Brad Hill – Senior Technical Sales Consultant

Data Mining & Text Analytics

Predicting outcomes with IBM SPSS Modeler

Business Analytics software

Business Analytics Software

What if..

- Reduce current customer attrition by 89%
- Increase the numbers of student applications by 7%
- Increase profits by 300% with better cross sell offers
- Lower crime rates by 19% over 4 years
- Reduce marketing costs by 40% while increasing profit

Business Analytics Software

Business Analytics Software

Predictive analytics	Data mining	Text analytics

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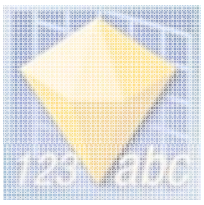

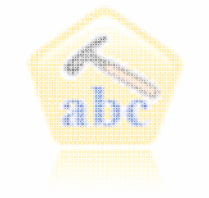

Predictive analytics | Data mining | Text analytics

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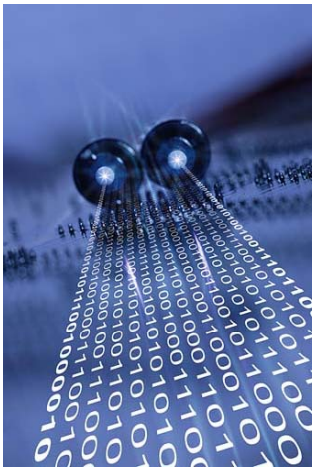
- **Instrumented**
- **Interconnected**
- **Intelligent**

What is predictive analytics?



Predictive Analytics helps connect data to effective action by drawing reliable conclusions about current conditions and future events

Gareth Herschel, Research Director, Gartner Group

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Predictive analytics in action

- Customer relationship management "analytical CRM"
  - Who are our best customers?
  - Can we get more like that?
  - What/why do they buy?
  - Why do they leave?
- Human capital management
  - Who are our best employees?
  - How do we keep our best employees from leaving?
  - Which prospects should we recruit?
- Science
  - Genetics
  - Drug discovery
  - Medical research
  - Food authentication
- Fraud detection
  - Money laundering
  - Network intrusion
  - Tax audits & collection
- Crime analysis
- Industrial process optimisation & QA

and many more…

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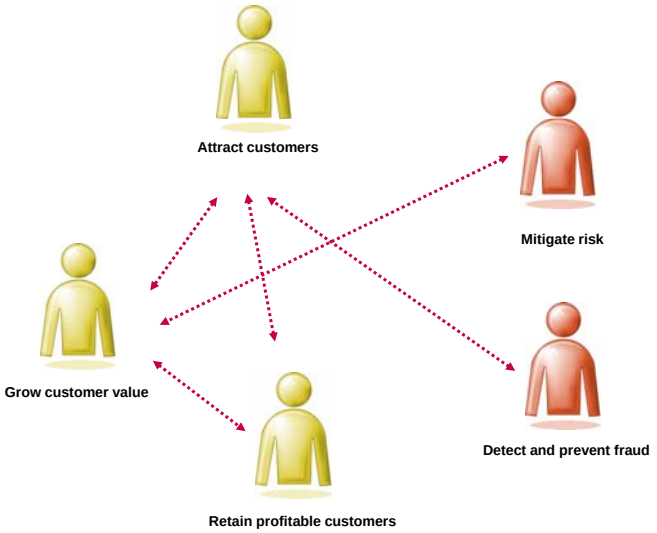

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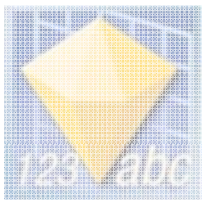

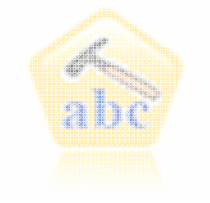

Predictive analytics

- Faster, better-informed decisions
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Data mining

Text analytics

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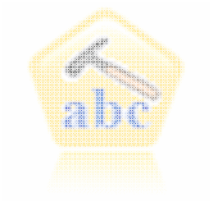

Predictive analytics

Data mining

Text analytics

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Data Mining

- Discover key relationships between variables
- Use advanced analytical techniques on data
- Model effect of variables on outcomes
- Determine influence on outcomes
- Predict outcomes
- Apply models to new data

