
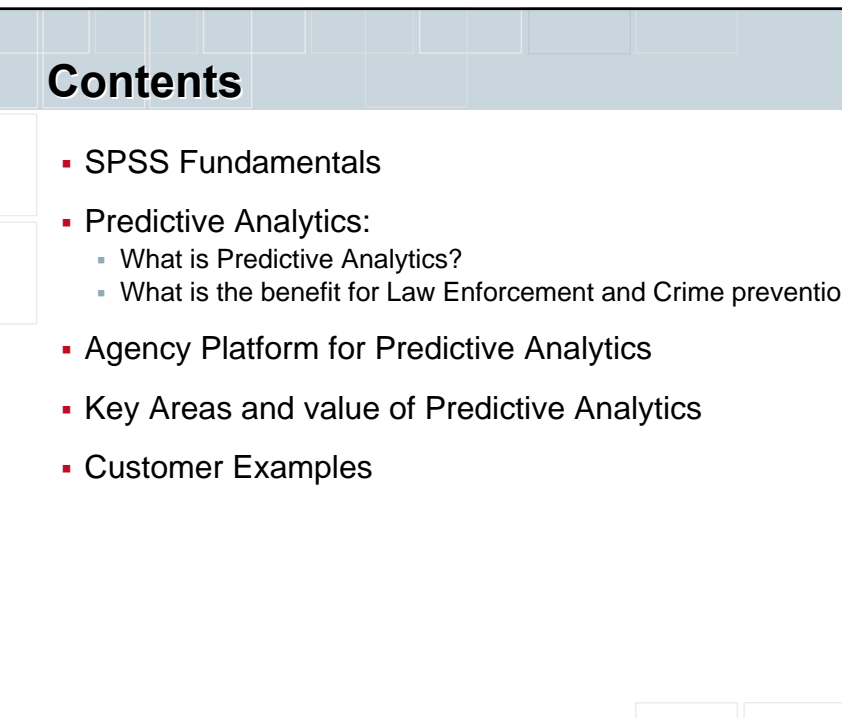


> Law Enforcement and Criminality Prevention with Predictive Analytics

10th European Police Congress,
February 12th 2007

Ralf Notz
Sales Manager Public Sector Germany



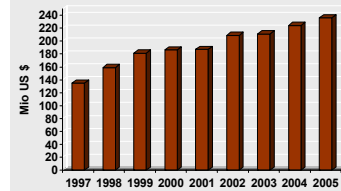
Contents

- SPSS Fundamentals
- Predictive Analytics:
 - What is Predictive Analytics?
 - What is the benefit for Law Enforcement and Crime prevention?
- Agency Platform for Predictive Analytics
- Key Areas and value of Predictive Analytics
- Customer Examples

SPSS – Fundamentals

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- **Founded 1968**
- **Market Leader in Predictive Analytics**
- **Proven track record with impressive customer base**
 - Customs and taxation offices on five continents
 - **Intelligence and public safety agencies on five continents**
 - Every US cabinet-level department & Defense military branch
 - Over 1600 public agencies in the UK, and all 50 US state governments
 - Hundreds of provincial, state, county, city and borough government entities; dozens of federal or national agencies and ministries around the world
 - **Bundeskriminalamt, 7 LKA's, scores of State Polices in Germany**
- **> 250.000 customer with about 3 Mio. User**
- **236 Mio.\$ revenue in 2005**
- **> 1.200 employees**



38 years experience in Statistics, Analytics, Market Research and Data Mining

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> **What is Predictive Analytics?**

What is the benefit for you?

A Contemporary View: Predictive Analysis

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Gartner Group:

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

The Evolution of Crime Fighting...

