

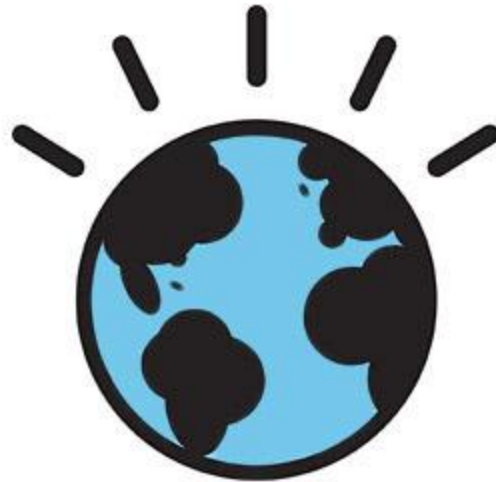
The Rise of Predictive Analytics



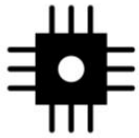
Agenda

- IBM Smarter Planet
- What is Predictive Analytics?
- The challenge
- What do we need?
- Some technology
- Bringing it all together

IBM SMARTER PLANET



Smarter Planet premise



Our world is becoming

INSTRUMENTED



Our world is becoming

INTERCONNECTED



Virtually all things, processes and ways
of working are becoming

INTELLIGENT

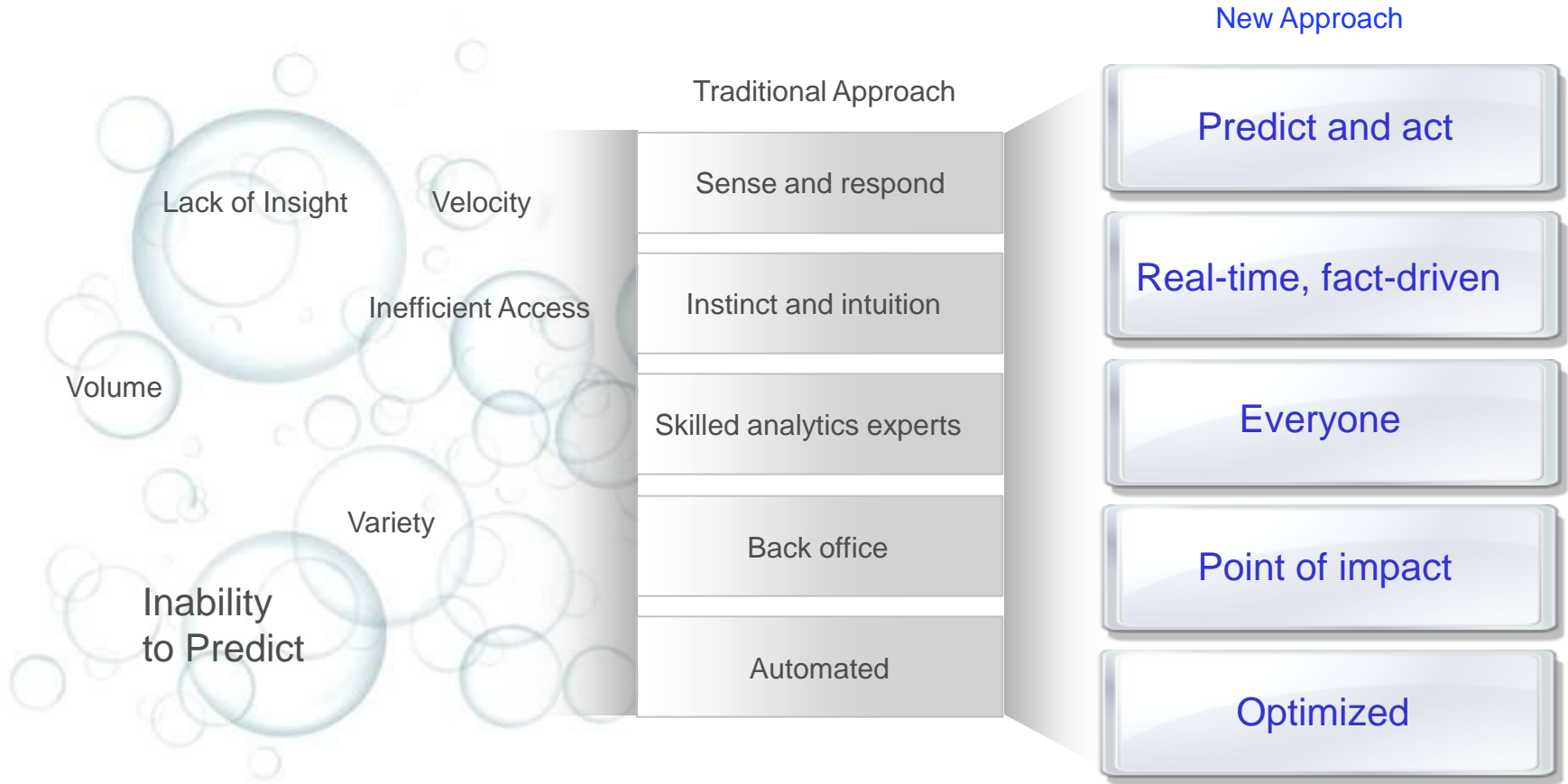
Smarter Planet premise



An opportunity to think and act in new ways - economically, socially and technically.

Smarter Planet

New ways of working to optimize decisions and actions



WHAT IS PREDICTIVE ANALYTICS?

A definition



WIKIPEDIA
The Free Encyclopedia

Predictive analytics

From Wikipedia, the free encyclopedia

Predictive analytics encompasses a variety of **statistical techniques** from **modeling**, **data mining** and **game theory** that analyze current and historical facts to make predictions about future events.

