IBM Software

Business Analytics Forum 2010

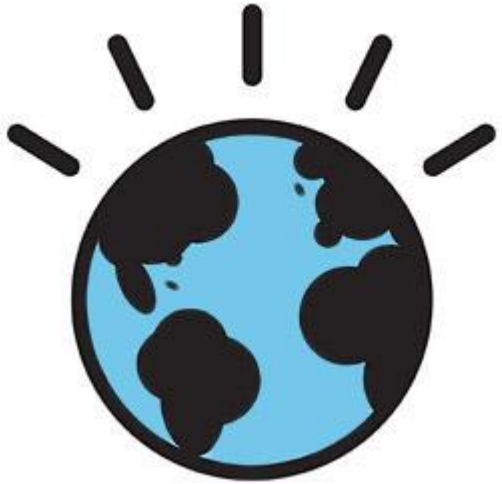
See The Future Of Decision Making

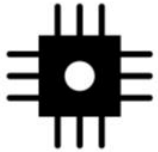
November 3-5, 2010
Gold Coast – QLD – Australia

The Power of Data Mining

Brad Hill
IBM Business Analytics

The world is changing, enabling organizations to make faster, better-informed decisions





Instrumented

Interconnected

Intelligent

With this change comes an explosion in information …

Volume of Digital Data

Variety of Information

Velocity of Decision Making

… Yet organizations are operating with blind spots

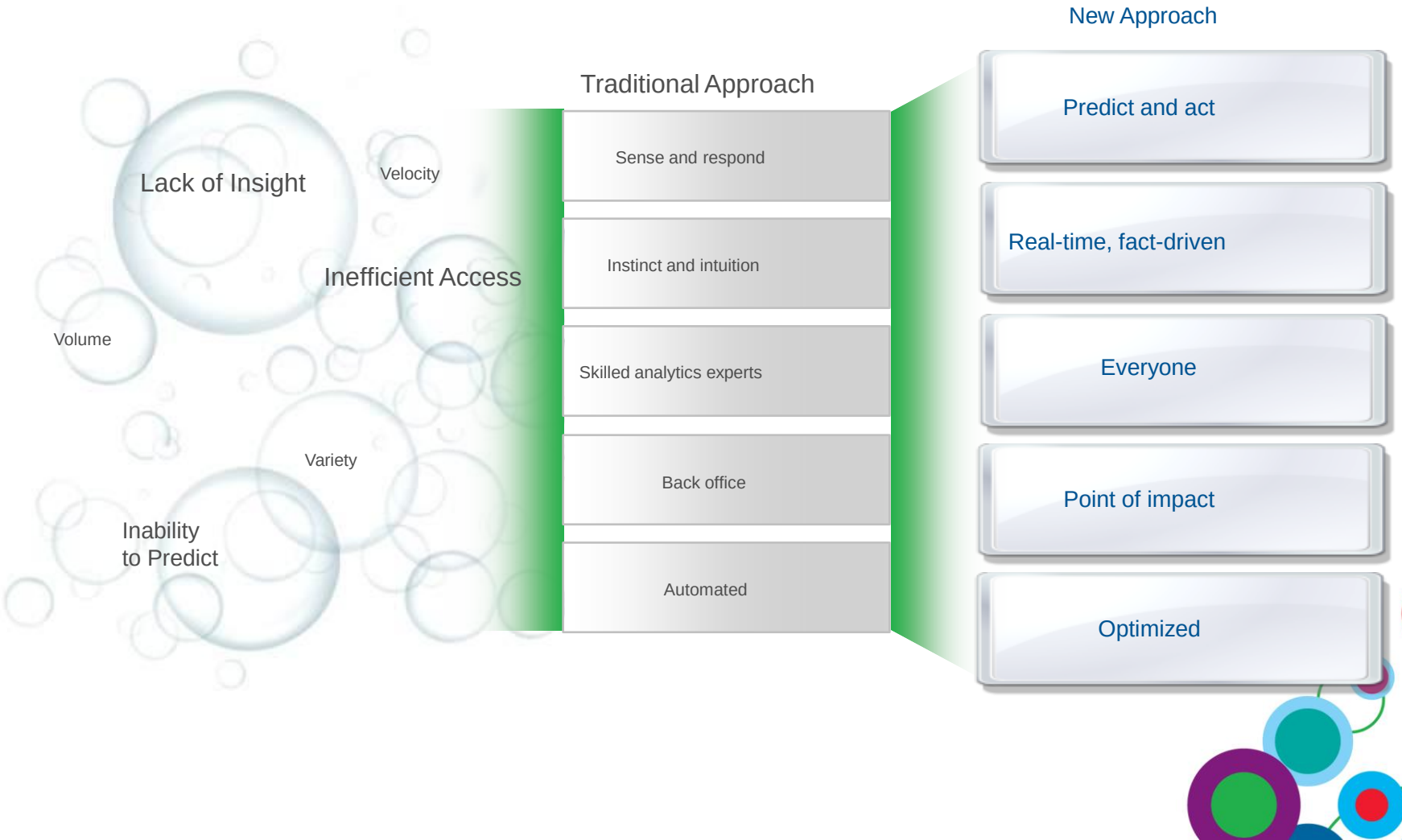
Lack of Insight
1 in 3 managers frequently make critical decisions without the information they need

Inefficient Access
1 in 2 don't have access to the information across their organization needed to do their jobs

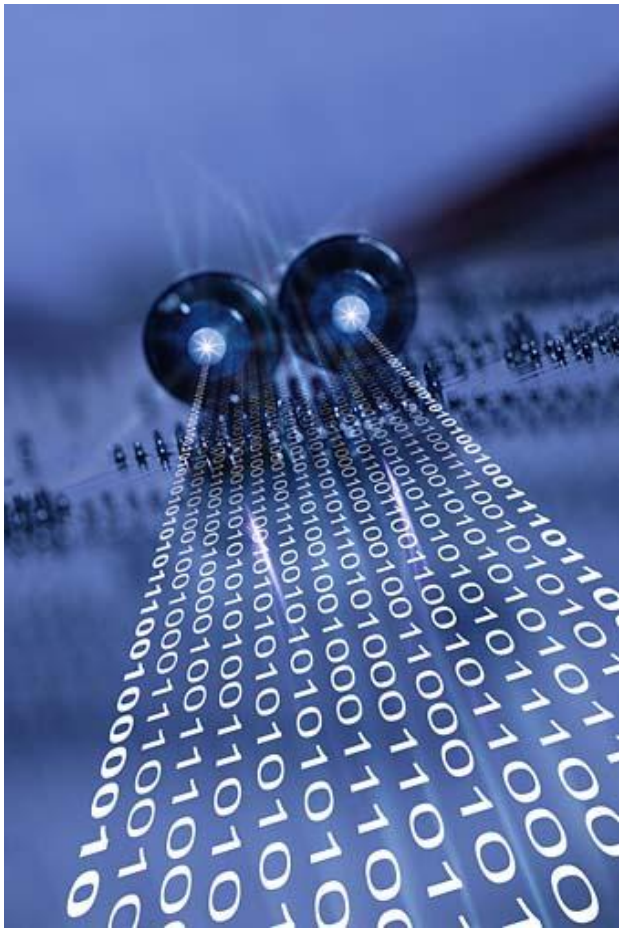
Inability to Predict
3 in 4 business leaders say more predictive information would drive better decisions