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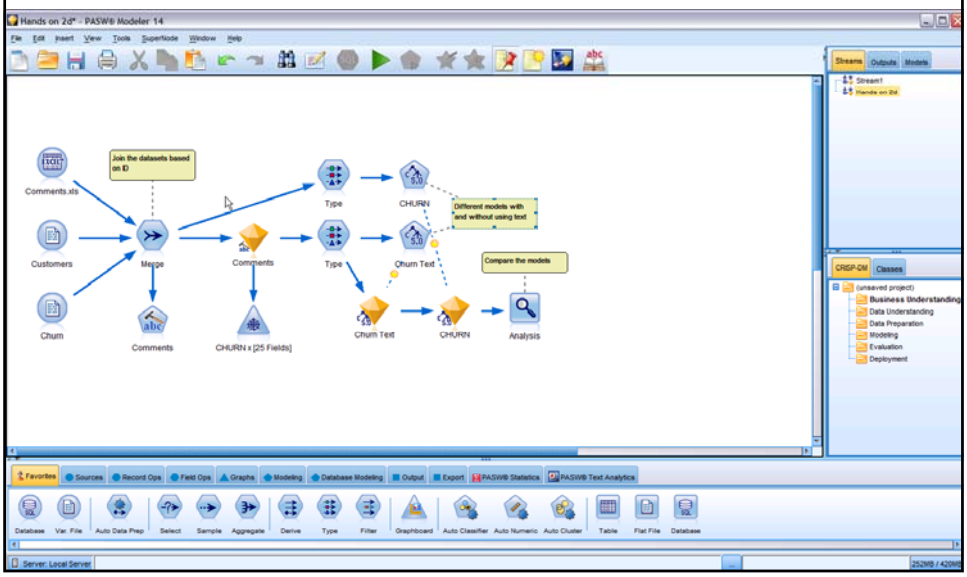
IBM SPSS Modeler

- High performance data mining and text analytics workbench
- Ability to create and operationalise predictive intelligence
- Used for the proactive and repeated…
  - Identification of revenue opportunities
  - Reduction of costs
  - Increase in productivity

Business Analytics Software

Complete workbench



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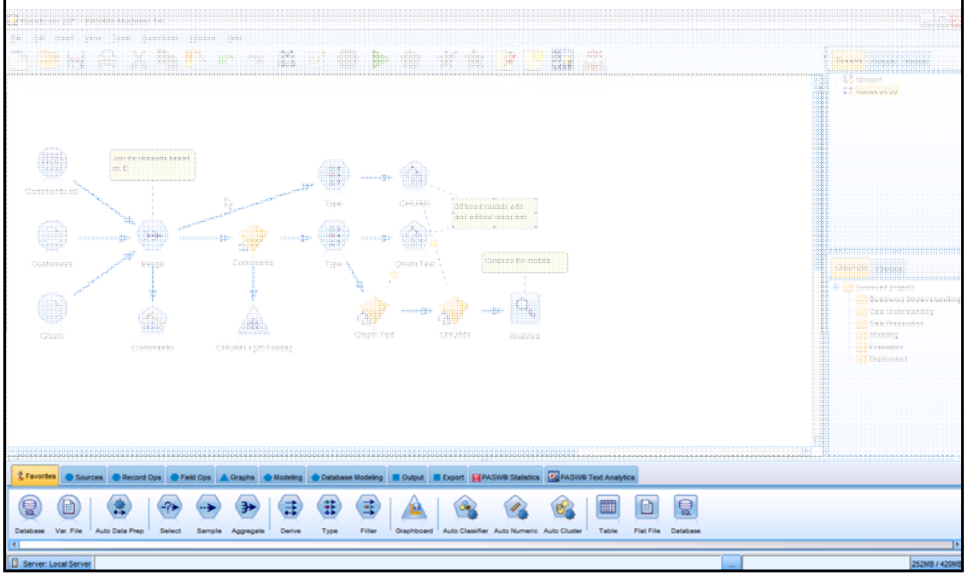

