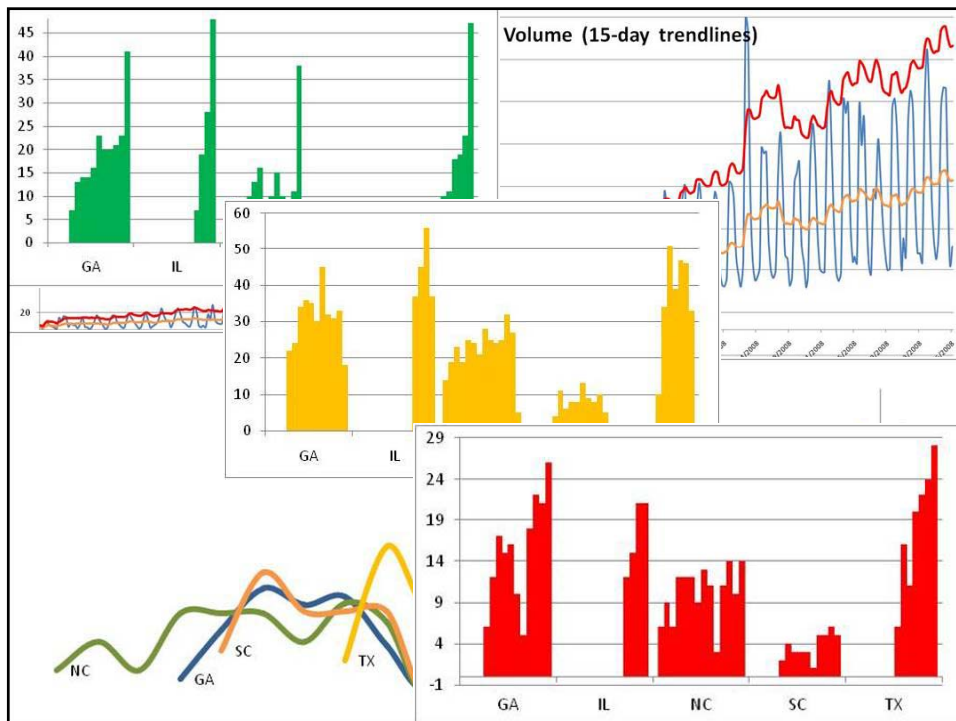


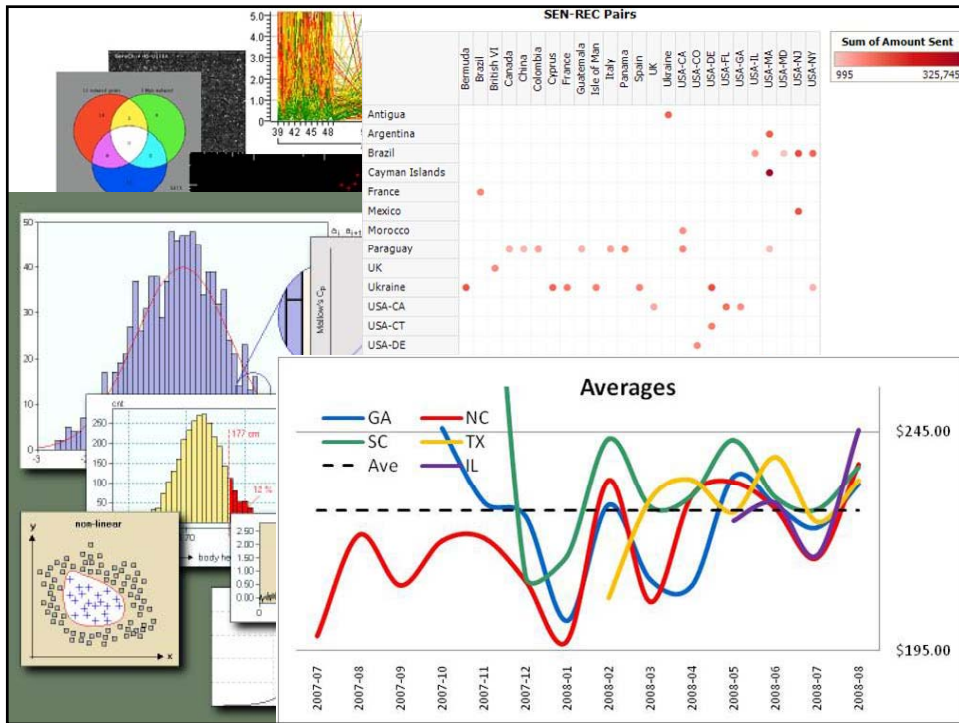
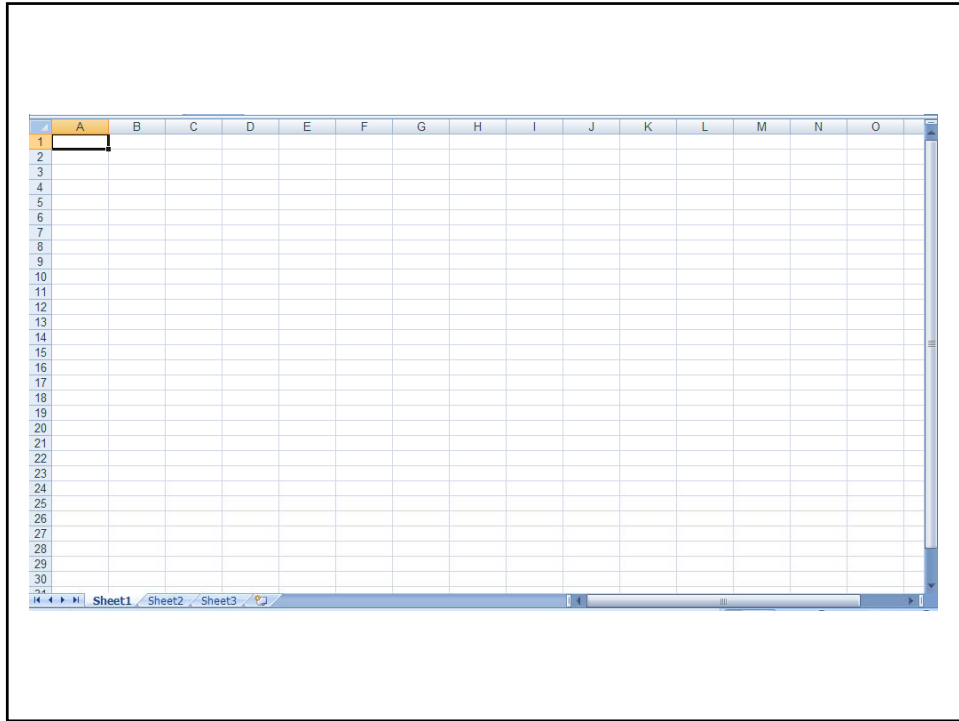


Data Analysis Secrets for Regulators and Compliance Professionals

by Juan Llanos, CAMS

MTRA Conference
Jackson, September 3 , 2008





Agenda

1. Data Management Skills

- The Data Project
- Data Preparation
- Excel Features Overview
- Pivot Tables
- Visualization Techniques

**Live
demo!**

2. Data Analysis Applied to...

- Suspicion detection
- Resource allocation
- Operations management
- Customer relationship management
- Etc., etc.

3. The Era of Behavioral Analytics

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1. Data Management Skills

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The Data **Project**

1. **Problem definition:** objectives, deliverables, gap analysis, costs and benefits

2. **Data preparation:** integrate, categorize, clean, remove, transform, segment

3. **Implementation of the analysis:**

Summarize the data: tables, graphs, descriptive and inferential statistics, etc.

4. **Deployment**

Clear goal = narrow focus

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The **Transactional** File

ENTITY	DATA POINTS
Transaction	<ul style="list-style-type: none"> • Unique ID • Date • Time • Status • Dollars, etc.
Agent	<ul style="list-style-type: none"> • Unique ID • Name • Address • Phone Number • Etc.
Sender	<ul style="list-style-type: none"> • Unique ID • Name, etc.
Recipient	<ul style="list-style-type: none"> • Unique ID • Name, etc.