Source: IBM Institute for Business Value

Business challenges and conditions have placed a renewed urgency on business analytics and optimization



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

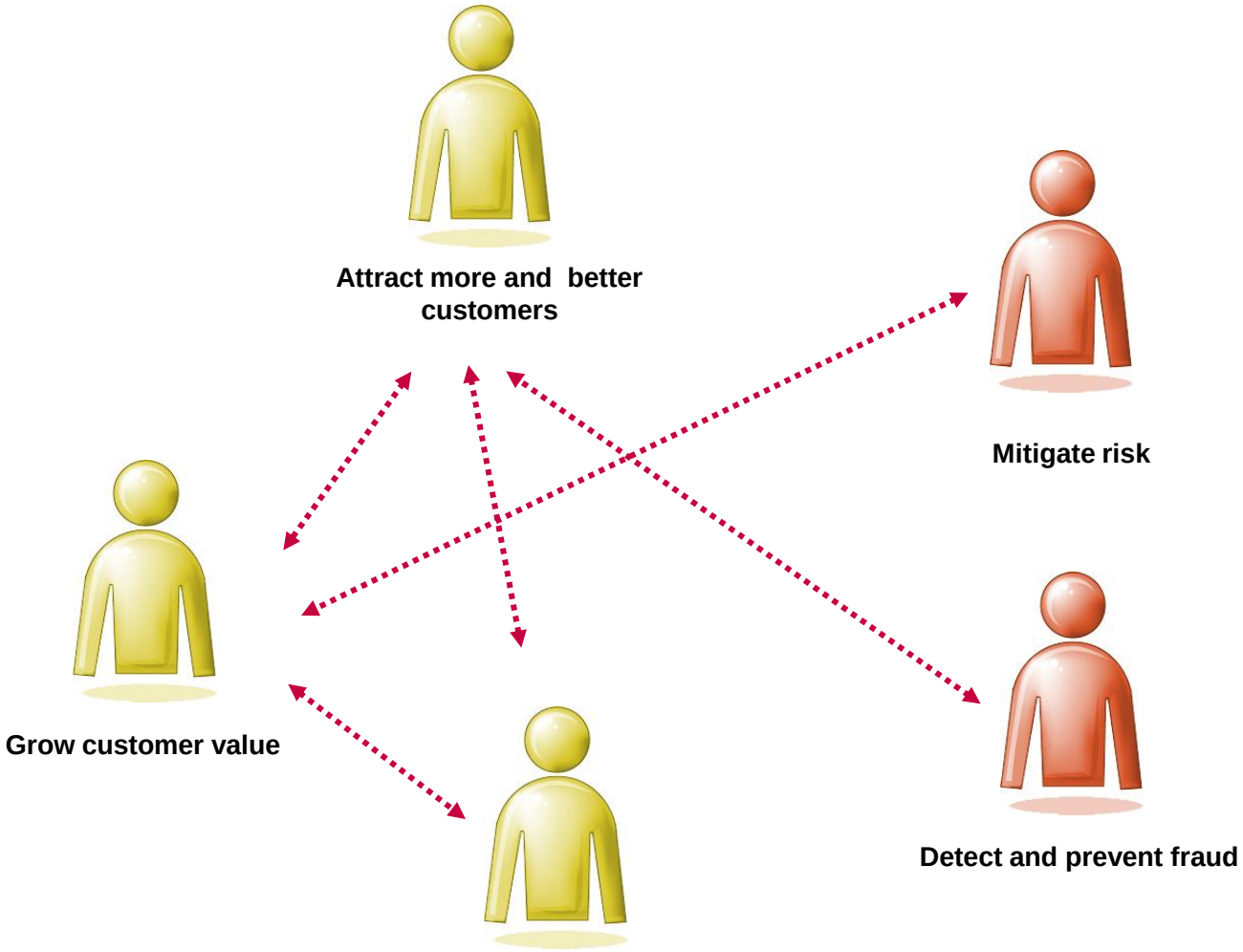
Predictive analytics in action

- 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
- Industrial process optimisation
- Fraud detection
  - Money laundering
  - Network intrusion
  - Tax audits & collection
- Crime analysis

