

INTRAMINE SYSTEM

Introduction

e-Governance has been the central theme of most of the computerization efforts of Government Departments. Government Departments felt the need to re-engineer and transform them to provide basic as well advanced service deliveries to the door-step of public and other stakeholders. Information and Communication Technologies (ICT) empower and transform the way stakeholders interact with ICT based e-Gov solutions.

This paper presents the approach towards the introduction of the Permit Management System (PMS) along with the INTRANET driven back-end systems called INTRAMINE in Orissa. We discuss briefly the computerized systems along with the basic governance framework and compare with the corresponding manual procedures followed in Orissa based on the discussions held with the officials from Orissa. The proposal calls for few best practices followed in Karnataka and may result in corresponding re-engineering in the procedures followed by Orissa Government and few policy changes.

The proposal covers the requirements for the introduction of PMS and related software components including the ICT infrastructure requirements like requirements for the hosting of applications (PMS and INTRAMINE) from the Data Centre, requirements at district level offices, etc.

We also propose that the workload on employees can be reduced considerably and reliance on ICT infrastructure at District offices where from Transport Permits are being issued can be minimized by allowing the lessees themselves to apply for permits online and after inspection and approval by DMG, the permits could be printed by the lessees at their premises. This involves several security measures like third-party DSC for lessees who have infrastructure

(systems, INTERNET connectivity, laser printer, UPS etc.), use of controlled stationery (if any), permits series, barcodes, etc.

We propose that the proposed systems with re-engineered processes will simplify the workloads at DMG offices by allowing the lessees to apply online for permits and other applications, remitting the royalties and fees ONLINE and then print and utilize the permits for the transportation of minerals. However, this call for stringent measures like controlled stationery holograms issue to lessees, improved checks at check posts, additional check posts, more vigilant enforcement activities etc and could be taken up in the second phase of implementation. However, the integration of payment gateways and SMS integration could be taken up in the first phase itself.

1. Overview of PMS and INTRAMINE

Minerals Activities Administration System (MAAS) has two independent systems: INTRAMINE – the web based, workflow and INTRANET driven application software for the management and administration of mineral activities and PMS (Permit Management System) – the workflow based INTERNET/ INTRANET driven software for the issue and management of Permits for the transportation of minerals.

INTRAMINE is driven by workflows covering all procedure and norms towards the administration of mineral administration and covers the following major functionalities:

- a) Mining Leases (New / Renewals)
- b) Quarry Leases (New / Renewals)
- c) Reconnaissance Permits (New / Renewals)
- d) Prospecting Leases (New / Renewals)
- e) Building Materials (New / Renewals)

- f) Patta Land Permits (New / Renewals)
- g) Sand Transport Permits
- h) Transportation Permits
- i) Enforcements
- j) Penalties
- k) Collection of Royalty / Dead Rent / Penalties and other payments
- l) Demand Collection Balance
- m) Suspension / Cancellation of Leases / Permits
- n) Surrender of Areas, Minerals, leases / permits etc
- o) Inspection Reports and Actions
- p) Court Cases
- q) Submission of Mandatory Reports

INTRAMINE covers all lifecycle activities and administrate and manage the various types of leases / permits. PMS is used for the issue of permits and monitoring the transportation at check posts.

INTRAMINE covers all lifecycle activities from application for leases / permits (new or renewal) to issue of leases / permits and administrate and manage these leases and permits on the usage like exploitation of minerals to transportation of minerals in a sustainable manner as per the government rules, procedures and systems.

Permit Management System (PMS) is used for the issue of permits and monitoring the transportation at check posts. Digital signatures, barcodes, watermarking and random number allocation are the security measures for the usage of permits. INTERNET users are forced to use 'Secure Word' as additional security for filing applications and printing permits.

INTRAMINE and PMS together constitute MAAS and these two packages are integrated with web services so that master data changes like new leases / permits, renewals, surrender,

royalty rates and other critical data like court cases information are reflected in the PMS as soon as they are updated using INTRAMINE.

