

Role of IT in Development of Transport System

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Professor (IT)

Scheme Of Presentation

- **Future Aspirations**
- **Possibilities – Technology**
- **Benefits – General, Applications Specific**
- **Authority/Responsibility For IT related Projects**
- **IT Projects In Indian Railways**
- **IT Future Possibilities -IR**

Energy Storage
Magnetic Levitation
Nano Technology
Brain Computer Interface
PHOTONICS LOW COST DESALINATION OPTOGENETICS
Wearable Devices
Nuclear Fusion
Synthetic Biology
Gamification
Telemedicine
Molecular Manufacturing
3D PRINTING
Novel Materials Photonics
Alternate Fuel
Real Time Translation
Big Data Analytics
Bio-mimetics
OPTOGENETICS
Novel Materials
Lab On Chip
Enernet
Energy Storage
Semantic
Web
Quantum Computing
Advanced Oil & Gas Exploration
Photonics
Immersive Virtual Reality
Digital Holography & 3d Imaging
Internet Of Things
CLOUD TECHNOLOGY
Advanced Genomics
Plasmonics
Novel Materials
Plasmonics
Novel Materials
Advanced Genomics
Low Cost Desalination
TECHNOLOGY
Plasmonics
NUCLEAR FUSION
ARTIFICIAL PHOTOSYNTHESIS
Advanced Genomics



Zero school dropouts



100% literacy, including knowledge of devices, instruments and machines

Delivery of language neutral content to all individuals



Primary health centre in every gram panchayat with remote access to specialists and super-specialists

Multi-specialty hospital in every district with air ambulance and trauma care services



Potable water in every household, even in difficult terrains



No place more than three hours away from a district headquarters, five hours from the state capital and eight hours from National Capital

5G

5G



Helipad in every panchayat



Medical evacuation within one hour

All dwellings disaster resistant and climate resilient



Speedy and error free criminal investigation



Indigenously manufactured passenger aircraft



No Indian is undernourished
No Indian woman and child is anaemic for want of proper nutrition

Maternal mortality rate of not more than 15 per 100,000

Ubiquitous internet connectivity

Location independent, fraud-proof voting procedure
Digital identity to all citizens - linked with health, education, employment and services



Zero pedestrian fatalities



No two points in a metropolitan area are more than one hour apart

Public transport within one km from home



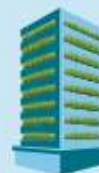
Every village connected with an all-weather road



Total power generation of 1000 GW at the national level
50% of power generation from renewable resources



Zero wastage of food



Vertical Farming

USMR of not more than 6 per 1000



Average life expectancy of 80 years at birth

Zero slums



Transmission and distribution losses less than 3% | 50% net zero houses in terms of energy and waste generation

30% of total area under forest cover

Transportation



VISION

Sustainable, clean, safe, inclusive, smart and integrated mobility system

SECTORS COVERED

- ▲ Railways
- ▲ Airways
- ▲ Roadways
- ▲ Waterways

FACTS AND FIGURES

- ▲ Second largest road network (4.7 Million km) in the world carries **85%** of Passenger traffic and more than **60%** of freight traffic
- ▲ **13-fold** growth in passenger **cars** in India by 2035 as against 2005
- ▲ Total **freight traffic** (Road & Rail) will be **13,000 BTKM** in 2031-32 (Billion Tonnes Kilometers) as against 2000 BTKM in 2011-12
- ▲ **Average trip length** of road will increase from 2.5-10.3 Km in 2007 to **4-14.8 Km** in 2031
- ▲ India will become the **5th largest** in domestic **air travel** by 2031

FUTURE TECHNOLOGIES

- ▲ Advanced propulsion technologies
- ▲ Fuel cell drive train
- ▲ Flying cars
- ▲ Alternative fuel based transportation

- ▲ Active aerodynamics
- ▲ Intelligent vehicles- Autonomous power train and vehicle control
- ▲ Super high efficiency electric machines- superconductors
- ▲ Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) communications
- ▲ Magnetic levitation
- ▲ Tilting train technologies
- ▲ Fuel cell technology or renewable sources of energy for all
- ▲ Fog vision systems
- ▲ Next generation avionics and flight control systems
- ▲ Biomimetics design for ship
- ▲ Flexible and foldable vehicles
- ▲ Automotive Paints to help charge the vehicle
- ▲ JPod, Hyper loop, high-speed pressure tubes for transportation
- ▲ Evacuated tube transport, non-stop trains

INTELLIGENT TRANSPORTATION SYSTEM	●	●	●	
ALTERNATE FUEL BASED TRANSPORTATION	●	●	●	
ADVANCED POWERTRAIN TECHNOLOGIES		●	●	
AFFORDABLE ENERGY STORAGE AND INFRASTRUCTURE FOR FAST CHARGING		●	●	
ACTIVE AERODYNAMICS		●		
HEAT RECOVERY SYSTEMS		●	●	
INTELLIGENT ROADS		●	●	
LONG LIFE, LOW MAINTENANCE ROADS AND STRUCTURES		●	●	
SELF HEALING ROADS				●
FOG VISION SYSTEM FOR ROAD AND RAIL	●	●		
ACTIVE AND PASSIVE SAFETY TECHNOLOGY	●	●	●	
MAGNETIC LEVITATION TECHNOLOGY		●	●	
TILTING TRAIN TECHNOLOGY			●	
AUTONOMOUS VEHICLES		●	●	
NOVEL MODES OF TRANSPORT (e.g.EVACUATED TUBE TRANSPORT, HYPERLOOP)			●	
AMPHIBIAN AND FLYING VEHICLES	●	●	●	
BIOMIMETICS DESIGN FOR SHIP			●	