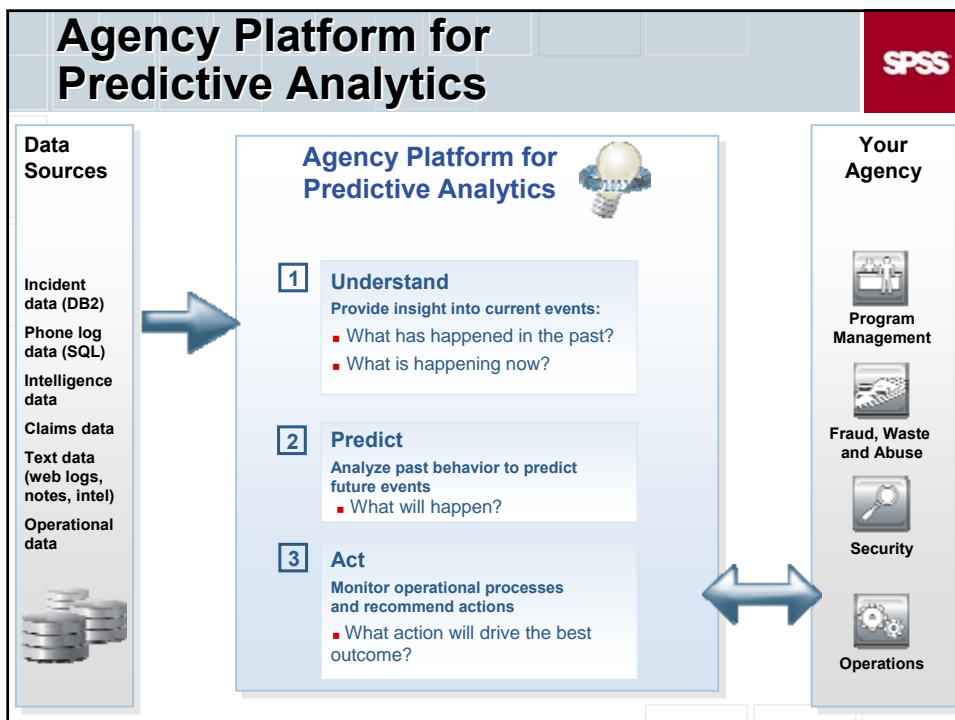
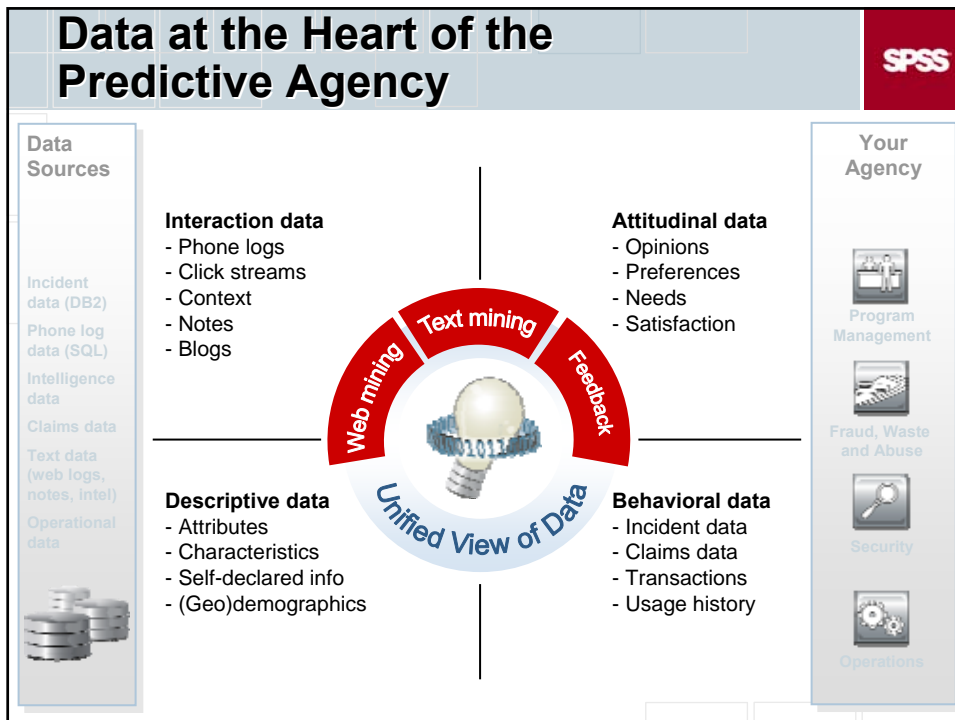
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From reactive...

