

**NAME OF CATEGORY—INNOVATIVE USE OF TECHNOLOGY IN e-
GOVERNANCE**

**Computerisation of parcel offices of Indian Railways—PARCEL
MANAGEMENT SYSTEM**

1. Coverage –Geographical and Demographic

(i) Comprehensiveness of reach of delivery centres

Railway Board sanctioned a Pilot project for computerization of parcel offices of seven stations of at an estimated cost of Rs.2 Crores in 2006-07. Based on its merits, Its proliferation to 223 more stations was sanctioned in 2008-09 at a cost of Rs.115.32. On successful running of pilot phase on 10 stations of New Delhi Howrah corridor, its expansion to 387 more stations has been sanctioned in Railway Budget 2014-15. Final target is to computerize all parcel booking offices under Parcel Management System(PMS) and to ensure centralized management through innovative use of IT

(ii) Number of Delivery centres

Already operational	10 stations
Commissioning in progress	77 stations
Scheduled commissioning in 2014-15	143 stations
Sanctioned stations in budget 2014/15	387 stations

(iii) Geographical

(a) National level --Number of state covered

23

Number of Railway zones covered 16

Number Railway Divisions covered 67

Specific details

The PMS pilot project was initially sanctioned for 7 stations in the year 2005-06 as a pilot project. The project was implemented with so much efficacy that Proliferation of PMS on 223 major stations of 10 corridors of Indian Railways was sanctioned by Railway Board at a cost of Rs.115.32 Crores. Apart from 223 stations, it is also proposed to provide PMS terminals at commercial headquarters of all 16 zones, 18 Traffic Accounts offices and 67 divisional headquarters for project monitoring, internal checking and MIS reports. In Ist Phase, 77 stations of 4 corridors are being taken up namely Delhi-Mumbai, Delhi-Chennai, Mumbai-Howrah and Howrah-Chennai for which Purchase orders have been issued. Phase-II will include 143 stations of six corridors namely Mumbai-Bangalore, Jammu Tawi-Kanniya kumari, New Delhi-Howrah(balance stations), Varanasi-Guwahati-Tinsukhia, Delhi-Ahmedabad and Delhi-Saharanpur-Lucknow-Samastipur. The tender preparation for Phase II is in progress and likely to floated shortly. Furthermore, proliferation for roll out of PMS on all 387 stations of A1, A and B category of Indian Railways has been sanctioned in the Railway Budget 2014-15 at a cost of Rs.17.52 Crores. This will bring major traffic handled by parcel handling stations of Indian Railways under Parcel Management System(PMS) The expansion of PMS across the country is in advanced stage of implementation

2. Situation before the initiative(Bottlenecks, challenges, constraints etc with specific details as to what triggered the Organisation to conceptualize this project

The major shortcomings in the Manual Booking of parcel/luggage packages were as follows:-

- i) No information regarding the rules and procedures involved in parcel booking
- ii) ambiguity regarding the pair of stations where parcels can be booked and the freight chargeable on parcel packages
- iii) cumbersome process of parcel booking at parcel counters
- iv) lack of transparency regarding time of transportation
- v) large scale irregularities regarding priority loading of packages
- vi) involvement of touts in parcel operations and corruption
- vii) Misplacement of packages and no mechanism to track and trace the lost packages
- viii) No management tool to identify the irregularities and fix responsibility on the culprits

Under the above circumstances it was decided to evolve and introduce a system which could tackle all the above irregularities/shortcomings/constraints and introduce a robust computerised system which could evolve full scale system of booking, loading, unloading and delivery of packages swiftly and thereby leading to passenger satisfaction. Thus evolved the [Parcel Management System\(PMS\)](#).

3. Scope of services/activities covered(Relevance of choice of application for client/agency, extent of e-enablement in terms of number of services, extent to which step in each service have been ICT-enabled

Parcel handling at the stations involved the following activities:-

- Acceptance of parcels and weighment
 - Generation of parcel way bills/luggage tickets
 - Shifting of packages to outward godowns and platforms
 - Loading of packages at originating station
 - Unloading of packages at destination
 - Shifting of packages from platforms to godowns
 - Delivery of packages
 - Correct collection of charges at originating and destination stations
 - Inventory management
 - Generation of reports
- In Parcel Management System, all these activities were taken up in computerization and exhaustive MIS reports provided for effective monitoring and management.

