



An IBM® SPSS® Event


The Predictive Analytics Agenda



Data Mining & Text Analytics


Predicting outcomes with IBM SPSS Modeler

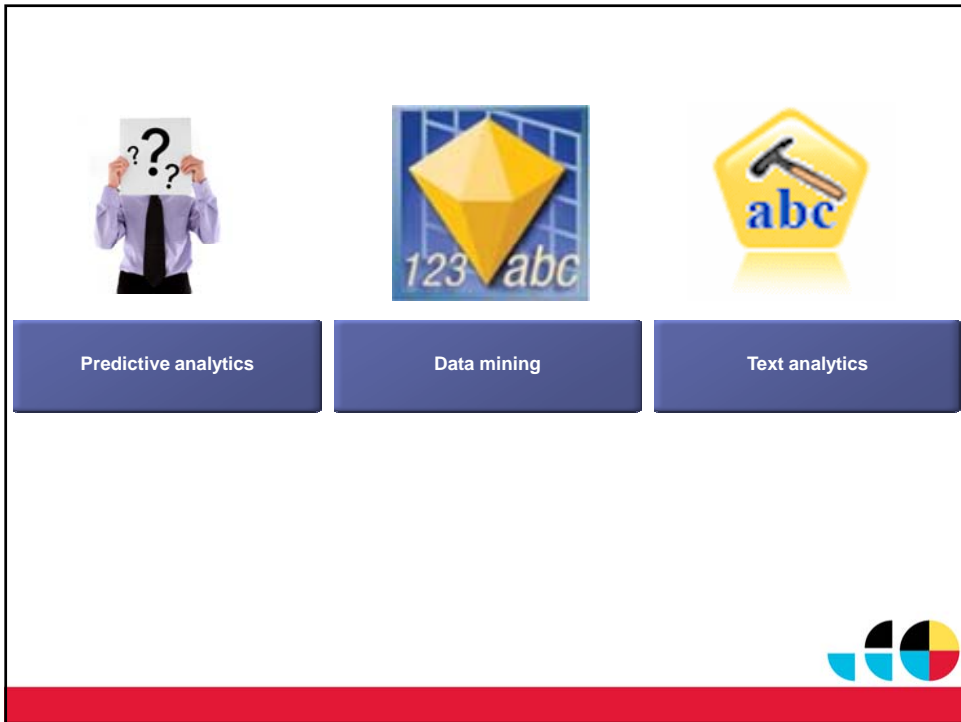
Brad Hill: Senior Technical Sales Consultant



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





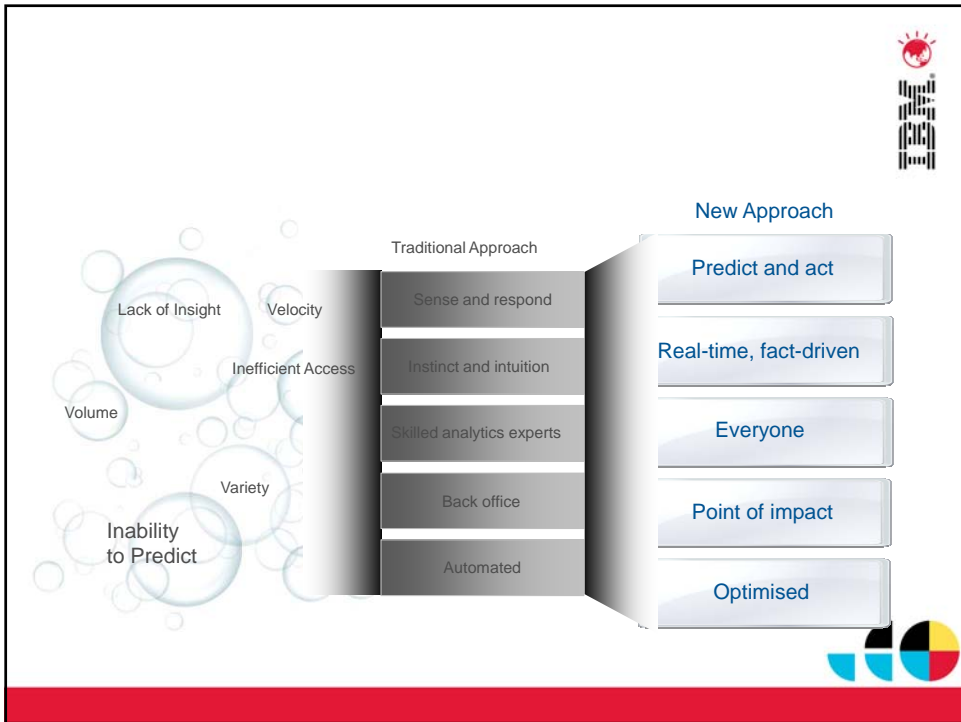
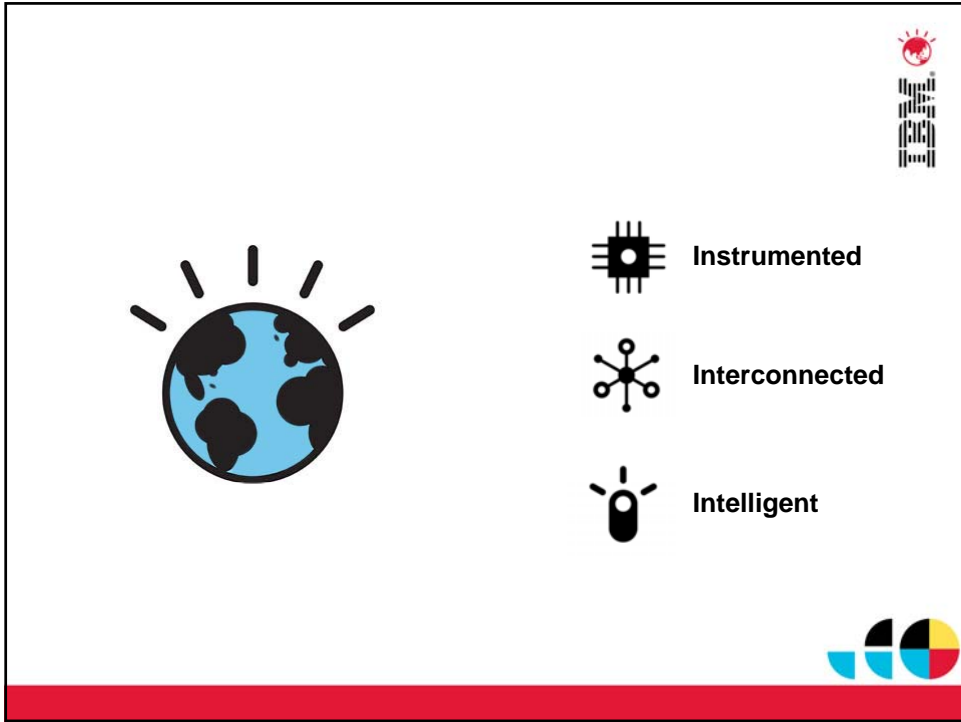