Technologies, concepts and approaches relating to safe and speedy mobility that—

- are readily deployable
- needs to be moved from Lab to Field
- require targeted research
- are still in the imagination

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CLASS: Economy AIRLINE PREFERENCE (OPTIONAL): Selected

ADULT (12+ YRS): - 1 + CHILD (2-11 YRS): - 0 + INFANT (0-2 YRS): - 0 +

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INDIA MODERN FESTIVE

REBOOT THE CLASSICS

Benefits

- **Customer Satisfaction - Convenience And Transparency**
- **Ease Of doing Transaction/Business**
- **Modernized Operations And Practices**
- **Optimum Utilization Of Resources**
- **Handling Of Commercial And Operational Aspects Of Passenger And Freight Movement**

Benefits

- **Better Decision Making Tools**
- **Help For Better Logistics Management**
- **Position Of Freight Trains In Computerized Territory, ETA/ETD At A Station www.fois.indianrail.gov.in**
- **Commodity Wise Flow For Customers *Like* Power Houses, Refineries, Fertilizers, Cement Plants, Steel Depots And Public Freight Terminals**
- **Attachment/Detachment Of Rolling Stock -Wagons In Yard, Locos In Shed**

Benefits

- **Detention -Loading/Unloading From Different Regions/Locations.**
- **Freight Earnings, RRs, Invoices, Demurrage Charges, Wharfage Charges And Other Local Charges**
- **Balance Sheet, Apportionment, E-payments, Empty Haulage Etc.**
- **Availability Of Data Like NTKMs, GTKMs, WTR, Outage Etc.**
- **Comparative/ Trend Analysis On Different Parameters**
- **FOIS Data Warehouse-the Data Warehouse Will Enable Analysis Of Data From FOIS To Assist In Strategic Decision Making**

Computerization & Information Systems Directorate

- **Nodal Directorate**
- **Implementation of All IT Projects**
- **Charged to Plan head Computerization**

Centre For Railway Information Systems (CRIS)

- **Autonomous Organization**
- **Develops & Manages The Information Technology Applications**
- **Provides IT Applications For Non-Railway Government And Public Sector Organizations**
- **<http://cris.org.in/CRIS/Home/Home>**

Projects in IR

- **Passenger Applications**
- **Freight/Operations Applications**
- **Other Important Applications**

Passenger Applications

- **Passenger Reservation System (PRS)**
- **Enhanced E-Ticketing / NGeT System**
- **Unreserved Ticketing System (UTS)**
- **National Train Enquiry System (NTES)**
- **Integrated Coaching Management System (ICMS)**
- **IR Web Portal**
- **SMS Gateway**

Passenger Reservation System (PRS)

- **5.43 crore Passengers booked in August-2016**
- **13,021 PRS Terminals**
- **3,430 Locations**
- **Over 6 Lakh Passengers Through Internet Booking in a day – 11.08.2016**
- **Earning Rs 3084 Crore – August- 2016**

Enhanced E-Ticketing / NGeT System for Indian Railways

- **Next Generation E-ticketing System**
- **Inaugurated By Hon'ble MR - On 13th Aug, 2014**
- **Maximum Concurrent users on www.nget.irctc.co.in – 3,02,806 (11.08.2016)**
- **Maximum booking per sec. – 616 (14.08.2016)**

[Logout](#) [Source: Shared by IRCTC website www.irctc.co.in - Specific for travelling Counter book and acceptance of International Cards \(available on IRCTC website\) - Specific for available in RATNAGAN TRAIN from H. Wazirwadi, NCTM to Azad Jammu & Kashmir](#) [Download An App](#)

Alerts & Updates View All

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 If you are not getting an e-mail or a message on your mobile, the same will be sent to you on 34 webpages.
 A verification of the details for the bookings done between 11:00 am to 11:15 am and 11:15 am to 11:30 am is being carried out. Passenger mobile number and passenger details. Any missing information may lead to cancellation of e-tickets and an appropriate legal action.
 List of Country/State/Other Terminal Station
 Counter from...
 Cases are reported to be solved however collection of technology problems or legal issues.

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[Cancellation, alteration or short termination of Indian E-Ticket passenger are subject to the TDS as per refund rules in place for the refund.](#)



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Unreserved Ticketing System (UTS)

- **Approx. 2 Crore Passengers Are Booked Daily**
- **Covers More Than 90% Of All Unreserved Tickets**
- **Tickets Worth About Rs 55 Crore Are Sold Daily**
- **12,147 Counters , 5,879 Locations**
- **More Than 2700 Self-service Automatic Ticket Vending Machines (ATVMs)**
- **450 Cash/Smart Card Operated Ticket Vending Machines (CoTVMs) Installed**

[PNR Status](#)[Train Between Stations](#)[Seat Availability](#)[Fare Enquiry](#)[Internet Reservation](#)

Services

- Mobile Ticketing Services **NEW**
- Registration of Train/Coach on Full Tariff Rate(FTR) **NEW**
- Availability at Major Stations
- Train Schedule
- Tatkal Scheme
- Upgraded Passenger Scheme
- SMS Service
- Current Booking Availability
- Train Berth Availability

Information

- Catering Charges
- Train Type Information
- View Codes
- Trains at a Glance
- Rules
- International Tourists
- Other Railway Websites

UNRESERVED MOBILE TICKETING SERVICES

An Un-Reserved Ticket through Mobile Application (UTS app) has been started from 27 Dec, 2014 from Mumbai Suburban area. This app is available free of cost for Android & Windows mobile phones.

