Deregulation of the telecoms industry has forced many companies to rethink their business strategies. Telekom Malaysia is meeting the challenge head-on in order to protect its market share and position.

In preparing its information infrastructure for privatization, the former state-owned monopoly, Telekom Malaysia (TM), recently crossed a significant threshold by installing a state-of-the-art GIS throughout its enterprise. The formal announcement of the TM Local Network Management System (LNMS) was made in late September, and there are indications that this project will be remembered throughout the region and the telecommunications industry for the remarkable speed with which it was implemented.

Since July 1997, all seven Critical Business Areas (CBAs) in West Malaysia — representing 60 percent of TM's income — have been equipped with servers and FRAMMI software from Intergraph Coop. RAID (Redundant Array of Inexpensive Disk) storage media and workstations running on NT v4.0. The CBAs are located at Selangor Timur, Penang, Kuala Lumpur, Melaka, Selangor Barat, Petaling Jaya and Johor Bahru. Two other sites are also being set up in the capital city of Kuala Lumpur: a development site in Brickfields and a training site at TM's training college.

A spokesperson from the IT Division of the LNMS Project, who declined to be named, cited upper management encouragement and monitoring as critical factors.
CONTENT

- BACKGROUND
- PROJECT BRIEF
- MAJOR CHALLENGES
- BENEFITS
- CONCLUSION
BACKGROUND

**GIS for public utility**
(Automated Mapping / Facility Management)

- Mapping public utility infrastructure
- Improve business performance
  - planning
  - implementation
  - operation
  - maintenance
1982: AM/FM International (Utility)
1994: Open GIS Consortium
1998: GITA (Geospatial Information and Technology Association)

1987: Cabinet approval to implement LIS (Land Information System)
      Critical to planning and development of the country.

1989: NALIS initiatives (Ministry of Land)
      National Coordinating Committee
      State Coordinating Committee

2002: MacGDI (Malaysian Centre for Geospatial Data Infrastructure)
In 1991, Telekom Malaysia embarked on its AM/FM Project Due to:

- Deregulation (competition)
  - Needs for faster response to customer demands
  - Needs for flexibility in network design

- Needs for a plant records and asset management system for outside plants, valued at exceeding RM 10 Billions
Project Brief: LNMS

Local Network Management System is TM Geo-spatial Information System to:

- Increase Productivity for TM Network Planners
- Improve Grade of Service to Partner/Customers
- Improve Utilization of Network Resources
- More Efficiently Manage Facilities/Assets Information
Project Brief: System Platform

- Window NT, Window 2000
- FRAMME (Intergraph) and Microstation
- ORACLE
- Client Server LAN with WAN
- System Hardware
  - 16 servers, 4 remote sites
  - 350 workstations
  - 14 high speed laser plotters
LNMS WAN NETWORK

COINS = Corporate Information Super Highway
Project Brief: LNMS Phases

- 2 exchange areas
- Project evaluation
- Technology evaluation

Phase 2: Rollout (1996-2001)
- 600 exchange areas
- Stage 1 (1996-1998)
  - KL, Selangor, Penang, Johore Baru
- Stage 2 (1997-2001)
  - Other remaining areas
Project brief: Phase 2 Milestones

- Tender - 9th Nov 95
- Live Production Test - 1st Mac 97
- System Acceptance - 15th July 97
- Production CBA (7) - Dec 1997
- Production Non_CBA (7) - Aug 1998
- Data Conversion CBA - Jun 1999
- Data Conversion Non-CBA - Dec 2000
Major Challenge 1: Application Development

- Civil Network Planning
- Copper Network Planning
- Fibre Network Planning
- Quality Checking
- Demand Forecasting
- Eng. Plot Application
- Property Registration
- Bill of Quantity
- Landbase Maintenance
- EIS or MIS

Data Exchange Interfaces

<table>
<thead>
<tr>
<th>PROMPT</th>
<th>CASS</th>
</tr>
</thead>
</table>
Major Challenge 1: Application Development

- Control Scope and User Expectation
- Control Data Needs
- Delivery time
- GIS expertise
Consequences

- User rejection
- Too much data, impossible to maintain
- Project failure
Major Challenge 2:
Base Map Creation and Maintenance

- Standard Sheet (Coordinate, lot info)
  - 1:4 chain
  - 1:10000
  - 1:5000
  - 1:1000

- MHA Map (Highway Info)

- Key Map (Exchange Bdy)

- Fundamental Map (Cabinet Bdy)

- Survey Map (Property, Street, Building)

- Developer Map (Property, Street, Building)

Land Area of about 330,000 sq km
60,000 Land Map Sheets
Major Challenge 2: Base Map Creation and Maintenance

1995 - 1998: Base Map Creation
1996 - 1999: Detail Map Update
1997 - Now: Field Verification
1998 - Now: GPS Survey and Verification
1999 - Now: Street Network / POI Enhancement
1999 - Now: Presentation Enhancement
Major Challenge 2:
Base Map Creation and Maintenance

Converted Standard Sheets, Survey Maps & Develop Map
Major Challenge 2:
Base Map Creation and Maintenance

