



# Advanced Analytics for Insurance

Claims Fraud

# Overview

- What is Predictive Analytics?
- What is the Predictive Analytics Value Proposition for Insurance?
- Predictive Analytics for Claims Fraud
- Quick Demo of the IBM SPSS Decision Management – Claims Fraud Solution
- Contacting QueBIT

# Analytics Value Chain

A large, light blue arrow pointing from the bottom-left towards the top-right, representing the progression of the Analytics Value Chain. The arrow is divided into five segments by four blue circular markers. Each segment is labeled with a stage name and a corresponding question. The background features a horizontal bar with yellow, red, and blue segments at the top, and a subtle dot pattern.

## Reporting

What happened?

## Analysis

Why did it happen?

## Monitoring

What's happening now?

## Predictive Analytics

What is most likely to happen?

## Optimization

What is the optimal action to take?

# Value Proposition for Insurance

## Claims Fraud

- Which claims are likely to be fraudulent?
- Which claims can be fast-tracked?

## Vendor Fraud

- Which vendors should be examined further for fraud?

## Underwriting

- How can we improve the straight through process to improve our competitiveness?

## Subrogation

- Which claims should be reviewed for possible subrogation?

## Marketing

- What products and offers will specific customers likely respond to?

## Human Capital Management

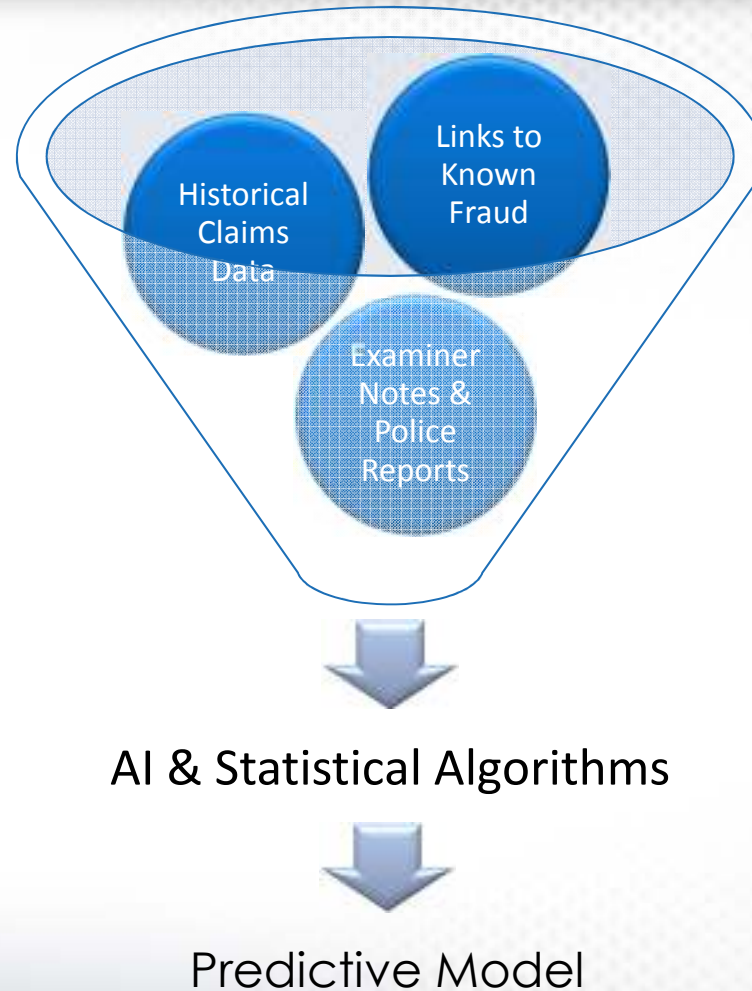
- Which of my high-performing employees is likely to leave in the next 6 months?

# Focus Area

## Claims Fraud

- Which claims are likely to be fraudulent?
- Which claims can be fast-tracked?