BOFF

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Excel Features Overview

- Zooming in and out
- Formatting (tab, cells)
- Quick copying
- Freezing (pane, cell)
- Quick counting (bottom menu)
- Disaggregating dates (dummies)
- Key shortcuts (Ctrl + Shift + ...)
- Quick sorting and custom sorting
- Vertical look-up
- Filtering
- Conditional formatting
- Find + Replace
- **PIVOT TABLES**
 - Filtering
 - Summarizing
 - Count, sum, average
- Data Analysis (Add-ins)
 - Histogram
 - Descriptive statistics

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2. Data Analysis Applied to...

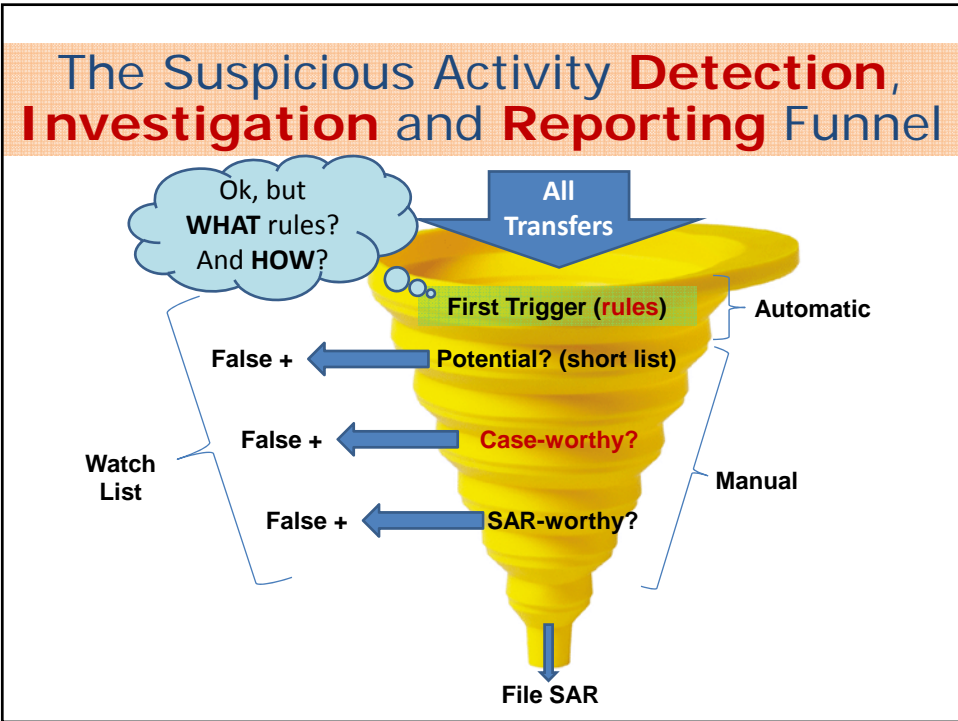
1. Suspicion Detection

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Sources of Suspicion

1. Direct Observation
@ POS or Back-Office
2. Intelligence
Third-Parties
3. Monitoring and Analysis
Back-Office

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Machine Learning Methods

SUPERVISED LEARNING: relies on two labeled classes (***KNOWN***)

1. Training set:
 - a. Select dataset with clean and dirty cases.
 - b. Classification algorithm to discriminate between the two classes (***finds the rules or conditions***)
 - c. Probabilities of class 1 and class 2 assignment
2. Run discrimination method on all future purchases.

UNSUPERVISED LEARNING: no class labels

1. Takes recent purchase history and summarize in descriptive statistics.
2. Measure whether selected variables exceed a certain threshold. (***deviations from the norm***)
3. Sound alarm and record a high score.