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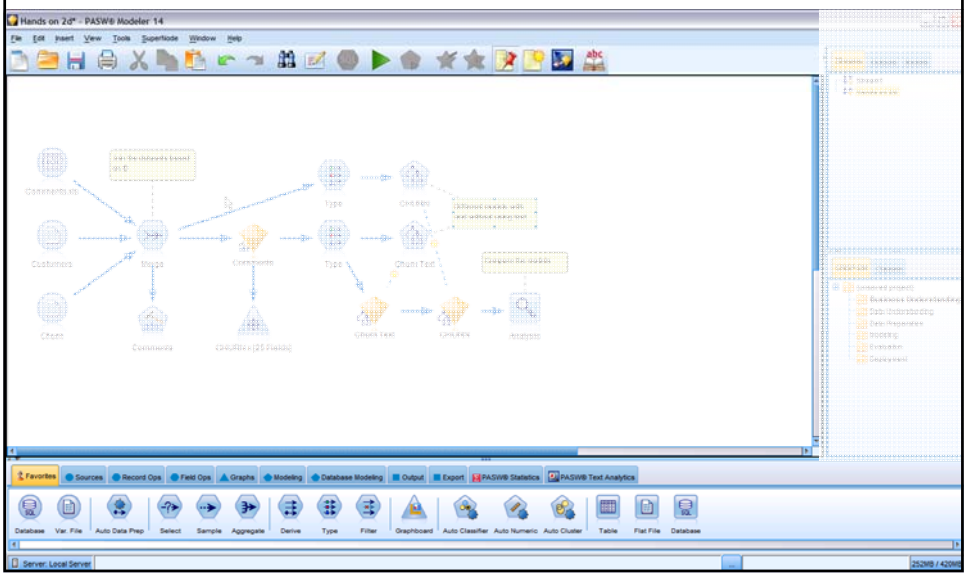

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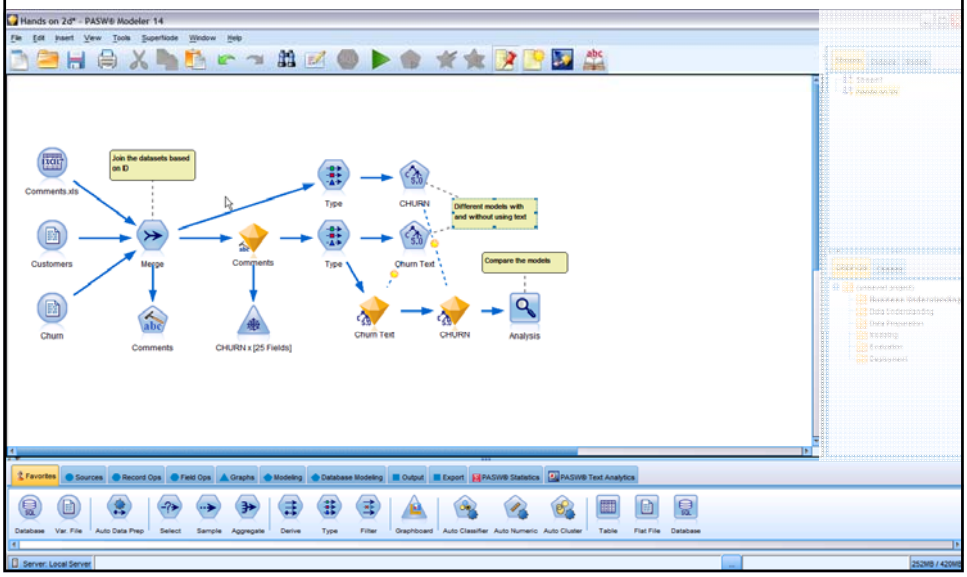

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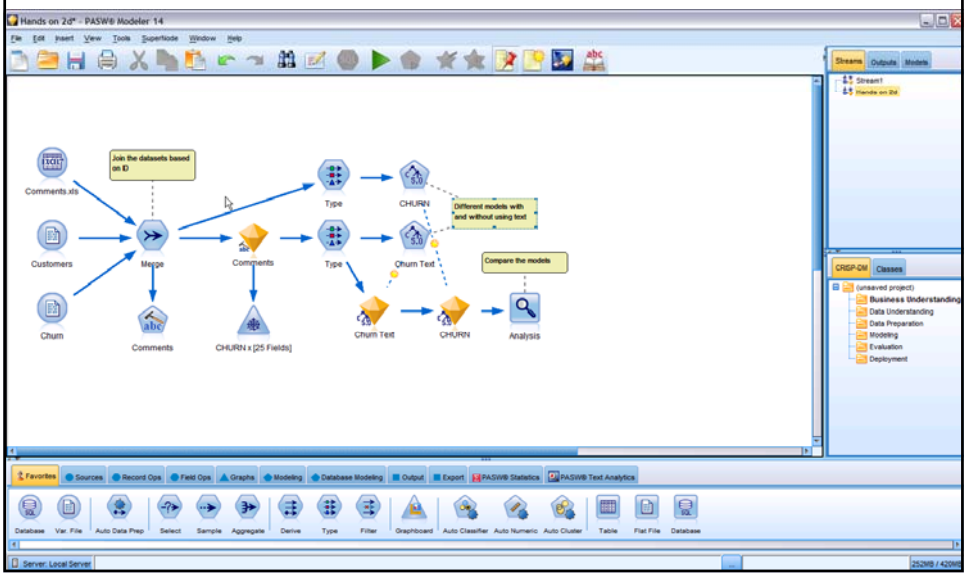