and many more…

Business objectives



Data mining and text analytics

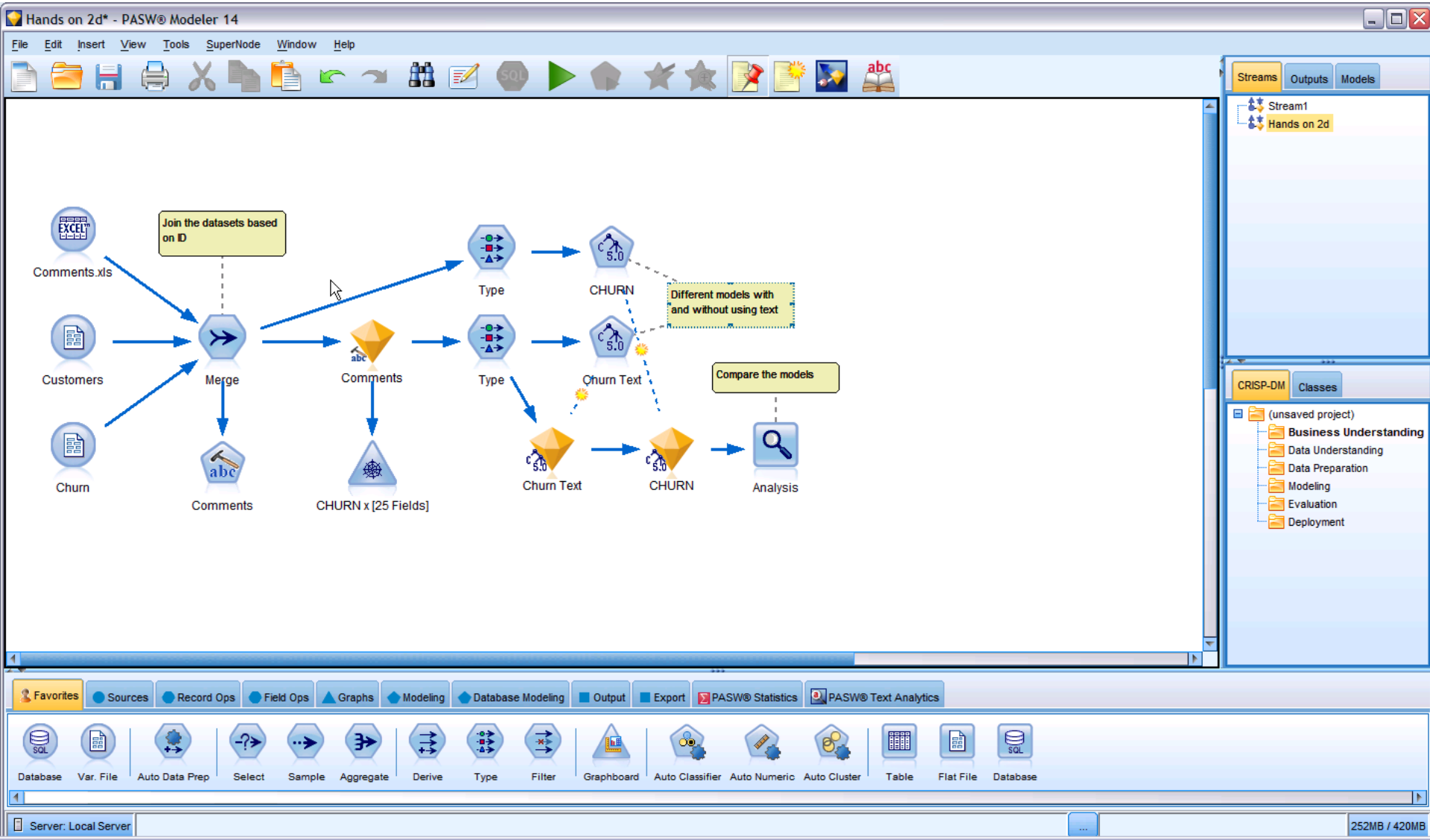
Data Mining

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

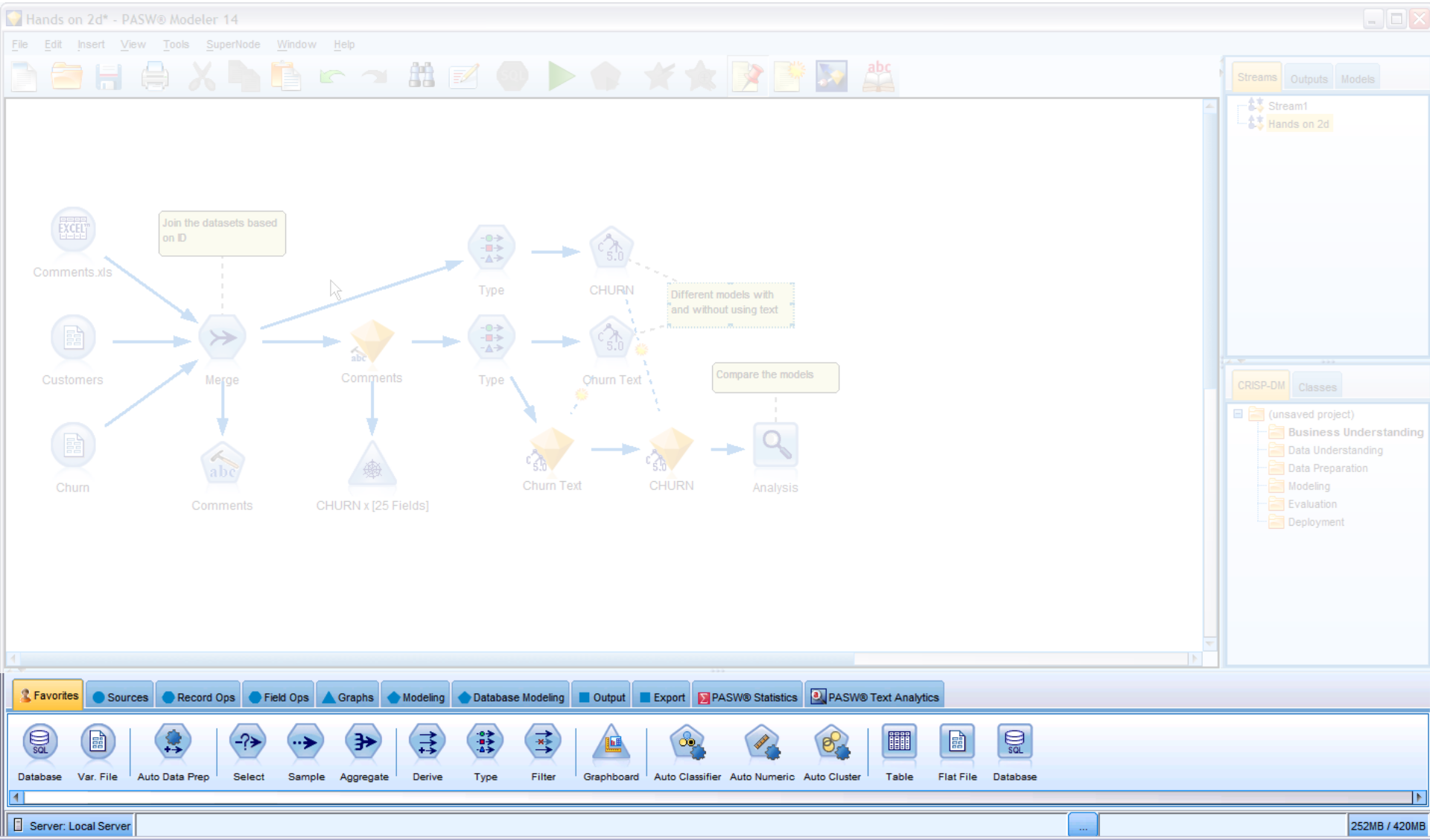
Text Analytics

- Extract, analyse and create structure for 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