Parcel Management System has following 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

4. Strategy adopted

(i) The details of base line study done

Parcel handling is a complex activity because it involves multiple rules for charging of parcels consisting of numerous commodities i.e hard parcels, perishables, birds, fish, fresh fruits, vehicles and horses dogs etc which have diverse charging rules and furthermore charging of parcels is done as per the class of train i.e Rajdhani, Premier or standard. Moreover, Railway has the responsibility to ship the packages swiftly and deliver the parcels and till the parcels are delivered the shipments are to be tracked

All activities involved from acceptance to Delivery of packages were studied in great details and software developed with the active participation of field staff and also got checked and tested by Traffic Accounts department of railways. The application was initially hosted on test servers and after rigorous testing of the software, the application was made live on approvals

(ii) Problems identified

PMS application was accepted by the users smoothly and no major resistance came from user end but some procedural problems noticed during implementation were as follows:-

- i) lack of infrastructure at the stations for commissioning of IT equipments like dusty environment, lack of air-conditioning
- ii) limited knowledge of staff towards use of computers
- iii) frequent transfers of training staff
- iv) lack of coordination between different agencies i.e commercial, S&T accounts
- v) lack of ownership

Problems were suitably addressed by provision of handholding, immediate attending of hardware related problems and resolution through meetings with management

(iii) Roll out/implementation model

- e) Strategies adopted for bringing about the transformation and positive impact

Most of new systems adopted for system improvement generally face

resistance from staff who are accustomed to stereo type working since long and who feel insecure in the changes. To countermand their fears and apprehensions following strategies were adopted to make the PMS roll out successful

- i) Setting up of testing terminals at major locations
- ii) Motivating the staff to experiment the new system at Testing site on Testing servers so that they are not afraid of making mistakes
- iii) On site training to the parcel booking staff. For training purpose online video files have been provided so that Parcel clerks can play back the same on their terminals for better understanding of the application
- iv) Deployment of handholding staff to tackle any hardware problems
- v) Recruitment of retired parcel supervisors to associate with the parcel booking during the field testing and training and coordination regarding fixing the bugs found during testing of the software.
- vi) Grant of appreciation and Awards to the staff doing quality work.

(iv) Communication and dissemination strategy and approach used

Different levels of communication with the users were provided as follows:-

- Provision of helpdesk number for logging of complaints and resolution
- Bug reporting on individual terminals for direct interface with database administrators
- Frequent meetings with concerned officials for progress of the project

Following additional facilities are being provided to users

- Emailing facility for all the users of PMS
- 24x7 helpdesk
- Asset management feature in helpdesk

5. Technology Platform used

(i) Description

Application Architecture

Entire application has been developed in Java and it is based on generic three tiered centralized approach with commonly accessed Storage area Network. The data server machines(a cluster of Linux Servers) will have open hardware platform of Xeon. Apache and Apache Tomcat has been used in high availability and Load balancing mode. RDBMS is accessed by JDBC in clustered mode.

Backend-RDBMS:

Oracle 10 g Enterprise Edition in RAC environment.

Middle Tier-Application Server:

IBM Websphere application server

Front End Clients:

Windows XP embedded OS based thin clients/PDA with Internet Explorer 6.0

(ii) Interoperability

PMS takes data of from Passenger Reservation Systems for verification of PNR details, Rates Branch System for fetching distances and Integrated Coaching Management System for train composition details. All these functions are carried out with the help of webservices and integration with other applications

(iii) Security concerns

Centre for Railway information Systems works on Railway intranet and IP based terminals. CRIS has put in place suitable firewalls and security features to protect the database and it is closely monitored to ensure protection from hackers and unintended users

(iv) Any issue with the technology use

No major issues

(v) Service Level Agreements SLAs

CRIS has mandated 99.5% uptime for central architecture and the vendor has to maintain SLA of 6 hours call to repair and 12 hours call to repair at locations

6 Demonstrate innovative use of ICT for development

Unique feature of PMS is the on-line tracking of consignments through website www.parcel.indianrail.gov.in. Besides, the status of the packages is also provided to customer through SMSs on his registered mobile number. This is possible only if complete tracking of parcel is done from booking to delivery on PMS locations. Extension of PMS to all stations upto D category, has been proposed, will enable IR to achieve this goal and to improve the quality of service to a larger number of customers by way of easy and transparent booking, transit and delivery system. In the PMS system developed by CRIS, the weight of the parcel is electronically transferred from the weighing machine to the Parcel Way Bill. The freight rate is also picked by the computer from a centralized data base. This ensures single window operation through universal counters which eventually makes booking of parcels for customers more user friendly and speedy unlike the age old archaic system where he had to run to different counters to get his parcel weighed and booked. Even for booking counters were segregated on directional/geographical basis. PMS ensures correct calculation of freight which is expected to reduce customer complaints substantially. On PMS the information about the loading done at the previous stations to the destination is available in advance. En-route and destination stations can improve planning of unloading and stacking of inward parcels thus eliminating over carriage/loss of packages. This is especially important for perishable consignments like milk, fish and poultry. Vacant spare availability in SLRs is available to all en-route stations. En-route stations can plan loading/unloading in advance in order to ensure optimum use of available space.