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Data mining techniques

Technique	Algorithms	Usage
Classification (or prediction)	Auto Classifiers, Decision Trees, Logistic, SVM, Time Series, etc	Used to predict group membership (ie will this employee leave?) or a number (ie how many widgets will I sell?)

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Association	APRIORI, Carma, Sequence	Used to find events that occur together or in a sequence (ie market basket).

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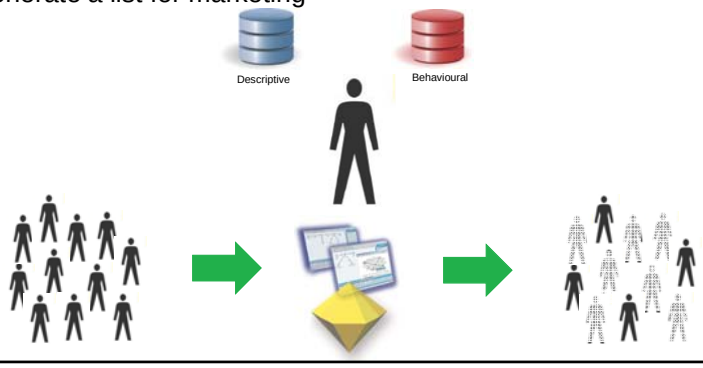
Scenario

- Customer and product data
- Explore and understand data
- Build a model to identify customers likely to respond
- Generate a list for marketing



Demonstration

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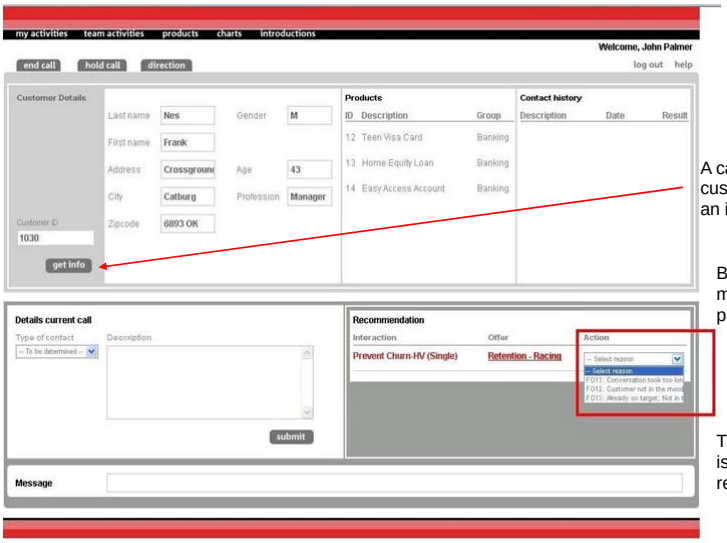
How predictive intelligence gets deployed



A call center agent submits customer information during an interaction

Based on the predictive model, a single offer is presented to the customer

The reaction to the offer is tracked and used to refine the model

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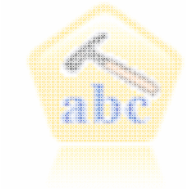

Predictive analytics

Data mining

- Access a variety of data
- Easy to use graphical interface
- Automatic data preparation and modelling
- Add value to BI
- Create predictive intelligence which can be operationalised

Text analytics

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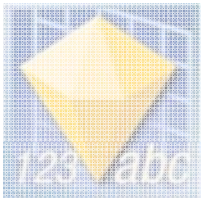

Predictive analytics | Data mining | **Text analytics**

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The importance of text

Because people communicate with words, not numbers, it has become critical to be able to mine text for its meaning and to sort, analyse, and understand it in the same way that data has been tamed. In fact, the two basic types of information complement each other, with data supplying the "what" and text supplying the "why".