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Searching for ***Known Behaviors***

- High **amounts**
- High **frequency**
- Use of **multiple locations**
- Use of **multiple identities**
- Values just **below threshold**
- Immediate **withdrawals / Velocity** of balance consumption (cards)

Case

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2. Data Analysis Applied to...

2. Risk-based resource allocation
3. Early warning (monitoring)

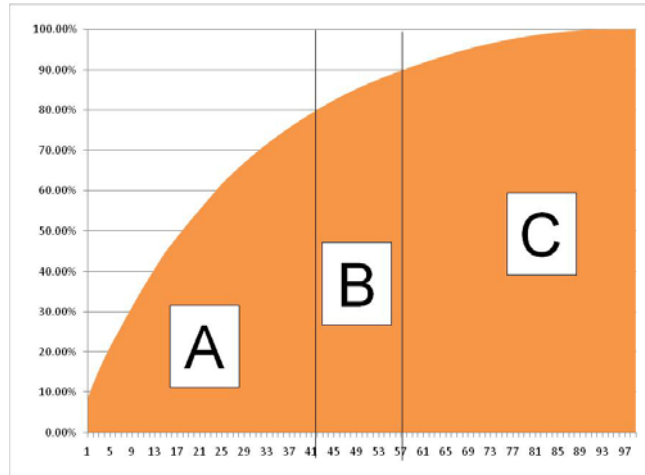
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"All generalizations
are dangerous.
Even this one."

Alexandre Dumas, fils

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The Risk-Based Approach: Separating the **Wheat** from the **Chaff**



- Measure, measure, measure.
- Treat different segments differently.