Currently, the application is enabled in the Chennai and Mumbai suburban section. There are two modes of taking mobile journey tickets.

1. Paper Ticket: The passenger can book ticket through the mobile app. On booking of ticket, he/she will get Booking ID along with other ticket details and take print out at the Automatic Ticket Vending Machine (ATVM) using the booking ID. This mode of ticket is enabled in Mumbai suburban area except Churchgate to Dahanu Road section of Mumbai suburban of Western Railway.
2. Paperless Ticket: The passenger can book paperless ticket through mobile application and ticket will be delivered in the mobile application itself. The passenger can travel without taking hardcopy of the ticket. This mode of ticket is enabled in Chennai suburban area and Churchgate to Dahanu Road section of Mumbai suburban of Western Railway. In order to have paperless ticket, the Smartphone should be GPS enabled.

For detail, please visit website <https://www.utsonmobile.indianrail.gov.in>

Also check here for:

[Paper ticket help document for Android Application](#)

[Paper ticket help document for Windows Application](#)

[Paperless ticket help document for Android Application](#)

[Paperless ticket help document for Windows Application](#)

National Train Enquiry System (NTES)

- Applications Provide Updated Train Running Information
- Information Through www.trainenquiry.com/enquiry.indianrail.gov.in And Number 139
- Mobile Interface Has Been Launched
- Core Application Feeding Information To All Interfaces



National Train Enquiry System



Trains 13352,12512,22648,12522,22646,13351,12688,12511,22647,22645,12521,22644,2

Spot Your Train

Live Station

Train Between Stations

Train schedule

Trains Cancelled

Rescheduled

Diverted

Enter train name/No. * |

Large empty rectangular area for search results or detailed information.

Indian Railways wishes passengers a safe and comfortable journey.



Fields with * are mandatory.

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Services

- Expression of Interest (EOI) for Station re-development **New!**
- Mobile Ticketing Services
- Registration of Train/Coach on Full Tariff Rate(FTR)
- Availability at Major Stations
- Reserved Train Schedule
- National Train Enquiry System
- SMS Service
- Current Booking Availability
- Train Berth Availability

Information

- Catering Charges
- Train Type Information
- View Codes
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Services

- [Mobile Ticketing Services **NEW!**](#)
- [Registration of Train/Coach on Full Tariff Rate\(FTR\) **NEW!**](#)
- [Availability at Major Stations](#)
- [Reserved Train Schedule](#)
- [National Train Enquiry System](#)
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Passenger Current Status

Enter the PNR for your booking below to get the current status. You will find it on the top left corner of the ticket.

[Get Status](#)[Clear](#)

Integrated Coaching Management System (ICMS)

- **Three Applications :**
 - **Punctuality Analysis Module (PAM)**
 - **Coaching Operations Information System (COIS)**
 - **Coach Maintenance Management (CMM) - Pilot**
- **Monitor The Coaching Stock And Running Of More Than 8,500 Passenger-carrying Trains Daily**
- **CMM Pilot at Three Locations : BCT/WR, NDLS/NR And LKO/NR**

Integrated Coaching Management System (ICMS) - CMM

- **Modules On :**
 - **Passenger Complaints**
 - **Contract Monitoring**
 - **Machinery & Plant**
 - **Coach Condemnation**
 - **Pit Charts**
 - **Special Drives**
 - **Project Tracking**
 - **Trial Monitoring**
 - **Budget Trains And Documentation**

IR Web Portal

- **Complaint Management System (CMS)**
- **Retiring Room Application**
- **Cloak Room Application – At New Delhi**
- **Portal Websites – 39 Web Sites**

Complaint Management System

- **Web Complaint Management System**
- **Access through Complaint & Suggestions Section of www.indianrailways.gov.in**
- **Direct Access through www.customercare.indianrailways.gov.in**
- **SMS Based Complaint Management System is Also Operational**
- **Complaints In Trains Or At Stations Can Also Be Logged And Tracked Through The Portal**



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SMS, WEB COMPLAINTS & SUGGESTIONS PORTAL



We welcome your Complaints & Suggestions

- » [Register Complaint and Suggestions](#)
- » [Track Web Based Complaint and Suggestion](#)
- » [Track Sms Based Complaint and Suggestion](#)



SMS, WEB COMPLAINTS & SUGGESTIONS PORTAL



Complaints & Suggestions Registration Form

Home

Complaint Details :

Fields marked with * are mandatory

Complaint/Feedback/Suggestions : * *Please select your major type of Complaint

Incident Date : * *Data Format DD/MM/YYYY is better

Name Of Staff :

Report Complaint :

Place Of Occurrence : *

Complaint Reported By :

Name :

Contact No. :

E-Mail Id. :

Address :