Payment Gateway Integration, SMS Integration, Mobile Check Posts and Mobile Enforcements with mobile / laptop / palmtop based applications and GIS applications with maps integrated with the lease / permit master data are some of the applications for which software development has been completed and implementation along with procurement of Infrastructure (mobile devices) and Services (Payment Gateway) is in progress.

PMS is being extended to lessees along with Payment Gateway so that lessees will be able to load applications from their places and after approval (with digitally signed permits), lessees print the digitally signed permits for transporting minerals. The advent of INTRANET and INTERNET and the matured technologies form the basis for the development of centralized systems and offer services over INTRANET and / or INTERNET. The growing need for e-Governance and the availability technologies and infrastructure forced NIC Karnataka to opt for a total solution covering all areas connected with the application.

Basic re-engineering was applied in all areas as the procedures and functionalities were available only as acts, rules, regulations, amendments, etc. There were acts and rules from both Central Government and state government. The acts, rules and regulations were converted into procedures along with non-redundant workflows. This would mean that the software available now is on the basis of acts, rules, regulations and the procedures evolved on the basis of these and the workflows as per best practices.

The systems and services evolved over time and matured enough to provide the required e-Government services. The software evolved from decentralized model (although web based) to centralized model.

The services are now being extended to the Lessees so that the applications will be filed by lessees themselves and print the permits after the approval with DSC. This would mean that the DMG authorities at the district level need not attend to mundane activities and instead

concentrate on enforcement related activities. The productivity of the staff / officers at DMG increases many-fold and the ICT infrastructure at DMG offices are used sparingly and no additional investments and expenditure towards procurement and maintenance of ICT infra is required.

Services like Payment Gateway, SMS integration and filing applications online and printing permits will definitely improve the services and both DMG and the Lease / Permit holders will benefit a lot. Thus we are extending the benefit of INTERNET like convenience, choice, reduction of cost, availability etc to the public.

The mobile applications as well as INTERNET portals will pave the way for Mobile Check Posts (Virtual) and Mobile Enforcements without the requirement for any immovable infrastructure like check posts with systems etc.

The software provided step-by-step procedures for filing applications, inspection and also during approvals and printing. The software is workflow driven and takes the end users in the right direction and with desired results.

Lessees could file multiple applications with each application for multiple permits. Applications filed for bulk permits can be inspected one-by-one or as a group or all and interactively complete the inspection process as well as approvals. All necessary information is provided to the end users to complete the procedures, process and the navigation is also simplified.

All interfaces are interactive and menu-driven and are workflow based. The individual forms, for capturing the details at each stage of the workflow, are interactive and are as per the manual forms and in the order in which data / information is available with the end user.

End users are provided with dashboards as per the role in the software. For instance, higher officials monitor the package usage using their dashboards and the lessees get dashboard with details like how many applications files, how many inspected, how many approved and how many printed etc. Lessees also get interactive ledgers along with status information. The key

success factor is the availability of services and the transparency they services provide to both DMG remote locations and public like lease holders and permit holders. This availability factor along with INTERNET technologies provides an unique opportunity for the public to leverage the technologies and derive the maximum benefit.

The product can be integrated with external stakeholders like IBM, Ministry of Mines, Environment and Forests, Pollution Control Boards, Police and Revenue Department.

Benefits and Key Indicators

The digital divide between lessees and DMG has been bridged with the centralized services as the lessees with a system and broadband connection could all the services they need in a transparent manner. The payment gateway reduces the gap by eliminating the need for the preparation of Demand Draft and takes the DD physically to DMG. The lessees could now transfer funds to DMG as royalty at their convenient time and choice.

The lessees could also be informed over SMS as soon as the Permit is ready. SMS could also be used for enforcement related activities.

However, there may be few lessees who could not afford for a system and internet connection and these class of users are still required to visit DMG.

