 5 and PCMM are used. For information security, B7799 standards are used. Six-Sigma and Boldwick framework is used to benchmark business processes. At many competing firms that use GDM, but do not perform well, standard benchmarking is not used effectively for measurements across the enterprise.

6. **Continuous improvement**: Infosys process repository, called PRIDE, has all processes captured. Metrics are constantly monitored and processes are fine tuned for operational effectiveness and robustness.

Implementing similar and scalable processes globally within the organization remains one of the key success factors for GDM. Infosys was able to develop and implement a set of similar best practices and similar process-oriented-culture when the enterprise was relatively small (i.e. when its employee strength was 4000 to 5000). It was able to retain and improve these similar set of processes as the company scaled up its operations and grew to its present strength of 65,000 employees. Many global IT firms who are now adopting GDP do have well defined processes for each region or country, but lack a systematized, common set of global process to function as a well-integrated set of teams. Creating and implementing similar processes across the firm in order to derive the benefits of a distributed environment remains a challenge for most of the competitors. Infosys also effectively uses processes for knowledge management, which enables the
creation and distribution of knowledge across the organization, globally enabling productivity improvements and innovations. Most of the competitors do not use knowledge management processes effectively.

4.2.3 IT Savvy evaluation

At Infosys, IT infrastructure has been a strategic catalyst and enabler to operational efficiencies, productivity, and growth in global delivery of IT services. Infosys has created knowledge networked work environment globally, which empowers employee productivity and reduces global delivery risks. Like other global IT services companies, Infosys utilizes global development centers and connectivity infrastructure to seamlessly communicate between the various distributed teams. The key differentiator for Infosys has been the superior well integrated information infrastructure that acts as a catalyst for global delivery, and this ensures flow of value across all stakeholders across the organization, business units, and projects. The key areas where IT infrastructure acts as a key enabler for Infosys’ GDM are;

- Project management and software quality management
- Employee productivity through knowledge management and collaboration
- Financial management, strategic planning and control across organization
- Client and account management

A robust set of GDM tools help Infosys manage complex IT projects distributed globally. The two main project management tool sets used are the Integrated Project Management (IPM) tool and the Process Database called PRIDE. A range of general purpose and specialized tools are integrated into these systems to help automate and simplify a wide variety of software engineering and project management tasks distributed
across various teams. These tools help control projects, avoiding defects and slippages enabling Infosys to be more nimble. The IPM tool has been custom-built to support Infosys’ GDM and SEI CMM level 5 processes. IPM provides functionality for all phases of an engagement cycle, spread across various global locations. The process database captures all project performance related metrics at Infosys. This database is available globally by project teams, and is used to derive trends, analyze project performance in terms of distribution of productivity, quality, schedule, effort, and defects. Infosys’ knowledge management infrastructure enables creation, storage, access and reuse of knowledge across project teams, accounts and organization wide. This enables improvement of productivity across distributed project teams. This also allows top management to understand customer needs and strategize services aligned to customer needs globally. Most of the global IT firms have an extensive infrastructure for their operations, but their enterprise architecture is not well integrated and standardized across geographically distributed teams. This leads to loss of value in global delivery due to redundancies and barriers in the flow of information across teams in IT service delivery. The findings of the evaluation of IT savvy dimension of GDM evaluation framework at Infosys are as follows:

1. **Collaborative tools**: All projects teams at Infosys effectively use collaborative tools such as voice, video, or customized Internet-based applications for communication enabling smooth integration of dynamic, global teams across time zones. Collaborative applications are standardized and available to all teams for wider collaboration and knowledge sharing. Uses of collaborative tools are not standardized in competing organizations that do not use GDM well.
2. **Project Management and software engineering tools:** Infosys also uses integrated project management tools, integrated software development environments, testing, other "CASE" tools, and collaborative software development tools. In this category, Infosys constantly searches for leading-edge products that help increase productivity that give an advantage over competitors. Integrated project management tools are designed to enable project visibility virtually to all stakeholders. This enables better project monitoring and reduction of risks. At most of the competing global IT firms the project management and software engineering tools are not standardized across all teams globally.