What is predictive analytics?

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

Gareth Herschel, Research Director, Gartner Group

The slide features a red bar at the bottom and a logo with four colored quadrants in the bottom right corner.

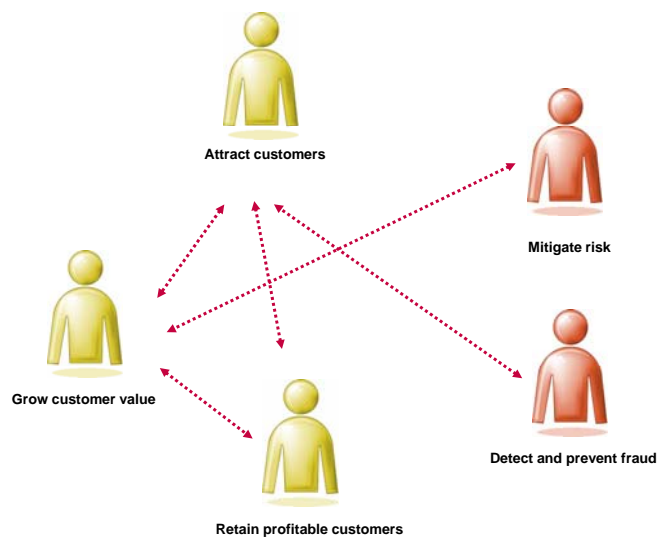


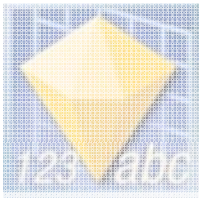
Predictive analytics in action



- 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

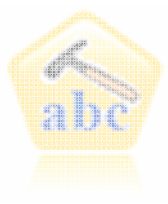


and many more...





Predictive analytics


- Faster, better-informed decisions
- Improve business processes
- Better understanding customers/constituents
- Predict and act



Predictive analytics

Data mining

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
- Apply models to new data
- Predict outcomes