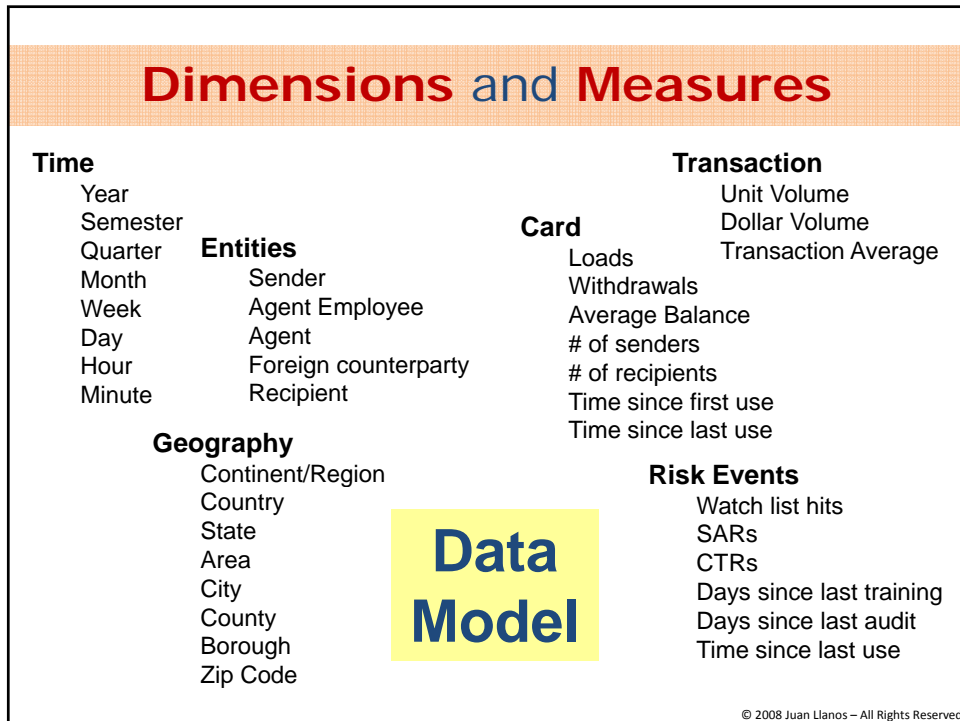
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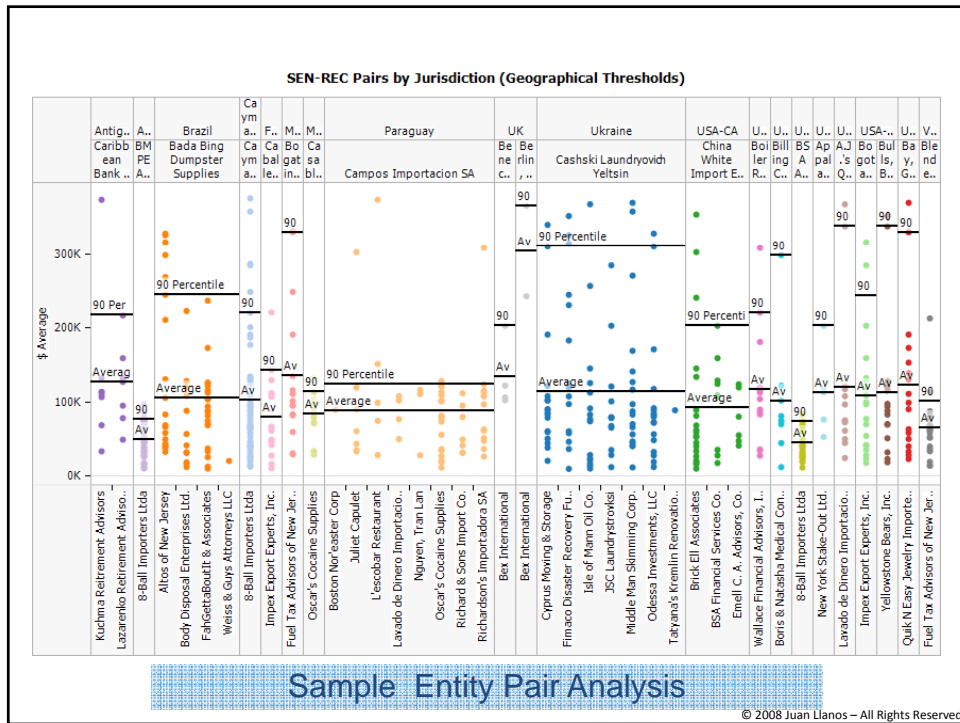
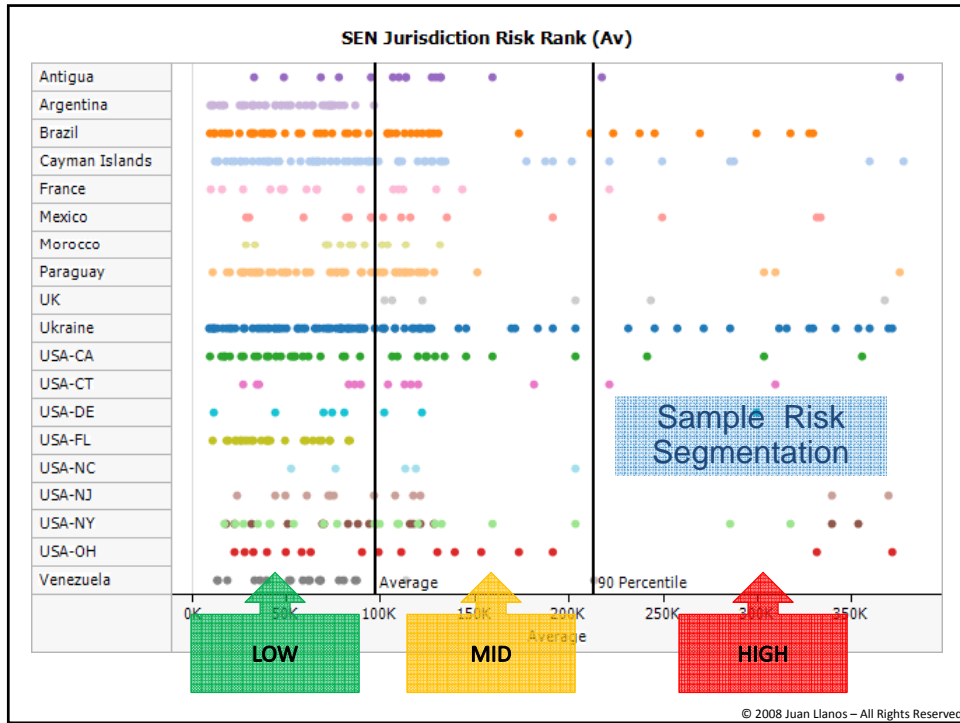
Data Visualization

