Esri Business Analyst: Overview and Update

James Killick
Part 1: Product Overview
A GIS System for optimizing decisions about where to locate & where to market
You have to make a multi-million dollar real estate decision.

Where is the best place to invest?

You need to maximize the performance of your store network.

Which ones should be doing better?

The Market is Changing. You need to plan for the future.

How can you stay competitive?
• Retail & Financial Services
• Commercial Real Estate
• Economic Development
Facility Site Selection

Urban & Regional Planning

Community Needs Assessment

Factories, Hospitals, Parks, Fire Stations et cetera

Economic Development & Economic Gardening

Greater New Orleans

Recruiting

US Air Force

Public Safety

Emergency Management

Utilities & Telco

Network Planning

Facility Site Selection

Hospitals, Parks, Fire Stations et cetera
Things Business Analyst Provides
Detailed, Current Facts About Any Area
6,000+ Variables. Current Year and 5 Year Forecast.

- Population
- Households
- Age
- Income
- Family Size
- Education
- Net Worth
- Consumer Spending
- Market Segmentation
- Businesses
- Business Types
- Products Consumption
- Services Consumption
- Supply vs. Demand

Access via Dynamic, Customizable Color Coded Maps

... and many, many more
Demo
Esri Data
Leveraging Esri Data for Market Planning

- 35+ years experience in building demographic data
- Processing 5th decennial census
- Current year estimates and 5 year forecasts
- We publish both methodologies and trends
2005:

“Affordable housing is becoming an issue and not only among lower income households”

“The era of easy money is definitely over”

2006:

“Increases in short-term interest rates are expected to take their toll on economic activity”

“Without the rapid appreciation of home value, home equity loans are also likely to decrease and decelerate consumer spending”
Using This Brain Trust is Easy…

- 400 Variables
- Easy to access within software
Powerful Geographic Analysis Tools for Location Analytics
Leveraging the Power of GIS for Analysis

- Customer Analytics
- Predictive Sales Modeling
- Suitability Mapping
- Market Penetration
- Territory Design & Optimization
- Cannibalization
Demo
Smart Map Search
• Model Builder Framework

• Python Scripting Framework

• Access Hundreds of Tools:
  • Geo-Analysis
  • Business Analysis
  • Spatial Statistics

• Designed for Analysts!
Predicting Performance using Models

**Inputs:**
- Actual Sales
- Demographics
- Competitor Locations
- Catchment Area
- Accessibility
- Attractiveness
...

**Functions:**
- Statistical Analysis
- Spatial Statistics Tools
- Geo-processing Tools
- Built in Demand Models

**Outputs:**
- Predicted Sales
- Predicted Profit
...

The Huff Demand Model

\[
P_{ij} = \frac{A_j^{\gamma} D_{ij}^{\lambda}}{N \sum_{j=1}^{N} A_k^{\gamma} D_{ik}^{\lambda}}
\]  

- \( P_{ij} \) = the probability of a consumer at a geographical area \( i \) traveling to a given shopping center \( j \);  
- \( A_j \) = is a measure of attraction of shopping center \( j \);  
- \( \gamma \) = a parameter for the sensitivity of \( P_{ij} \) associated with attraction characteristic;  
- \( D_{ij} \) = is a measure of accessibility of shopping center \( j \) to a consumer located at \( i \);  
- \( \lambda \) = a parameter for the sensitivity of \( P_{ij} \) with respect to accessibility;  
- \( N \) = the number of shopping centers.
### Example of How Modeling is Used

**Design & Build a Model That Predicts Actual Sales as Accurately as Possible**

<table>
<thead>
<tr>
<th>Store</th>
<th>Actual Sales</th>
<th>Predicted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,100,000</td>
<td>$1,310,000</td>
</tr>
<tr>
<td>2</td>
<td>$2,300,000</td>
<td>$2,150,000</td>
</tr>
<tr>
<td>3</td>
<td>$1,750,000</td>
<td>$1,600,000</td>
</tr>
</tbody>
</table>
Use Model to Predict Sales

• What would the sales be if I opened at location X?
• How would that affect sales at existing stores?