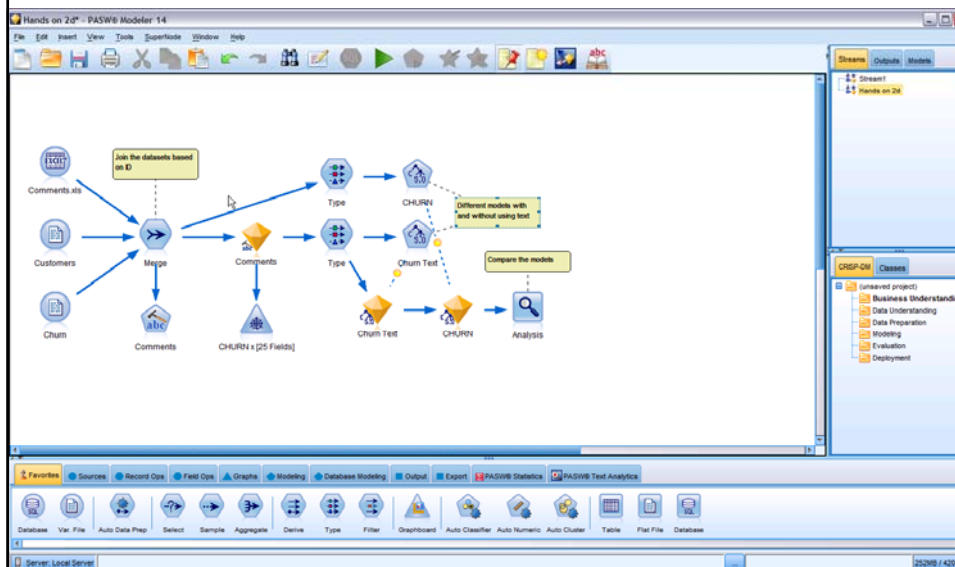


IBM SPSS Modeler

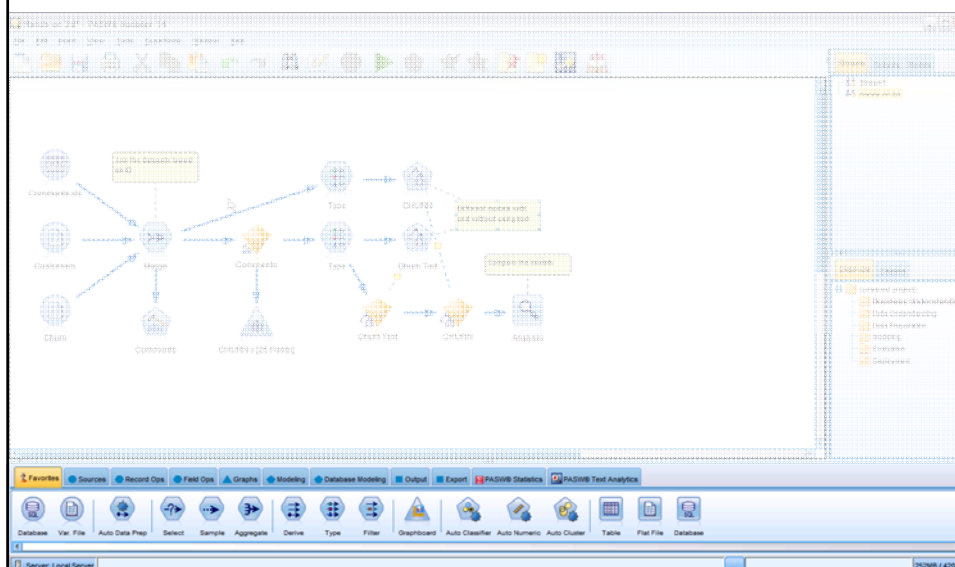
- High performance data mining and text analytics workbench
- Ability to create and operationalise predictive intelligence
- Used for the proactive and repeated...
 - Identification of revenue opportunities
 - Reduction of costs
 - Increase in productivity