Source IDC: "Text Analytics: Software's Missing Piece?"

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Text analytics

- Extract, analyse and create structure from unstructured data
- Integrate analysis results into operational systems
- Integrate analysis results into Business Intelligence applications
- Integrate analysis results with structured data and use as input for Data mining
- Improves model accuracy.

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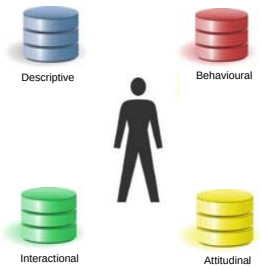

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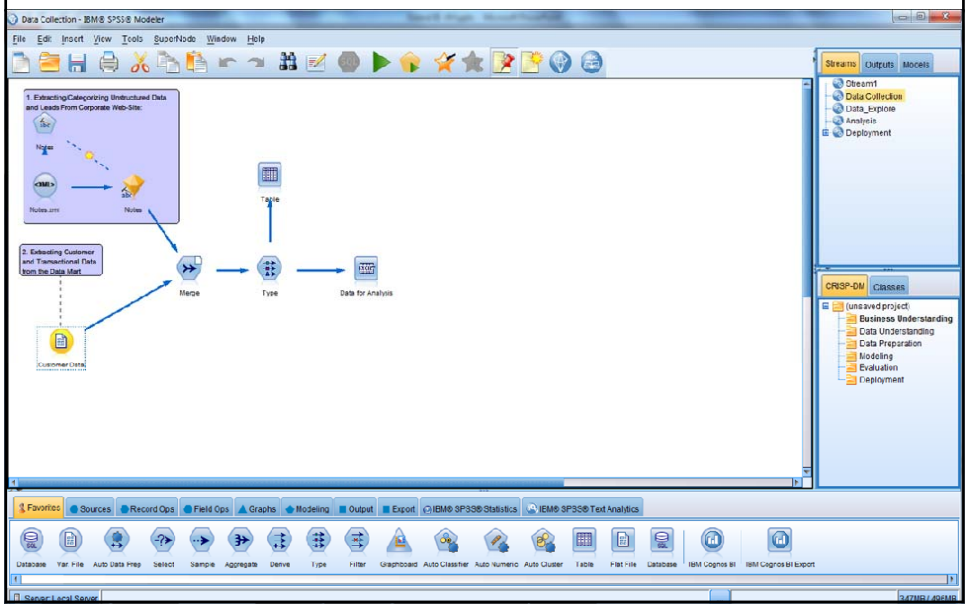
Text analytics within IBM SPSS Modeler



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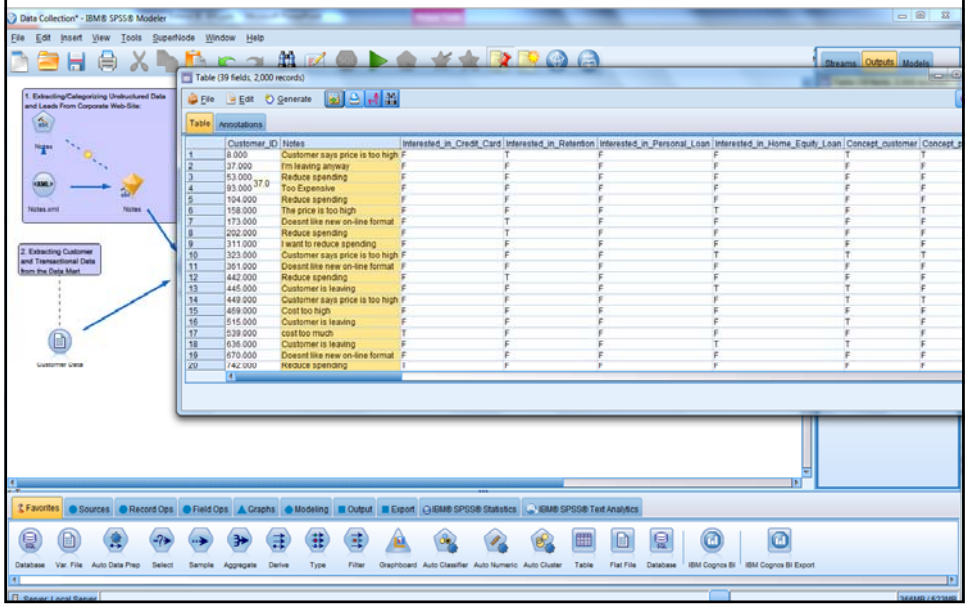