The bar coding technology introduced in PMS would enable IR to track the movement of parcels on end-to-end basis. This will reduce the possibility of over-carriage, mis-dispatch and misplacement of parcels in transit thereby reduction in claims. PMS being web-based application it would be possible for IR to inform the customers about the real time status of their consignment by way of information about the status of their parcels on internet. The data captured through PMS would enable better planning, utilization of rolling stock and rating of commodities through a variety of MIS reports.

7 Citizen Centricity

(i) Impact on effort, time and cost incurred by user

Outcomes i.e. impact/benefits resulting from the initiative, for example

- Improvement in delivery time of services
PMS has drastically reduced the delivery time of consignments which is based on the following features:-
 - a) Complete information regarding inventory(outward and inward packages)
 - b) Priority loading
 - c) Barcode labelling
 - d) Tracking of packages through barcode scanners at the time of loading and unloading
 - e) Advance information to the consignee regarding loading/arrival of package through SMS and hence instant delivery leading to saving for the customer in respect of wharfage/storage charges. It is also proposed to introduce email updates in future.
 - f) Prompt clearance of packages from platforms and godowns thereby free space
 - g) Reduction in claims because of loss and pilferage

(ii) Feedback/grievance redressal mechanism

Problems were suitably addressed by provision of handholding, immediate attending of hardware related problems and resolution through meetings with management. PMS also envisages 24x7 helpdesk with toll free number and stringent SLA conditions

(iii) Audit Trails

Indian Railways have a robust system of internal checks on all transactions through Traffic Accounts office and Travelling Inspectors of Accounts apart from Audit inspections. Any discrepancy brought to the notice of CRIS is promptly examined with relation to the rules and necessary modifications carried out in the software and intimation given. Any query desiring clarification is suitably raised to Railways and Railway Board for clarification

(iv) Interactive platform for service delivery

PMS itself is service oriented application which aims at transparency in operation, expediting transshipment of packages and giving real time information to user about the status of their consignments. This is achieved by giving SMS to consignee and consignor at different stages of transshipment from booking, loading, unloading and delivery. Additionally any user can track his package at www.parcel.indianrail.gov.in

(v) Stakeholder consultation

Transparency and Stakeholder participation:- Parcel Management System is a central architecture based application which replicates the codal provisions and procedures being following in manual system of Parcel booking and delivery. It is based on the rates prescribed by Railway Board as further notified by concerned zonal railways. All software modifications are released

to concerned zonal railways for testing purpose and are made on line only on approval of the software from the concerned stakeholder. Every stake holder carries out his duty as per predefined role and in PMS application the concerned railway is given the permission to revised the scales of trains as per latest notifications. Moreover all the transactions generated on PMS system are subject to periodical integrity checks by Travelling Inspectors of Accounts and Traffic Accounts office. Any bugs detected during testing and on line transactions are immediately brought to the notice of CRIS through online bug reporting and which are settled after discussion, and an online trail is available from start to finish

8. Adaptability and Scalability

PMS software has provision of generation of Parcel Way Bill and Luggage tickets in bilingual i.e. English and hindi fonts. All hardware is purchased with capabilities to print hindi fonts. Central Architecture also has the capability to take load of additional users and provide service to additional stations keeping in view the expansion of PMS in the next five years

9.

(i) Measures to ensure adaptability and scalability

PMS has ease of use single page interface for easy and minimal data entry and printing in Dual language i.e. English and Hindi. PMS is a web based application and can function on any hardware having windows OS and can function of any make model of Dotmatrix printers

(ii) Measures to ensure replicability

PMS is a web based centralized application and easily replicable

(iii) Restrictions if any in replication and scalability

PMS works on centralized intranet network which uses secure Railway intranet

(iv) Risk Analysis

PMS works on clustered application as well as database server. Thus failure of one server or application will not hamper the working. Moreover data back up is maintained on Storage Area network and also in Tape library and mirroring is applied on the online database at two different locations to ensure data protection

10 New models of Service Delivery

PMS application also provides useful information on Railway public website www.indianrailways.gov.in

11 Efficiency enhancement

i) volumes of transactions processed

As a result of popularity of PMS application the quantum of traffic booked i.e. performance indicators are given in table given below