<table>
<thead>
<tr>
<th>Store</th>
<th>Predicted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,210,000</td>
</tr>
<tr>
<td>2</td>
<td>$1,890,000</td>
</tr>
<tr>
<td>3</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>X</td>
<td>$1,300,000</td>
</tr>
</tbody>
</table>
Fully Customizable Reports
Fully Customizable Reports…

Excel

<table>
<thead>
<tr>
<th>Tapestry Segmentation Area Profile</th>
<th>Ranked by Households</th>
</tr>
</thead>
</table>

Top Twenty Tapestry Segments

<table>
<thead>
<tr>
<th>Rank</th>
<th>Tapestry Segment</th>
<th>Households</th>
<th>Cumulative Percent</th>
<th>U.S. Households</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Laptops and Lathers</td>
<td>67.2%</td>
<td>67.2%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>2</td>
<td>21st Century Lifestyles</td>
<td>18.1%</td>
<td>85.3%</td>
<td>1.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td>3</td>
<td>Entertainment Centers</td>
<td>10.7%</td>
<td>95.9%</td>
<td>1.1%</td>
<td>3.5%</td>
</tr>
<tr>
<td>4</td>
<td>Urban Living</td>
<td>7.4%</td>
<td>93.2%</td>
<td>1.0%</td>
<td>4.5%</td>
</tr>
<tr>
<td>5</td>
<td>Urban Natives</td>
<td>4.1%</td>
<td>89.0%</td>
<td>1.1%</td>
<td>5.6%</td>
</tr>
<tr>
<td>6</td>
<td>Rural Dreamers</td>
<td>2.0%</td>
<td>86.9%</td>
<td>0.2%</td>
<td>5.8%</td>
</tr>
<tr>
<td>7</td>
<td>High Income Families</td>
<td>1.0%</td>
<td>85.9%</td>
<td>0.0%</td>
<td>5.9%</td>
</tr>
<tr>
<td>8</td>
<td>Retirees</td>
<td>0.8%</td>
<td>84.8%</td>
<td>0.0%</td>
<td>5.9%</td>
</tr>
<tr>
<td>9</td>
<td>Top Tiers</td>
<td>0.6%</td>
<td>84.0%</td>
<td>0.0%</td>
<td>5.9%</td>
</tr>
<tr>
<td>10</td>
<td>Urban Chi</td>
<td>0.5%</td>
<td>83.1%</td>
<td>0.0%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

PDF

XML (for Dynamic Display)
... For Any Shaped Area

- Rings
- Drive Time Areas
- User Defined Areas
- Standard Geographic Areas (e.g. ZIP)

In All Cases Data is Precisely & Accurately Aggregated
An API - for Integration of Business Analyst into Your Business Process
Business Analyst API

- Get detailed, current facts about any community or user defined area
- Access analytical tools, charts & reports, create suitability maps
- Easily incorporate into web & mobile apps
- REST, Flex, Silverlight, SOAP
- Choose between Esri hosted API or on-premises server
Demo

API Resources and UI Components
Esri Business Analyst
A Complete System Built on ArcGIS

Enterprise:
BA API & BA Server

Professional Analysts:
BA Desktop

Business Professionals:
BA Web App (BAO)

Field Users:
BA Mobile App (BAO)
Typical Deployments

- Centrally Managed Location Data
- Market & Demographic Data
- Reports & Report Templates
- Workflow Templates

Server

Desktop Client

- Analyst
  - Ad Hoc Analyses
  - Custom Report Development

Web/Mobile Clients

- Manager @ Office 1
- Manager @ Office 2
- Executive Dashboard
- Admin
Demo
Enterprise App
Part 2: Product Update
American Community Survey (ACS)

- ACS is complex due to Margin of Error in sample data
- You Asked Us to Make ACS Easy…
- So we responded
Esri Reliability Flag for ACS Data