In business, predictive models exploit patterns found in historical and transactional data to identify risks and opportunities. Models capture relationships among many factors to allow assessment of risk or potential associated with a particular set of conditions, guiding **decision making** for candidate transactions

IBM SPSS' vision for Predictive Analytics

We had a view about the transformative nature of predictive analytics, from this...

$$\begin{aligned}
 V(e_{123}) &= E(e_{123}^2) = \frac{1}{N} \sum e_{123}^2 = \frac{1}{N} \sum (X_i - X_{123})^2 \\
 &= \frac{1}{N} \sum (X_i^2 + X_{123}^2 - 2X_i X_{123}) \\
 &= \frac{1}{N} \sum X_i^2 + \frac{1}{N} \sum X_{123}^2 - \frac{2}{N} \sum X_i X_{123} \\
 &= \sigma_1^2 - \sigma_{123}^2
 \end{aligned}$$

$$\therefore R_{123} = \frac{\sigma_1^2 - \sigma_{123}^2}{\sqrt{\sigma_1^2(\sigma_1^2 - \sigma_{123}^2)}}$$

$$R_{123}^2 = \frac{\sigma_1^2 - \sigma_{123}^2}{\sigma_1^2} = 1 - \frac{\sigma_{123}^2}{\sigma_1^2}$$

$$1 - R_{123}^2 = \frac{\sigma_{123}^2}{\sigma_1^2} = \omega$$

$$\omega = \begin{vmatrix} 1 & r_{12} & r_{13} \\ r_{21} & 1 & r_{23} \\ r_{31} & r_{32} & 1 \end{vmatrix} = 1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23}$$

$$\omega_{11} = \begin{vmatrix} 1 & r_{23} \\ r_{32} & 1 \end{vmatrix} = 1 - r_{23}^2$$

$$R_{123}^2 = 1 - \frac{\omega}{\omega_{11}} = \frac{r_{12}^2 + r_{13}^2 - 2r_{12}r_{13}r_{23}}{1 - r_{23}^2}$$

Vision: transformative conversations



From fantasy...

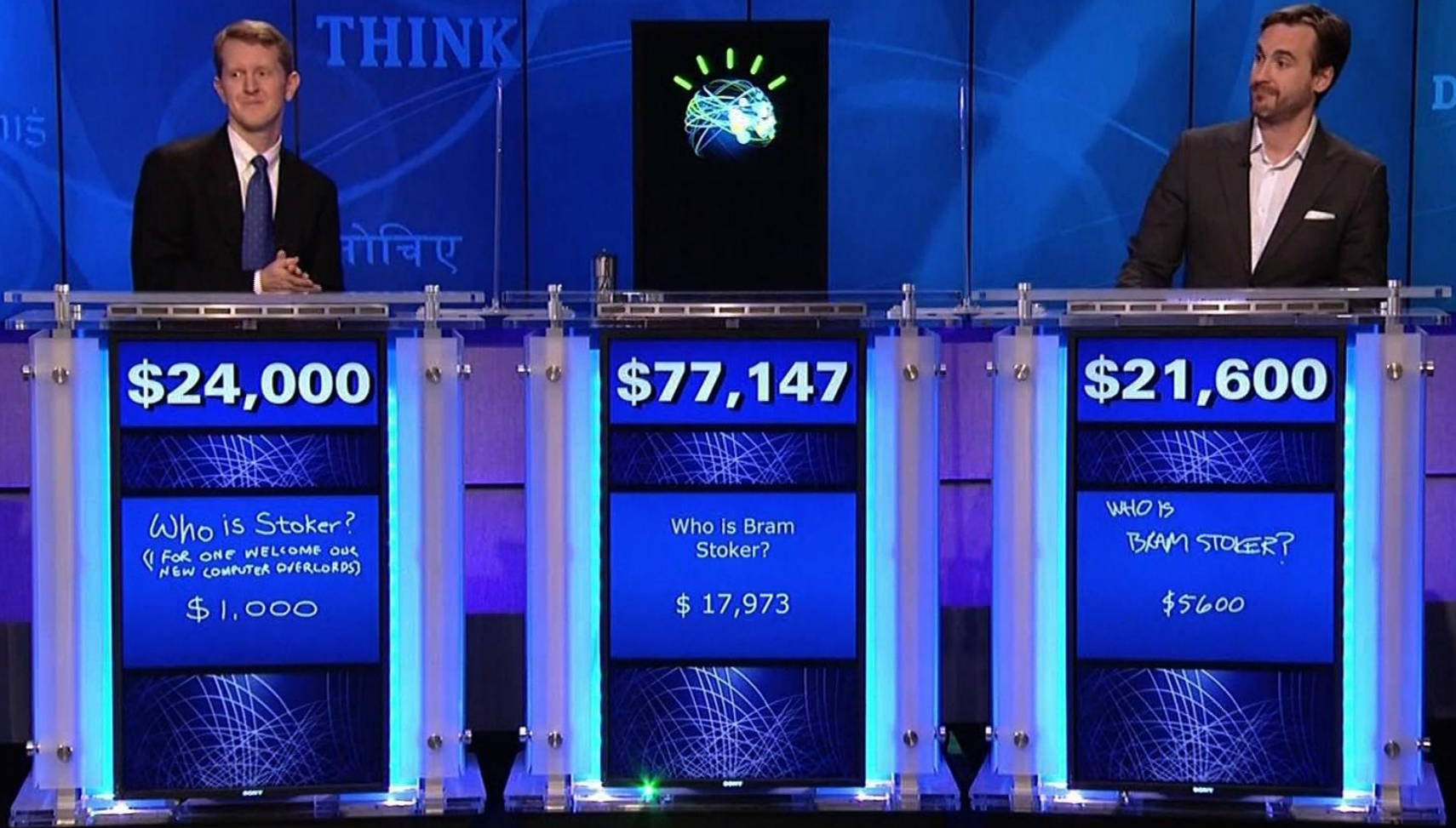
A billboard that scans your eye

...To reality

A billboard that scans your clothes



... and it just gets better!



IBM Watson wins Jeopardy

THE CHALLENGE



Multiple channels: web, email, mobile, call centre, stores, kiosk...