Please enter the Complaint Description : *

Attachment if any(Supporting Document) :

Please type the characters appearing in the image below(Letters are case-sensitive) : *

h32JyV

[CLICK HERE TO TRY DIFFERENT WORD](#)

Retiring Room Application

- **Almost 59,000 Retiring Room Bookings Each Month**
- **490 Stations**
- **Through The Internet And Station Counters**
- **Earning Over Rs 2 Crore Monthly**



HOME



TOUR PACKAGE



FLIGHTS



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GALLERY



E-BEDROLL



ACCOMMODATION



CAB/BUS



TOURIST TRAINS

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[Click here to check List of Stations currently available for Online Reservation of Railways Retiring Rooms](#)

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SMS Gateway

- **More Than 1.5 Lakh SMSs Are Being Sent Daily**
- **To Passengers To Inform Them About Change In Their Reservation Status**
- **Pre-Chart SMS Alerts – Once In A Day, Beginning From 5 Days Before The Journey Date**
- **Post Chart SMS Alerts – Actual Berth No., Coach No. And RAC Seat No.**
- **SMS Alert For Any Ticket Upgradation Or Seat Re-allotment**



RAIL INFO ON SMS

SMS RAIL TO 139



IRCTC is proud to announce the launch of their latest initiative in Customer Satisfaction,

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Now you have the power of **RAIL ENQUIRY** on **SMS 139** You can avail the following services

- **PNR Enquiry**
- **Train Arrival/Departure Enquiry**
- **Accommodation Availability**
- **Fare Enquiry**
- **Train Time Table Enquiry**
- **Train Name/Number**

This service is currently available on

Aircel, Airtel, BSNL, IDEA, LOOP, MTNL, MTS, Reliance, Tata, Uninor, Vodafone operators.

Now 139 service is also available at USSD for Reliance and Uninor users. Just Dial *139#.

Launching soon on other Operators also.

The details of the services available are listed below



For PNR Enquiry: SMS "PNR <10-digit PNR number>" to 139

For example: PNR 1234567890

For Train Arrival/Departure Enquiry: SMS "AD <Train number> <Station STD code>"

For example: AD 12859 022





[PNR Status](#)

[Train Between Important Stations](#)

[Seat Availability](#)

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SMS Services

Now all the enquiries like Train Alert, PNR Status, Train Status, Seat Availability, Train Schedule, Train Information, Train Time Table, Train Fare etc offered on the web site www.indianrail.gov.in are available on your mobile phone through SMS facility. For more information on the mobile service providers and the key words to be used on the mobile, please click here

 **SMS 54959**
Click to know more

 **SMS 139**
Click to know more

Freight Operations Applications

- **Freight Operations Information System (FOIS)**
- **Control Office Application (COA)**
- **Timetable Management System (SATSaNG)**
- **Crew Management System (CMS)**
- **Locomotive Management System (LMS for Diesel Locomotives) and SLAM (for Electric Locomotives)**

Freight Operations Information System (FOIS)

- **Two Major Sub Systems :**
 - **Rake Management System (RMS) – For Handling The Operational Aspects Of IR**
 - **Terminal Management System (TMS) – For Handling the Commercial Aspects Of IR**

Rake Management System (RMS)

- **RMS captures the following events in real time**
 - **Customer indents**
 - **Wagon supply - date and time**
 - **Departure after loading**
 - **Running particulars - arrival/departure at stations enroute with attachments/detachments if any**
 - **Arrival at destination**
 - **Handling and delivery at destination**

Rake Management System (RMS)

- **Train Operations**
- **Interchange & Forecast**
- **Rake based consignment tracking**
- **Train in pipeline**
- **Wagon type wise stock holding**
- **Consist reporting on summary basis**
- **Terminal handling performance**
- **Loco holding, outage and power on line.**

Terminal Management System (TMS)

- **Introduced As Phase II Of FOIS In 2006**
 - **Enables Management Of Activities At Freight Terminals**
 - **Commercial Activities— RR Preparations; E-payment**
 - **Document Generation—wagon Consist, Labels**
 - **Data Capture And Report Generation—DC, WC, Etc.**
 - **Detention Analysis**
 - **Commodity And Customer Details Capture**
 - **Customer Facilitation In Tracking Consignments For Large Customers**

Terminal Management System (TMS)

- **Customers – Profile, Concessions, Etc**
- **Booking – Arrival, Demand Register, Haulage, RR, Etc**
- **Rake Handling**
- **Piecemeal**
- **Outward – F/Notes**
- **Inward – Delivery, On Hand, Etc**
- **Charges – Local, Remittance, WC, DC, Bill**
- **Transshipment**
- **Query**
- **Message**

Terminal Management System (TMS)

- **E-payment- Facility Extended To 946 Customers**
- **Covering 80.40% Of All RRs**
- **Total Of Rs 6010 Crores Of Freight Payment During August – 2016**
- **About 2.9 Million Tonnes Of Freight Are Booked Daily**
- **Nearly 1,600 Railway Receipts (RRs)**



FREIGHT OPERATIONS INFORMATION SYSTEM

Ministry of Railways, Government of India

CRIS



new SYSTEM. View Expected Freight For Your Consignment Online Using Freight Calculator On This Site Under Quick Links/Er