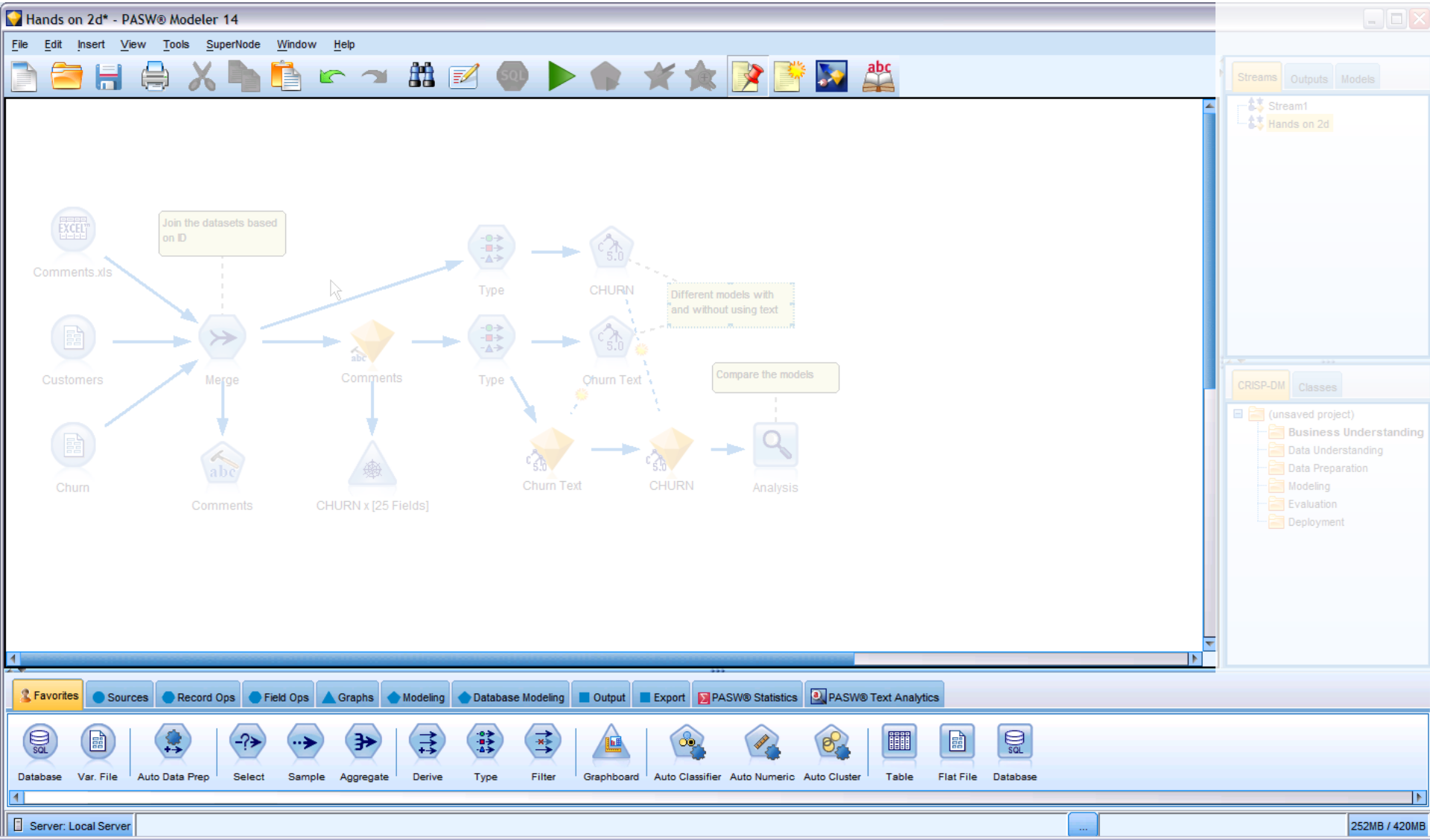
Complete workbench



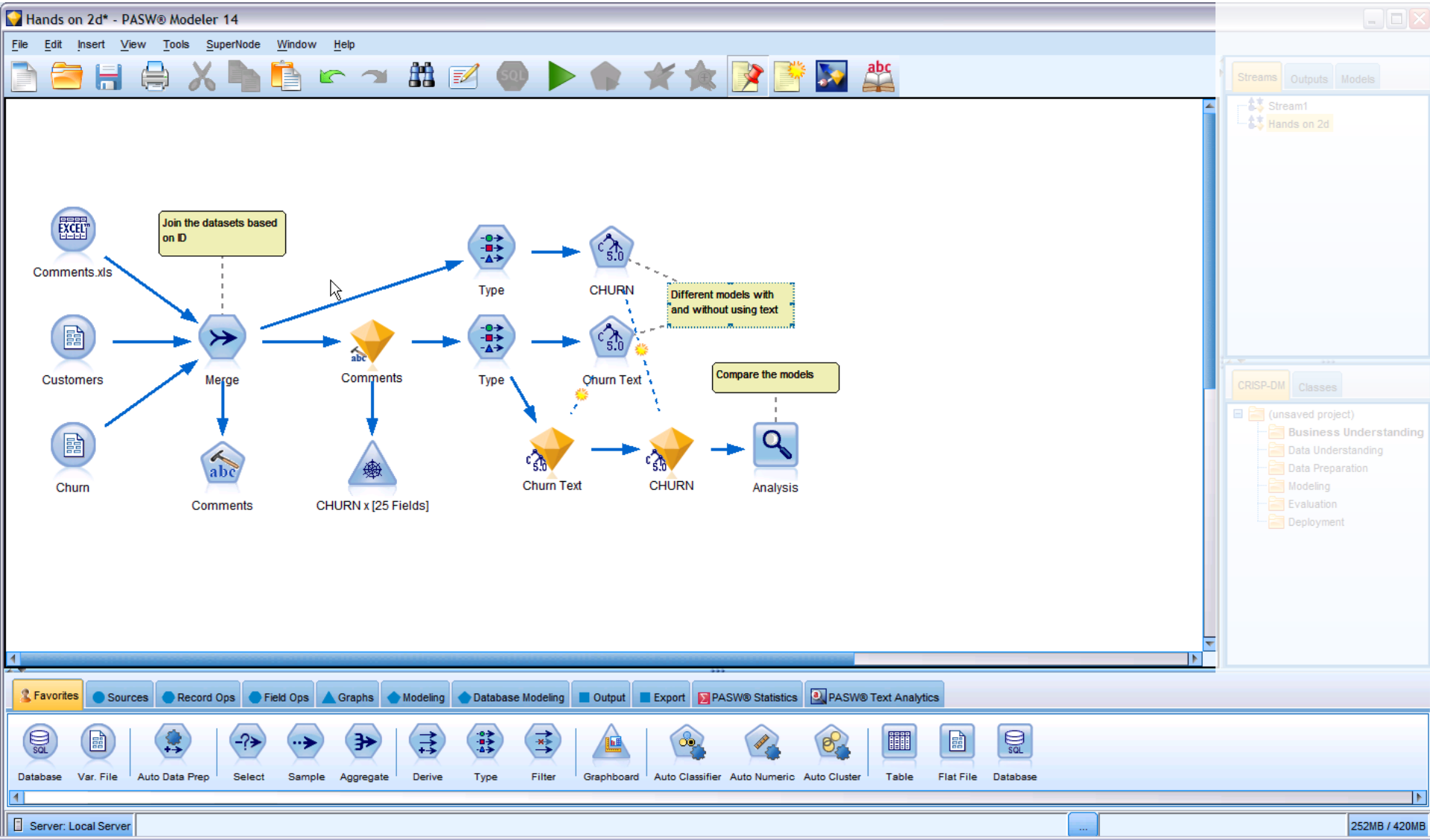
Complete workbench



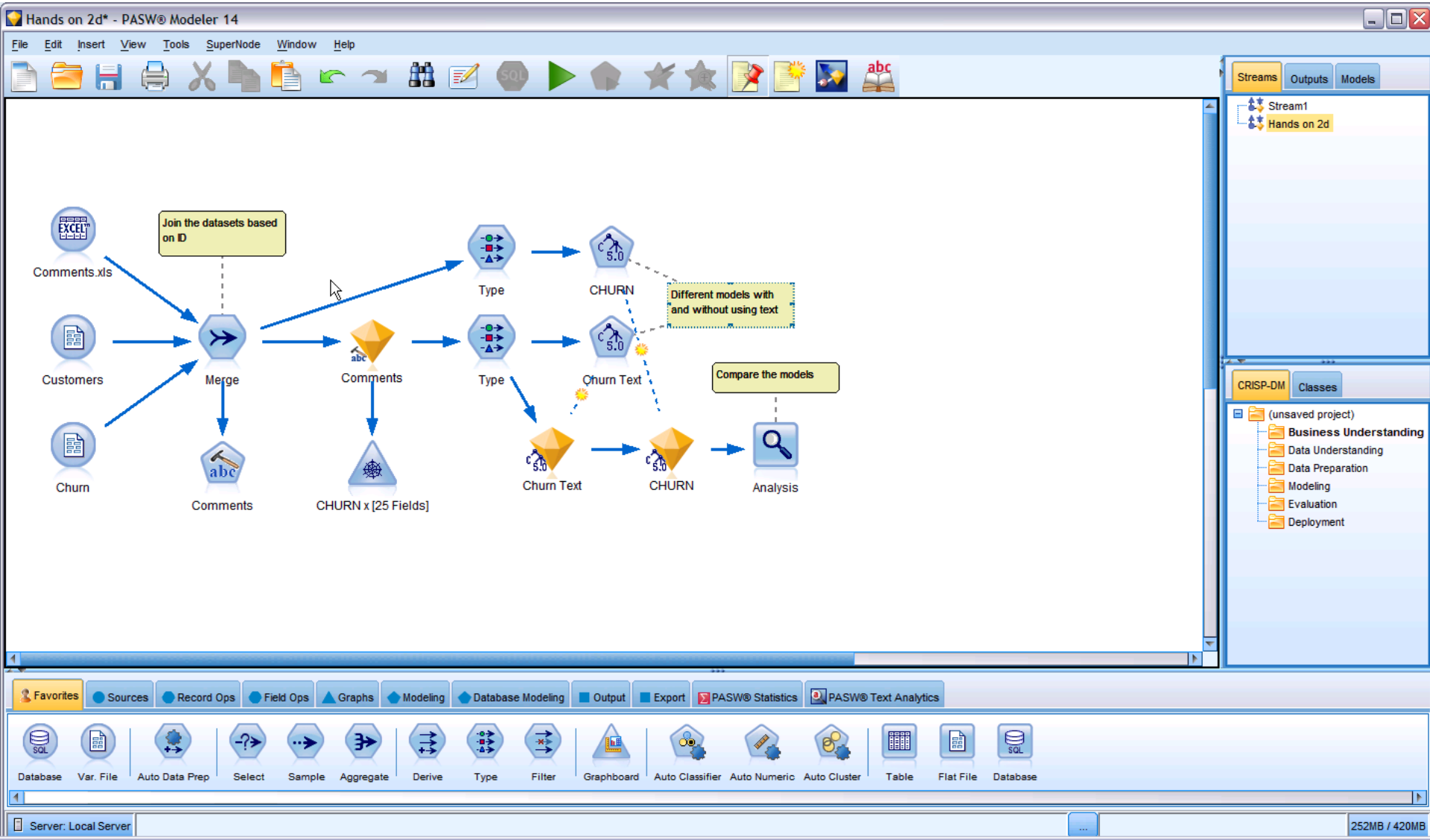
Complete workbench



Complete workbench

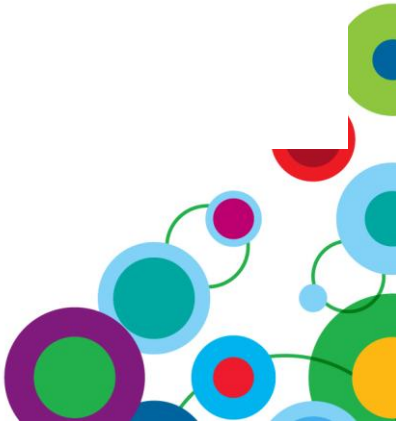


Complete workbench



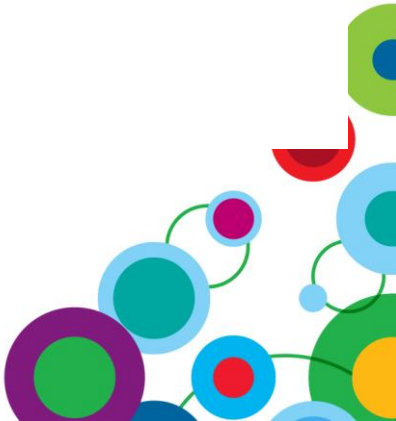
Data mining techniques

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?)



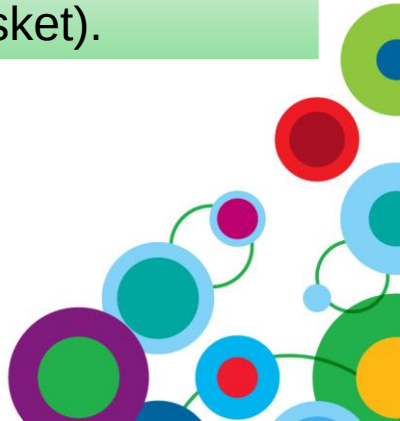
Data mining techniques

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?)
Segmentation	Auto Clustering, K-means, etc. Anomoly detection	Used to classify data points into groups that are internally homogenous and externally heterogeneous. Identify cases that are unusual



