Location-based Risk Management with Oracle Spatial Technologies

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INFOTECH
Speaker Bio - Ali Ufuk Peker

• B.Sc. 1991, M.Sc. 1993, Ph.D. 2017, Computer Engineering, at Bogazici University, Istanbul. He has 25 years of experience in telecoms, mobile and LBS. He has experience in large scale system integration projects in public and private sectors. He is in the management of Infotech for fifteen years. He started as a software designer and became a software architect at Nortel. He worked in No. 7 signaling projects and intelligent network projects for public switching (1992-1995). Thereafter he became the software development director at GISMAP Inc., responsible for GIS applications (1997-1999). In the year 2000 he became vice president of Infotech, responsible for private sector projects and products. He is now the CEO of Infotech since 2007. His PhD. work is focused on using GNSS and digital maps to enhance ADAS applications.
Agenda

• About Infotech
• Objectives
• Solution
• Sample Screens
• References
Infotech

- Oracle Gold Partner from Istanbul, Turkey
- Primarily covering countries around Europe and the Middle East
- Expertise:
  - Strategic Partnerships
  - Specializations

[Diagram showing GIS, Navigation, Mobile Location Based Services, and Fleet & Field Management categories with LBS Platform, Geocoded Enterprise Data, and LBS Content]

- Strategic Partnerships
- Specializations
Objectives

• A Spatial Risk Management System
• Decision Support
• GIS based Datasets:
   • Address Database
   • Risk Maps: (Fire, Earthquake, Flood)
   • Point of Interest (POI) datasets, like (Commercial Centers, Official Facilities, Banks, Medical Facilities)
   • Geocoded Policy Information
System Usage

- Risk Analysis
  - Policy Acceptance
  - Policy Pricing
  - Field Expertise Operations
  - Pml Calculation
- Portfolio Analysis
  - Risk Accumulation
  - Customer Analysis
- Market Analysis
Problems

- Based on Past Experience
- Expertise operations are performed via field inspection
- Risk accumulation is performed according to the Address Structure in the current MIS System.

Problems of current risk management approach
- At Busy Periods of Policy Acceptance field inspections become impossible to manage
- Correctness of customer addresses can not be verified.
- Accuracy of PML calculations with the existing address structure is questionable.
- Risks can not be compared with each other.
- Policy Pricing can not be performed according to risk micro-zones.
Targets

• Geocoded Addresses (Automatic cleanup for old records)
• Address validation
• Location based micro risk scoring with Risk Datasets (Earthquake, Fire Exposure, Flood, etc.)
• Location based PML calculation
• Location based risk acceptance
• Spatial risk accumulation
• Pre-risk analysis without field survey
• Better Risk Management, Pricing, Reassurance
SOLUTION
Oracle Spatial Summit at BIWA 2017

Vector and Raster Map Data
POI, Traffic, Risk, Demographic Data
User Data (Point, Line, Polygon)
Metadata (Maps, Themes, Styles)

Oracle Database Server 11g R2
Enterprise Edition
+ Spatial and Graph

Oracle WebLogic Server
Enterprise Edition
+ MapViewer
+ Routing Server

JavaScript API
Web Services API
Mobile SDK (iOS, Android)
Routing Server

Mobile Applications
Web Mapping Applications
BI Integration
Location Based Services
Enterprise Application Integration

Oracle Spatial Summit at BIWA 2017
Oracle Database 11g R2 Enterprise Edition + Spatial + Partitioning

Oracle Web Logic Server

INFOTECH LOCATIONBOX

Locationbox Risk Server API
Locationbox Inforisk User Interface

LOCATIONBOX DATABASE

Risk Database

Address Database

Risk Database

Map Database (Maps, Themes, Styles)

Risk Score Calculation
Geocoding
Reverse Geocoding
POI Search
Address Search

MIS Software

Risk Address Entry
Risk Analysis
Premium Calculation
Risk Accumulation

Detailed Reporting
Expertise
Risk Accumulation
Internet / Intranet
Risk Reporting
Risk Data Sets

- Earthquake
  - Geological Information
  - Seismic Intensity
  - Liquefaction Potential
  - PGA & PGV
  - Building Damage
  - Infrastructure Damage
  - Earthquake Catalogue
- Land Slide
  - Slope
  - Geological Information
- Flood
  - Rivers & lakes
  - Slope
  - Elevation
- Fire Outbreak
  - Infrastructure
  - Hazardous Facilities
SAMPLE SCREENS
Geology, PGV&PGA
Earthquake Zones / Faults
Policies and Risk Accumulation
Probable Maximum Loss (PML)
BI Integration
Risk Analysis

- The Study on A Disaster Prevention / Mitigation Basic Plan in Istanbul including Seismic Micro zonation in the Republic of TURKEY
- Japan Pacific Consultant International and OYO Corporation
  - Project Duration : 2 years
  - Services within the scope of Project
- Development of GIS Database
- The Final Report including Earthquake scenarios and building damage estimation, vulnerability analysis is published
OVERVIEW
- Customer

CHALLENGES / OPPORTUNITIES
- An Operational System / High availability
- Risk Scoring
- High number of transactions
- Text based address / Field survey requirements
- Spatial, Datawarehouse and OLTP Requirements

SOLUTIONS
- Oracle Database 11g Enterprise Edition
  - Spatial Option with GeoRaster, Network Data Model
  - Partitioning
- Oracle Fusion Middleware 11.1.1.7
  - MapViewer
- Oracle Business Intelligence Enterprise Edition

RESULTS -
- Geocoded Addresses (Automatic cleanup for old records)
- Address validation
- Location based micro risk scoring with Risk Datasets (Earthquake, Fire Exposure, Flood, etc.)
- Location based PML calculation
- Location based risk acceptance
- Spatial risk accumulation
- Pre-risk analysis without field survey
- Better Risk Management, Pricing, Reassurance
- Operational system Integration