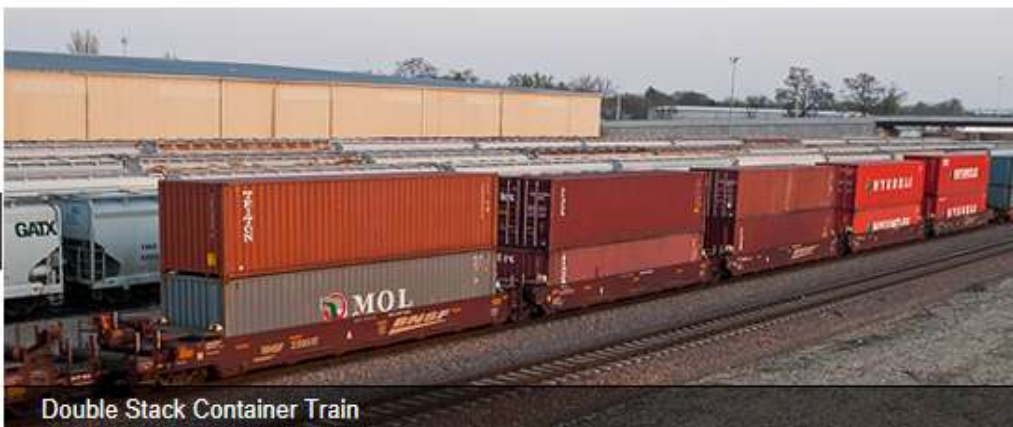
SITMAP



ASSISTANCE

- Quick Links
- Web Reports
- RMS Zonal
- RMS Queries
- TMS Queries

- Applications
- E-Services
- Enquiry
- RBS
- Rate Circulars
- Guidelines



Double Stack Container Train

- RAS IRON ORE
- Iron Ore Indents
- Outstanding Demands for CKP
- Rake Allocation Plan
- Rake Allotment for CKP
- Rake Allotment for KUR
- RAS COAL

WELCOME TO FOIS

There has been a longstanding demand of Indian Railways for transparency in sharing of information to give the customers an upto-date business-like environment. An idea originated in the year 1986 to take advantage of Information Technology to efficiently and effectively manage the processing of information. FOIS - A Strategic Advantage to both IR and its customers. [More >>](#)

- e-Demand
- Freight Calculator
- FNR Enquiry

FNR Enquiry Through SMS

Type: **FNR**<space><11 Digit FNR> and send this to **08860622020**

INFORMATION

- Now You Can Track Your Consignment Through SMS. Type **FNR**< space ><11 Digit FNR>, and send it to [08860622020](tel:08860622020)
- Now You Can Register Your Demand Online With **E-Demand Registration System**.

- CRIS HOME
- ABOUT FOIS
- IR MAPS
- DOWNLOADS
- CONTACT US

FREIGHT OPERATIONS INFORMATION SYSTEM

FNR ENQUIRY

FNR Number :

* FNR Number: 11-Digit Number Printed on Top-Left of Railway Receipt (RR)

Enter Code To Confirm: 

FREIGHT OPERATIONS INFORMATION SYSTEM**FNR STATUS**FNR Number: **13080610849**

Station From:	M/S ADANI PETRONET(DAHEJ) PORT PVT. LTD. SDG.(MAPD)
Station To:	ADANI POWER RAJASTHAN LIMITED SIDING(APLS)
Last Reported Status:	DEPARTED FROM CHAMPANER ROAD JN.(CPN) ON 07-08 AT 13:41
Expected At Destination:	15:51 08-08

[BACK](#)**DISCLAIMER:**

1. DETAILS SHOWN ABOVE ARE FOR INFORMATION PURPOSE.
2. DETAILS SHOULD BE VERIFIED FROM CONCERNED RAILWAY.

Control Office Application (COA)

- **77 Divisions/Area Controls**
- **Integration Between FOIS & COA, Adjoining COA, NTES And ICMS**
- **About 5,00,000 Arrival/ Departure Events Of 14000 Trains Are Recorded Each Day**
- **Satsang Assists In The Preparation Of Train Timetables To Optimize Running Of Trains And Timetable Management System (Satsang)**

Control Office Application (COA)

- **Comprehensive Software For The Automation Of Control Charting**
- **Replaced The Tedious Manual Plotting Of Running Trains On A Chart**
- **The Core Functionality Of The Control Charting With Ergonomics Provided The Traffic Controllers Good Look-and-feel And User-friendly Work Environment**

Functionalities of COA

- **Train Ordering**
- **Maintain Train Information**
- **Manage Train Movement (Abnormal Working, Stabling, Banker Movement)**
- **Report Unusual Occurrences.**
- **Management Of Maintenance Blocks**
- **Caution Orders**

Functionalities Of COA

- **Plot Graph.**
- **Advance Plotting _ System / Manual**
- **Maintain Referential Data**
- **MIS Reports**
- **Yard Management Siding**
- **Miscellaneous Functions**
- **View Station Layout**

Software Aided Train Scheduling and Network Governance (SATSaNG)

- **Fixed Infrastructure Resources Module (FIRM)**
- **Rolling Assets Module (RoAM)**
- **Scheduling Module for Allocation of Resources to Trains (SMART)**
- **Publish Report and Exchange Supporting System (PRESS)**
- **Freight Type Unscheduled Trains & Utilization of Resources Estimation (FUTURE)**
- **Simulation Module and Run Time Estimation Reports (SMaRTER)**
- **Demand Evaluation Module to Assist in New Design of Services (DEMANDS)**