Proliferation: digital noise = semantic deafness

Products Proliferation

- TNS Media Intelligence has 4 million brands in its database growing at 700 a day, over 10% a year



Networks Proliferation

Access Proliferation



WHAT DO WE NEED?

360 degrees of the customer

High value: source of competitive differentiation

Interaction data

- E-Mail / chat transcripts
- Call center notes
- Web Click-streams
- In person dialogues

Attitudinal data

- Market Research
- Social Media

Descriptive data

- Attributes
- Characteristics
- Self-declared info
- (Geo)demographics

Behavioural data

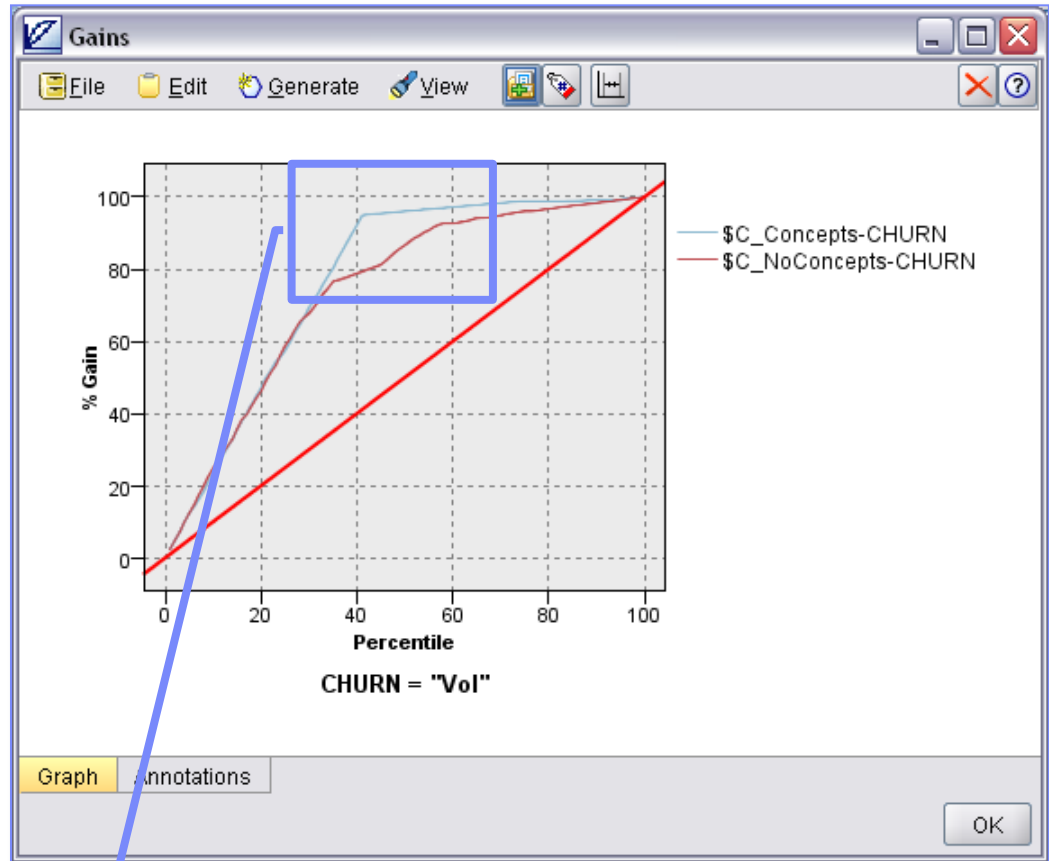
- Orders
- Transactions
- Payment history
- Usage history



Traditional approach

360 degrees of what, for what?

- Why have a 360 degree view?
 - To build a better model
- “When properly implemented as part of an overall customer satisfaction strategy, Nucleus has found that text mining has the ability to **cut customer churn in half.**”

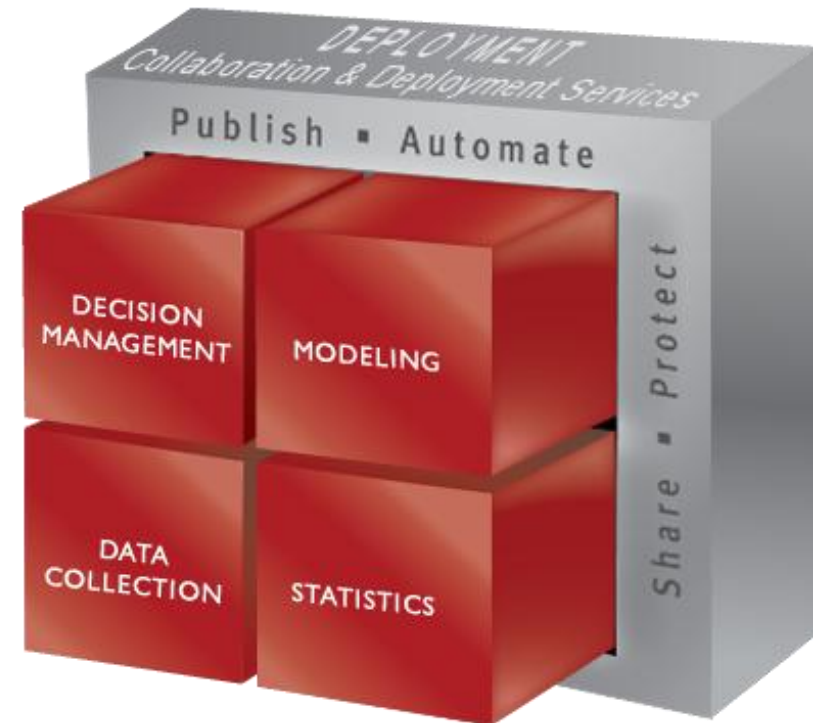


Value of adding text to data mining

SOME TECHNOLOGY

Capture/Detect – Predict – Act

- **Capture** information
 - Attributes, Interactions, Behaviors, and Attitudes
- **Predict** behavior and preferences
 - Statistics for deeper insight
 - Data Mining for predictive modeling
 - Text Analytics for unstructured insight
- **Act** on results
 - Decision Management for business context
 - Collaboration & Deployment Services for efficient deployment