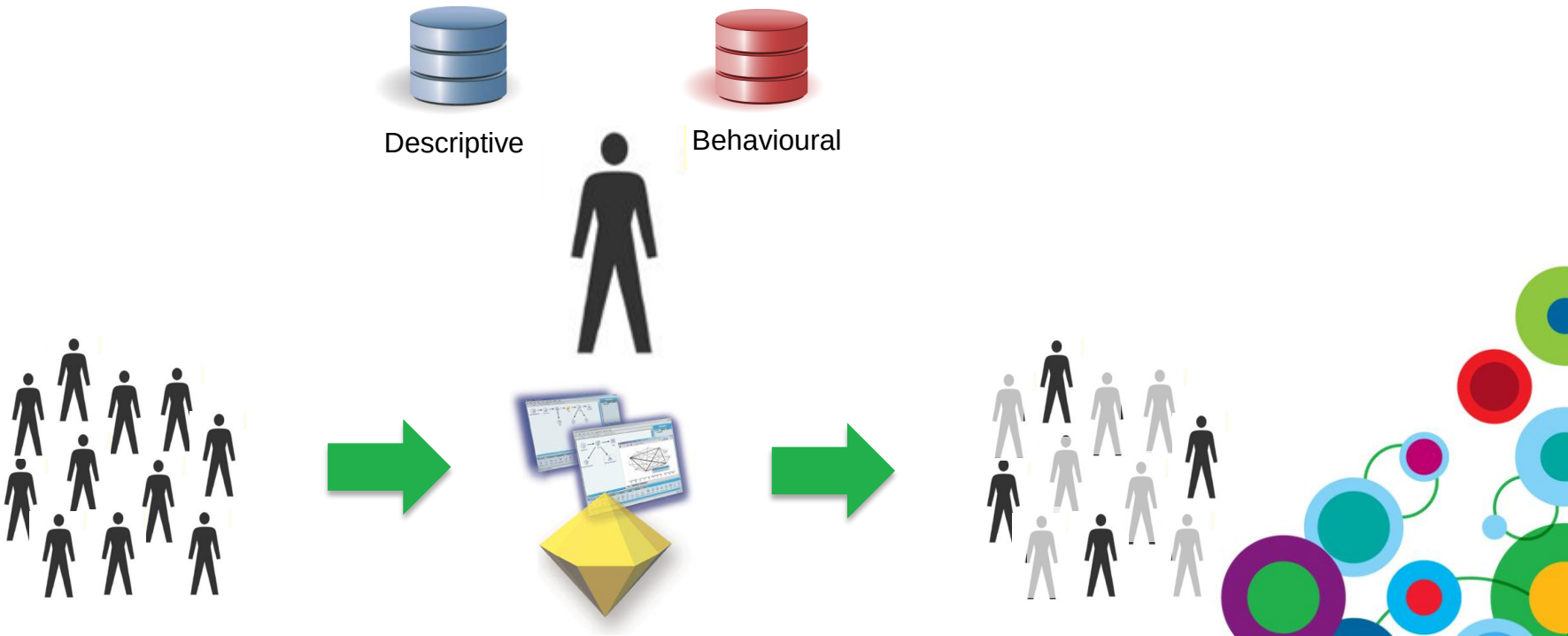
Data mining techniques

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?)
Segmentation	Auto Clustering, K-means, etc. Anomoly detection	Used to classify data points into groups that are internally homogenous and externally heterogeneous. Identify cases that are unusual
Association	APRIORI, Carma, Sequence	Used to find events that occur together or in a sequence (ie market basket).

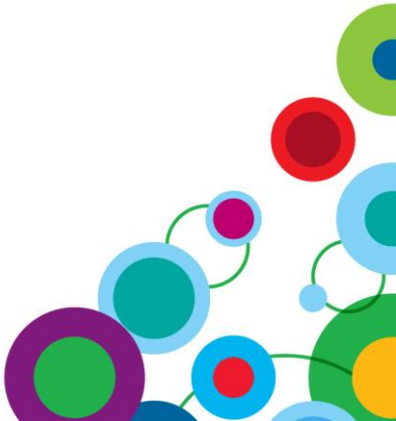


Scenario

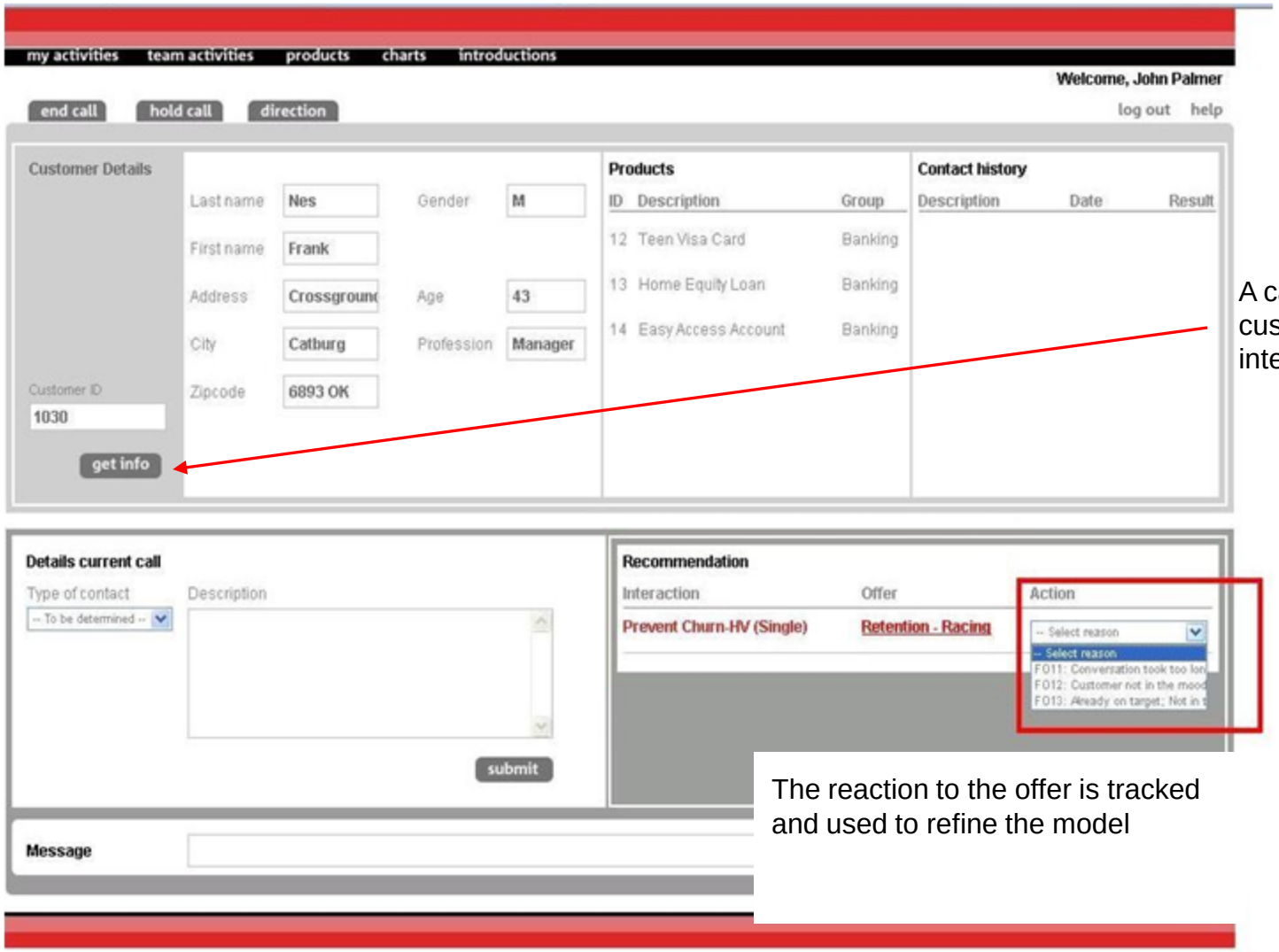
- Customer and product data
- Explore and understand data
- Build a model to identify customers likely to respond
- Generate a list for marketing