Crew Management System (CMS)

- **362 Lobbies Provided With CMS**
- **System Serves 47,000 Calls Daily Via SMS**
- **Enabling Train Crews To Sign On And Sign Off At CMS Kiosks**

Locomotive Management System (LMS For Diesel Locomotives) And SLAM (For Electric Locomotives)

- These Applications Presently Implemented At A Few Sheds**
- Will Ultimately Manage The Maintenance Of Over 10,000 Locomotives**

Other Important Applications

- **E-Procurement System (EPS) including e-Auction and Reverse Auction**
- **Parcel Management System (PMS)**
- **I-PAS (Accounting Management System)**
- **WISE (Workshop Management System)**
- **ERP systems in Production Units**
- **Energy Management System**
- **Track Management System**

E-procurement System (EPS)

- **Includes E-auction And Reverse Auction**
- **Nearly 15,000 Tenders Are Issued Each Month Through This System**
- **Till Date, Over 5.67 Lakh Tenders Have Been Issued**
- **21,776 Vendors Are Already Enrolled**
- **Scrap Worth Rs 4,339.61 Crore Has Been Sold Through The E-auction Sub-system So Far**

Parcel Management System (PMS)

- **Booking, Delivery And Tracking Of Parcels Is Possible**
- **Presently Covering 80 Stations of 4 Corridors**
- **New Delhi – Mumbai Central, Chennai – New Delhi, Chhatrapati Shivaji Terminus, Mumbai - Howrah, Howrah - Chennai Corridors**
- **System Is Being Expanded To 143 More Stations In A Phased Manner**
- **Over 2.6 Lakh Parcel Way Bills Generated Per Month**
- **Rs 35 Crore Revenue Per Month**

Parcel Management System (PMS)

- **Project architecture – RDBMS-based software on three-tiered network**
- **Modules**
 - **Booking and Delivery Modules**
 - **Loading and Unloading modules**
 - **Demurrage and Wharfage calculation**
 - **VP and lease Booking**
 - **Printing of Bar Code Labels on packages and scanning**
 - **On Line Status and tracking**
 - **Over-carriage and Undercarriage position**

Civil Engineering Projects

- **Track Management System**
- **Indian Railway Projects Sanctions And Management**
- **Railway Land Management System – Pilot Project For 1 Division**

Track Management System

- **Asset Management**
- **Rail And Track Monitoring**
- **Maintenance**
- **Ultrasonic Testing**
- **Track Renewal**
- **Patrolling**
- **Tunnels And Bridges**
- **Implemented In 28 Divisions**

I-PAS (Accounting Management System)

- **Integrated Payroll And Accounting System**
- **I-PAS Is Centralized Financial Management Software**
- **Presently Being Implemented In Phases In Zonal Railways And Production Units**
- **Web Enabled Railway Budget System**

WISE (Workshop Management System)

- **System Is Under Implementation In Railway Workshops**
- **To Be Implemented In 34 Workshops**
- **System Launched At Raipur Workshop, Lower Parel, Charbagh , Liluah And Lallaguda**

Electrical Projects

- **Electrical Energy Management System- Part Of The UNDP Project For Energy Efficiency In Railways, Which Targets 15% Energy Saving By 2020**
- **Traction Distribution And Management System**

ISRO And IR

- **Memorandum Of Understanding (MOU) - “Effective Use Of Space Technology In Remote Sensing And Graphic Information System (GIS) Based Governance Application For Indian Railways” , Signed On 17thmarch, 2016**
- **Aim:**
 - **Developing Applications In The Field Of Remote Sensing And Geographic Information System (GIS)**
 - **Ministry Of Railways Proposes To Use Space Technology Tools In Providing Passenger Information System In All Trains Indicating The Next Station / Stoppage**
 - **Real Time Train Tracking**
 - **Survey Of New Rail Route Alignments Particularly In Hilly And Difficult Terrains**
 - **Conduct Track Vulnerability Studies**
 - **Mapping Of Assets And Introducing Web Enabled Rail User Centric Services**

Future Possibilities

- **Automatic Data Collection Systems**
- **Automatic Vehicle Location Systems**
- **Automatic Passenger Counting Systems**
- **Advanced Passenger Information Systems**
- **Electronic Fare Payment And Ticketing Systems**
- **Impact On The Quality And Availability Of Information**
 - **For Service And Operations Planning**
 - **Controlling The Service**
 - **Measuring The Resultant Service Quality Delivered To Passengers**

Future Possibilities

- **Internet Of Things**
- **Big Data**
- **Data Analytics**
- **Analytics Of Things**