Reliability of Data
## Esri Reliability Flag for ACS Data

### WORKERS AGE 16+ YEARS BY PLACE OF WORK

<table>
<thead>
<tr>
<th></th>
<th>2005 - 2009 ACS Estimate</th>
<th>Percent</th>
<th>MOE(±)</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>31,007</td>
<td>100.0%</td>
<td>1,744</td>
<td></td>
</tr>
<tr>
<td>Worked in state and in county of residence</td>
<td>24,478</td>
<td>78.9%</td>
<td>1,570</td>
<td></td>
</tr>
<tr>
<td>Worked in state and outside county of residence</td>
<td>6,502</td>
<td>21.0%</td>
<td>724</td>
<td></td>
</tr>
<tr>
<td>Worked outside state of residence</td>
<td>28</td>
<td>0.1%</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

### WORKERS AGE 16+ YEARS BY MEANS OF TRANSPORTATION TO WORK

<table>
<thead>
<tr>
<th></th>
<th>2005 - 2009 ACS Estimate</th>
<th>Percent</th>
<th>MOE(±)</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>31,007</td>
<td>100.0%</td>
<td>1,744</td>
<td></td>
</tr>
<tr>
<td>Drove alone</td>
<td>18,463</td>
<td>59.5%</td>
<td>1,107</td>
<td></td>
</tr>
<tr>
<td>Carpooled</td>
<td>4,637</td>
<td>15.0%</td>
<td>616</td>
<td></td>
</tr>
<tr>
<td>Public transportation (excluding taxicab)</td>
<td>4,486</td>
<td>14.5%</td>
<td>569</td>
<td></td>
</tr>
<tr>
<td>Bus or trolley bus</td>
<td>2,813</td>
<td>9.1%</td>
<td>478</td>
<td></td>
</tr>
<tr>
<td>Streetcar or trolley car</td>
<td>42</td>
<td>0.1%</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Subway or elevated</td>
<td>1,575</td>
<td>5.1%</td>
<td>316</td>
<td></td>
</tr>
<tr>
<td>Railroad</td>
<td>57</td>
<td>0.2%</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Ferryboat</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Taxicab</td>
<td>14</td>
<td>0.0%</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Motorcycle</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bicycle</td>
<td>72</td>
<td>0.2%</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Walked</td>
<td>685</td>
<td>2.2%</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td>Other means</td>
<td>1,554</td>
<td>5.0%</td>
<td>443</td>
<td></td>
</tr>
<tr>
<td>Worked at home</td>
<td>1,096</td>
<td>3.5%</td>
<td>268</td>
<td></td>
</tr>
</tbody>
</table>
iPhone & iPad App: “BAO”

- Free
- Native iPad app
- Subscribers get access to BAO reports
- Provides access to Key Facts and all Reports
- Highly valued by users
Demo
BAO iPad App
BAO Web App

- Advanced Business Search
- ArcGIS.com Access
- ACS and Census 2010 Maps & Reports
Demo
Business Analyst Online
BAO Add-in for ArcGIS

- Works with ArcMap
- Login with your BAO Subscription
- Access any BAO online report
- Run for any area or map layer
- Attaches report variables as attributes to your layer

Do more with your subscription at bao.esri.com
BA Desktop 10

60x Faster than 9.3.1

Streamlined UI

Cloud Access to Esri Data

Easy Thematic Mapping
BA Server 10

60x

Faster than 9.3.1

Native Flex & Silverlight APIs

Business Analyst UI Components
Part 3: Road Map
Global Solution

Esri Business Analyst

- Basemaps (ArcGIS Online)
- Statistical Data & Reports
- Street Network for Drive Times
- POI Data

USA
Canada
Europe
...
Mobile Road Map

1. Mobile Application Template
   - Custom Enterprise Apps
   - International Support

2. Enterprise Enable our Mobile Apps
   - ArcGIS for Business Server
   - Access custom reports

3. Connect to ArcGIS Online
   - Share work & Edit Content in Field

4. Support Android Platform
   - ~50% of BA Users have Android
   - Summer 2011
Desktop 10.1: “Fusion” Reports

• Quickly combine data from multiple sources

• Examples:
  • Esri demographics
  • Customer data
  • Maps

• Author in minutes… no tweezers required!
Desktop 10.1: Publish BA GP Tools to BA Server
Desktop 10.1: Smart Variable Select
The Issue:
You Have to Pick Your Own Variables
Desktop 10.1: Smart Variable Select