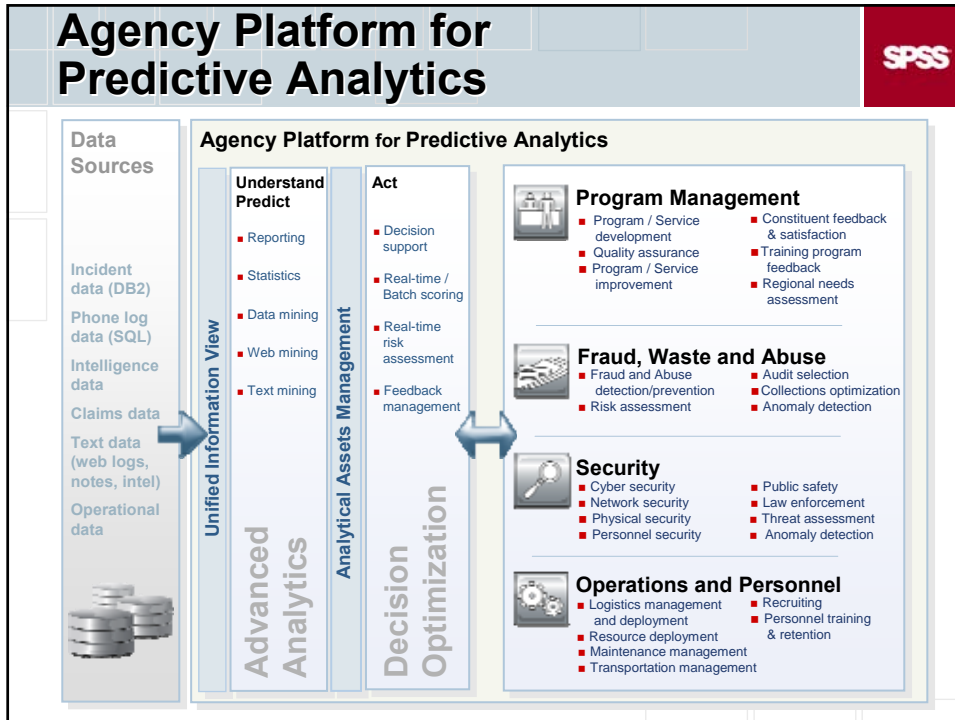
...to proactive

...to predictive

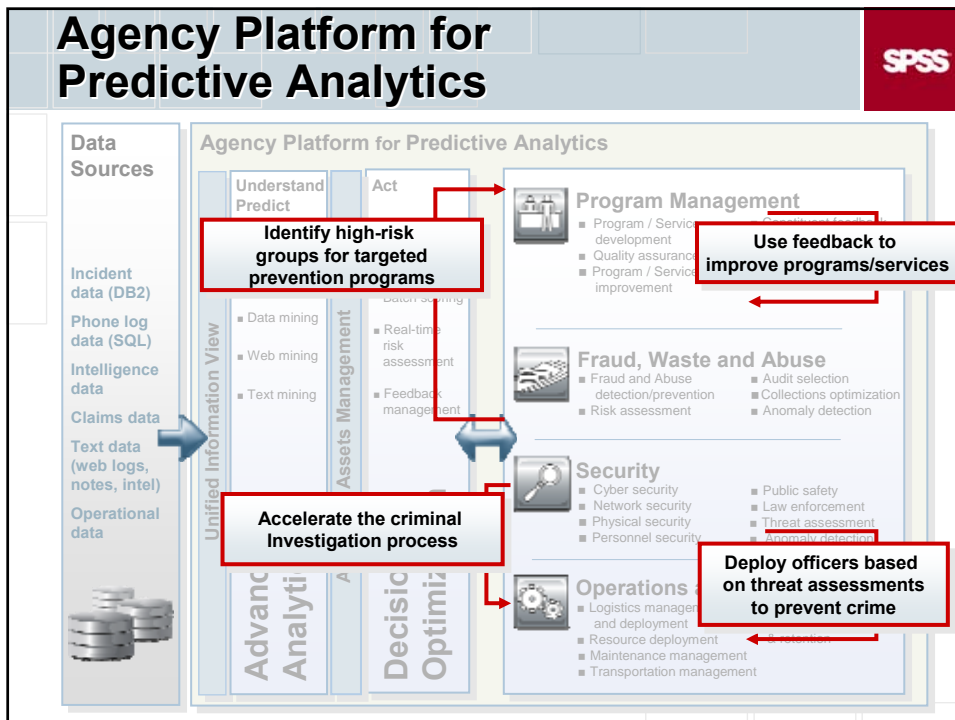




Agency Platform for Predictive Analytics