- Volumes of data is high
- Quality (accuracy, clarity, completeness)
- Availability (missing document to be recreated)
- Time for Data / Document Collection
- Edge Matching between States
- Constant changes to landscape (new, change)
1995 - 1998 : Base Map Creation
1996 - 1999 : Detail Map Update
1997 - Now : Field Verification
1998 - Now : GPS Survey and Verification
1999 - Now : Street Network / POI Enhancement
1999 - Now : Presentation Enhancement
Major Challenge 2:
Base Map Creation and Maintenance

Global Positioning System (GPS) Equipment

GPS Team

Data Capture

Enhancement of landbase Accuracy via GPS..
Major Challenge 2:
Base Map Creation and Maintenance
Major Challenge 2: Base Map Creation and Maintenance

Consequences

- Erroneous base map
- Wrong foundation for network
- Time delay and cost escalation
- Project failure
Project Challenge 3: Infrastructure Conversion

- It is a process of converting manual records and drawing into digital format.

- It is the most labor intensive and time consuming process in the typical AM/FM project.
Land Area of about 330,000 sq km
60,000 Land Map Sheets to be Converted
67,000 engineering drawing
100,000 duct space records
Millions of plant items
Project Challenge 3: Infrastructure Conversion

- Volumes of data is high
- Availability (missing document to be recreated)
- Time for Data / Document Collection
- Quality (accuracy, clarity, completeness)
- Time consuming
- Fast pace of network expansion and changes
Project Challenge: Infrastructure Conversion

Scheduling & Coordinating

Records Inventory

Records Prep & Scrub

Field Verification

Digitizing

Quality Check
Major Challenge 3: Infrastructure Conversion

Consequences

- Erroneous infrastructure information
- Time delay and cost escalation
- User lost interest
- Project failure
## Project Challenge 4: Project Management

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Application Software Development</td>
<td>40</td>
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<tr>
<td>System Operations/Implementation</td>
<td>4</td>
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<tr>
<td>Data Conversion Implementation</td>
<td>17</td>
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<tr>
<td>Source Document Updating</td>
<td>198</td>
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<tr>
<td>Document Preparation / Scrubbing</td>
<td>46</td>
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<tr>
<td>Digitization</td>
<td>279</td>
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<tr>
<td>QA/QC</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>616</strong></td>
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<tr>
<td>Bosses / Users</td>
<td>1000</td>
</tr>
<tr>
<td><strong>COST</strong></td>
<td>???</td>
</tr>
</tbody>
</table>
Project Challenge 4: Project Management

User Participation

- HEAD NET DEVT
  - NETWORK PLANNERS
  - LNMS COORDINATOR
  - LNMS SUPPORT
    - LNMC HEAD
      - SYSTEM ADMIN.
      - LNMC OPERATOR
    - DATA CONV SUPERVISOR
      - PREP. SCRUB TEAM
      - DIGITISER
    - SOURCE DOC UPDT TEAM
      - QA/QC TEAM
Project Challenge 4: Project Management

Site Implementation Program

- Source Documents Preparation Workshop
- Site Preparation and Systems (H/W & S/W) Installation
- Pre-Production Discussion (LNMC Role and Formation)
- Users Training (30% of Users)
- Production Workshop (Production & Conversion)
- On-Site Training (LNMC and Contract Staff)
- Update Landbase Maps Backlog
- Update Landbase/Network Data for Production
- Production Cut-over
- On-Site Production Support (2 months)
Project Challenge :
Implementation Strategy

- User buy-in thru involvement (all levels)
- Create success story (pick the best start)
- Minimize time from development to production
- Distributed approach (multiple project sites)
- In-house Data Conversion:
  - Centralized Base map Data Conversion
  - Distributed Infrastructure Data Conversion.
Minimize time to deploy through Conversion and Production Integration

- Planners Get to Use the System Early
- Major Costs Reduction
- Self-paced Conversion Progress
- Eliminate Backlog
- Eliminate Potential Contractual Disputes with Data Conversion Vendors Due To Quality of Source Maps/Plans.
Project Challenge:
Critical Success Factor

- Management support
- User support
- Strong project team
TM Infrastructure (civil network)
TM Fibre Optic Network
DSLAM (ADSL) Record

PGD A019
(2004)
1248/448
Project Benefits
Outside Plant Planning

- 50% cycle time reduction
- 40% reduction in planning site / manpower
- Improve quality of plan
- Improve utilization of asset
- Improve asset management
Project Benefit: CNO Redmark

Efficient Network Maintenance

Sample Redmark - please update manhole type from JB22 to R2A and pole (iron) to pole (concrete)
Project Benefit: CNO-ICC
Reduce time to serve customer
Project Benefit: CNO-AVL
Reduce time to serve customer
Project Benefits

Deploying GIS to Other Areas
LBS : Tracking and Interacting with Mobile
TM GIS – Location Search Engine
LBS - Mobile GIS and Tracker

PDA Mapping
LBS - Mobile GIS for Phones

GIS Maps on 3G and GPRS mobile phones
Conclusion
Implementing GIS in Public Utilities

- Tremendous Challenges
- High chance of failure
- Strategies are important
- Manage the critical success factor
- Many benefits
- Essential for today business environment
THANK YOU FOR YOUR ATTENTION

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