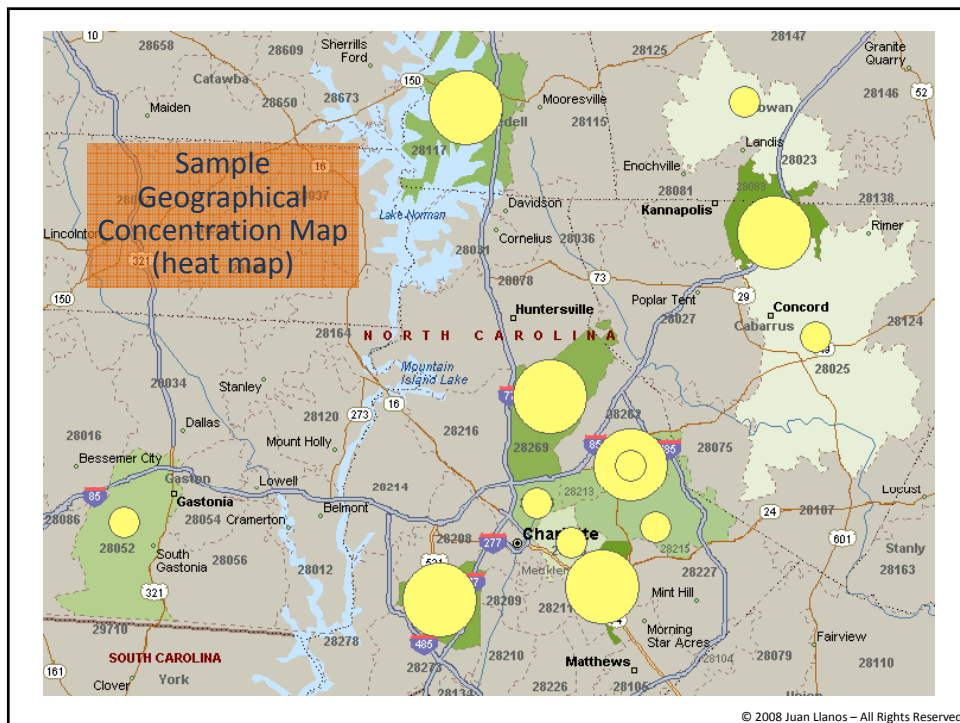
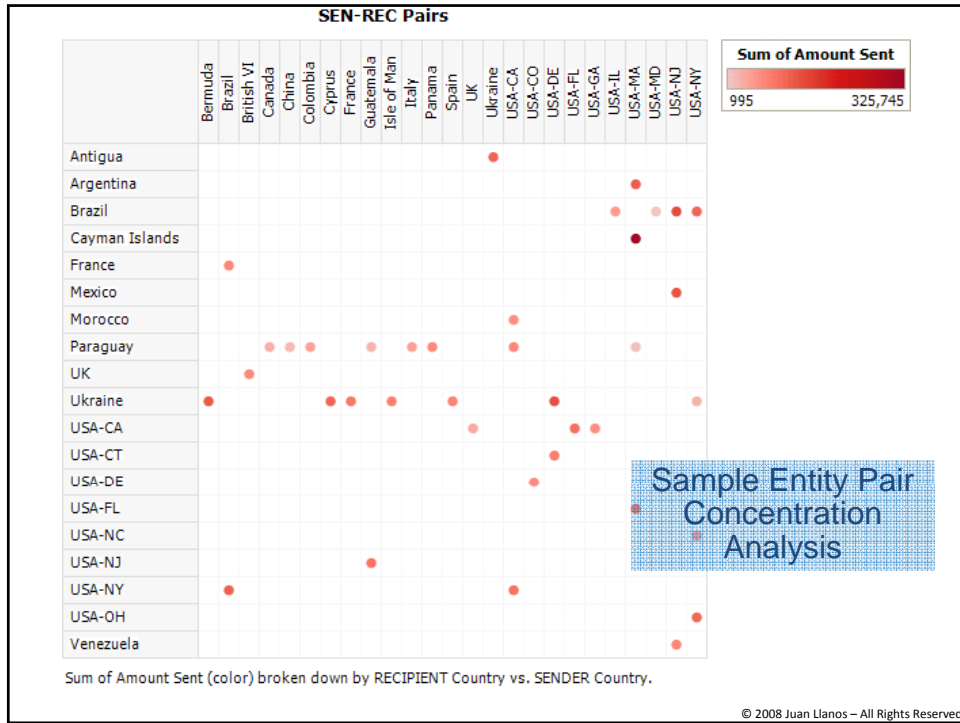
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	A	B	C	D	E	AF	AG	AH	AI	AJ	AK
1	TransactionID	Status	Date	Time	Agent Code	Recipient City	Recipient State	Recipient Zip Code	Recipient Country	\$ US Amount	MEX\$ FX R
178	6071	Completed	09052008	23:45:26	NC02202	Misquahuala	Hidalgo	42740	Mexico	\$185.00	\$10.86
179	6072	Completed	09052008	23:50:03	NC02125	Encarnacion de Diaz	Jalisco	47270	Mexico	\$150.00	\$10.86
180	6073	Completed	09052008	23:55:44	NC02098	delegacion chapalapa	Distrito Federal	05700	Mexico	\$200.00	\$10.86
181	6074	Completed	09052008	00:01:10	NC02202	Imiquilpan	Hidalgo	42740	Mexico	\$50.00	\$10.86
182	6075	Completed	09062008	00:01:13	GA02069	Acapulco	Guerrero	39800	Mexico	\$130.00	\$10.86
183	6076	Completed	09062008	00:18:25	NC02114	Acapulco	Guerrero	39799	Mexico	\$80.00	\$10.86
184	6077	Completed	09062008	00:18:36	GA02149	Morelia	Michoacán	000000	Mexico	\$50.00	\$10.86
185	6078	Completed	09062008	00:25:05	NC02121	San Marcos	Guerrero	39980	Mexico	\$50.00	\$10.86
186	6079	Completed	09062008	00:31:23	TM02769	Puebla	Puebla	72830	Mexico	\$100.00	\$10.91
187	6080	Completed	09062008	00:39:58	GA02067	Aguascalientes	Aguascalientes	20197	Mexico	\$100.00	\$10.86
188	6081	Completed	09062008	00:58:05	NC02156	Icoctenean	Tamaulipas	00000	Mexico	\$130.00	\$10.86
189	6082	Completed	09062008	01:04:41	GA02091	Monterrey	Nuevo León	00000	Mexico	\$150.00	\$10.86
190	6083	Completed	09062008	01:24:35	GA02089	Satamacha	Guerrero	36380	Mexico	\$100.00	\$10.86