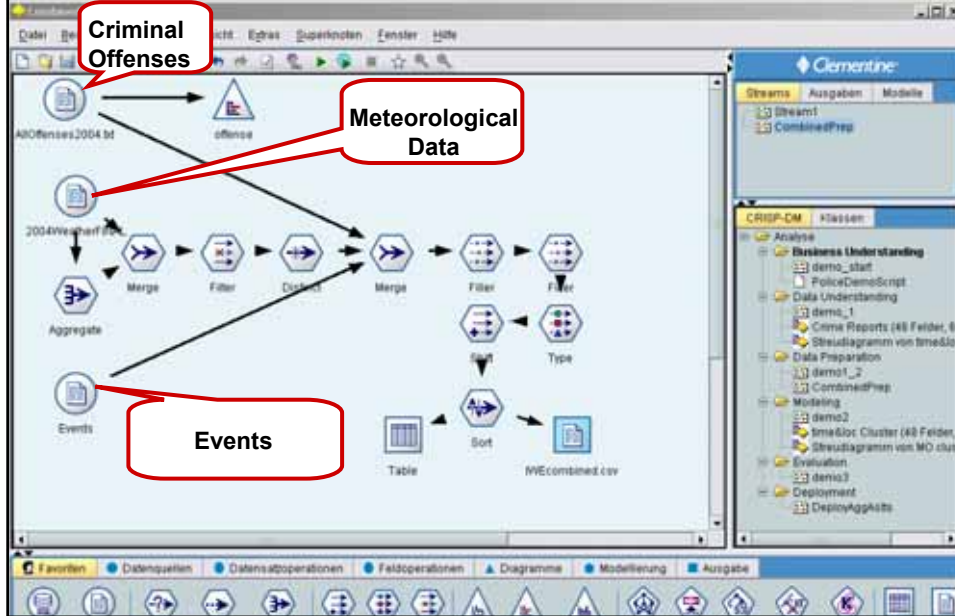


Agency Platform for Predictive Analytics



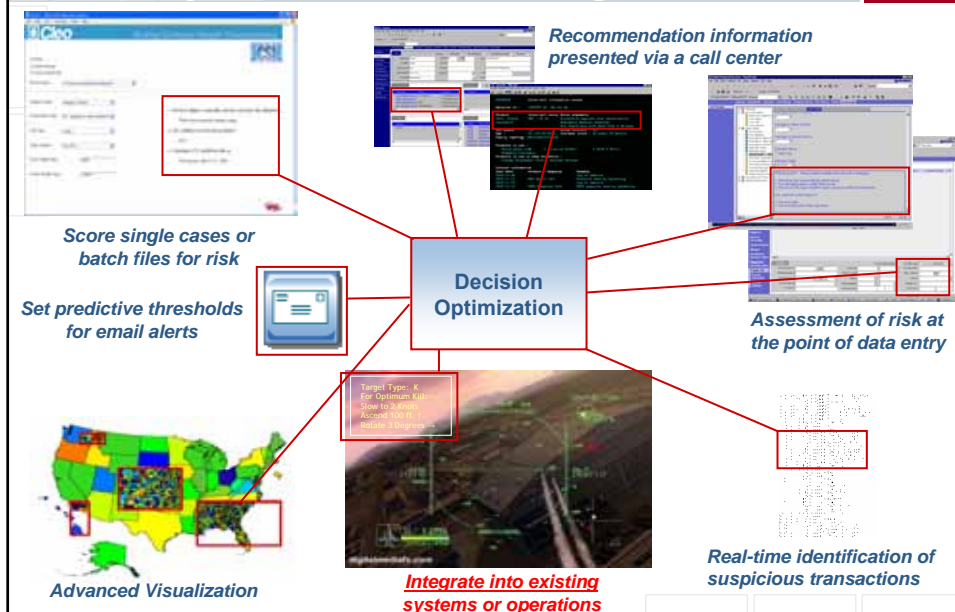
Example: Integration Different Data Origins