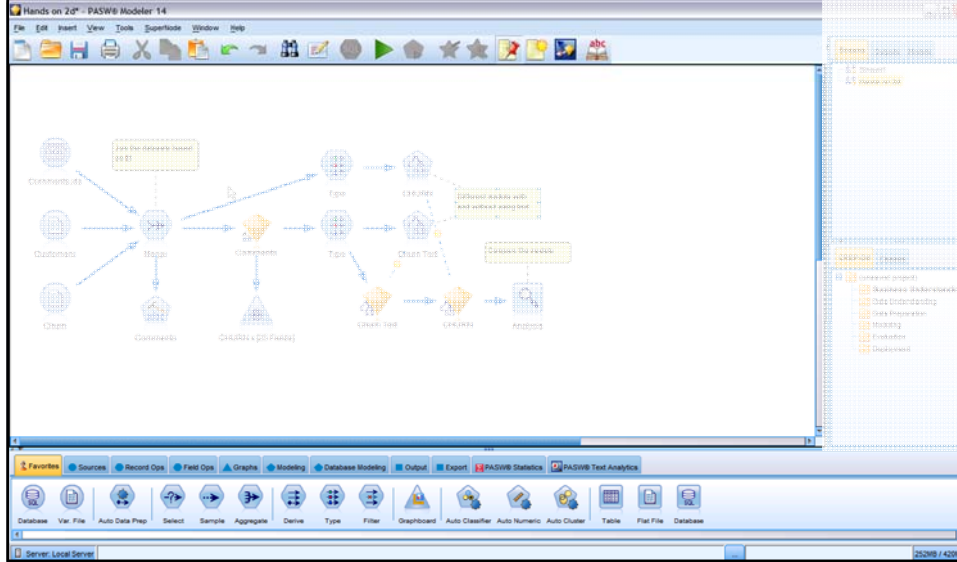
Complete workbench



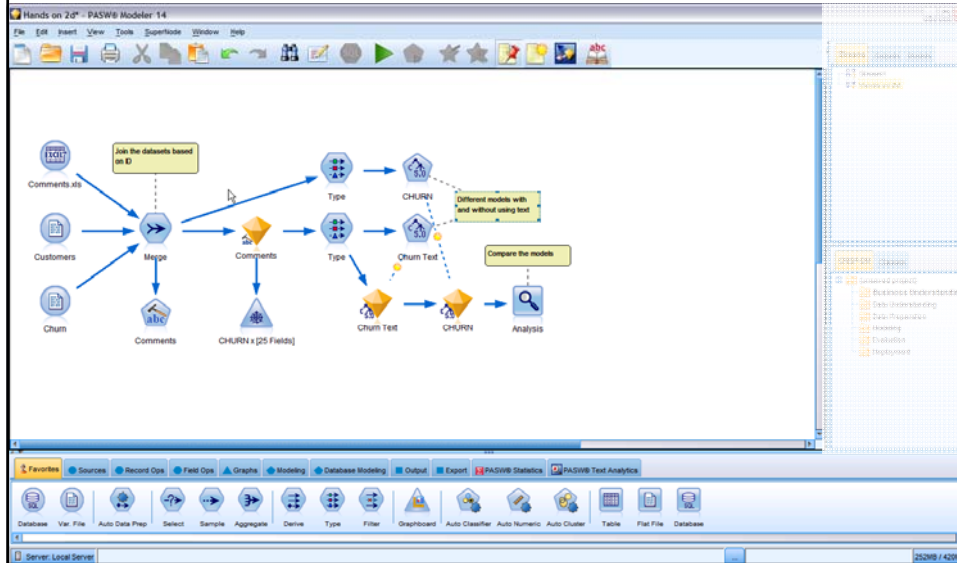
Complete workbench



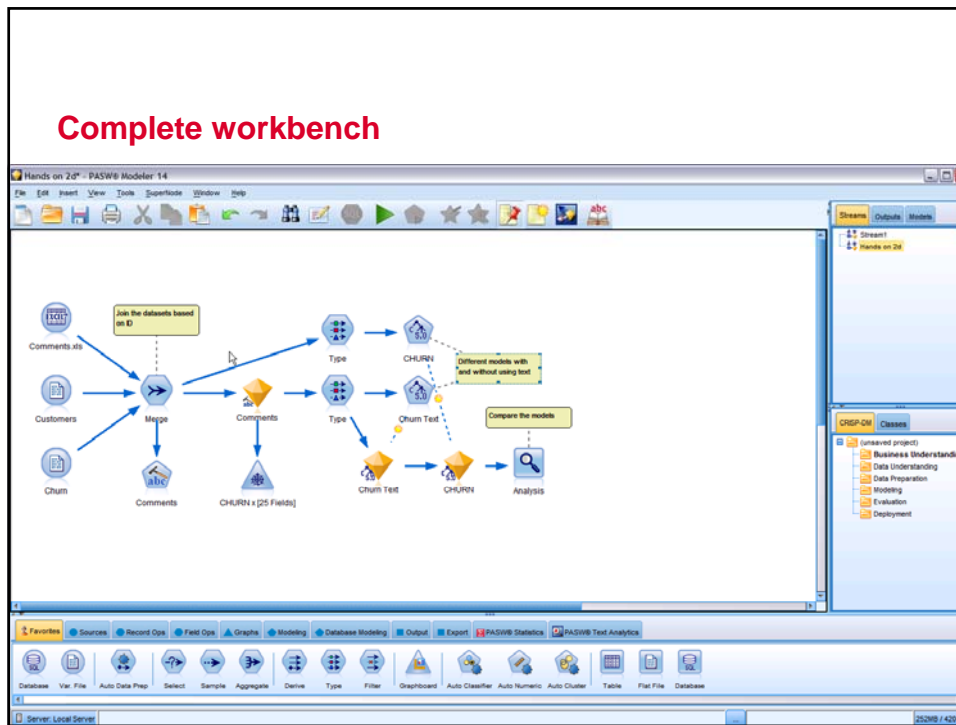
Complete workbench



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



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




Data mining techniques



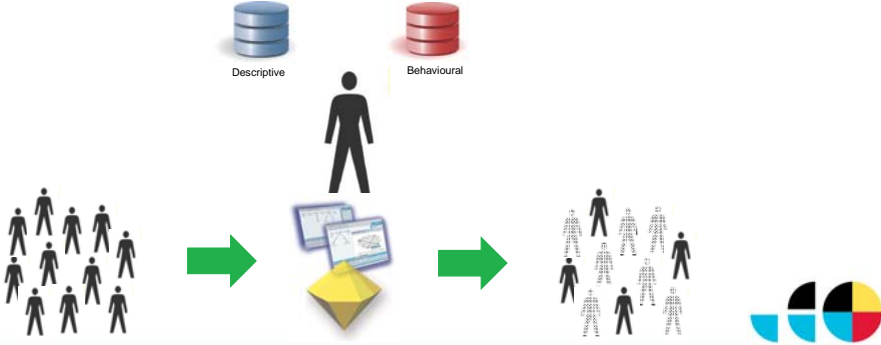
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Association	APRIORI, Carma, Sequence	Used to find events that occur together or in a sequence (ie market basket).





Scenario

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



The diagram illustrates a data-driven marketing process. It starts with a group of customer icons on the left. A green arrow points to a central figure representing an analyst, who is surrounded by icons for 'Descriptive' (blue database) and 'Behavioural' (red database) data. Another green arrow points to a second group of customer icons on the right, which are segmented into different categories, represented by a pie chart icon at the bottom right.



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Demonstration

The slide features a decorative graphic on the right side consisting of a grid of semi-circles in black, blue, yellow, and red, arranged in a pattern that tapers to the left.

How predictive intelligence gets deployed



The screenshot shows a call center agent's interface. At the top, there are navigation tabs: "my activities", "team activities", "products", "charts", and "introductions". A welcome message "Welcome, John Palmer" and "log out help" are visible. The main interface is divided into several sections:

- Customer Details:** A form with fields for Last name (Nes), Gender (M), First name (Frank), Address (Crossgrove), City (Catburg), Profession (Manager), and Zipcode (6883 OK). A "get info" button is at the bottom.
- Products:** A table with columns ID, Description, Group, and Description. It lists three items: ID 12 (Teen Visa Card, Banking), ID 13 (Home Equity Loan, Banking), and ID 14 (Easy Access Account, Banking).
- Contact history:** A table with columns Description, Date, and Result.
- Details current call:** A section with a "Type of contact" dropdown (set to "to be determined") and a "Description" text area. A "submit" button is at the bottom.
- Recommendation:** A table with columns Interaction and Offer. It shows "Prevent Churn-HV (Single)" with the offer "Referral - Racine". An "Action" dropdown menu is open, showing options: "Select record", "F011: Conversation took too long", "F012: Customer not in the mood", and "F013: Already on target. Not in a".

A red arrow points from the "get info" button to the text: "A call center agent submits customer information during an interaction".

