GNSS Scenario in India

By
Dr Ashok Kaushal
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Introduction

- Miniaturization of chips & reduction of prices
- Enhanced use of location sensitive devices
- Removal of restrictions on GPS accuracy
- Proliferation of cell phones
- Mobility of people/ assets
- Enhanced use of WWW
- Awareness in significance of location data
- Development of open standards
- Availability of map data from multiple sources
- Adoption of new map policy by Govt. of India
Significance of Location

- Discover *timely location-sensitive* business intelligence
- Process location-sensitive alerts & transactions
- Organize business activities by location & time
- Find or track a customer, place, asset, …
- Coordinate field operations
- Provide customer service
- Plan and track delivery services
Trends

- Emphasis on info/service in place of data/tools
- Solutions driven by
  - Technology
    - GNSS
    - High resolution satellite imagery
  - Applications
    - Use of SCOTS/OSS tools for development
    - Consensus on standards & interoperability
  - Data/Content
    - Use of COTS data from multiple sources
    - Use of Web GIS for data dissemination
Trends

- Spread of wireless communication along length and breadth of the country
- Growth of Internet & Broadband (including last mile connectivity)
- Easy access to GNSS for applications in positioning, navigation and tracking of mobile assets
- Emergence of Google Earth & Virtual Earth for dissemination of location info on Web
- Community participation in Wikipedia/Wikimapia for knowledge management
Trends

Indian Telecommunications Scenario

- 232.9 million users (including 193 million wireless subscribers) as of July 2007
  - 7.1 million wireless subscribers registered in June 2007 and 8.1 million in July 2007
- 462 million wireless subscribers (38.6% of total population) projected to reach in 2011
  - 58% of rural population & 95% of urban population with mobile phone by 2011
  - Manufacturing of 107 million mobile handsets in India by 2011
- Wireless subscription may exceed 50% by 2015
Trends

World scenario

- Mobile subscribers will grow by another 500 million to reach 3 billion by end of 2007
  - Share of India is estimated at 80 million
- Growth of global mobile industry:
  - ~ 40 million subscribers per month
  - Share of Asia Pacific is estimated at 41%
- India and China accounted for 25% of growth worldwide over previous year
Trends

Mobility

- 24 x 7 x 365 business through adoption of WWW
- Growth in number and functions of cell phones
- Enhanced business with population on move
- Exchange of location info to personnel for field data acquisition and providing services to users
- Management of mobile assets (trucks, railways) based on their locations at any moment
- Effective response through integration of wireless communication with positioning technologies
- Common framework using industry standards
G³ Perspective

Technology Providers

Larger Reach

Efficient Delivery

Application/Content Provider

Info Dissemination

Service Provider

Citizen

Technology Proliferation
G³ Perspective

- Completeness
- Accuracy
- Interoperability
- Standards

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G³ Perspective
Location Based Services

- Security & Safety Services
- Ambulance Service
- Towing Service
- Hotel
- Tourism Services
- Travel Agency
- Auto Repair Shop
- Transportation Company
- 100 Police HQ
- Commercial Establishment
- 101 Fire HQ
- Accident Scene
- Hospital
- Health Insurance
- Insurance Claims
Location Based Services

- Enterprise Fleet Management Services
- Fleet Tracking System
- Fleet Maintenance System

- End User
- Call Centre
- Transportation Company
- Tourism
- Parts Vendor
- Taxi Operator

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Location Based Services

LBS Value Chain

- Wireless Operator
- Location Provider
- Content Developer
- Application Developer
- Wireless ASP
- End User

GNSS scenario in India

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Location Based Services

LBS Architectural Functions

Positioning
- Determine spatial coordinates of a target

Spatial Analysis (GIS)
- Provide/ administer base map data: man made structures (roads, colonies) & terrain (hills, rivers)
- Manage point-of-interest data such as location of petrol stations, restaurants, malls, etc.

Location Management
- Process positioning & GIS data
- Mediate between positioning equipment and LBS infrastructure

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Business Potential

- Defence
- Transport (VTS/ FMS): Call centers, Crime (Police), Health (Ambulances)
- Municipalities (Garbage dump vehicles, Asset Management, Property taxation)
- Utility (data collection, fault detection)
- Environment (trees identification)
- National parks (movement of wild animals)
- Advertising (sign boards)
- Automobiles (navigation, thefts, break-down, accidents, drivers performance)
### Business Potential

#### Vehicle Statistics – Growing India

<table>
<thead>
<tr>
<th>Year</th>
<th>All Vehicles</th>
<th>Cars, Jeeps and Taxis</th>
<th>Buses</th>
<th>Goods Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>48,857</td>
<td>6,143</td>
<td>562</td>
<td>2,715</td>
</tr>
<tr>
<td>2001</td>
<td>54,991</td>
<td>7,058</td>
<td>634</td>
<td>2,948</td>
</tr>
<tr>
<td>2002</td>
<td>58,863</td>
<td>7,571</td>
<td>659</td>
<td>3,045</td>
</tr>
<tr>
<td>2003</td>
<td>63,863</td>
<td>8,285</td>
<td>709</td>
<td>3,210</td>
</tr>
<tr>
<td>2004</td>
<td>67,454</td>
<td>8,987</td>
<td>824</td>
<td>3,325</td>
</tr>
<tr>
<td>2005</td>
<td>71,037</td>
<td>9,686</td>
<td>943</td>
<td>3,512</td>
</tr>
</tbody>
</table>