Driving smarter business outcomes

Capture/Detect

Enable a complete view of the customer combining enterprise, survey and social media based data



Data Collection



Predict

Understand customers micro-behaviour across channels, predict their next move and make the next best offer



Text Mining

Data Mining

Statistics



Business Rules

Platform

Pre-Built Content



Attract



Up-sell



Retain



Act

Deploy predictive analytics within business processes, across access platforms, maximizing operational impact



Deployment Technologies

Phase 1

CAPTURE/DETECT



Surveys: IBM SPSS Data Collection

- Create a survey which will reach all constituents, regardless of language or location
- Control the entire survey process – from design and data collection through to analysis and reporting
- Apply real-time logic and data validation to ensure clean, high quality data

Employee Satisfaction - IBM® SPSS® Data Collection Author

File Edit View Insert Group Tools Help

Question English (United Kingdom)

Times New Roman 3 (12 pt)

Insert Question Insert Routing Item

您是谁 :

永久雇员

资讯科技承办商

临时工作人员

上一步 下一步

5%

Shortcuts

| | |
|--------------------|---|
| Managing_Change | When changes happen, they are usually managed well. |
| Company_Leadership | I have confidence in the company's leadership. |
| Overall_Management | In my opinion the following are well managed. |

Insert Question

Open a Statistics file...

Members

Language: English (United Kingdom)

© 2011 IBM Corporation

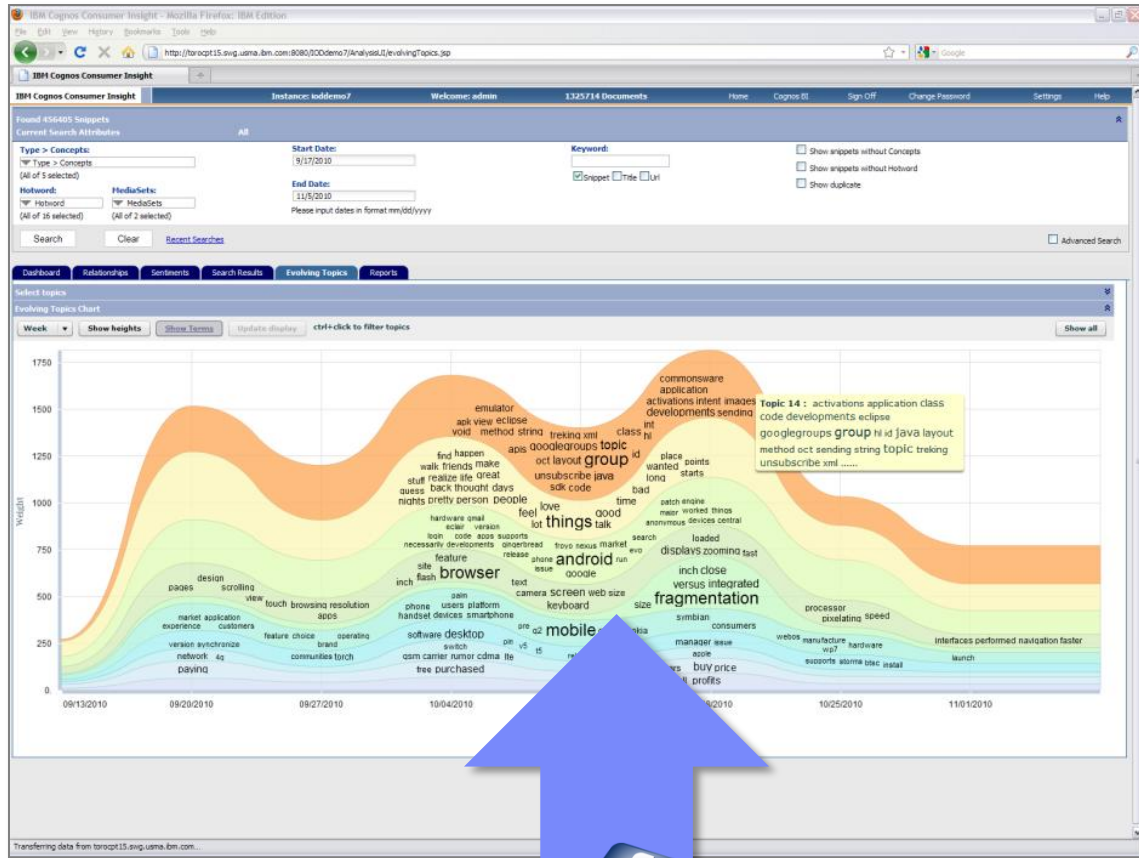
“Do you work:
 - Full time
 - Part time”

“Travaillez-vous:
 - À temps plein
 - À temps partiel”

“你的工作:
 - 全职
 - 兼职”

Social Media: IBM Cognos Consumer Insight

- Understand your customer needs to target new offers and products more cost effectively
- Help you enhance your reputation among your customers and constituencies
- Respond more quickly to customer requests to improve service level effectiveness/customer care