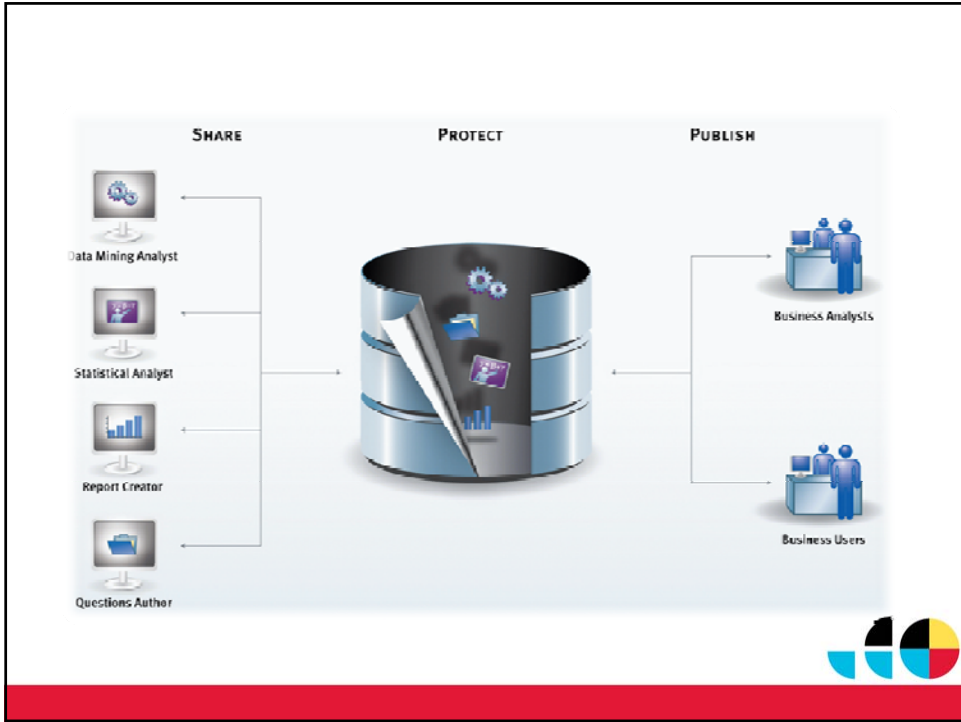
Another red arrow points from the "Action" dropdown menu to the text: "Based on the predictive model, a single offer is presented to the customer".

A third red arrow points from the "Action" dropdown menu to the text: "The reaction to the offer is tracked and used to refine the model".



A large grid of small icons representing customer interactions. Each icon consists of a yellow graduation cap with a blue tassel and a blue gear. The icons are arranged in a grid that forms a large, stylized shape resembling a call center or a service area. In the bottom right corner, there is a logo with a circle divided into four quadrants: blue, black, yellow, and red.

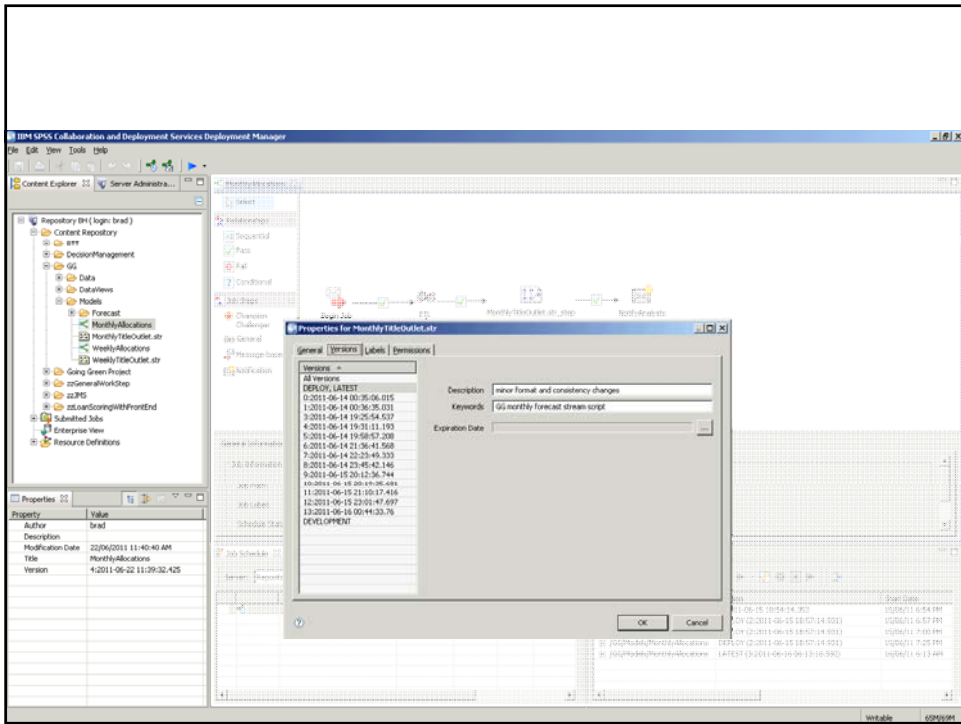
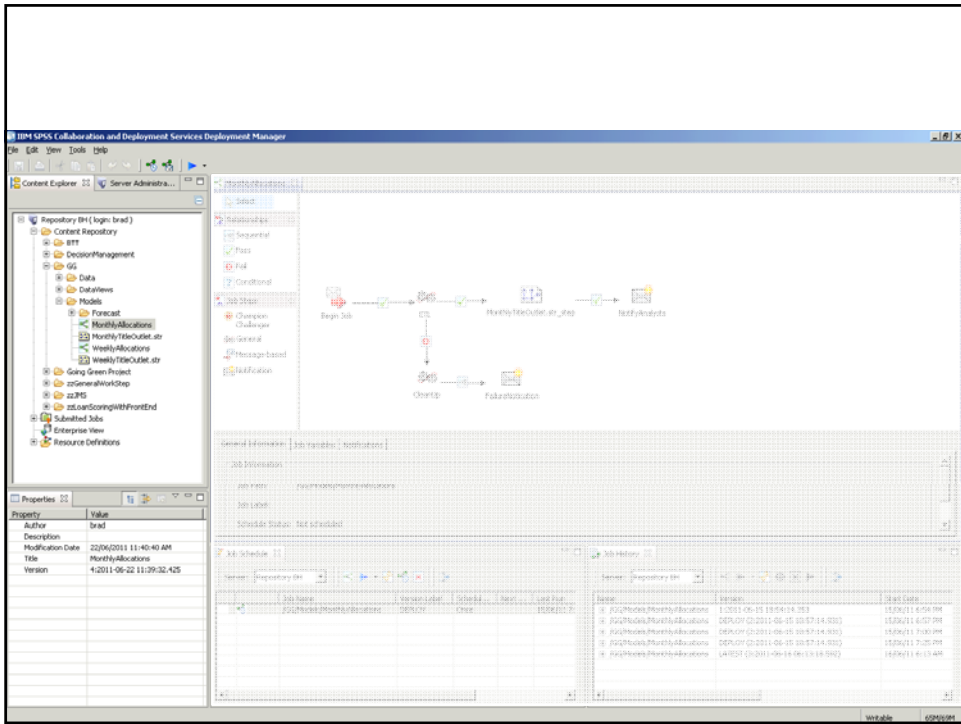