# Predictive Modeling



# Business Rules

*NICB Rule: Despite expensive damage claims, the claimant vehicle remains drivable.*

Police Report*	→	“The vehicle did not require a tow truck”	→	NO_TOW = 1
Appraisal				\$18,000
Medical Bills				\$32,815
<b>Risk Points</b>				<b>10</b>

\* Unstructured text is analyzed using natural language processing in IBM SPSS Text Analytics

*Internal Rule: Claims where the claimant has prior claims are at a higher risk of being fraudulent.*

Susan Smith** Susan Palmer Suzie Smith	→	Susan Smith 123 Elm St	→	Prior Claims = 2
<b>Risk Points</b>				<b>15</b>

\*\* Duplicate identities are resolved using IBM SPSS Entity Analytics



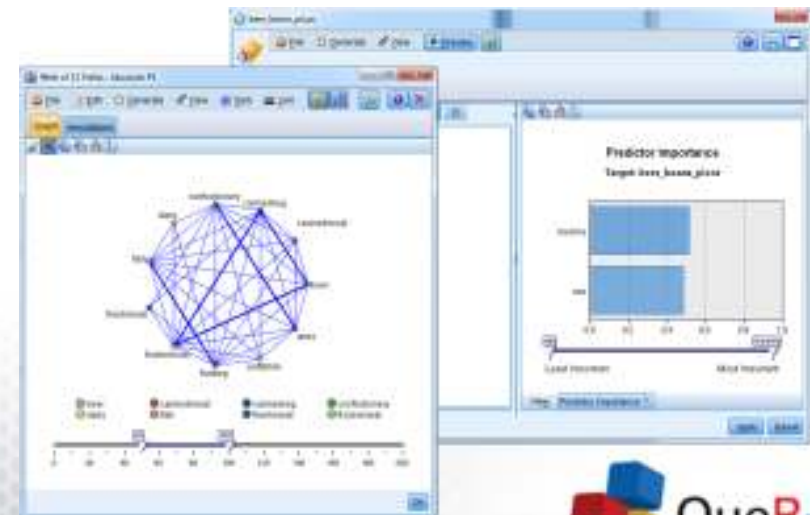
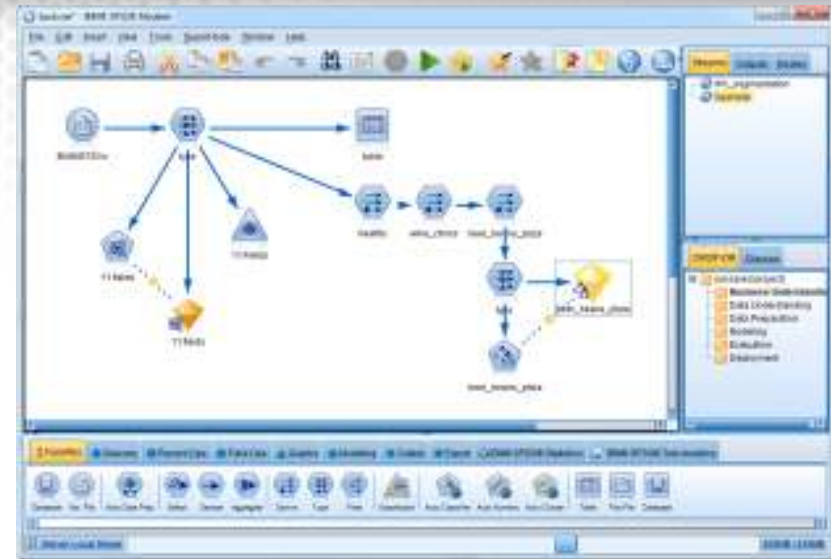
# Merging Predictive Models with Rules