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193	6086	Completed	09062008	02:18:37	GA02087	Papanla	Veracruz	93645	Mexico	\$140.00	\$10.86
194	6087	Completed	09062008	02:28:28	NC02105	luis moja	Zacatecas	98770	Mexico	\$232.00	\$10.86
195	6088	Completed	09062008	02:31:27	NC02105	Rincon de Romos	Aguascalientes	20400	Mexico	\$46.96	\$10.86
196	6089	Completed	09062008	03:03:42	GA02063	Zacatecas	Zacatecas	96957	Mexico	\$100.00	\$10.86
197	6090	Completed	09062008	14:24:33	NC02160	Villalagos	Hidalgo	42400	Mexico	\$10.00	\$10.86
198	6091	Completed	09062008	15:44:46	GA02083	Rioverde	San Luis Potosí	79007	Mexico	\$230.20	\$10.86
199	6092	Completed	09062008	15:44:05	GA02063	DELEGACION TLAHUAC	Distrito Federal	00000	Mexico	\$120.00	\$10.86
200	6093	Completed	09062008	15:46:34	GA02096	Tejic	Nayarit	6384	Mexico	\$240.00	\$10.86
201	6094	Completed	09062008	16:18:49	NC02125	Tullepe	Estado de México	54980	Mexico	\$230.00	\$10.86
202	6095	Completed	09062008	16:32:12	GA02069	Toluca	Veracruz	94050	Mexico	\$100.00	\$10.86
203	6096	Completed	09062008	16:55:58	NC02128	Tullepec	Estado de México	5460	Mexico	\$200.00	\$10.86
204	6097	Completed	09062008	17:20:12	NC02120	Acapulco	Guerrero	39740	Mexico	\$635.00	\$10.86
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212	6105	Completed	09062008	19:07:04	NC02110	Acapulco	Guerrero	39610	Mexico	\$150.00	\$10.86
213	6106	Completed	09062008	19:10:01	GA02080	D.F. Mexico	Distrito Federal	13950	Mexico	\$50.00	\$10.86