**2 billion+
blog postings**

**100,000+
discussion forums**

Phase 2

PREDICT



Building models... for the expert user

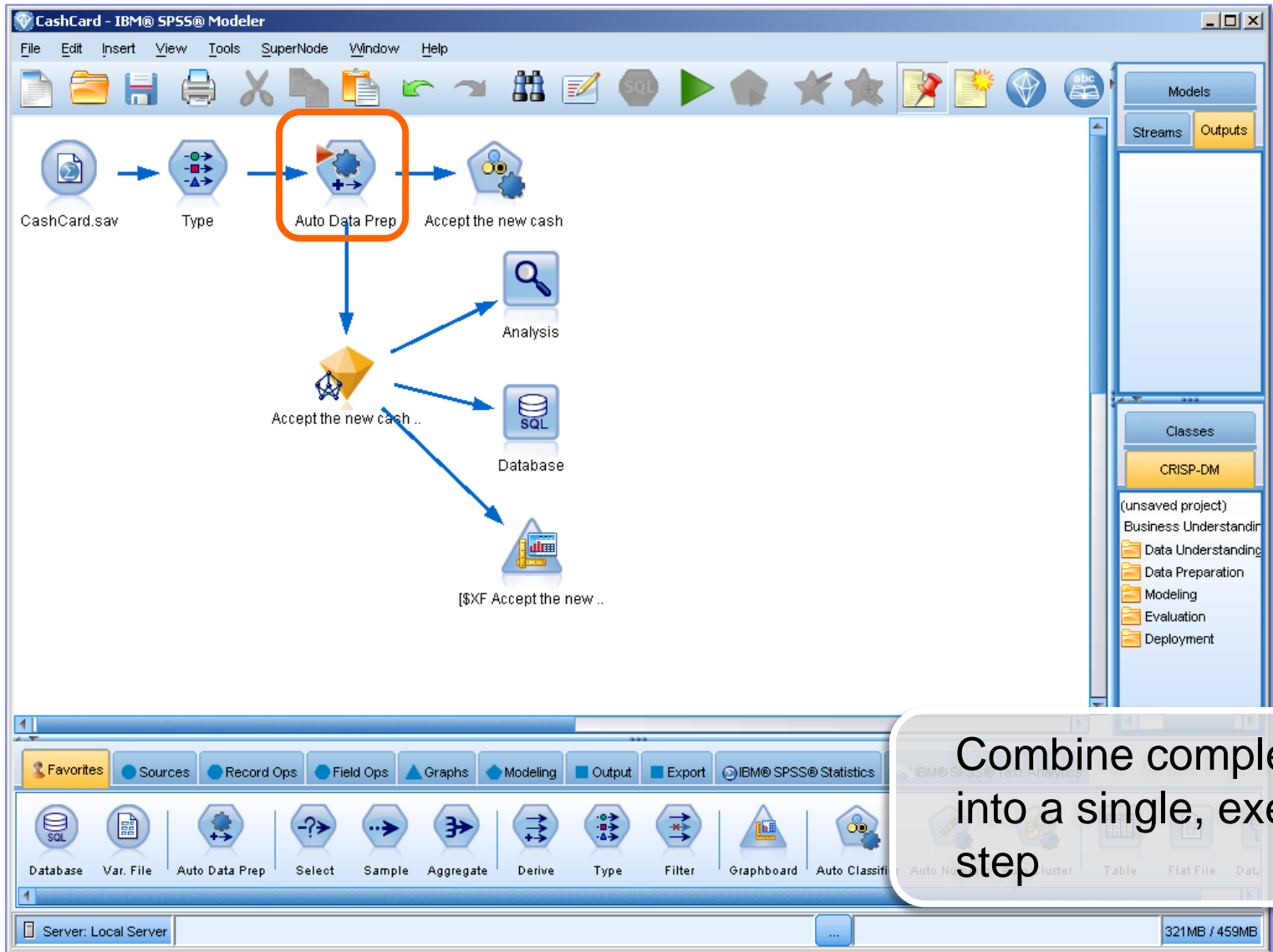
The screenshot displays the IBM SPSS Modeler interface for a project named 'CashCard'. The main workspace shows a workflow diagram starting with 'CashCard.sav' and proceeding through 'Type', 'Sort', 'Filter', '(generated)', 'SetToFlag', 'Restructure', and another '(generated)' node. A central 'Type' node is connected to several other nodes, including '9 Fields', '5.0', 'CART', 'QUEST', 'CHAID', and three 'Accept the new cash...' nodes. An 'Ensemble' node is also present, connected to 'Database' and another 'Accept the new cash...' node. The right-hand pane shows a 'Models' tab with 'Streams' and 'Outputs' sub-tabs, and a 'CRISP-DM' section with 'Classes' and a project tree containing 'Streams', 'Nodes', 'Generated', 'Tables, Gra...', and 'Other'. The bottom toolbar includes tabs for 'Favorites', 'Sources', 'Record Ops', 'Field Ops', 'Graphs', 'Modeling', 'Output', and 'Export', along with icons for 'Database', 'Var. File', 'Auto Data Prep', 'Select', 'Sample', 'Aggregate', 'Derive', 'Type', and 'Filter'. The status bar at the bottom indicates 'Server: Local Server' and '307MB / 457MB'.



Build models to understand segments and predict behaviour



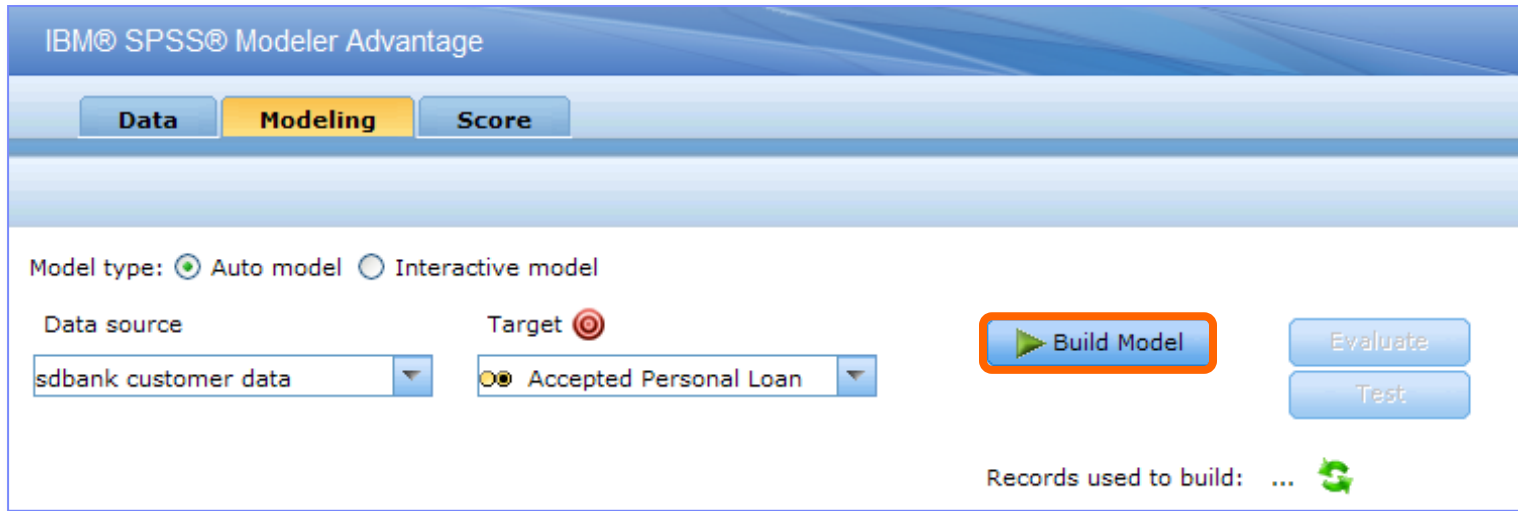
Building models... for the intermediate user