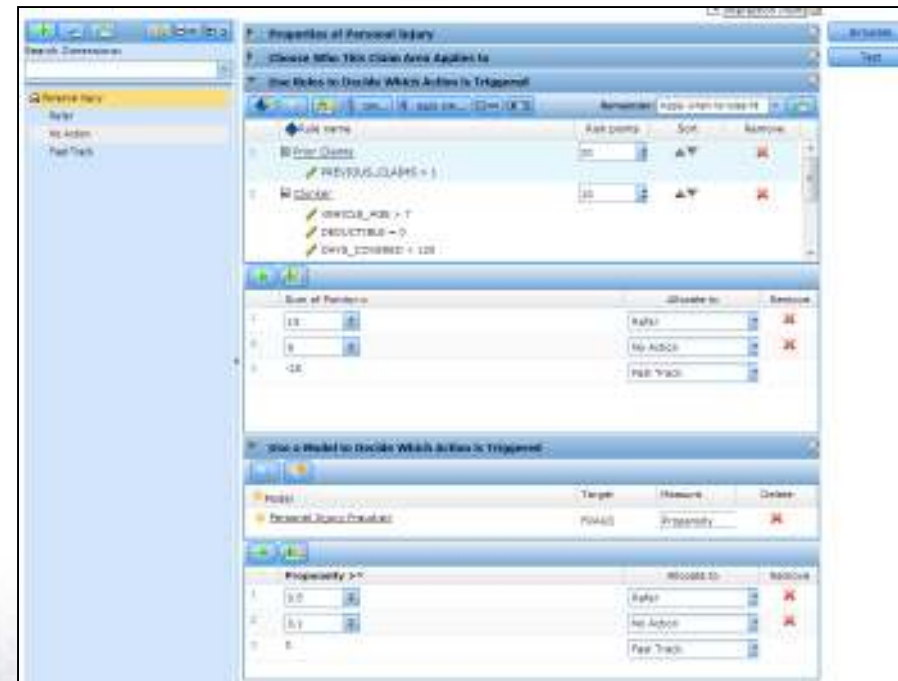
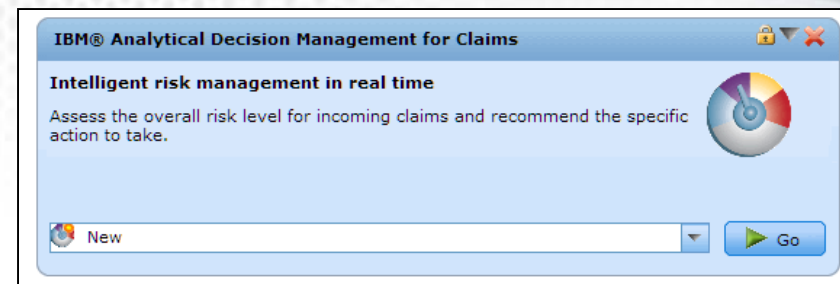
# IBM SPSS Modeler

- **Extremely low barrier to entry**
  - Visual (point-n-click) work-flow interface
- **Access (Nearly )Any Data, Anywhere**
  - RDBMS, unstructured text, flat files, XML, Excel, social media, PMML, etc.
- **Powerful, scalable and robust algorithms**
  - Designed with massive data sets in mind (“Big Data” with the use of Modeler Server)
  - Sophisticated algorithms with the ability to build ensemble models (many models working together)
  - Ability to analyze free-form text (with Modeler Premium)
- **Sophisticated visualization**
  - 2D, 3D graphs and maps



# IBM SPSS Decision Management

- **Extremely low barrier to entry**
  - Point-n-click web based application
  - No data mining experience required
- **Analytical Decision Management for Claims**
  - Assess the overall risk level for incoming claims and recommend the specific action to take.



# IBM SPSS Analytical Decision Management

Demo

# IBM SPSS Decision Management – Claims Fraud

IBM Analytical Decision Management for Claims

Home | admin | Help | About | Logout | IBM

Data | Global Selections | Define | Combine | Deploy | Reports

Lock project (other users will be unable to edit) Personal Injury Fraud - D... Lock all Define options

Hide Define tab from non-administrators Interaction Points Simulate Test

**Properties of Personal Injury**

Choose Who This Claim Area Applies to

Use Rules to Decide Which Action is Triggered

Rule name	Risk points	Sort	Remove
1. Rule 1.1 APPRaisal_AMT >= 5000 NO_TOW = 1	10	▲▼	✖
2. Rule 1.2 PREVIOUS_CLAIMS > 1	15	▲▼	✖
3. Rule 1.3	10	▲▼	✖