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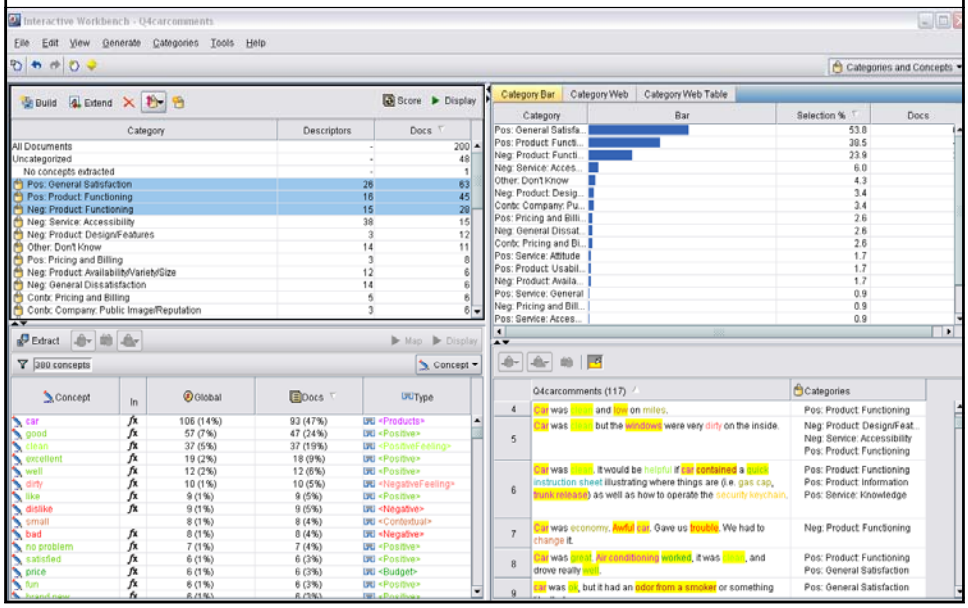

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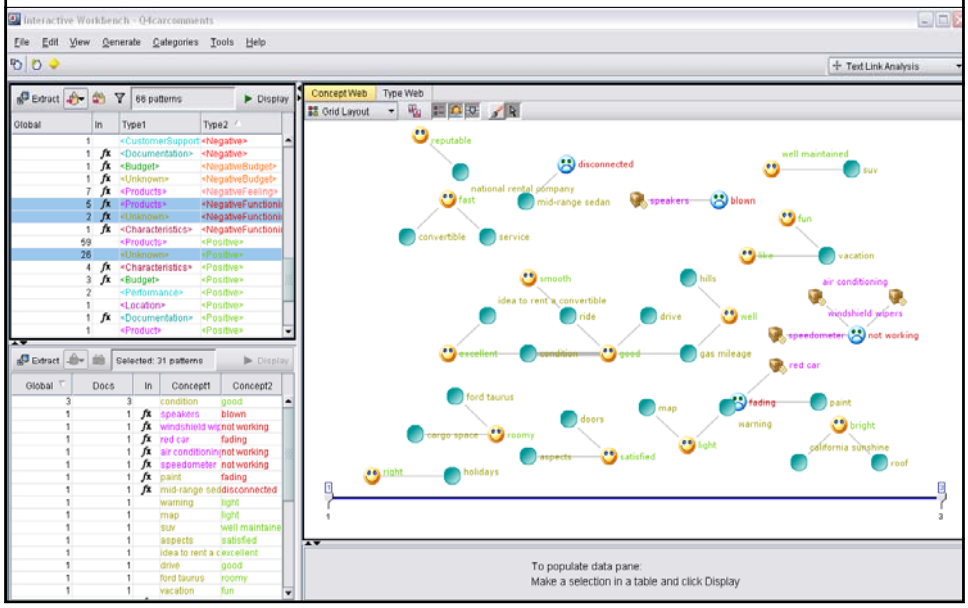