Demonstration



How predictive intelligence gets deployed



A call center agent submits customer information during an interaction

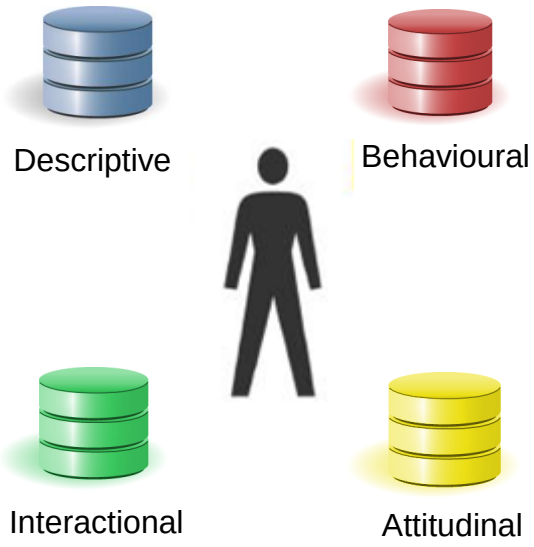
Based on the predictive model, a single offer is presented to the customer

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

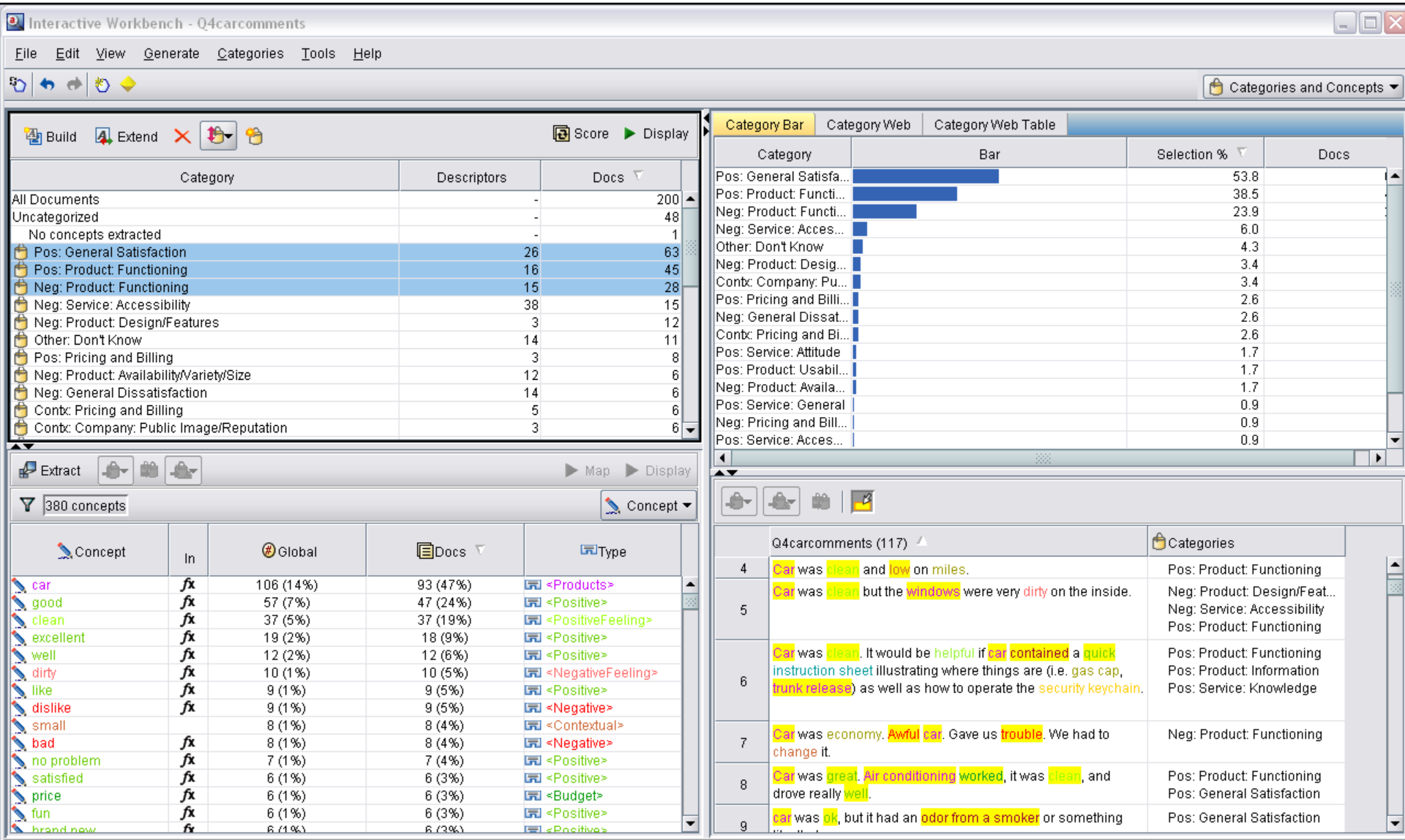
The importance of text

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**".