3. **Knowledge Management tools:** K-Shop, Infosys' organization-wide knowledge sharing portal, enables global teams to access best practices and collective organizational knowledge, both at organization level as well as project levels. The process database (PRIDE) captures all project performance related metrics at Infosys. This helped Infosys to improve productivity and reduce defects significantly. At most of the competing global IT firms, knowledge management is not leveraged well across all teams globally.

4. **IT Infrastructure architecture:** Infosys has developed a sound IT execution platform enabling similar, repeatable, and scalable processes across all teams through technology enablement. Infrastructure is integrated globally enabling seamless delivery of information across all teams, faster and speedy decision making. SOA oriented IT architecture is used enabling standardization and flexibility. IT infrastructure is integrated across all functions enabling the flow of information between IT services projects and other functions, such as finance,
human resources, information systems, and quality. All Web-based tools are
customized and simplified to enable best processes and usability across teams. All
employee support functions are available to employees via the Web and work-
flow enabled providing employees the ability to work from virtual locations. At
many competing IT companies, infrastructure is not integrated and is evolving
from business silo architecture or Standardized technology architecture to
optimized core architecture or business modularity architecture. Infosys has been
quick to adopt business modularity architecture, and only few firms currently
have this architecture.

5. **IT Governance and technology adoption:** A technology council studies and
advices on technology trends for market opportunities, internal information
requirements, and technology infrastructure. To maintain state-of-the-art
technology infrastructure, Infosys follows technology adoption framework and
governance to keep the IT infrastructure aligned to Infosys’ changing business
needs of IT services.

4.2.4 **People evaluation:**

1. **Collaborative culture:** Infosys has been able to develop common set of values,
culture, global mindset, trust, commitment, and communication skills among
employees that enable them to work better as a team using GDM. Common values
at Infosys are[15]:

   - Solution focused
   - Global mindset
   - Connected
Trustworthy and committed
Competent
Excellence in execution
Client first mindset

2. **Global talent:** Infosys' vision is to be a multicultural global consulting firm.

Though Infosys has 98% of revenues from outside India, it currently deploys an Indian workforce to a large extent. Its average mix of onsite/offshore employee ratio is about 30% onsite to 70% offshore locations. The offshore ratio is generally higher than that used by other IT majors. Infosys has been able to attract top talent and train them to work effectively using GDM. More than 70% of the workforce is based in India. Infosys has been able to attract the best talent from the large pool of talent in India. It has been able to select top 2.7% of candidates who applied for jobs at Infosys, and still able to grow at 48% per year.

![Onsite-Offshore Ratio](image)

*Figure 27: Onsite-Offshore Ratio [4]*
3. **Utilization and attrition**: Infosys has high employee utilization rates of 70% to 80% and has an attrition rate of 11% globally. Many competing firms have an attrition rate of 25% to 30% in emerging economies which creates constant changes in global team structure.
4. **Incentives**: Incentives at Infosys are aligned to global team success. This enables better teamwork and distribution of work globally. At Infosys, employee performance incentives are aligned to company performance, team performance, and individual performance. This enables teams spread across globally focus on team and company goals.

5. **Training**: Working in a distributed, collaborative environment requires additional skills apart from high-quality talent. Infosys employees constantly go through various training programs related to technology and domain training, quality and
process training, and leadership training to ensure that employees acquire the skills to work efficiently on global teams using GDM.

6. **Employee services:** At Infosys, employee services are Web enabled, allowing teams to work effectively and get support from virtual locations. Employee services are oriented towards end-to-end talent management, are integrated, systematized, and Web enabled across all locations ensuring seamless employee support and motivation irrespective of team location.

Organizations that have integrated, end-to-end talent management strategies have processes and technology that are more agile, more innovative, and have lower attrition rates of top talent than those that do not. These organizations have a significant competitive advantage as they are able to create an integrated talent management lifecycle to: recruit and retain the right people; develop and deploy top talent and key workforces rapidly, based on changes in the business environment; and create a learning and collaboration culture. This strategy gets the best people in the right place and time working together effectively, therefore, a more engaged, satisfied, and productive workforce.