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Example: Deploy Actionable Intelligence

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Solution Overview - Threat Analysis and Security

	Identify Cyber Threats	Detect Money Laundering Behavior	
	Identify Insider Threats	Detect Fraud	
	Detect Smuggling and Drug Trafficking Associations	Identify True Identity of Individuals	
	Predict Non-Compliance of Foreign Visitors	Better Allocate Security Resources	
	Ensure Maritime Domain Awareness	Discover Terrorist Organization Affiliation	
	Discover Potentially Suspicious Inbound Cargo	Predict Risk Potential for Threats to Safety	

Key Areas Police

- Tactical crime analysis and deployment
- Risk and threat assessment
- Behavioral analysis of violent crime
- Analysis of Internet, Web log and telephone data
- Citizen satisfaction using survey

Your value ...

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- Improve your crime-fighting ability and control costs by deploying personnel where they're needed most
- Predict which types of events are most likely to escalate into serious or violent crimes and guard against this escalation
- Conduct new criminal investigations more efficiently
- Discover patterns in unsolved crimes that suggest areas for further investigation
- Explore security threats and study the people and organizations involved
- Deliver information to the field, where and when it's needed

Richmond Police Department

Effective force deployment = less cost, less crime

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Background

- Established in 1807 as one of the first official law enforcement agencies in the US
- City of Richmond, Virginia is divided into 12 policing sectors, serving ~200,000 residents

Business goals

- Proactively reduce crime by using existing data to predict & staff likely "hot spots"
- Present officers with real-time data displayed in geographic maps
- Reduce staffing costs

Solution

- Merge and analyze data resources that do not traditionally coexist (weather, events...)
- Build model to characterize and predict criminal activity, incl. locales/times
- Display results in an inter-active GIS



Results

- Proven model identifies *actionable* crime patterns
- Reduced crime
- Reduced staffing costs

E.g.: New Year's Eve (2003/4)

- 49% reduction in random gunfire incidents
- 246% increase in weapons seized
- Saved \$15,000 in overtime costs

Richmond Police Department: Use of SPSS Data Mining and Analysis

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- Force Deployment
- Risk Assessment & Risk-Based Deployment
- Behavioral Analysis of Violent Crime
- Analysis of Telephone Records
- Infrastructure Protection
(Electronic Counter Surveillance)



Atlanta Police Department Project Safe Neighborhoods – a federal initiative

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Background

- 1732 sworn officers, serving ~416474 citizens

Business goals

- Identify city's most violent and repeat offenders
- Provide officers with more complete information

Solution

- Merge large databases, summarize histories, analyze violent patterns, and prioritize active offenders
- Automate criminal history and corrections data for law enforcement intelligence



Results

- Identifying "Top" Atlanta offenders resulted in 466 arrests in 2002
- Deterred individuals on probation and on parole from committing additional crimes
- Deployed officers to areas frequented by violent and dangerous criminals
- Increased officer safety by informing them of criminals located within their beat

West Midlands Police Department Resurrecting (and solving!) cold case files

SPSS

Background

- 2nd largest police force in the UK, serving ~2.63 million residents in 348 sq miles

Business goals

- Gain insight in unsolved criminal cases
- Quickly and easily find key case patterns and trends

Solution

- Identify coinciding characteristics between physical descriptions of the criminal and their modus operandi (MOs)
- Analyze/Investigate the behavior of prolific repeat offenders, and identify crimes that seem to fit their behavioral pattern



Results

- Matched unsolved cases with known perpetrators
- Better targeting and “catching” of repeat offenders

Charlotte Police Department Community Problem-Oriented Policing

SPSS

Background

- The fastest growing and 20th most populous city in the US – Approx 2000 officers
- Mission: to build partnerships with citizens to prevent the next crime

Business goals

- Proactively identify crime areas & secure community involvement
- Increase citizen satisfaction and safety

Solution

- Document, analyze, & geographically map the multiple variables associated with break-ins and larceny
- Present results of the analysis as a compelling evidence that community involvement was necessary to develop effective long-term solutions.