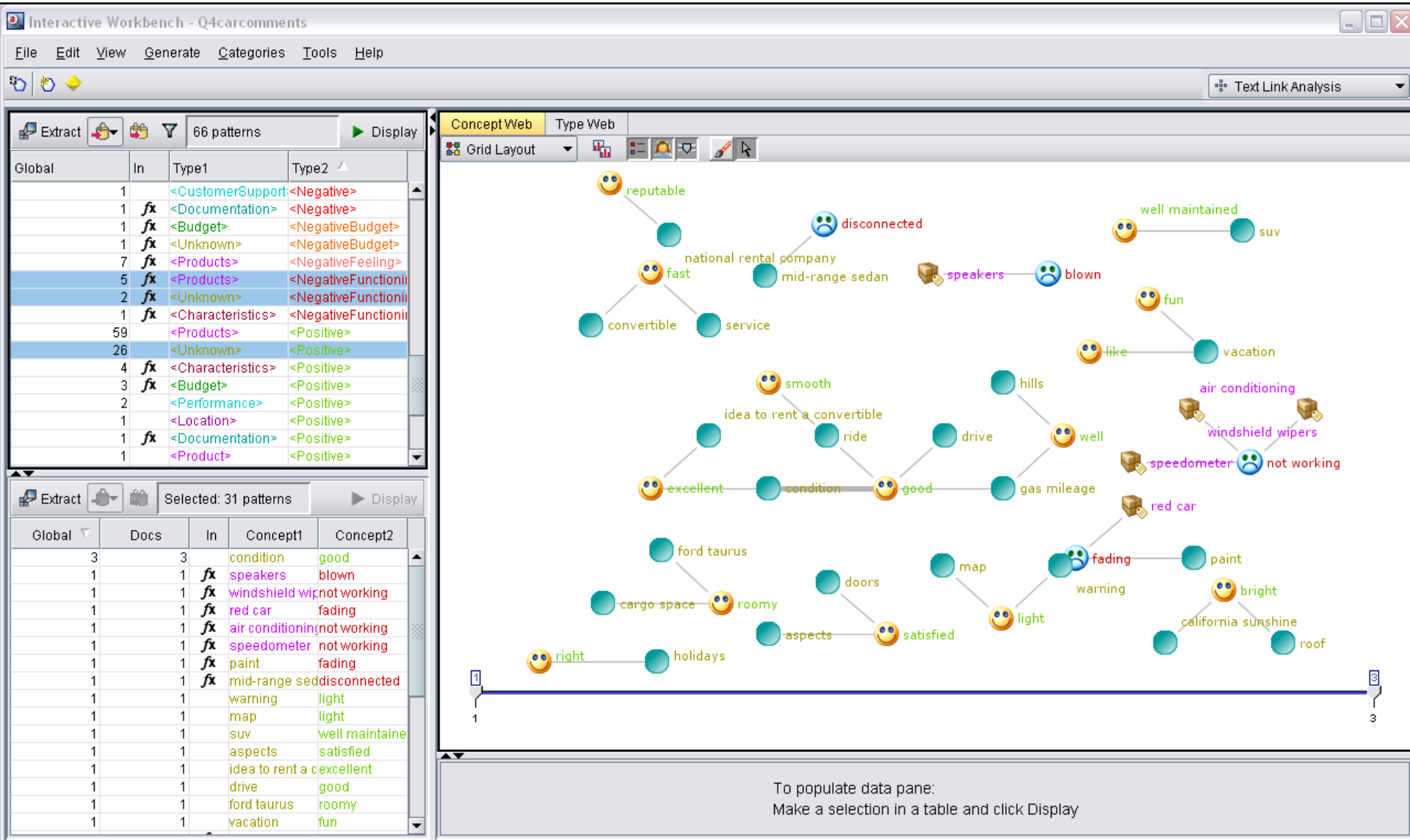
Source IDC: "Text Analytics: Software's Missing Piece?"


Descriptive
Behavioural
Interactional
Attitudinal

Text mining within IBM SPSS Modeler



Text mining within IBM SPSS Modeler



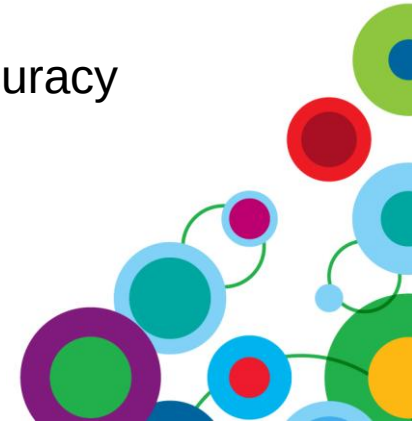
Data mining and text analytics

Data Mining

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

Text Analytics

- Extract, analyse and create structure for 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



IDC – Independent financial impact study

The median ROI for the projects that **incorporated predictive technologies was 145%**, compared with a median ROI of 89% for those projects that did not.

Source IDC: "Predictive Analytics and ROI: Lessons from IDC's Financial Impact Study"

Proven track record

- "**94% achieved a positive return on investment** with an average payback period of **10.7 months**."
- "Returns were achieved through reduced costs, increased productivity, increased employee and customer satisfaction, and greater visibility."
- "Flexibility, performance, and price were all key factors in purchase decisions."

Nucleas Research, *An independent provider of Global Research and Advisory Services.*

cablecom

"Reduced churn from 19 to 2%"

FBTO

"35% reduction in mailing cost, 2X response rate, 29% more profit"

BT

"100% increase in campaign effectiveness"

AEGON

"30 Million Euro in new revenue"

Maximises revenue from targeted email marketing

Challenge

- What are the factors that are driving 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

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

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

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**

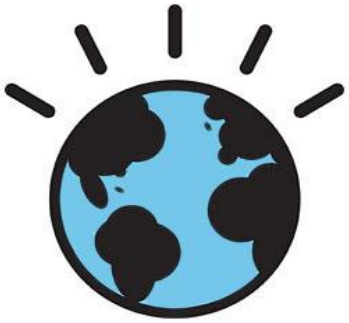
Results

- **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

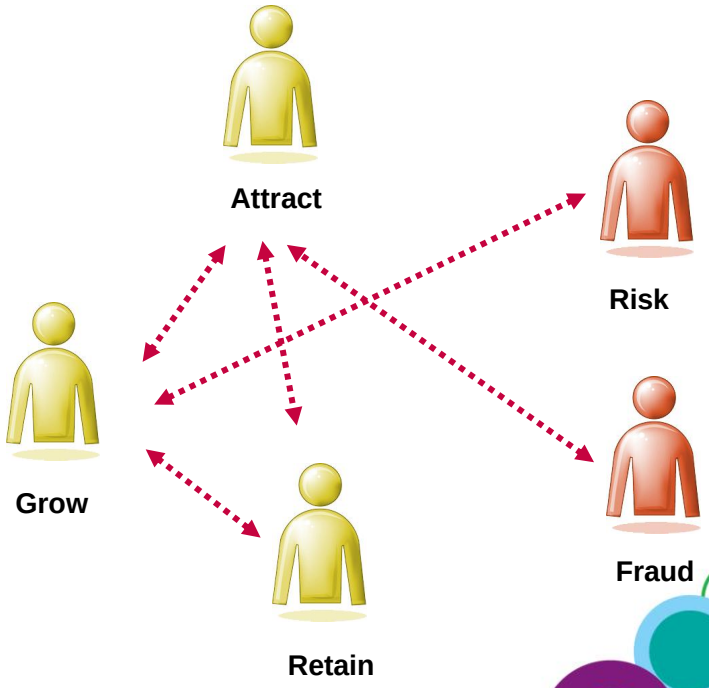
Drive data in decision making



Instrumented

Interconnected

Intelligent



WIN an Apple® iPad

Please remember to complete your session evaluation online at the Communication Station or point your Smart Phone browser to:

www.spss.com/goldcoast

For a chance to win an Apple® iPad