4.2.5 **Technology/Domain competence evaluation:**

1. **Expertise:** Through domain competency group, software engineering, and technology labs, Infosys researches and engineers create new solutions tailored for their clients and respective industries. This ability of Infosys to develop and distribute new solutions in the changing marketplace will remain a critical factor for competitiveness, especially due to the “hyper disruption” in the marketplace as predicted by leading research firms such as Gartner and IDC. Large global IT
services firms have the expertise to develop new solutions and can adapt these solutions to GDM, however, the low-cost offshore players who compete on cost, and do not have large expertise, will find the new emerging environment in IT services challenging. Infosys has recently been active in developing patents and IP assets. It has created 82 invention disclosures and 20 patents [9]. This is relatively small compared to other IT majors such as IBM. The ability to develop expertise in various domains and technologies enable higher quality solutions to be delivered through GDM.

2. **Knowledge management:** Infosys effectively uses processes for knowledge management, which enable creation and distribution of knowledge across the organization, globally enabling productivity improvements and innovations. Most of the competitors have not been using knowledge management processes effectively.

**4.2.6 Global presence evaluation:**

1. **Market geographies:** Infosys derived 98.3% of its revenues from client projects based outside India, however, the offshore utilization of employee man-hours contributed to 70.8% in the year 2006. It has 43 sales offices across the globe [6]. The revenues from America reduced from 78% during FY 2000 to 64% during FY 2006. Also, revenues from Europe have increased from 15% during FY 2000 to 26% during FY 2006. Infosys, which had European revenues of only €18 million in 1999, is anticipating revenues of €1.4 billion in 2008, up from 950 million this year, showing a compounded average growth rate of 62% over nearly a decade [17]. This shows that Infosys has been diversifying to new markets.
However, the revenues from new emerging markets such as China, India, or South America are substantially low, even though nearly 70% of the service delivery is from India. Competing companies such as IBM are aggressively moving to new emerging markets such as China and India. As part of the $6 billion investment in India in the next three years, IBM is setting up in India, the first in a new breed of IBM service delivery centers that deploy processes and technologies to automate IT services delivery. "IBM has about 43,000 staff in India, and is using the country as a base for offering services to its customers worldwide. The investment in India is part of IBM's strategy to grow its presence in emerging markets such as China and Brazil, both because these are attractive markets, and also because they offer vast pools of staff" [18]. Infosys needs to develop aggressive strategies utilizing GDM to venture into new emerging markets.

![Revenue by Geography](image)

Figure 32: Revenue by Geography (FY2000 and FY2006) [6]
2. **Delivery capabilities:** Though 70% of delivery of IT services from Infosys is from India, it has developed 44 development centers operating in 44 countries [6]. Infosys has been investing into the growth of development centers in China and Western European countries. It needs to actively evaluate its global supply needs and needs develop centers closer to customer locations to leverage further benefits based on changing IT services market environment.

4.2.7 **Organization structure and governance evaluation:**

1. **Organization structure:** At Infosys the organization structure is aligned across geographies so that all teams are synchronized towards the same goals and there is no silo effect happening. It has a matrix structure across teams and functions which are better aligned to GDM needs. Many competing organizations which are not executing GDM well still have geography-based silo organization structure. This reduces the speed of decision making and also creates barriers to effective collaboration required for GDM.

2. **Vision and strategy:** Infosys has a strong vision and has developed strategies for development of capabilities which are aligned to GDM and based on changes in the global IT services environment. This enables investments and development of
capabilities across the organization that will ensure competitive advantage in executing GDM. Many competing companies that rely on cost arbitrage and do not understand the global delivery system for IT services well, have not been able to focus their investments for strategic long term capability development. This will act as a barrier to competitiveness while using GDM.

3. **Leadership and governance:** Infosys provides top quality management leadership who are equipped with skill to manage global IT services teams. Top management representation and involvement in programs aligned to GDM ensures success of these initiatives with right investments and focus across all initiatives globally. A high level of visibility on performance of various projects and services through online dashboards across all levels of the organization enable better and faster governance decisions. Many competing companies using GDM do not have the right vision or visibility across the organization to enable good GDMs.