All stakeholders are empowered and the biggest beneficiary is the Lessees / Permit Holders and Public. In the manual system, lease holders or their representatives need to visit the DMG office several times in a day to have the permits to transport minerals which they had produced.

Another benefit for the lessee is the convenience, choice, location-independent access to software and file applications, and Print and uses the permits by themselves once the approval is communicated to them. This makes life simpler for both the lessee and the DMG. The DMG officials also need not do filing of applications using computers and print hundreds of permits in office. The time gained could be used for better inspection and enforcements.

At the Government side, with the introduction of centralized services and with the fact that lessees are filing applications and printing permits on their own, the resource requirements as well as infrastructure requirements significantly reduced both in terms of procurement as well as maintenance.

The services are transparent, cost effective, available and above all accessed conveniently and as per choice.

The mobile / laptop based low cost solutions pave the way for Mobile Check Posts and Mobile Enforcement which would not have been possible without the centralized PMS software.

2. Gaps Analysis

In Karnataka, the issue and management of permits for the transportation of minerals is done through PMS and INTRAMINE software packages. These packages have evolved over the last three years and matured enough to follow the acts, rules and procedures of the Government of Karnataka. As the primary objective of this proposal is for the introduction of Permit Management System (PMS) in Orissa, we shall confine ourselves to what the software offers and to what extent the software differs from the acts, rules and procedures followed by Government of Orissa.

The following are the major modules of PMS:

- a) Software for filing applications for Permits
- b) Software for the Inspection of Applications
- c) Software for the Approval / Rejection of Applications and Permits
- d) Software for Generation of Permits and Printing
- e) Integration of Barcodes, Digital Signatures, Watermarking, Random Numbers, Finger Print Devices, Payment Gateways etc.
- f) Renewal of Permits

- g) Surrender of Permits
- h) Royalty Collection
- i) Cancellation of Applications for Permits
- j) Master Data Management (Leases, permits etc)
- k) Control Data Maintenance (Royalty Rates, schedules etc)
- l) Integration of Business Rules governing Production and transportation

The basic differences between Orissa practices and that of the PMS package followed in Karnataka are the following:

- a) In Karnataka, for all types of permits, royalty is collected in advance. In Orissa, Royalty is collected after the permits are issued and interest is collected if not paid within the stipulated time.
- b) In Orissa, permits once issued cannot be surrendered. In Karnataka, lessees are allowed to surrender the permits if they are not able to transport the minerals within the permissible period and for other reasons. In Karnataka, if the lessees surrender the permits without valid reasons, they forfeit the royalty paid. However, the quantity is restored and could be transported later on.
- c) In Karnataka, Department of Mines and Geology (DMG) is the Nodal Agency and the Sole Authority for the Administration of Mineral Development in the State as well as for the issue, management and monitoring of permits across the state. Forest and Revenue departments act as enforcement authorities in addition to DMG Check Posts and enforcement officials. Forest Department issues Transit Passes only for allowing the vehicles with minerals to pass through the Forest Areas. Forest and Revenue Authorities do not collect royalties.
- d) However, in Orissa, apart from the Department of Mines and Geology, other Departments like Forest and Revenue also issue permits and collect royalties.

3. Requirements for Implementation in Orissa

The requirements could be classified into two:

- A. Management Solutions and Requirements
- B. Technical Solutions and Requirements

Management Requirements:

The Government of Orissa, in principle, desires to utilize the PMS and INTRAMINE software from Karnataka for the issue and management of Transit Permits / Mineral Dispatch Permits for the transportation of minerals. However, as PMS software is based on the acts, rules and procedures followed in Karnataka, either Orissa has to adapt the same PMS in Orissa by amending some of the rules and procedures or the PMS software has to be modified to follow the Orissa practices. This is the first management decision to be taken by the government of Orissa.