???







3. The Era of Behavioral Analytics

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“What customers *do*
speaks so loudly
that I cannot hear
what they’re saying.”

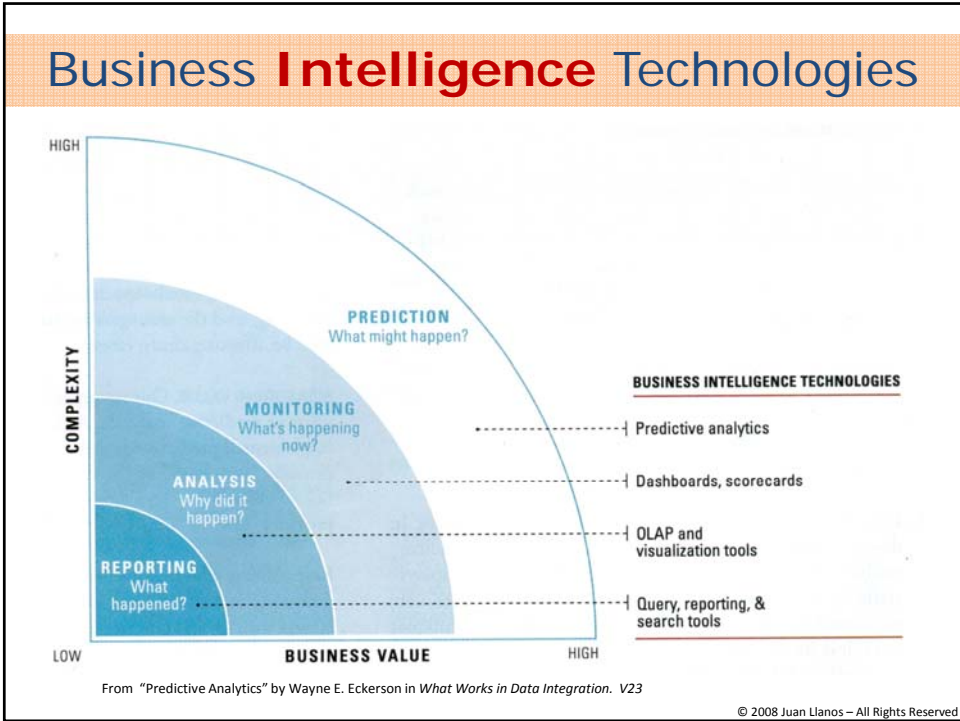
(Paraphrasing Ralph Waldo Emerson)



Customer *Identification* vs. Customer *Knowledge*

BEHAVIORAL ANALYTICS

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Summary and Takeaways

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Technology → *enabler*

Judgment → *driver*

(James Lam)

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Thank you!

Juan Llanos

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