Statistical Analysis (PCA)

Esri Data & User Data

Statistically Significant Variables for the Area in Question

$$P_{ij} = \frac{A_j^T D_{ij}^\lambda}{\sum_{j=1}^{N} A_k^T D_{ik}^\lambda}$$

Var 1

Var 12

Var 16
Location / Allocation: determine an optimal location for one or more facilities that will service demand from a given set of customers or prospects.
Desktop 10.1: **Smart Market Planning**

**Maximize Attendance:**

**Maximize Market Share:** Given you want to open X new facilities out of a choice of Y possible locations, identify exactly which subset of possible locations will maximize your market share.

**Target Market Share:** chooses the minimum number of facilities necessary to capture a specific percentage of the total market share in the presence of competitors.
API Road Map: “2.0” API

Simple APIs…

• GetFacts
• MapFacts
• CompareAreas

... Designed to Scale

20,000 to 50,000,000 customers
1,000+ records / minute

[API Shown For Example Only]
BA Server 10.1: Application Template

- The App that ships with BA Server
- Extensible, Skinnable, Configurable, Localizable
- Use with hosted BA API or with BA Server
Where to Learn More
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Preparing &amp; Using Custom Data in Business Analyst</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>11</td>
<td>Adding Location Intelligence to your Apps using the Business Analyst API</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>2</td>
<td>What’s new in Business Analyst Online</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>3</td>
<td>Census 2010 &amp; American Community Survey (ACS): Top 10 Things to Know</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>3.15</td>
<td>Retail Special Interest Group Meeting</td>
<td>30C</td>
</tr>
<tr>
<td>3.15</td>
<td>Esri Business Analyst: Optimizing Site Selection</td>
<td>32A</td>
</tr>
<tr>
<td>3.40</td>
<td>Esri Business Analyst: Optimizing Target Marketing</td>
<td>32A</td>
</tr>
<tr>
<td>4.05</td>
<td>Esri Business Analyst: Optimizing Territories &amp; Districts</td>
<td>32A</td>
</tr>
<tr>
<td>Time</td>
<td>Title</td>
<td>Room</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>8.30</td>
<td>Census 2010 and the Data User</td>
<td>32A</td>
</tr>
<tr>
<td>10</td>
<td>A Preview of Business Analyst Desktop 10.1</td>
<td>Demo Theater</td>
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<td>10.15</td>
<td>American Community Survey (ACS) and the Data User</td>
<td>32A</td>
</tr>
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<td>11</td>
<td>A Preview of Business Analyst Server 10.1</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>1.30</td>
<td>Esri Business Analyst – Economic Gardening &amp; Economic Development</td>
<td>32A</td>
</tr>
<tr>
<td>2</td>
<td>Esri Demographic, Lifestyle and Business Data</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>3</td>
<td>Perform Site Selection On-the-Go with the Business Analyst Mobile App</td>
<td>Demo Theater</td>
</tr>
<tr>
<td>3.15</td>
<td>Segmentation Data for Community &amp; Market Analysis</td>
<td>32A</td>
</tr>
<tr>
<td>Time</td>
<td>Title</td>
<td>Room</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>8.30</td>
<td>Best Practices for App Development: A Case Study of User Centered Design</td>
<td>32A</td>
</tr>
<tr>
<td>10.15</td>
<td>Community &amp; Demographic Analysis – Build Your Own Apps and Web Sites</td>
<td>32A</td>
</tr>
</tbody>
</table>
Other Ways to Reach Us

Visit the Commercial Solutions Island

Read Our Blog!
esri.com/bablog

Email Us!
bateam@esri.com
General Info:
esri.com/ba

Technical Info, Videos, Doc, Help:
resources.arcgis.com ➔ Business Analyst
Please Fill Out Your Surveys!
esri.com/sessionevals