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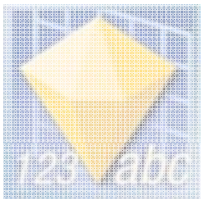

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- Achieve better insight
- Do something with qualitative data

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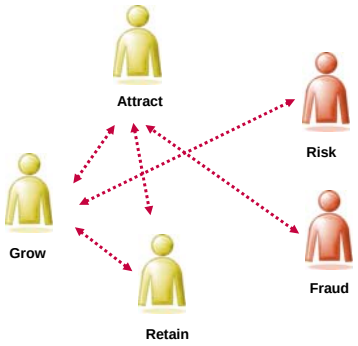

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Richmond

Increase public safety

Challenge

- Find innovative ways to fight escalating crime
- Find a cost-efficient way to analyse crime data, assess public safety risks, make intelligent decisions about personnel

Solution

- **Analysts and officers users IBM SPSS Modeler to pore through data and find crime patterns and predict outcomes**
- **Forecast strategic positions for personnel and deployed "hot spot" maps to officers**
- **Used to identify key crime patterns to develop proactive policing strategies**

Results

- **Dramatic reduction in crime between 2006 and 2007 despite economic conditions**
- **New Year's Eve test saw 246% increase in weapon seizure, 49% decrease in gunfire, and $15,000 savings in overtime**
- **Gives even rookie officers veteran-like insight into crime data**

"IBM SPSS Modeler and data mining represent a revolution in our ability to access previously unobtainable data, and pull meaning and value from it. This is as close to a crystal ball as we are ever going to get."

➥ Colleen McCue, program manager for the Department's Crime Analysis Unit

Business Analytics Software

INFINITY PROPERTY & CASUALTY CORPORATION

Claims identification

Challenge

- Reduce payments on fraudulent claims
- Improve ability to collect payments from other insurance companies

Solution

- **Used IBM SPSS Modeler to develop models of fraudulent claims**
- **Leveraged text analytics to interpret and analyse handwritten notes for use in investigation**
- **Extended use of predictive analytics beyond claims to customer retention and pricing analysis**

Results

- **403% ROI in first 3 months**
- **Realised $5 Million in benefit in the first year post-implementation**
- **Reduced cost of claims payment by enabling earlier, more targeted investigations**
- **Models deployed within call center to streamline claims process and gather the right data**

"The relationship we have with our customers is put to the test when they file a claim, as they want a resolution so their lives can return to normal as quickly as possible. With SPSS, we can fast track valid claims or flag possible counterfeit claims for further review, saving our customers time and money."

➥ Bill Dibble, SVP of Claims

Business Analytics Software

AVIS

Maximises revenue from targeted email marketing

Challenge

- What factors drive direct business through their e-commerce channels
- How to use wealth of customer data to tailor each marketing communication to a customer's unique needs

Solution

- **Used IBM SPSS Modeler to develop customer profiles**
- **Used IBM SPSS Modeler to develop more accurate segmentation models**
- **Applied predictive intelligence to e-mail marketing campaign to target the right communication to the right customer**

Results

- **Cost of e-mail marketing as a percentage of revenue (CPR) cut by 42% in 2009 vs. 2008**
- **Increased insight into customer activity drives loyalty**
- **Models and customer segmentation revealed where to target marketing spend**

"The Customer Segmentation project allows us to keep in touch with our large database using cost-effective e-mail, but with all the benefits of a one-to-one relationship because we now have a clearly defined picture of each customer."

➥ Chris Parker, direct analytics specialist at Avis Europe

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Baruch COLLEGE

Gain and retain the right students

Challenge

- Access data held in multiple silos (admissions office, registrar, accounts receivable, etc.)
- Increase market visibility and target specific segments of prospective students

Solution

- **Used IBM SPSS Modeler to access and consolidate multiple data stores to create a single view**
- **Created models for at-risk students, course placement, and student retention, and more**
- **Applied predictive intelligence across the student lifecycle**

Results

- **In a declining business school market, saw 7.1% increased applications to business school**
- **21% annual increase in transfer students**
- **Decreased dropouts significantly by using predictive analytics to improve freshman placement**

"These days, no meeting to make policy changes takes place without analysis based on predictive analytics"

➥Jimmy Jung, Assistant VP for Enrollment Management

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Seminar feedback

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