Financial year	Number of Parcel Way Bills/Luggage tickets	Total packages	Total chargeable weight(Kgs)	Total Earnings(Rs.)
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2007-08	784367	4258112	191670118	419855835
2008-09	699400	4486951	183774950	429759347
2009-10	722909	4745186	200525960	498517587
2010-11	705836	5583064	233909340	578530440
2011-12	1215278	8509129	345743180	826643907
2012-13	1540997	1106016 9	441963310	1389035676
2013-14	1781304	1383368 6	549877680	2061975503
2014-15 (upto July 14)	560144	4531426	184276910	816976840

ii) Coping with transaction volume growth

PMS application hardware has capability to handle traffic growth upto 700000 transactions per minute

ii) Time taken to process transactions

Each parcel booking takes less than one minutes time to process after completion of weightment of packages

iii) Accuracy of the output

Freight calculation is based on vetted freight input in the database and parcel way bill or luggage ticket gives accurate information about the transaction

iv) Number of delays in the service delivery

PMS envisages 95% uptime at the locations and number of delays in service delivery is reduced to very minimal

12 User convenience

(i) Service delivery channels

The end user i.e. general public has been benefitted by advance information about the trains between pair of stations, freight calculator, single window operation of weightment and booking, barcode labelling, Status updates through SMS and tracking of the packages through IR website www.parcel.indianrail.gov.in

(ii) completeness of the information provided to the users

Latest information provided on PMS website www.parcel.indianrail.gov.in gives complete information about the time, train and location of parcels while in transit and in case of the consignee not turning up for delivery of consignment, SMS reminders will be given to the consignee and consignor on every four days interval regarding arrival of package and prompting them to take delivery

(iii) Time window

PMS envisages universal windows and ample number of parcel booking and delivery terminals have been provided to minimize the time taken for booking and delivery of packages

(iv) Distance required to travel to access points

PMS terminals have been provided in the station buildings where parcels are brought to be booked which are conveniently located and at walkable distance in the station premises

(v) Facility for online and offline download and online submission of forms

PMS permits downloading and generation of forwarding note at party's premises from website www.parcel.indianrail.gov.in which will reduce the time taken for booking at originating station since major inputs have already been fed and captured in PMS database at the time of generation of forwarding note

(vi) Status tracking

Latest information provided on PMS website www.parcel.indianrail.gov.in gives complete information about the time, train and location of parcels while in transit and in case of the consignee not turning up for delivery of consignment, SMS reminders will be given to the consignee and consignor on every four days interval regarding arrival of package and prompting them to take delivery

13 Sustainability

PMS uses java based application using J2EE technology which creates multi user environment. User ID, password and counter details are primary inputs required to access PMS application thereby ensuring security. Passwords are in encrypted format. Single user cannot access PMS application at more than one terminals which is monitored through IP based monitoring. Onsite training to PMS users is given through test server. PMS terminals also have speaker based monitors to run audio visual training files. Improvement in quality of service by way of transparency and optimum utilization of parcel loading space ensures attracting new avenues of traffic and revenue generation

14 Results achieved

(i) To organization

PMS has been a favoured application since the inception amongst Railway users because of the ease of operation, inbuilt freight calculator, wharfage/ undercharge calculator. Railway staff has shown tremendous enthusiasm in propagating the PMS application. It was because of this popularity, PMS is functional at 23 stations of IR

(ii) To citizen

The end user i.e. general public has been benefitted by advance information about the trains between pair of stations, freight calculator, single window operation of weighment and booking, barcode labelling, Status updates through SMS and tracking of the packages through IR website www.parcel.indianrail.gov.in

(iii) To other stake holders

Lease holders are being benefitted with facility of e registration for e tendering of leased SLRs for parcel loading

15 Extent to which objective of the project is fulfilled

Railways have been benefitted through increase in traffic and revenue generation as detailed above in para 11 above. G2B and G2C model have been successful based on positive impact of increase in earnings and decision of Railways to expand the application to all major parcel stations of Indian Railways in next two years

16 Comparative Analysis

Analysis of increase in earning have been given from year to year in table 11 above which clearly indicates increase in volumes and earnings based on shifting to PMS system of booking and delivery from year to year. In the manual system of booking there were dedicated windows destination/route wise which have now been transformed to universal window of booking in PMS. In manual booking there was no way of monitoring the priority loading which has been enforced through PMS system of Loading guidance

17 Other distinctive features

1. PMS application gives the facility to get information about the transactions upto a period of 5 years and keeping online data for 3 months from the date of transaction. This enables the management to take decisions regarding lost parcels and claims settlements.
2. PMS has improved in delivery time of services
PMS has drastically reduced the delivery time of consignments which is based on the following features:-
 - a) Complete information regarding inventory(outward and inward packages)
 - b) Priority loading
 - c) Tracking of packages through barcode scanners at the time of loading and unloading
 - d) Advance information to the consignee regarding loading/arrival of package through SMS and hence instant delivery leading to saving for the customer in respect of wharfage/storage charges.
 - e) Prompt clearance of packages from platforms and godowns thereby free space on platforms
 - f) Reduction in claims because of loss and pilferage