The screenshot shows the IBM SPSS Collaboration and Deployment Services Development Manager interface. The main window displays a workflow diagram with nodes for "Begin Job", "ClearUp", "FetchAllocations", and "TaskAnalysis". The left pane shows a "Content Explorer" with a tree view of a repository containing folders like "DataViews", "Models", and "Forecast". The bottom pane shows "Job Information" and "Job History" for a job named "MonthlyForecastJob".

Job ID	Job Name	Job Level	Job Status
1001100001	MonthlyForecastJob	Job Level	Not Activated

Server	Repository ID	Job Name	Job ID	Job Status	Job Start Time	Job End Time
Repository ID	1001100001	MonthlyForecastJob	1001100001	Not Activated		



IBM SPSS Collaboration and Deployment Services Deployment Manager

Content Explorer: MonthlyAllocations

Relationships: Sequential, Pass, Fail, Conditional

Job Steps: Champion, Challenger, General, Message-based, Notification

Job Flow: Begin Job → ETL → MonthlyTitleOutlet_str_step → NotifyAnalysts
 ETL → Cleanup → FailureNotification

Properties:

Property	Value
Author	brad
Description	
Modification Date	22/06/2011 11:40:40 AM
Title	MonthlyAllocations
Version	4:2011-06-22 11:39:32.425

Job Info: /r/n/room/monthlyallocations
 Job Label:
 Schedule Status: Not scheduled

Job Schedule:

Job Name	Version Label	Schedule	Start	Last Run
/r/n/room/monthlyallocations	4:2011-06-22 11:39:32.425	None		

Job History:

Step	Start	End
Begin Job	15/06/11 6:54 AM	15/06/11 6:54 AM
ETL	15/06/11 6:57 AM	15/06/11 7:00 AM
MonthlyTitleOutlet_str_step	15/06/11 7:00 AM	15/06/11 7:05 AM
NotifyAnalysts	15/06/11 7:05 AM	15/06/11 8:13 AM

IBM SPSS Collaboration and Deployment Services Deployment Manager

Content Explorer: Repository BR (login: brad)

- Content Repository
- Decision Management
- Data
- Data Views
- Models
 - Forecast
 - MonthlyAllocations
 - MonthlyTitleOutlet_str
 - WeeklyTitleOutlet_str
- Going Green Project
- GeneralWorkShop
- zspis
- zslvarScoringWithFrontend
- Submitted Jobs
- Enterprise View
- Resource Definitions

Relationships: Sequential, Pass, Fail, Conditional

Job Steps: Champion, Challenger, General, Message-based, Notification

Job Flow: Begin Job → ETL → MonthlyTitleOutlet_str_step → NotifyAnalysts
 ETL → Cleanup → FailureNotification

Properties:

Property	Value
Author	brad
Description	
Modification Date	22/06/2011 11:40:40 AM
Title	MonthlyAllocations
Version	4:2011-06-22 11:39:32.425

General Information | Job Variables | Notifications

Job Information:

Job Name: /r/n/room/monthlyallocations
 Job Label:
 Schedule Status: Not scheduled

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Job Name	Version Label	Schedule	Start	Last Run
/r/n/room/monthlyallocations	4:2011-06-22 11:39:32.425	None		

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NotifyAnalysts	15/06/11 7:05 AM	15/06/11 8:13 AM

The screenshot displays the IBM SPSS Collaboration and Deployment Services Deployment Manager interface. The main window shows a workflow diagram for a job named 'MonthlyAllocations'. The workflow starts with a 'Begin Job' step, followed by an 'ETL' step, then a 'MonthlyFileOutlet_str_step', and finally a 'NotifyAnalysts' step. There are also 'Cleanup' and 'FutureAllocation' steps. The interface includes a 'Content Explorer' on the left showing a tree view of the repository, a 'Properties' window at the bottom left, and a 'Job Schedule' and 'Job History' window at the bottom right. The 'Job History' table shows several runs of the job.

Name	Version	Start Date
Jobs/Models/MonthlyAllocations	1	2011-06-15 10:04:14.363
Jobs/Models/MonthlyAllocations	DEPLOY (2)	2011-06-15 10:57:14.901
Jobs/Models/MonthlyAllocations	DEPLOY (2)	2011-06-15 10:57:14.901
Jobs/Models/MonthlyAllocations	DEPLOY (2)	2011-06-15 10:57:14.901
Jobs/Models/MonthlyAllocations	LATEST (3)	2011-06-15 06:13:15.592


The diagram illustrates the integration of three data analysis techniques: Predictive analytics, Data mining, and Text analytics. Each technique is represented by an icon: a person with question marks for Predictive analytics, a yellow pyramid for Data mining, and a yellow hexagon with a hammer and 'abc' for Text analytics. Below the icons are three boxes, each containing a list of benefits for the corresponding technique.