Remember: Apply when no rules hit

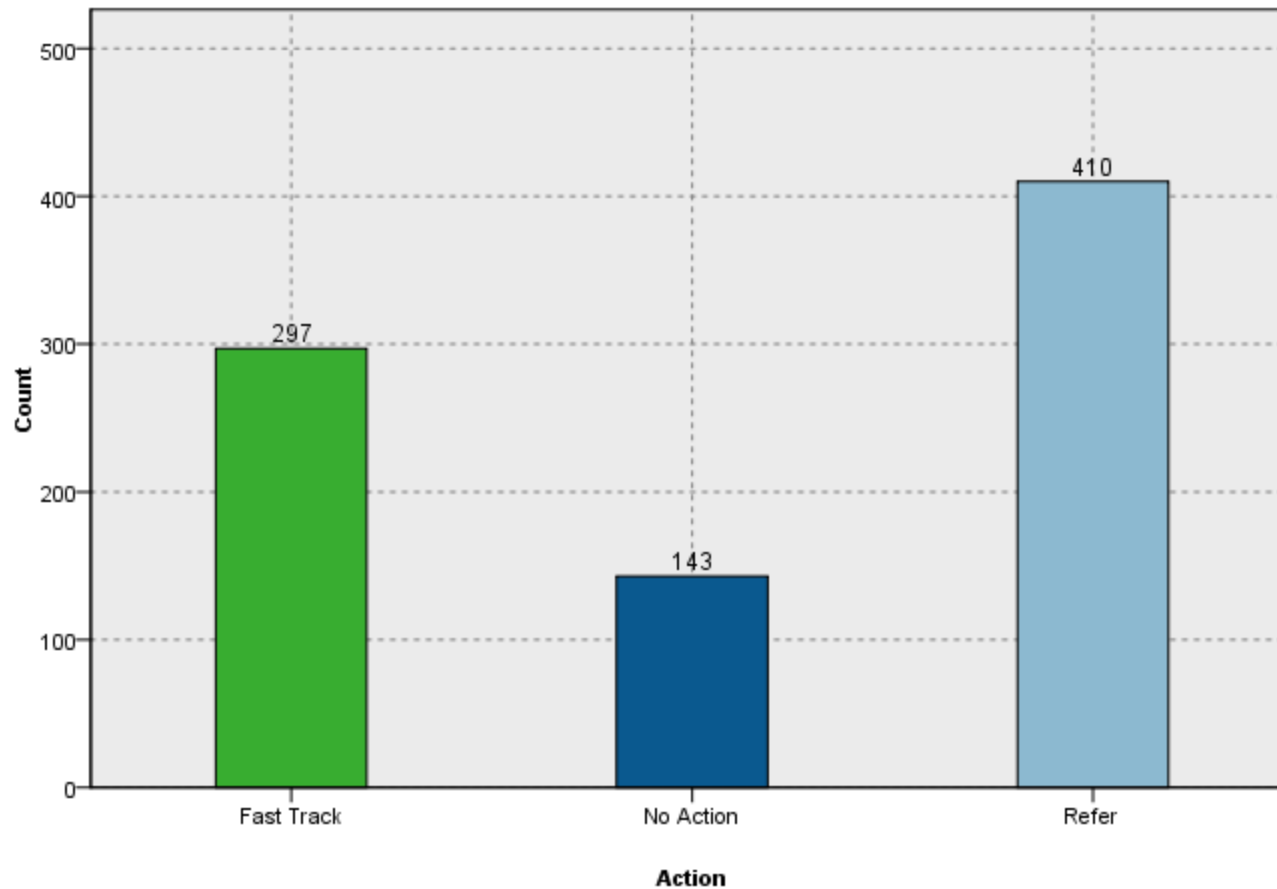
Sum of Points >=	Allocate to	Remove
1. 15	Refer	✖
2. 5	No Action	✖
3. -20	Fast Track	