### 4.3 Recommendations: Infosys

Here are the critical challenges and opportunities for Infosys to take the lead in transformation to maintain competitiveness in IT Services market:

1. **Employ diverse people and retain top talent:** With its goals to transform from an Indian company to a truly multinational company providing IT services globally, it needs to be attracting the best talent from diversified geographies. Infosys has developed an environment that is able to retain the top Indian talent, motivate, develop skills, develop highly effective, distributed teams and develop a
unique corporate culture that enables distributed teams to work as a single team regardless of location. The change in focus from hiring top Indian talent to top global talent, with larger geographical and cultural diversity, has an impact on the characteristics of the key components of GDM: people, global presence, governance and process efficiency. Employing diverse people and retaining top talent will provide better opportunities for higher performance by globally distributed teams. Due to changes in the composition of a global workforce, Infosys needs to constantly refine and adapt its GDM, its policies for talent recruitment, development, and retention. This will ensure strong commitment by a diversified talent pool, changing their mindsets, capabilities, behaviors, and enable adaptability to Infosys’ culture, resulting greater employee satisfaction, improved competitiveness, and superior IT services delivery to clients.

2. **Continuous Improvement of Global Delivery Model**: Infosys has, over the years, developed a strong GDM, with efficient processes, infrastructure and top talent. In order to maintain competitiveness of GDM and leverage new opportunities, Infosys needs to continuously improve its GDM based on changing characteristics of its various components of GDM. Infosys currently has developed a GDM which is efficient and produces superior results. With the current version of GDM as a baseline, it needs to develop, re-engineer, refine, and customize the various constituents of its existing GDM suiting it for higher diversity in talent pool, diversified IT services provided from multiple geographies.
3. **Develop global leadership for operational competence:** In order to sustain the competitiveness of IT services, and to manage globally diversified top talent, the leadership needs to develop global management skills. The current leadership should be broadened to develop new leaders from various geographies and business units to ensure that leaders have the right focus and skills to manage and motivate diversified teams globally.

4. **Build leaner governance mechanisms and introduce innovative management practices:** With the growth of Infosys, expansion across new regions, services, and with a more diversified, multicultural talent, Infosys needs to develop better governance mechanisms to adapt to the changing needs of various stakeholders. In order to ensure agility and seamless delivery of IT solutions to clients, it is important to ensure that the leadership is integrated, key decisions at various levels are made faster, and incentives are aligned for improved team performance. Efficient processes, knowledge management systems, IT infrastructure, and applications will act as catalysts to streamline decision making and improve agility.

5. **Look at geographies and expand geographically:** Infosys currently has been focusing on expanding services across Europe with revenues increasing from 15% in FY2000 to 26% during FY2006. Also, with improved focus on high-end consulting and improved geographical diversity, it would need to increase its workforce in its existing main markets of US and Western Europe. The revenues from emerging markets such as China, India, and South America are less than 2% and represent a significant opportunity to expand into new emerging markets.
regard to the delivery locations, though Infosys maintains 44 development centers operating in 44 countries, India still remains the key location for delivery of IT services. To become a truly global organization, it needs to offer equivalent attractive service from alternative locations in China, Eastern Europe, or other attractive locations near existing, or new, markets such as China, USA, Brazil, and Canada. Based on its 5-year corporate planning exercise, it needs to strategically evaluate its long term needs and develop new centers near to customer locations to penetrate into new markets with the early mover advantage. It also should be able to develop new capabilities to be more flexible in deciding delivery locations near to client locations as an alternative location apart from locations in India. This will also enable Infosys to target new deals where the customer prefers to have multiple delivery locations or delivery locations near to its location.

6. **Look at IT service offerings and expand the offerings basket**: Constant changes in technology and the business environment creates new opportunities for IT service providers to develop new services that can be delivered faster, cheaper, and in a better manner. Infosys, through its software engineering and technology labs and domain competency group, constantly researches and develops new services for its clients. The ability to be an early mover and deliver new services to clients provides it with a competitive advantage, and puts it in the leadership position, while enabling it to be a preferred provider of the new service to clients. Also, the ability to seamlessly deliver new service along with existing services enables growth in revenues from clients. High-end services often result in more
services downstream, resulting in steady revenue during various phases of projects and based on varied customer needs.

