



# G.L. Bajaj Institute of Management & Research

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## POST GRADUATE DIPLOMA IN MANAGEMENT (2017-19) MID TERM EXAMINATIONS

Paper Name- **Information Technology for Managers**  
(Paper Code)- **PG-05**

Time: **90 Minutes**  
Max Marks: **20**

### Section A

[8 Marks]

Case Study- Indian Railways: Availability of New E-Ticketing System

Founded in 1853, Indian Railways is the world's second-largest railway network with nearly 7,000 stations and 72,000 miles of track. Every day, the railway carries over 23 million passengers on more than 12,000 trains. Passengers have always been able to purchase reserved tickets at railway stations—often waiting in long lines. In 2002, The Indian Rail Catering and Tourism Corporation (IRCTC), designed an Internet-based ticketing system. Initially, tickets were delivered by courier to customers and in they moved to a completely web-based e-ticketing system where tickets could be printed using a web-based application. In the beginning, the e-ticketing system generated around 100 e-tickets a day, but over the years demand has grown to where the system generates approximately 500,000 tickets daily.

While the e-ticketing system definitely made it easier to buy reserved tickets, the experience was far from seamless. Indian Railways' unique Tatkal ticketing system offers the ability to book last minute trips one day before the date of travel starting at 10 a.m. In the past, the e-ticketing system would often crash at 10 a.m. because of Tatkal ticket demand, but the system experienced issues any time there were more than 40,000 concurrent users logged on to purchase tickets. Even when it didn't crash, the system was so slow that it would take customers up to 15 minutes to buy a ticket—and often the system would time out and not allow customers to finish their purchases. Because of the unreliability and slow performance of the e-ticketing system at peak hours, it was easier for customers to travel to train stations and wait in long lines in person to buy Tatkal tickets. A system had been designed in 2002 and scaled for 10 years, but could no longer meet growing demand. In 2013 railway management decided it was time to re-architect the e-ticketing system to better manage existing e-ticket sales, minimize impact on counter sales and accommodate future growth and hired the Centre for Railway Information Systems (CRIS) to complete the work.

CRIS experts had already determined that simply adding new hardware would not solve performance issues. They designed a completely new application but realized they also needed to incorporate technology that would enable the new e-ticketing system to manage huge concurrent workloads, migrate 3 million users and provide dynamic load balancing to seamlessly manage demand at peak hours. In the past, the old system would crash if more than 40,000 users tried to access the system at one time. Now, the new system can easily scale to more than 200,000 concurrent users without impacting performance—even at high demand times. Today, because of dynamic load balancing and improved performance, the system can manage surges in sales of more than 10,000 per minute, such as during holiday periods such as Diwali. And on an hourly basis, average online sales are now nearly two and a half times higher than they used to be, growing from 60,000 per hour in online ticket sales to 150,000 per hour.

1. Based on the above Case Study, explain how IRCTC used IT for its competitive advantage. What is the type of Information System implemented by IRCTC for its e-Ticketing Service?

## **Section B**

**[3 × 2 Marks]**

2. Explain the type of User Interface of Windows..
3. What is the function of a directory in UNIX operating system?
4. Explain the concept of Interorganization Information System with atleast 2 examples.

## **Section C**

**[2 × 3 Marks]**

5. Explain the difference between following with business examples:
  - A. Information & Data
  - B. Information System & Information Technology
6. Explain the different layers of Software and it's functions in a computer system along with a logical diagram.