Harnessing Big Data and Machine Learning for Investment Attraction

C2ER Webinar - April 11th 2017

Steven Jast
President

Nadine Jeserich
VP Analytics
Overview of ROI - RESEARCH ON INVESTMENT

North America’s leading authority on investment attraction for economic development organizations.

Since 2001, worked with over 350 EDOs; over $20 billion of capital investment, creating over 150,000 jobs.

6 offices across North America and global strategic partnership with APCO; 30 major international business centres.

How we distinguish ourselves:
1. 100% vertically integrated
2. 100% commitment to client care and data transparency.
LOCAL INDUSTRY TARGET STRATEGY

1. Assess your industry & clusters performance
2. Find top growth & emerging niche industries
3. Find supply chain opportunities
4. Find growth regions to target
5. Conduct a SWOT to assess suitability
6. Benchmark your region to refine your value proposition

Priority Industry Target List

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LEAD GENERATION PROCESS

STEP 1: Based on your priority industry target strategy, build a target company prospect list (TCPL)

STEP 2: Multi-touch outreach to TCPL

STEP 3: Assessment / Scoring of potential of expansion to your jurisdiction

STEP 4: Meeting / Site Visits

Successful Investment Attraction

Average meeting conversion rate is 3% of TCPL

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IDENTIFYING TARGET COMPANIES

There are over 5 million firms in the US alone
SIGNALS – BIG DATA

• Change in C-level staffing
• Recruitment of senior resources in non-traditional markets
• Strong employee benefits
• Expansion over the past 5-years
• Spike in job posting intensity
• Web site translated
• Spike in social web activity
• Patent Applications
• New or changed addresses
• Acquisitions / JV
• Divestiture
• Value Chain Gaps / Workforce analysis
• Company hierarchy analysis
• Growth (revenues / employment / market share)
• Conducive industry or regional environment
FINDING THE SIGNALS - SOURCES

• Word Recognition Software
• Social Web Mapping software
• Lead generation companies
• Free data sources:
  • U.S. Dept. of Labor
  • U.S. Dept. of Commerce
  • U.S. Census Bureau
  • Bureau of Economic Analysis
  • Economic Development Administration
  • Economics and Statistics Administration
  • Bureau of Labor Statistics
  • SEC Filings
  • US Patent and Trade Office
  • US Cluster Mapping Project
  • World Bank
  • OECD
  • Eurostat

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IDENTIFYING LEADS - GAZELLES

- Gazelles make up less than 1% of businesses, yet account for 10% of net job creation in any given year.
- The top 5% of companies measured by employment growth (273,000 firms) create 66% of jobs in any given year.

Almost half of all large companies ($1B+) in 2025 will be new ones, many will be faster-growing gazelles that will generate the bulk of new jobs and value added in the global economy (Source: McKinsey&Company)

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• Gazelle company ratings

• **Human qualified projects** – 160,000 executive interviews per year

• **Industry heat maps** - Including *sales* and *profits* trends

• **National Industry profiles** – detailed insights into performance, supply chains, export activity

• **Featured fast-growth company lists**
DEMO
IDENTIFYING LEADS ON GAZELLE – GAZELLE SCORES

GOAL: Predict company expansion announcements 1-2 years ahead

METHOD:
• Test model on actual past events
  • What you are aiming for is an improvement in your “conversion rate”, not to academically explain every single event

• Let the data do the talking
  • Include as much information as possible
  • Means traditional statistical techniques won’t work
GAZELLE SCORES – OUR DATA

<table>
<thead>
<tr>
<th>Number of Companies Analyzed</th>
<th>Number of Variables Tested</th>
<th>Number of Model Tests Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,600</td>
<td>194</td>
<td>&gt;58</td>
</tr>
</tbody>
</table>

- **Cleaning** the data – manually
- **Estimating** missing data for signals
- Run extensive model tests: removing and adding variables, transforming the data, testing different estimation, control, and prediction parameters
- **Validation tests** assessing the accuracy of the model in predicting (out-of-sample) 2016 events that have already occurred
GAZELLE SCORES – OUR FINDINGS

EXAMPLES OF GROWTH SIGNALS

- Age of company
- Financial ratios
- International exposure of county-industry
- State factors: innovation activity & capital

Manufacturing vs Services
**GAZELLE SCORES - HOW TO INTERPRET THEM**

Sift through the overload of information:

1. **1st STEP** is to narrow down your call lists: => remove over 60% from your company lists
2. **2nd STEP** is to prioritize who to call first

<table>
<thead>
<tr>
<th>Score</th>
<th>Lead Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Established investment lead – humanly verified</td>
</tr>
<tr>
<td>5</td>
<td>Probable investment lead</td>
</tr>
<tr>
<td>4</td>
<td>Prospect investment lead</td>
</tr>
<tr>
<td>3</td>
<td>Suspect investment lead</td>
</tr>
<tr>
<td>2</td>
<td>Non-qualified investment lead</td>
</tr>
<tr>
<td>1</td>
<td>No opportunity</td>
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</tbody>
</table>
CONTACTS

ROI – Research on Investment
www.researchoninvestment.com

Steven Jast, President
sjast@researchoninvestment.com
Direct: +1.514.495.5521

Nadine Jeserich, VP Analytics
NJeserich@researchoninvestment.com
Direct: +1.608.778.8895