7. **Create new skill sets and domain specialty:** In order to maintain competitiveness of GDM, it is essential to develop new skills and domain specialty across the organization. With its ability to attract, recruit, and train top talent in large volumes, Infosys has been successful in growing organically, maintaining the unique company culture, values, and processes throughout the company, which is essential for efficiently managing GDM. To secure key areas of expertise that the company thus far been unable to attain quickly—particularly those areas needed to develop or maintain a critical advantage—it needs to acquire new skills through acquisition and develop them to suit to global delivery.

4.4 Conclusion: Infosys

Infosys currently has a key advantage of having developed a superior execution platform in place for delivery IT services using GDM. Infosys constantly evaluates changes in technology and business environment, has been able to plan and create a GDM for IT services, which is efficient, scalable, competitive, and adds value for customers globally. However, the external IT services market environment is constantly changing. Its own components of GDM are changing. Also, other competitors have been attaining maturity in their GDM. Infosys needs to constantly innovate and differentiate. It needs to look beyond GDM to maintain growth and sustainability for delivering superior IT services globally.
5.0 RECOMMENDATIONS

5.1 Introduction

The capabilities and maturity levels of GDM adoption vary across IT services companies. Some of the characteristics that large organizations pursue when spreading software development process globally are higher productivity, cost and risk reduction, and quality improvement. In order to ensure that all teams globally derive the best advantages of GDM, it is important to have a good strategy, robust execution platform for IT services, sound methodologies, and frameworks for providing software services globally, integrated collaborative environments, and innovative management processes. It is essential to develop flexible, integrated, and sustainable GDM for IT service delivery, based on changing environment for demand and supply of IT services globally. This chapter provides key recommendations for IT services organizations based on the study on GDM in previous chapters.

5.2 Key Recommendations for Global IT Services firms:

Based on study of GDMs and external environments in the previous chapters, the author provides the following key recommendations for changes within IT service organizations in order to leverage opportunities to be competitive when looking beyond GDM.

1. **Integrate levels of leadership and organization structure globally**: GDM requires team leaders to manage virtual teams across geographies, cultures, and time zones. Integration of the leadership structure across the organization ensures that everybody is synchronized towards the same goal and no silo effect happens.
Leaders need to develop a collaborative mindset, visit team members at various locations, establish rapport, and begin the process of building trust. Leaders must be sensitive to cultural differences, and they must train team members on appropriate interactive skills and behaviors. To enhance team communication, leaders should encourage frequent team meetings using conference calls. Leaders should develop a clear sense of team purpose, and an understanding of how a team’s mission connects with the vision and goals of the organization. They should undertake a set of priorities that enable building a culture of collaboration, information transparency, and accountability by all teams distributed globally.

Figure 33: Global Delivery Model as a System of Systems

Figure 33 holistically depicts the relationship between the various subsystems within a global system of IT services organization which impact global delivery of software services. The main subsystems in this IT services organization are:

- Top management
- Business units and support units
- Globally distributed project teams
- Globally distributed IT services or systems

The performance and effectiveness of globally distributed IT services depends upon the effectiveness of resources deployed to the globally distributed projects to manage services. The ability to develop good project teams depends upon the business units and support units within IT services organization. The ability to effectively align business units and support units in line with the needs of GDM depends upon the top management of IT services firm. Hence, there is a direct correlation between the effectiveness of globally distributed IT services provided by the firm and the direction provided by various levels of the management within a company. Companies that perform better have developed better strategies and have integrated architecture resulting in better operational performance and results.

2. **Systemize processes weeding out stale process and methods**: As companies develop their global delivery capabilities, they will need to standardize and institutionalize best process for IT services. This will enable weeding out stale processes and establish consistency of processes across all teams globally. Institutionalization of best practices across the organization remains a major challenge. Embedding processes in primary work support applications, such as project management software, collaborative software development tools, document management applications, and knowledge management software will ensure that teams distributed globally use consistent best processes. Also, to
bundle seamlessly a range of IT services to address client needs, the processes should be made modular to enable tight integration between services provided by all business units and geographies. Organizations should use dashboards and metrics at all levels and teams to measure operational effectiveness. Process benchmarking and continuous improvements based on changes in technology and market needs ensure consistent productivity improvements in IT services offerings.