Combine complex tasks into a single, executable step



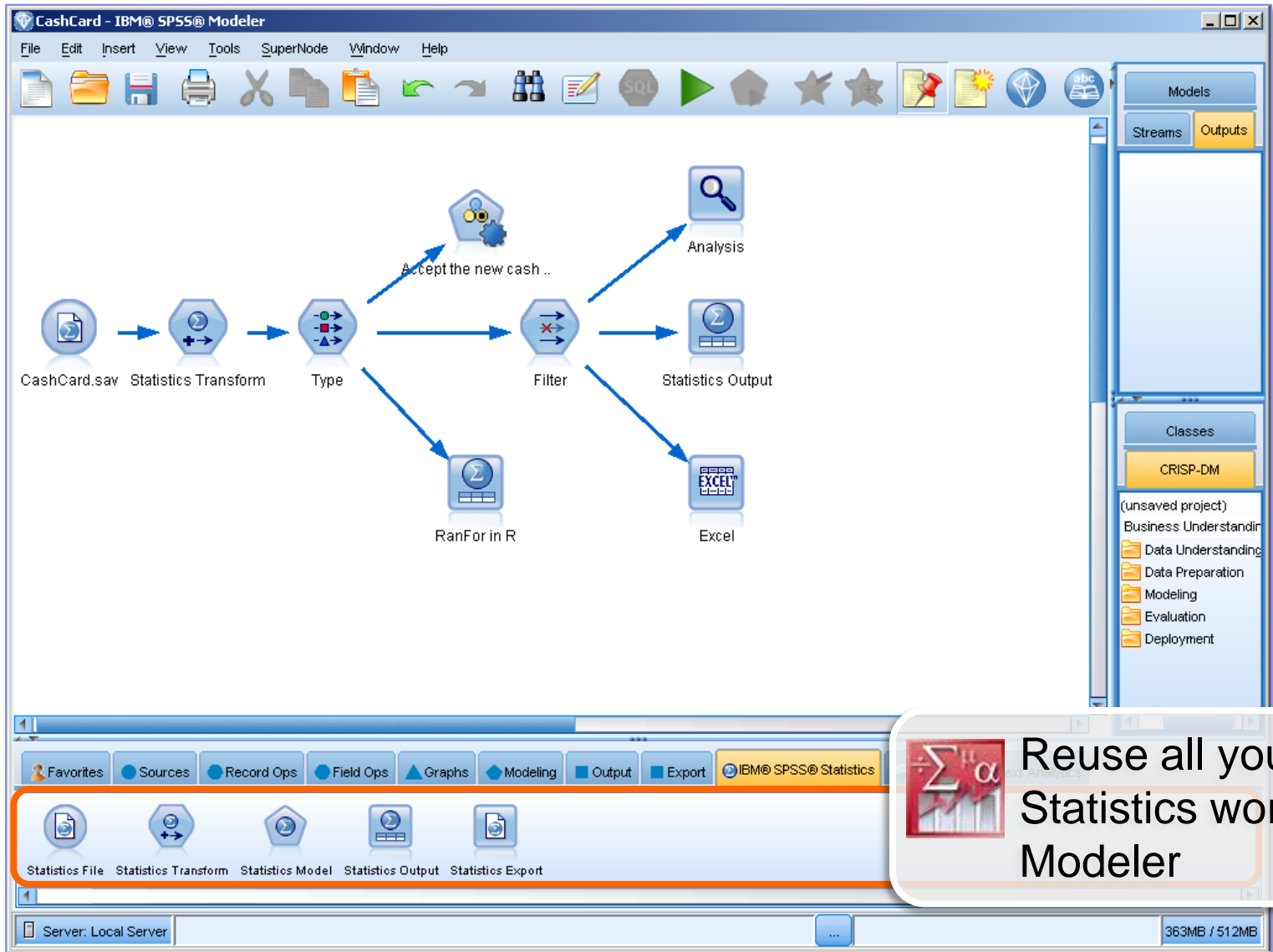
Building models... for the novice user




Simple, easy to use
web-based model
building and scoring



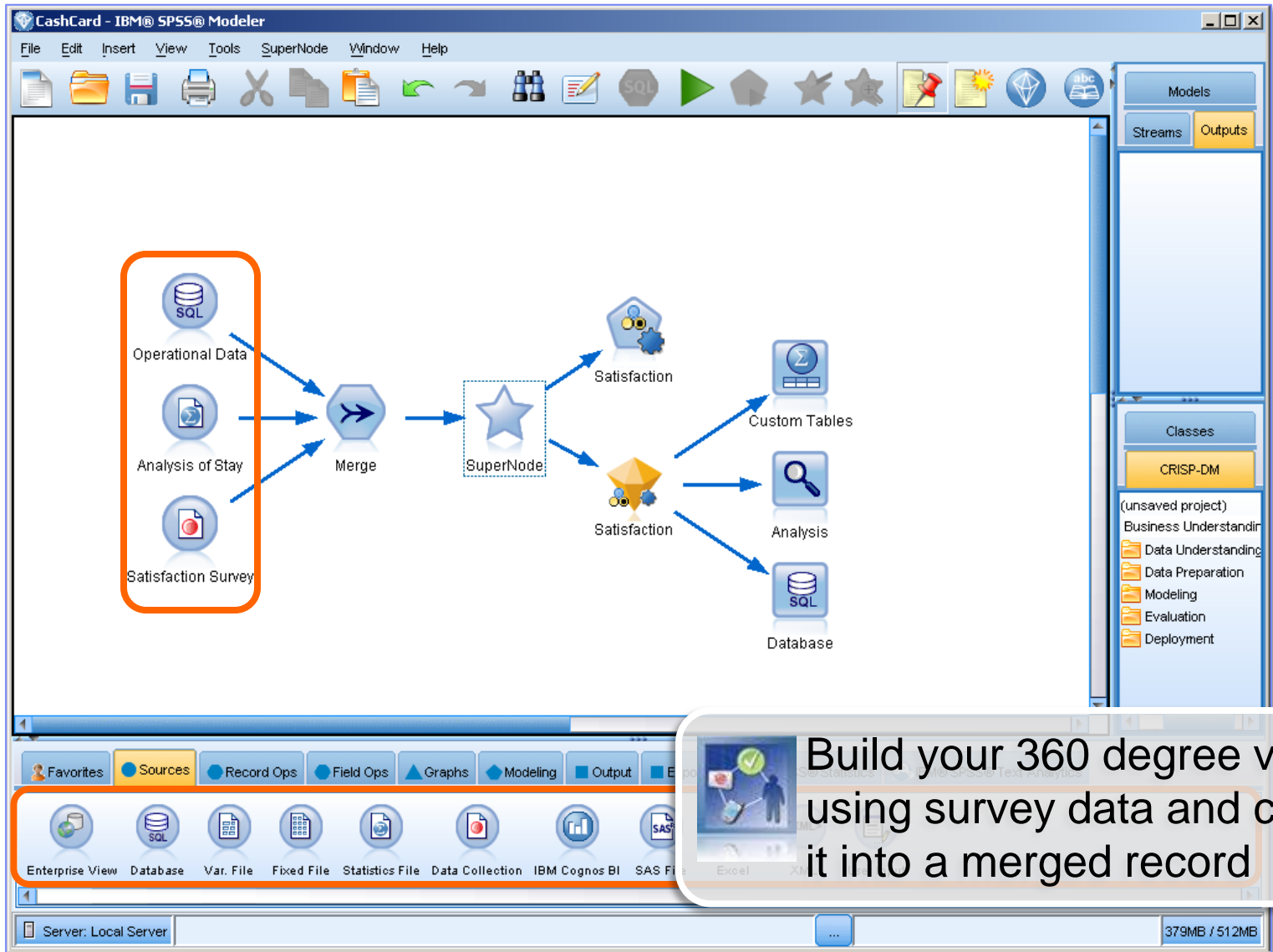
Super workbench: integration of Statistics nodes in Modeler



 Reuse all your Statistics work within Modeler



Getting data is not a problem



Build your 360 degree view using survey data and combine it into a merged record

Phase 3

ACT



Deploying models: configurable framework

IBM® SPSS® Decision Management for Claims

What If...
✕

Simulation Data Source:
Simulation Date:
Claim Area:
Interaction Point:

| Combine matrix | | Model actions | | | Results | | |
|----------------|------------|---------------|------------|--------------|------------|------------|-------------|
| | | Refer | Standard | Fast Track | Action | Count | Percent |
| Rules actions | Refer | Refer ▼ | Refer ▼ | Standard ▼ | Refer | 77 | 9.872% |
| | Standard | Refer ▼ | Refer ▼ | Standard ▼ | Standard | 187 | 23.974% |
| | Fast Track | Refer ▼ | Standard ▼ | Fast Track ▼ | Fast Track | 516 | 66.154% |
| | | | | | | 780 | 100% |

Name:

Total Simulation Records: 975

Display Number of runs retained: 3

| Action | Run 1 ✕ | Run 2 ✕ | Run 3 ✕ | Distribution |
|--------------|------------|------------|------------|--------------|
| Refer | 22 | 25 | 77 | |
| Standard | 55 | 239 | 187 | |
| Fast Track | 703 | 516 | 516 | |
| Total | 780 | 780 | 780 | |

Use the configurable Decision Management framework to deploy

BRINGING IT ALL TOGETHER

High value: source of competitive differentiation

Interaction data

- E-Mail / chat transcripts
- Call center notes
- Web Click-streams
- In person dialogues

Attitudinal data

- Market Research
- Social Media

Descriptive data

- Attributes
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Behavioural data