Predictive analytics

- 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

Data mining

Text analytics



Predictive analytics Data mining Text analytics

The importance of text

BY FAILURE OF PERFORMANCE, ERROR, OMISSION, INTERRUPTION, DELETION, EFFECT, DELAY IN OPERATION OR TRANSMISSION, COMPUTER VIRUS, COMMUNICATION LINE FAILURE, THEFT OR DESTRUCTION OR UNAUTHORIZED ACCESS TO, ALTERATION OF, OR USE OF, THE SITE OR THE SERVICE, WHETHER ARISING FROM BREACH OF WARRANTY, BREACH OF CONTRACT, TORTIOUS BEHAVIOR, NEGLIGENCE, OR UNDER ANY OTHER CAUSE OF ACTION, YOU SPECIFICALLY AGREE THAT Mr. Thing IS NOT LIABLE FOR THE DEFAMATORY, OFFENSIVE OR ILLEGIBLE CONDUCT OF OTHER USERS OR THIRD PARTIES AND THAT THE RISK OF DAMAGE FROM THE FOREGOING RESTS ENTIRELY WITH YOU. 8. INDEMNITY 8.1 You and we indemnify, keep indemnified and forever hold harmless, Mr. Thing, its partners, agents, affiliates and content partners from any costs (including legal costs), costs, damages, claims or disputes, which arise out of or incidental to the User Content, your use of the Site or the Service or a breach of these Terms of Use. 9. DISCLAIMER FOR THIRD PARTIES 9.1 The Site may contain links to websites of our advertisers or other third parties ("Third Parties"). Third Parties may also use their products or make offers to you via email sent to your account. Mr. Thing has no control over and shall not be responsible for the accuracy, quality, safety or legality of the goods or services available on the websites of Third Parties. (b) The truth, accuracy or availability of the content on the websites of Third Parties or Mr. Thing shall not be guaranteed. 10. TERMINATION 10.1 Mr. Thing may terminate a user's access to the Site without notice to the user if the user does not log in for 90 days. 10.2 Mr. Thing may designate any user who is not logged in for 90 days as inactive. You may be able to reactivate an inactive account, but it may not be recoverable. 10.3 Mr. Thing may terminate a user's access to the Site if the user's account contains information, software, photos, videos, audio files, or other materials ("User Content"). The User Content is the property of the user and is owned by Mr. Thing. Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.4 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.5 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.6 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.7 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.8 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.9 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.10 Mr. Thing shall not be responsible for any loss or damage to the User Content caused by the user or any third party. 10.11 Mr. Thing shall not be 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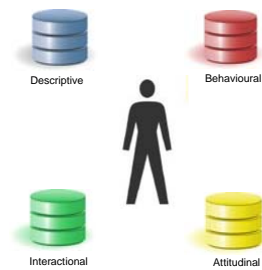
Because people communicate with **words**, not numbers, it has become critical to be able to **mine text** for its **meaning** and to sort, analyse, and understand it in the same way that data has been tamed. In fact, the two basic types of information complement each other, with data supplying the **"what"** and text supplying the **"why"**.