Internet Of Things

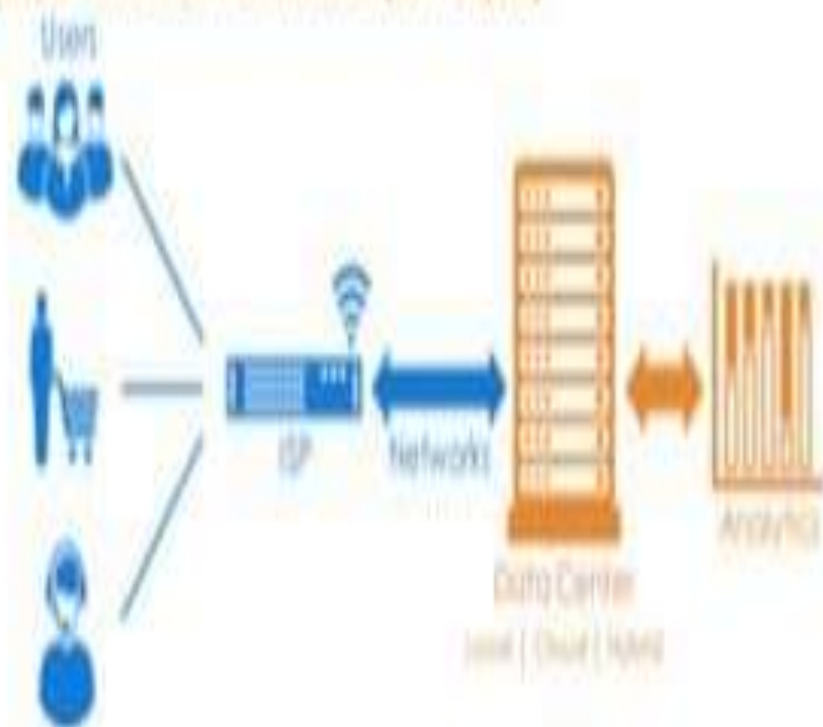
- **Internetworking Of Physical Devices, Vehicles (Also Referred To As "Connected Devices" And "Smart Devices"), Buildings And Other Items—Embedded With Electronics, Software, Sensors, Actuators, And Network Connectivity That Enable These Objects To Collect And Exchange Data**

Internet Of Things

- **The Internet Of Things (IoT) Has Been Defined By *International Telecommunication Union* In Recommendation ITU-T Y.2060 (06/2012)**
- **The IoT Is A “Network” Of ‘Things’ That Can Broadcast Data And Connect To The Internet Or To A Network**
- **Objects, Animals Or People Are Given Unique Identifiers And The Capability To Transfer Data Over A Network**
- **The Convergence Of Wireless Technologies, Micro-electromechanical Systems (Mems) And The Internet Leads To IoT**

The Internet (of people)

Simple View of the Internet (of People)



The Internet of Things

Simple View of the Internet of Things



Big data

- **Big Data Is A Term For Data Sets That Are So Large Or Complex That Traditional Data Processing Applications Are Inadequate To Deal With Them**
- **Challenges Include Analysis, Capture, Data Curation, Search, Sharing, Storage, Transfer, Visualization, Querying, Updating And Information Privacy**
- **The Term "Big Data" Often Refers Simply To The Use Of Predictive Analytics, User Behaviour Analytics, Or Certain Other Advanced Data Analytics Methods That Extract Value From Data, And Seldom To A Particular Size Of Data Set**
- **Accuracy In Big Data May Lead To More Confident Decision-making, And Better Decisions Can Result In Greater Operational Efficiency, Cost Reduction And Reduced Risk**

Data Analytics (DA)

- **The Science Of Examining Raw Data With The Purpose Of Drawing Conclusions About That Information**
- **Used In Many Industries To Allow Companies And Organization To Make Better Business Decisions**
- **Used In The Sciences To Verify Or Disprove Existing Models Or Theories**
- **Distinguished From Data Mining By The Scope, Purpose And Focus Of The Analysis**
- **Data Miners Sort Through Huge Data Sets Using Sophisticated Software To Identify Undiscovered Patterns And Establish Hidden Relationships**
- **Data Analytics Focuses On Inference, The Process Of Deriving A Conclusion Based Solely On What Is Already Known By The Researcher**

Data Analytics

- **Refers To Qualitative And Quantitative Techniques And Processes Used To Enhance Productivity And Business Gain**
- **Data Is Extracted And Categorized To Identify And Analyse Behavioural Data And Patterns,**
- **Techniques Vary According To Organizational Requirements**

Big Data Analytics

- **Examines Large Amounts Of Data To Uncover Hidden Patterns, Correlations And Other Insights**
- **With Today's Technology, It's Possible To Analyse Data And Get Answers From It Almost Immediately**
- **An Effort That's Slower And Less Efficient With More Traditional Business Intelligence Solutions**

Analytics Of Things

- **The Term Used To Describe The Analysis Of The Data Generated By The Internet Of Things Devices**
- **In Other Words, Analytics Of The Internet Of Things Is Analytics Of Things**
- **Analytics Of Things Is Required So As To Make The Connected Devices Smart And To Give The Devices The Ability To Make Intelligent Decisions**

Operations of Things

Things



Factoring



Gateway



The Edge

Analytics of Things

Network



Data Center

Local | Cloud | Hybrid



Analytics

Thank You

COA - Technology

- **Application Developed With A 3 Layered Architecture**
- **Client, Application Servers And Database Servers**
- **Operating System Is Windows Server 2003, 64 Bit For Servers And Win XP For Clients**
- **Database Is Oracle 10g 64 Bit**
- **GUI Is Based On ASP**
- **Net, C# Win Forms And Middleware Is Dot Net Framework With IIS**