Source: Internet

Red: Estimated

Vehicles in thousands

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Business Potential

Vehicle Statistics – Growing India

Source: Ministry of Road Transport and Highways 2003
Business Potential

Current scale of road transport in India

- 10 million vehicles manufactured annually while 2 million four-wheelers added on the roads annually
- 3.3 million KM road network crisscrosses whole country
- NH network (less than 2% of road network), carries about 40% of road traffic
- 3 million commercial vehicles carry loads using the roads network
Business Potential

Fleet Management Services (FMS)

- Logistics
- Retail & Consumer
- Refrigerated Cargo
- RMC
- School
- BPO
- Taxi
- Waste Management
- State Transport
- Railways
- Oil & Milk
- Mines
- Docks
- Marine
- Forest
- Hospital

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Business Potential

Driving parameters for use of FMS/ VTS:

- Reasonable cost
- Appropriate quality of data
- Availability of communication network
- Support for local language
- Ease of use (graphical interface)
- Voice interface (Text to speech)
- Insurance (against thefts)
- Citizen interface (concern for public safety)
- Keyboard along with joy-stick/ touch screen
- Optimal power management
Business Potential

- GPS/ GNSS + Industrial Sensors
- Information Dissemination Using Internet/Intranet
- Intelligent Fleet Management Systems
- GIS, Data Interoperability, Service Oriented Architecture
- Wireless Communication Using GSM/ GPRS/CDMA/Radio
- Tracking, Alarm Monitoring, Report Generation
- Low Cost, User Friendly, Optimized Power Devices

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Business Potential

Value Delivery Model

- WISDOM ➔ ACTION
- INSIGHTS ➔ DECISION SUPPORT
- INTELLIGENCE ➔ ANALYSIS
- INFORMATION ➔ APPLICATION
- DATA ➔ TRACKING / MAP...

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Business Potential (India)

VTS
- 2005
  - US$ 06.4 Million
- 2011
  - US$ 78.2 Million
  (Frost & Sullivan, 23.05.06)

VTS
- 2004
  - 15 – 20
- 2007
  - ~ 150
  (Economic Times, 10.07.07)
Business Potential (India)

GPS & Telematics market
- 2006 - 2007 US $ 22 millions
- 2009 - 2010 US $ 448 millions
(Frost & Sullivan, 23.05.06)

Consumer LBS (2009)
- Average subscription (in US $) 1 - 2
- Penetration (in %) 30 – 50
- Revenue (in million US $) 300
### Business Potential (World)

<table>
<thead>
<tr>
<th>GNSS scenario in India</th>
<th>VTS</th>
<th>Million Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>040</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>(ABI Research, 21.09.06)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In-vehicle Navigation</th>
<th>Units (%age)</th>
<th>Revenue (%age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>2011</td>
<td>34</td>
<td>29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Handsets (Communication)</th>
<th>Units (%age)</th>
<th>Revenue (%age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>43</td>
<td>09</td>
</tr>
<tr>
<td>2011</td>
<td>69</td>
<td>18</td>
</tr>
</tbody>
</table>
Business Potential (World)

Location based services
- 2005
- 2010

US$ 040 millions
US$ 1600 millions
(Yankee Group, 06.03.07)

GPS enabled LBS Subscribers
- 2005
- 2011

Units (million) Revenue (%age)
012 0.5
315 9
(ABI Research, 10.05.07)

GPS enabled handsets (Communication)
- 2010

Units (million)
300
(IMS Research, 25.03.07)
Break down of Turnover

- Personal mobility
- Mass market vehicles
- Commercial Vehicles
- Aviation
- Maritime
- Emergency services
- Surveying
- Others

By 2001
By 2015
Challenges

- Majority of fleet under unorganized sector
- Market is price sensitive
- Consumer are interested in immediate ROI and direct vehicle movement control
- Consumers are not tech-savvy
- Consumers are interested in limited features
- Innovative applications/services still awaited
- Market is awaiting suitable business model
- Higher revenues by increased data transfer
- Quality maps available over select cities only
- Migration to 3G spectrum is still awaited
Asl: First Indian Company to produce GPS receivers with Military certification:
- ‘DGQA certification for Armoured vehicles’.
- ‘CEMILAC certification for Military Airworthiness’.

Few thousands GPS Receivers, along with life-cycle support systems, supplied to Defence Services.

Few hundred GPS based VTS supplied for civil applications in Transport, Health & Crime.
About ASL

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GeoTrans: Geo-Intelligent Solutions for Transport

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GeoTrans: Geo-Intelligent Solutions for Transport

About ASL

GPS based AVL

Wireless Network

Data Server

Comm. App

Map data
Address info
Operator info
Client info
Mobile asset
Driver info
Route plan
Billing info
User info

Connector

Web Server

Application Server

Web Page

Internet

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GNSS scenario in India

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About ASL

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Concluding Remarks

- G³ provides suitable platform to develop LBS
- Drivers of GNSS market:
  - Competitive prices of chips and receivers
  - Innovative packaging of VTS
  - Suitable business model for FMS
  - Mobile phones with built-in GPS
  - Quality & updated large scale digital maps
  - Aggressive marketing of VAS by carriers
- GNSS is transforming from ‘pure navigation to also navigation’
THANK YOU