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

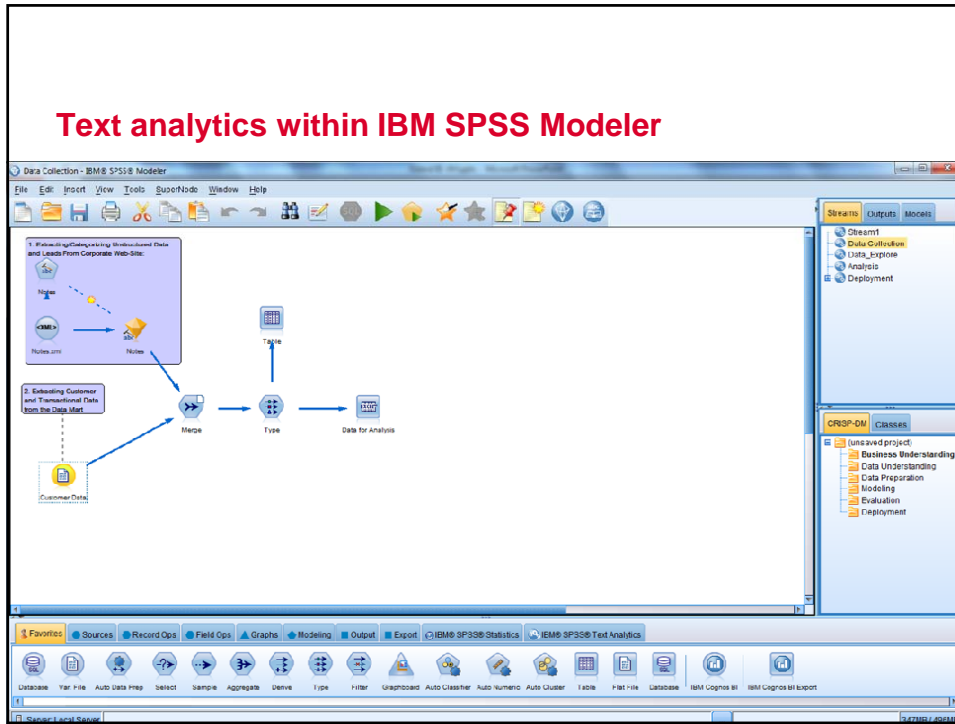


Text analytics

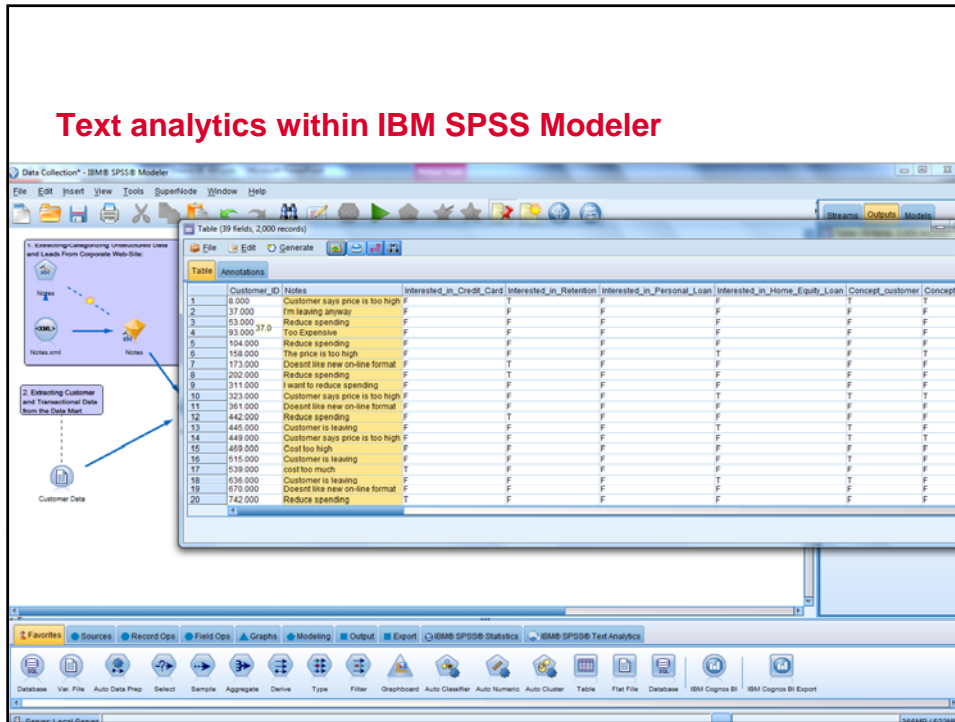
- Extract, analyse and create structure from unstructured data
- Integrate analysis results with structured data and use as input for data mining
- Improve model accuracy.

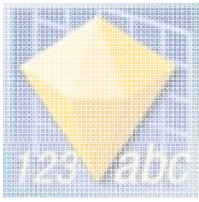



Text analytics within IBM SPSS Modeler

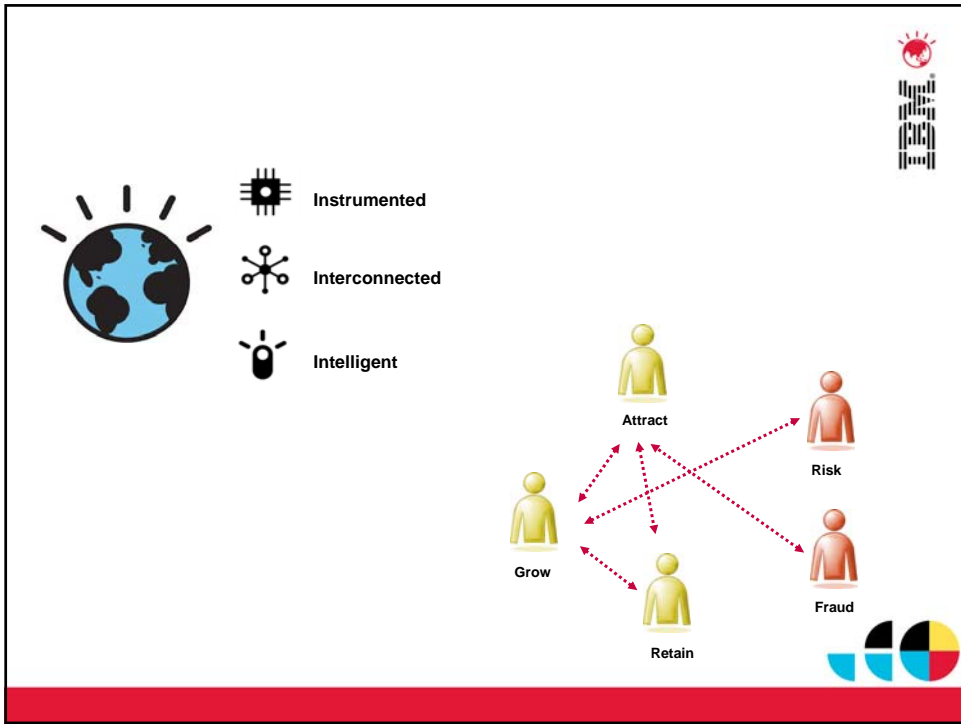


Text analytics within IBM SPSS Modeler




		
Predictive analytics	Data mining	Text analytics
		<ul style="list-style-type: none">■ 360° view of customer■ Improve model accuracy■ Achieve better insight■ Do something with qualitative data

		
Predictive analytics	Data Mining	Text analytics
<ul style="list-style-type: none">■ Faster, better-informed decisions■ Improve business processes■ Better understanding customers/constituents■ Predict and act	<ul style="list-style-type: none">■ Access a variety of data■ Easy to use graphical interface■ Automation data preparation and modelling■ Add value to BI■ Create predictive intelligence which can be operationalised	<ul style="list-style-type: none">■ 360° view of customer■ Improve model accuracy■ Achieve better insight■ Do something with qualitative data



- 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



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

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



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



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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