The above involves, among other things, as discussed earlier on, a decision on when to collect the Royalty: in advance while issuing the permits as done in Karnataka or after the permits are issued. The Government should also decide whether to allow surrender of permits or not.

Secondly, Government of Orissa should decide whether permits will be issued only by the Mines and Geology Department or by other departments like Forests and Revenue also. If other departments issue permits, then the software requires to be modified to cater to this requirement.

Another aspect for which a management decision is required is related to the following:

- a) Check Posts

- b) Skilled manpower for Check Posts
- c) Routes (from Source to Destination)
- d) Route based allocation of Validity period (in number of days) for transportation
- e) Destinations

Technical Requirements:

The following are the main technical requirements for the implementation of PMS in the state of Orissa:

1. Data Centre ICT infrastructure

- 1.1 Two Server Class Servers (Two Quad or better processors each, 16GB / 32 GB Server Class Memory each, 5 Hot Swappable Hard Disks each, Redundant Gigabit Ethernet Cards, etc)
- 1.2 KVM Switches (if required)
- 1.3 Rack (as per the data centre requirements, not required if shared from Data Centre)
- 1.4 Power Supply (not required if shared from Data Centre)
- 1.5 Other Accessories (if required)

2. Requirements for each District Office

- 2.1 Computer Systems with Anti Virus Software (2 or 4GB RAM, latest processor and motherboard, 100/1000 Mbps Ethernet Card or better, 160 GB Hard Disk or better, 17" LCD Monitor, and other accessories)
- 2.2 Entry Level Laser Printer with Network Card (16-24 PPM) for locations that serve about 500 permits per day

- 2.3 Heavy Duty Laser Printers with Network Card / Heavy Duty Line Matrix Printers (1000 / 2000 LPM or Page Printers (if the load is too heavy) could also be used if the number of permits to be printed are large.

The Laser Printers or Line Matrix Printers should be capable of printing Barcodes of standard symbologies like PDF417 and other standard 2-dim and 3-dim barcodes.

- 2.4 Preparation of LAN (Local Area Networking) with Switch, Cabling, Patch Chords etc)
- 2.5 Broadband (256 Kbps or 2 Mbps depending on the load) Connection
- 2.6 If Connectivity is available from Orissa State Wide Area Network Project, then Broadband connections are not required (however the adequacy of OSWAN to be ascertained)
- 2.7 Uninterrupted Power Supply (UPS). On an average, one 2 KVA UPS may support 4 Systems and a Printer. District offices may be provided with 2 Hours battery backup. Offices having power outages may be provided with 4 hours backup and provision of Solar panels based power may be looked into.
- 2.8 Power Cabling
- 2.9 Computer Furniture
- 2.10 Site Preparation (a small compact area 200 to 400 Sq. Ft may be prepared to have the LAN).
- 2.11 Air Conditioning is **not Mandatory**.
- 2.12 Digital Signature Certificates for all identified officials from each office.
- 2.13 Finger Print Device for each system (Optional)
- 2.14 Barcode Scanners / Readers (2-D and 3-D, capable of reading the barcodes on the permits)
- 2.15 Holograms (essential)

2.16 Controlled Stationery (Optional but desirable for enforcement activities)

Note:

- a) The number of systems required for each office depends on the number of leases under that office and the number of permits being issued on an average per day. The rough estimate is that one computer could be used for the issue of about 500 permits per day. However, if Heavy Duty Printers are attached, the same system could be used for serving more than 20,000 to 30,000 permits per day.
- b) All systems and printers should be under the LAN

3. Requirements for Directorate

- a) Identified Officers at Directorate may be provided with computer systems with Anti Virus Software and connected to the LAN of the Department
- b) Sections may be provided with adequate number of systems and printers to process Lease applications and manage the Lifecycle activities
- c) The Directorate may be connected to the OSWAN or NIC State Data Centre over 2 Mbps or higher Leased Line bandwidth
- d) Officers on enforcement may provided with Mini Laptops with Barcode Readers
- e) Officers could also use Mobile Phones for sending and receiving SMS related truck movement and enforcement.