Results

- Enabled community to reduce home appliance theft from construction sites
- Identified new ways to reduce automobile larceny from uptown parking lots
- Assessed citizen satisfaction with community policing efforts

Greater Manchester Police

Effective surveying to reduce crime

SPSS

Background

- Greater Manchester Police (GMP) has a workforce of over 7000 police officers and 3500 support staff. Serving some two and a half million people and ten metropolitan boroughs, GMP is one of the largest police forces in the UK. Consultation is a statutory function of GMP and is ongoing throughout the year.

Business goals

- Carry out surveys to establish a community-based policing program.
- Establish youth forums to deliver problem solving initiatives to tackle anti-social behaviour and youth offending

Solution

- Questionnaire design through dedicated application (Quancept)
- Efficient data collection and scanning software (MrPaper and MrScan)
- More sophisticated analysis via SPSS base and Regression



Results

- 400 volunteers to work with the force on community initiatives
- £13K saved in 2 weeks
- Huge reduction in project data collection and processing time
- Project results referenced by other departments as example of efficiency savings

Bremen Police

Effective surveying to improve relationship with citizens

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Background

- Project in co-operation with Bremen Public Administration College

Business goals

- To improve the service provided to the community using online research

Solution

- SPSS was used to facilitate faster analysis of online survey results in order to identify areas for improvement



Results

- Fast analysis of online survey results
- Daily analysis of completed questionnaires
- Improved relationship with citizens

Example Intelligence Customer Successes

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- **Department of Defense prevents fraud**

- 95% accuracy in predicting suspicious transactions



- **National Security Agency gains operational efficiency**

- Reduced workload for Artificial Intelligence and Signals Analysis/Modeling



- **[US Intelligence Agency] improves security**

- Prevent information leaks by predicting insider threats and infrastructure breaches using structured & unstructured data

Example: Security Customer Successes

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- **Sandia National Laboratories improves security**

- Faster and more accurate identification of insider threats (network, phone, etc.) and infrastructure breaches (id cards, etc.)



- **Homeland Infrastructure Security Threats Office improves cyber security**

- Predict malicious activity in unknown data



- **United States Customs and Border Protection**

- More efficient screening of inbound cargo. Use of predictive analysis to identify anomalous cargo and potential security threats.

Nucleus Research: The Real ROI from SPSS

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- 94% of customers achieved a positive ROI, with an average payback period of 10.7 months
- Key benefits achieved include reduced costs, increased productivity, improved customer & employee satisfaction, and greater visibility into operations
- 81% of projects deployed on time, 75% on or under budget



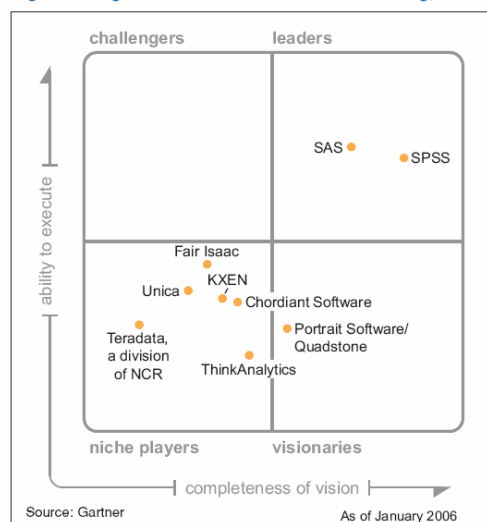
“This is one of the highest ROI scores Nucleus has ever seen in its Real ROI series of research reports.”

Rebecca Wettemann, Vice President of Research, Nucleus Research

Gartner: SPSS = Leader in Data Mining

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MAGIC QUADRANT
Figure 1. Magic Quadrant for Customer Data Mining, 1Q06



For more information

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Questions?