3. **Create collaborative culture:** Companies should develop a common set of values globally, that will enable teams to work together from different locations as a single team. Team leaders should encourage collaboration and should receive leadership development training that covers issues of cultural and language differences, and coordinating work across time zones. Project goals and incentives should be aligned to team behavior, instead of measuring individual performance to ensure positive team results. Also, all teams should be provided training and encouraged to use of standard collaborative tools and process to ensure that collaborative systems and tools deployed by the firm are used effectively by all teams globally.

4. **Develop and deploy collaborative tools and systems globally for managing end-to-end IT services:** GDM for IT services require companies to create effective collaborative tools to enable collaboration and knowledge sharing across all teams. Global infrastructure should be integrated and should enable sharing of data across all business units within the company. Collaboration enables globally distributed teams to work across geographies and time zones as a single team.
Collaborative project management tools enable deployment of consistent project delivery methodologies across global teams. Role-based access enables up-to-the-minute views on project progress to any project stakeholder. Document management capabilities, templates, and discussion threads enforce consistent language and bridge communication differences among global teams. Application development tools that support end-to-end processes of software development lifecycle should be preferred by global teams to enable traceability across the lifecycle from any geographic location. To work effectively, teams will require a basic suite of collaborative applications apart from additional required applications depending on the nature of the team's mission. Process teams will require a different mixture of applications that emphasizes process and workflow. Teams will require application to support online synchronous meetings, in combination with audio or videoconferencing capabilities.

5. **Institutionalize knowledge management and encourage innovation**: The ability to create, retain, distribute, and leverage institutional knowledge is vital for teams to gain knowledge and to generate new ideas and solutions, providing competitive advantage in today’s technology driven world. IT services related projects depend on the latest knowledge and key learning from similar projects executed by the company in the past. Institutionalizing knowledge management by global IT services companies enables the ability to easily react to customer project requests, improves productivity through fewer defects and rework, improves teamwork, and improves project success globally.
6. **Employ diverse people and retain top talent globally:** The talent required by IT services companies has become a global commodity fought for by multiple competitors. The attractiveness of GDMs coupled with increasing size and geographic reach of multinational companies in search of new markets, economies of scale, and new sources of labor have created a dynamic environment for finding and retaining top talent. The diversity of people enables better access to talent and new markets. The quality of employee talent at various locations determines the success of globally distributed IT projects. For success of GDMs, IT services companies need to ensure that they are able to retain good talent on projects. Companies need to reduce attrition rates at all global locations in order to ensure success of IT services delivery and to improve productivity.

7. **Ensure higher productivity through optimization of people, process and technology utilization:** Increasing competition in the use of GDMs for IT services will require companies to differentiate themselves by optimizing and innovating. In order to achieve higher productivity it is necessary to achieve the right balance of technology, process, and people skills. IT services companies using GDMs need to improve the effectiveness of IT service delivery, efficiency, and consistency of the process globally, improve the use of shared collaborative tools, technologies, and business standards. The use of GDMs enables IT service providers to tap into global talent pool of resources with multiple national cultures, time zones, skills, and cost structure. In order to develop a competitive advantage, the IT services firms need to develop the capabilities to bring together an optimal combination of people, processes, and technology from the pool of
resources globally. This requires strategic investments and long term planning to develop infrastructure, processes, and top talent across the globe based on market needs and firm’s vision. Also, effective knowledge management within the firm enables more informed tactical and operational decisions that will enable optimization of people, process, and technology utilization.

8. **Build leaner organization structure and governance mechanisms**: In order to effectively enable global delivery of software services, companies need to have integrated organization structure and leaner governance models to ensure all levels of the organization develop strategies and actions to enable global delivery of IT services effectively. This requires commitment from senior management and there is a need to introduce innovative management practices globally.