4. Check Posts Requirements

- a) Each check post may be provided with a Mini Laptop with Barcode Readers.
- b) Anti Virus Software for Laptops
- c) The laptop should have adequate batter backup (8 hours)
- d) Use of Solar Panel based backup facilities may be worked out
- e) Mobile Phones could be used for updating data related to movement of loads and minerals as well as for enforcement.

5. General Requirements

- a) SMS Integration
- b) Payment Gateway Integration

4. Manpower Requirements

Customization of PMS for Orissa and modification of INTRAMINE as per Orissa requirements require One Senior Developer (Programmer/ Senior Programmer) and One Developer (Assistant Programmer). As there are severe manpower problems in NIC, we propose to utilize the services of developers hired from software industry through NICSI. Standard rates are available which could be provided along with Proforma Invoices from NICSI.

Initially, One Programmer and Asst. Programmer may be posted for six months and one of them or both may be retained after that based on the requirements. The Programmers will be under NIC Karnataka for a limited period for customization and modification. After that they would be posted in Orissa for implementation and software support.

5. Recommendations

A. Business Process Re-Engineering

- ➔ Change in policies related to collection of royalties – whether to collect in advance or after the permits are issued
- ➔ Whether to allow surrender of permits or not
- ➔ Whether only one department would issue permits and collect royalties.
- ➔ Decision on the number of check posts
- ➔ Source to Destination routes, Route based allocation of permit validity, etc

➔ Use of Controlled Stationery with Holograms

B. ICT Infrastructure

➔ Data Centre Requirements (Two Servers and associated hardware and accessories)

➔ District Centre Requirements (LAN with Systems and Network Printers with Standard Barcode Printing Capabilities, Barcode Scanners / readers, Finger Print Devices, DSC Certificates, UPS etc and Broadband Internet Connection or OSWAN Connection with adequate bandwidth)

➔ Directorate Requirements (LAN with Systems and Network Printers, Barcode Scanners / readers for enforcement officials, DSC Certificates, UPS etc and Broadband Internet Connection (2 Mbps) or OSWAN Connection with adequate bandwidth preferably with 2 Mbps Leased Line or otherwise)

➔ Requirements at Check Posts (Mini Laptops with Barcode Readers, Mobiles for SMS based monitoring, Power Supply backups, manpower)

➔ Requirements for Enforcement (Mini Laptops with Barcode Readers, Mobiles for SMS based monitoring, Power Supply backups)

C. Digital Signatures

➔ NICCA Smart Card Digital Signatures / USB e-Token for DMG officers

➔ Third Party DSC for Lessees for ONLINE access and submitting applications and printing permits

➔ Certificate Policies from Government for Employees

➔ Practice Statement from Lessees

D. Payment Gateway Integration

- ➔ Identification of PG Services
- ➔ Negotiation with PG vendor for reduction / discounted services with no charges for DMG
- ➔ Service Charges for Lessees (may be less than that of DD commission)
- ➔ Integration with Treasury Account
- ➔ Payment Gateway Integration and ONLINE applications from Lessees will reduce the workload considerably at DMG district offices.

E. Virtual Check Posts and Anywhere Enforcement

- ➔ Use of Mobile / laptop / palmtops
- ➔ Additional Charged batteries as backup power or Laptop with Solar Powered backup
- ➔ No Computer Cell at Check Posts
- ➔ SMS Integration helps monitoring the movement of trucks / loads

F. Anti-virus Management

- ➔ Enterprise Anti-virus solution will be the right choice
- ➔ Once OSWAN and Government Data Centre is fully commissioned at district and sub-district level, Enterprise AV will be available from the State Government.
- ➔ If the applications are hosted from NIC State Data Centre, all nodes running PMS / INTRAMINE and connecting to NIC State Data Centre could opt for the Enterprise Anti Virus Solution from NIC.