FOIS - Technology

- **Application Developed In House With A 3-tier Architecture Using Visual Basic 6.0 (EE), Oracle Tuxedo 10 (Middleware) And Oracle 10g As Database**
- **Reports Are Available On J2EE Platform Accessible Both On FOIS Network And Over The Web At www.fois.indianrail.gov.in**
- **FOIS Is Integrated With Other Operations Modules Of CRIS Using An Enterprise Application Integration Software And With Banks And Customer Legacy System Through SOA Using Web Services**
- **Oracle Grid Including Oracle Weblogic, Oracle Tuxedo And Oracle DB Are Used For The Same**

Unreserved Ticketing System

- **Application Developed With A Two Layered Architecture In C++**
- **Database Requirements Are Met Through A Sybase Product, ASE-CE**
- **Java Version Of The Application Is Used In The ATVMs To Provide Additional Features In The User Interface**

Integrated Coaching Management System (ICMS)

- Operations (COIS) And Punctuality (PAM) Modules Developed In-house On The Java EE 6 Platform**
- Hosted On IBM Websphere Application Server**
- Maintenance Module Leverages The Capabilities Of IBM Maximo Asset Management Software**

Software Aided Train Scheduling and Network Governance (SATSaNG)

- **Fixed Infrastructure Resources Module (FIRM)**
 - The Infrastructure Module will have information on the fixed infrastructure and definitions required for assignment of train services. All information on tracks and signaling will be used to determine the appropriate definitions for conflict free assignment of fixed infrastructure resources. The user interface will include a view of the IR network map.
- **Rolling Assets Module (RoAM)**
 - The rolling assets resources module will handle all the mobile resources, the rakes, the locomotive and the running staff. The rules for utilizing these resources will be handled within this module.
- **Scheduling Module for Allocation of Resources to Trains (SMART)**
 - The Scheduling Module is at the heart of the Time Tabling software. This is the module where all the assignment of resources will be done. The resources will be assigned to train services in a manner that there is no conflicting demand on the same resource and the entire allocation is consistent across all the resources.

Software Aided Train Scheduling and Network Governance (SATSaNG)

- **Publish Report and Exchange Supporting System (PRESS)**
 - The publishing module will contain all the output from the scheduling module and publish it to the other applications like COA, ICMS, PRS, NTES, and CMS. This module will also be used to publish hard copies of the time table in the format specified by the user.
- **Freight Type Unscheduled Trains & Utilization of Resources Estimation (FUTURE)**
 - The capacity module will take all passenger train schedules as fixed and can be used to identify potential freight paths. Further this module will have the capability of building in “what if” scenarios.
- **Simulation Module and Run Time Estimation Reports (SMaRTER)**
 - The simulation module will contain three elements; the train performance or run time calculator, the sectional simulation tool and the terminal simulation tool.
- **Demand Evaluation Module to Assist in New Design of Services (DEMANDS)**
 - The Demands Module will contain analysis of the data from the Passenger Reservation System (PRS) and Unreserved Ticketing System (UTS).

SATSaNG - Technology

- **Application Is Being Developed In House**
- **Using Microsoft Technologies Like Microsoft Visual Studio C# For Development, Microsoft Expression Blend For Designing Interfaces, WPF Framework For Rich Graphical Interface And MVVM For Design Patterns**
- **Oracle 11G Provides The Backbone For The Centralized Database**
- **Application Is Being Designed Based On A Three Layered Architecture**
- **Terminal Servers Will Be Used To Host Application Centrally**
- **All The Servers Will Reside In CRIS Data Centre In High Availability Mode**



About Projects

- » Unreserved Ticketing System
- » Control Office Application
- » Freight Operations Information System
- » Integrated Coaching Management System
- » National Train Enquiry System
- » Passenger Reservation System
- » Software Aided Train Scheduling
- » web National Train Enquiry System

CRIS Projects at a glance

CRIS IT Projects Status

 Tenders & Payments [» View More](#)

PRs – PASSENGER RESERVATION SYSTEM

- » ABOUT PRS
- » SERVICES
- » TEAM

» Technology

CONCERT Architecture

CONCERT architecture is based on the state of the art technology using 3-tier client-server distributed transaction processing paradigm. The system has distributed architecture with 5 server clusters placed in server centers in five cities: New Delhi, Mumbai, Kolkata, Chennai and Secunderabad. The server clusters are connected together by a core network based on a mesh of 02x02 Mbps leased lines. It is an on-line client server application developed in 'C' on OVMS using RTR (Reliable Transaction Router) as middleware. It is currently hosted on state of art converged infrastructure (Itanium blade servers).

Server	Blade servers having 64-Bit Itanium 9340 Processor
Operating System	Open VMS 8.4
Database	In-house CRIS proprietary
Middleware	HP Reliable Transaction Router (RTR)
Frontend	DEC Forms, C and FORTRAN as development tools
Communication Systems	CISCO routers using 2Mbps DOT lines
Network Topology	Mesh Topology
Network protocol	TCPIP, DECNET

Hand Held Terminals for Ticket Checking

The application is developed in-house based on IBM Lotus Expeditor technology. The mobile technologies used are Lotus mobile connect version 6.1.1 for VPN, Lotus expeditor synch server (version 6.2) and DB2E on mobile devices. IBM Tivoli directory server LDAP (version 6.0) is being used for user authentication. The servers are Xeon (Dell power edge 2950) with OS - RHEL 4 update 4. The RDBMS is DB2 version 9.1.5 and Application server - IBM WAS 7.0.0.9.