9. **Look at geographies and expand geographically**: The market analysis of IT services across geographies, done in section 2.3.2, show that demand and supply of IT service talent are matched inefficiently globally. Demand exceeds supply in some locations such as North America and Western Europe, while supply exceeds demand in some locations such as Asia, Eastern Europe, and South America. Also, wages in different countries vary with various levels of risk associated with delivery of services from various countries. IT services companies should undertake a strategic plan to understand the cultural and social demands of a location, and plan for delivery locations that will distribute the best IT services to clients.
10. **Look at IT service offerings and expand the offerings basket:** The market segment analysis of global IT services done in section 2.3.1 shows that adoption of GDM is most mature in the application development market segment. The adoptions of GDM in infrastructure services is in its early stages and not yet mature. The adoption of GDM in business process management is still in its infancy. There exists significant opportunities to expand the offerings basket to tap into new services across various geographies. IT services companies need to develop abilities to tap new market and manage new services, since new services will constantly evolve globally and leaders will be able to consolidate into new emerging market segments. IT service companies need to evaluate their needs and invest into developing new capabilities to tap into new markets based on GDM.

11. **Create new skill sets and domain specialty:** In order to be competitive in a convergent global IT services market, it becomes essential for companies to provide the best services from various global locations. Also, the study of IT services market in section 2.3 shows that 2007 and beyond will see IT service markets going through hyper-disruption, competition, transformation, and convergence. The delivery of IT services through GDM requires employees to develop global skills to deal with teams with diverse cultural backgrounds, and extensively use collaborative tools to work on global teams. Teams need to develop new competencies and domain specialties to ensure higher levels of maturity and expertise to seamlessly deliver IT services globally.
12. Focus only on cost cutting or cost arbitrage to be competitive may not really help in long run: Many organizations that have not yet attained maturity in their global delivery models are those who currently lack the understanding and capabilities of a global system for delivery of IT services efficiently. By changing narrow-minded cost arbitrage strategy to an emphasis on a globally integrated software services organization should improve organization’s competitiveness.

5.3 Conclusion

The GDM for IT services is fine as of now, but for the companies to grow and remain profitable, while adding value for customers, they need to get better at doing GDM. Opportunities and challenges exist for global IT services companies to innovate their GDM to remain competitive in the highly disruptive and changing global IT services market. In order to be competitive in the next five to ten years, companies need to undertake strategic long term and tactical initiatives to ensure that they are able to effectively leverage opportunities due to the changing technology and business environment. The ability to meet the needs of a fast-changing technology and business landscape, the ability to create value-added services, efficient and agile IT services, global supply chain, and development of key competencies across the globally distributed teams will enable it to be competitive. The recommendation provided in the previous section enable IT services companies to remain competitive in the next five to ten years.
5.4 Recommendations for further research

This research focused on: the study of GDMs for IT services; the development of a framework for evaluation criteria for competitiveness of global delivery of IT services; evaluating Infosys and competitors using this evaluation criterion; and providing recommendations for improving competitiveness. However, there is much more work that can be done to further develop concepts introduced in this thesis. Further research on GDM for IT services using system dynamics model and quantitative techniques to analyze competitiveness of global delivery of IT services should be done, given the complexity of the systems architecture of global IT services.

Further case studies to evaluate this framework should be studied in depth. More theoretical work in this area could also be done. Analysis of the framework could benefit by creating and simulating a control theory model with more mathematical rigor with a system dynamics model. An investigation as to how well the various pillars of the framework for competitiveness for global IT services correlate can also be carried out. Based on further investigation of the various pillars of this framework, a spider graph visualization tool can be used for case studies based on competencies of various pillars of the framework for GDM for IT services. Additional studies would be of interest to understand the best use of other visualization tools for depicting competencies of global IT services.

The recommended future work is identified as thoughts to further research competitiveness of GDM for IT services. As with the evolution of technology and business environment, the environment is never static. The objective is to enable an
enterprise to take advantage of new capabilities to produce better IT services globally while remaining competitive in today's business environment.
Figure 34: Cause effect diagram of capabilities and competitiveness for global IT services
REFERENCES (by Section)

INTRODUCTION


CHRONOLOGICAL STUDY OF OPERATING MODELS FOR GLOBAL IT SERVICE


Follow the Evolution of IT Service Categories Delivered Offshore, Gartner, August 2006.


FRAMEWORK FOR EVALUATING GLOBAL OPERATING MODEL FOR IT SERVICES

IDC Predictions 2007: Prospering in an Era of Hyper disruption, IDC,


**INFOSYS CASE STUDY**


[4] Operational Highlights 2005-06, S. Gopalakrishnan, Chief Operating Officer and Deputy Managing Director,


