A Location Based Business Intelligence (LBBI) system for the Israeli real estate market

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• Established in 1920 by the British Mandate
• Employs around 300 employees.
• More than 30% of the employees have a Masters Degree or higher
• Lead the Israeli inter-governmental committee for GIS
• Govern using ~20 orders, acts and government decisions.
The Survey of Israel is a governmental agency for Mapping, Geodesy, Cadastre and Geo information.
Survey of Israel Chief Scientist activities
Content

- Background (the problem)
- Project goals
- Input data
- Analysis
- Output and pilot results
- Conclusions and future work
It's all about real-estate: Understanding the key challenge for the Israeli government

Thousands protest in Israel over house prices and low salaries.

CNN analyst: Israel housing market not a bubble.

IMF warns of real estate bubble.

IMF: Israel's housing market is overpriced and a sharp correction will cause recession.
Understanding the housing crisis requires good data

- State Comptroller's Office notes that the absence of full and complete data on the real-estate market means lack of proper supervision and inability to manage the situation.

- Any activities without a reliable and comprehensive database may not be optimal.

- Real-estate data in Israel is entered by hand written forms.

- Data is inserted with no quality control.

- Data is not geo-tagged.
The situation has brought the need for efficient Location Based Business Intelligence (LBBI) system to manage the real estate market.

A national project was initiated by an intergovernmental forum.

The project has **four tasks:**

1. Creation of unified property database
2. Development of Location Based Business Intelligence (LBBI) system for the Israeli real estate market
3. Development of data presentation and dissemination system
4. Formation of management tools to supervise national construction projects
1. Creation of unified property database

- **Governmental databases will be consolidated using alpha-numeric and spatial properties**
- These database include (1st phase):
  - Topographic data (SOI)
  - Cadastral data
  - Financial data (tax)
  - Ownership data (register office)
- Personal and private data will not be used.
Basic datasets for the LBBI

- Financial data (Land, valuation, mortgages, Taxes)
- Demographics and social data
- Infrastructure (water, power, etc)
- Right and limits
- Environmental protection
- Land Registry, title, ownership
- Planning
- Framework
- Spatial data
## Development of a real-estate database

1. Textual matching techniques are used to connect property records.

2. Different databases used different identifiers including street name, cadastral identifier, database number. These identifiers are not unique and may change with time.

3. Geographic coordinates are the least common denominator among the datasets, and provide tools for quality improvement and for data consolidation.

4. This is a classical process of geocoding:

<table>
<thead>
<tr>
<th>Block</th>
<th>Parcel</th>
<th>Sub-No</th>
<th>City</th>
<th>Street</th>
<th>No</th>
<th>DB no</th>
<th>Details</th>
<th>East Coordinate</th>
<th>North Coordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>6586</td>
<td>359</td>
<td>43</td>
<td>Tel-Aviv</td>
<td>Lincoln</td>
<td>1</td>
<td>48658</td>
<td>......</td>
<td>188644</td>
<td>675934</td>
</tr>
</tbody>
</table>
Using spatial properties to obtain coordinates

Scenario A

Scenario B

Scenario C

Scenario D

Scenario E

Scenario F
2. Development of data presentation and dissemination system

Special module was developed in the national geo-spatial portal to query and present real-estate data.
3. A Location Based Business Intelligence (LBBI) system for the Israeli real estate market

- The development of LBBI is a complicated task which was divided into three components:
  - **Input:** the system has to include a rich database of real estate datasets including topographic, cadastral, financial, planning demographic, etc. The creation of this integrated database is a challenging undertaking.
  - **Functionality:** the LBBI should provide a plethora of tools, queries and analysis methods for a variety of governmental users and needs.
  - **Output:** the LBBI should be linked and connected with a variety of computerized systems and output platforms. Moreover, the LBBI output should be diverse and include maps, report, text and database files, charts and graphs.
Location based Business Intelligence Infrastructure

- Maps
- Reports
- Charts and graphs
- Advanced queries
- Analytics and prediction
- Output to Many formats
- Network Services

Analysis of governmental data
- Advanced query system
- Multi-dimensional calculations
- Data validation and integration

Layer of basic datasets
- Ownership and rights database
- Topographic database
- Planning and marketing database
- Financial data
- WS to tax authority database
**Analysis of a Location Based Business Intelligence (LBBI)**

- **Analysis goal:** Identification of proper locations for renovation projects

- **Criteria:**
  1. Parcels with no buildings
  2. Adjacent to parcels with old (<1984) buildings and 2-4 floors
  3. Purpose – residential in the zoning maps
  4. Owned by the government
  5. Classified according to parcel size
An Example of the analysis results
4. Management tools to supervise national construction projects

- Interfaces between planning and construction systems
- Overseeing all the design to construction phases
- Identifying bottlenecks

Mapping and monitoring of all project phases (design, development, construction, registration), using geographic information systems and aerial photographs
Management tools to supervise national construction projects
Conclusions

• Information systems and technology have always proved to be efficient solutions (in terms of cost and benefits) to manage problems that are caused by shortage of resources.

• The project deals with the three components of information technology: Input data, analysis, and presentation.

• The national project is in progress and initial results are showing good prospects.
Thank you