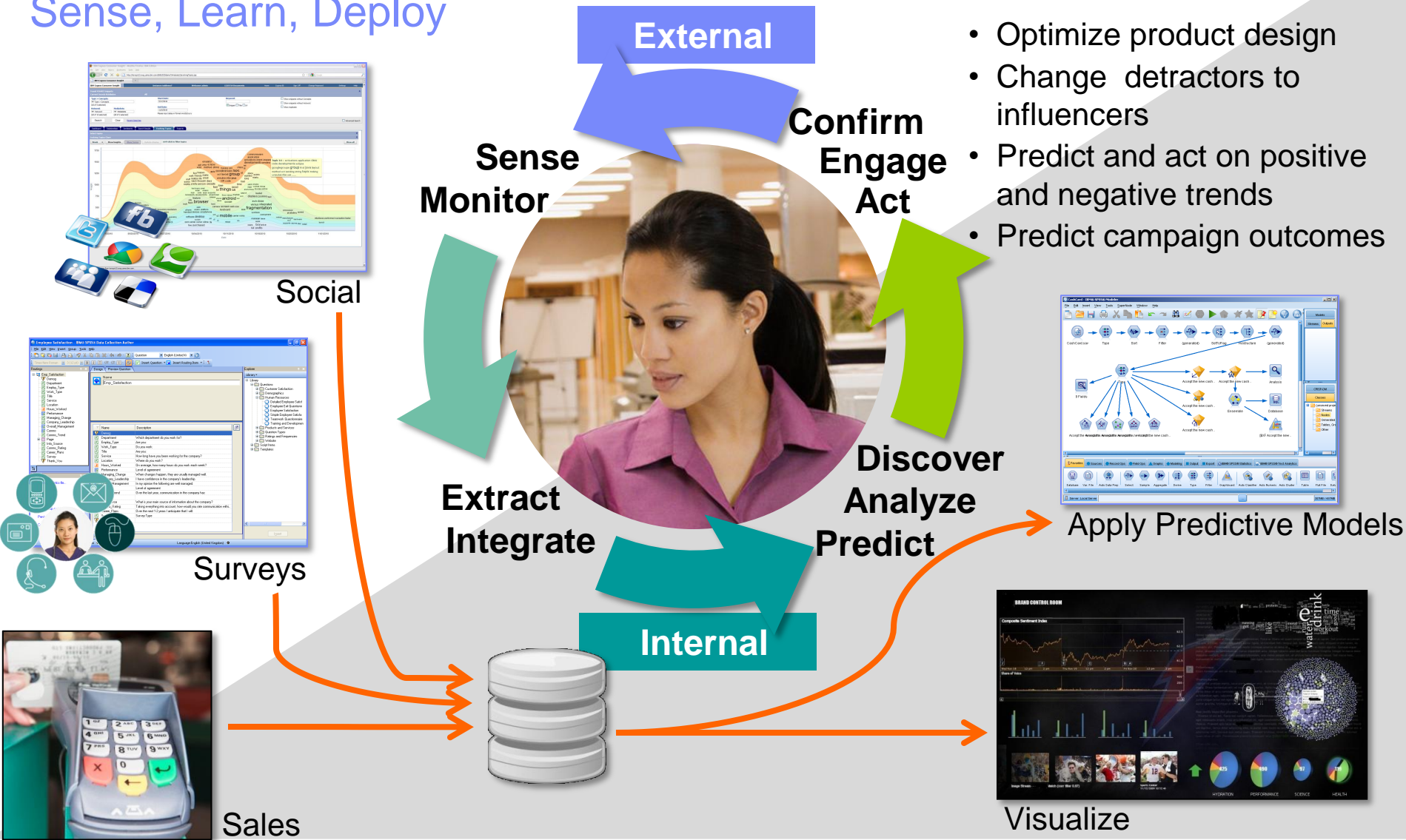
- Orders
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Traditional approach



Social + Surveys + Predictive Analytics

Sense, Learn, Deploy

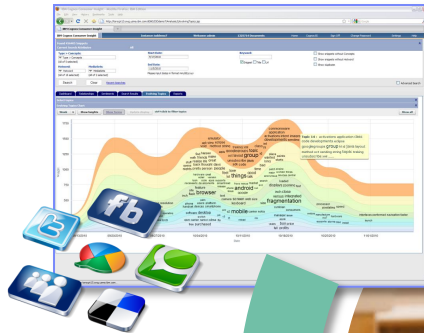


- Optimize product design
- Change detractors to influencers
- Predict and act on positive and negative trends
- Predict campaign outcomes

Social + Surveys + Predictive Analytics

From anonymous insights to specific actions with specific people

1. Analyse social contribution

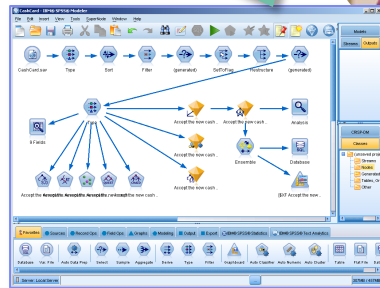


4. DM package to outreach to specific people in target segments

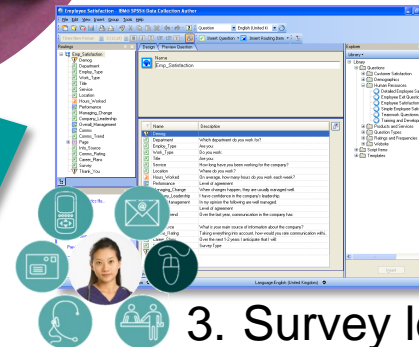
A screenshot of the IBM SPSS Decision Management for Claims software. It displays a simulation results table with columns for 'Model outcome' and 'Results'. The table includes rows for 'Action', 'Under action', and 'Final Track' with various status indicators (red, green, yellow).

| Model outcome | Results |
|---------------|-----------------------------------|
| Action | Refer 9.830% |
| Under action | Standard 10% Fast Track 23.54% |
| Final Track | Max 84.13% |
| | Min 14% |

2. Determine segment profiles



3. Survey looking for characteristics of preferred segment(s)



Some questions

- Is IBM SPSS Data Collection at the center or a feed?
 - A feed – one of the ones that drives competitive advantage.
- Do I need to redo all my IBM SPSS Data Collection work ?
 - No, IBM SPSS Data Collection is a core component for attitudinal data.
 - IBM SPSS is a modular platform. Add modules to build predictive models, gather additional data sources like social media, build data views, execute artifacts smartly, etc.
- Do I need a massive data warehouse?
 - Not to start. Your customer may already have a warehouse/mart.
 - Extract respondent/customer data from various sources to build models.
 - In the long run, if there are lots of sources and a time dimension, then should consider.
 - Bootstrap your way up!



Summary & Next Steps

- Develop new opportunities and offerings by exploiting these concepts
 - Social + Surveys + Predictive Analytics
 - Technology exists
 - Expertise exists
- Let's bring something differentiated to market!



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