Use a Model to Decide Which Action is Triggered

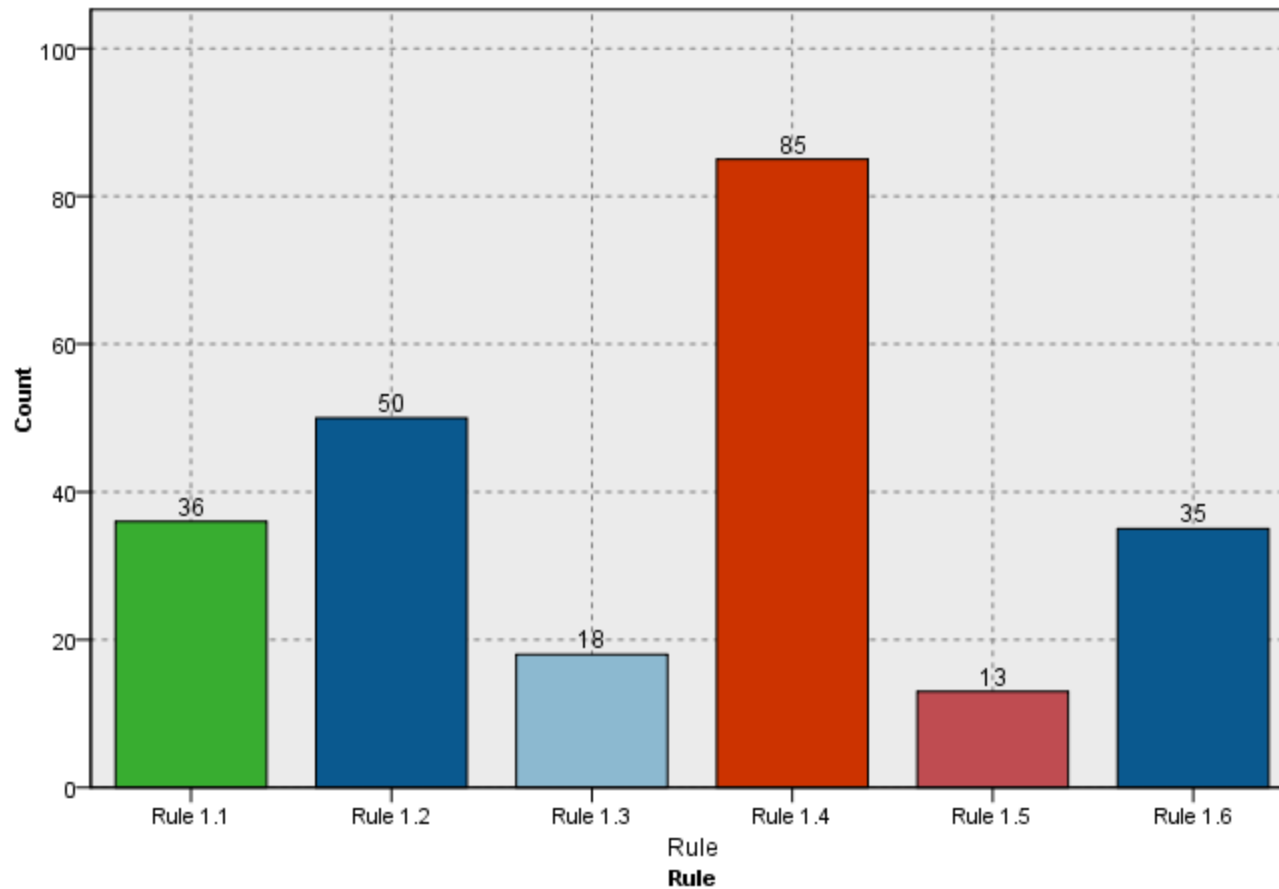
Model	Target	Measure	Delete
Personal Injury Fraud.str	FRAUD	Propensity	✖

Propensity >=	Allocate to	Remove
1. 0.5	Refer	✖
2. 0.1	No Action	✖
3. 0	Fast Track	

# IBM SPSS Decision Management - Results



# IBM SPSS Decision Management - Results





# IBM SPSS Decision Management - Results

scored\_claims.xls [Compatibility Mode] - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

A1 Model Propensity

	A	B	C	D	E	F	G	H	I	J	
1	Model Propensity	Rules Risk Score	Rules Triggered	Action	CLAIM	FIRST_NAME	MIDDLE_NAME	LAST_NAME	SUFFIX	GENDER	ADDRESS
40	100%	20	Rule 1.4   Rule 1.6	Refer	3584-2	Brandon	Douglas	Barnes		M	56 Fir
41	100%	20	Rule 1.4   Rule 1.6	Refer	3301-3	Julie	Mildred	Hayes		F	53 Yoc
42	99%	20	Rule 1.4   Rule 1.6	Refer	1939-1	Eric	David	Torres		M	33 Jun
117	96%	25	Rule 1.3   Rule 1.6	Refer	1013-3	Marie	Diane	Perry		F	41 Fir I
118	93%	25	Rule 1.3   Rule 1.6	Refer	912-3	Marie	Stephanie	Kelly		F	26 Dur
119	36%	15	Rule 1.3   Rule 1.4	Refer	4440-1	Clarence	Earl	Hill		M	30 Bar
120	100%	15	Rule 1.3   Rule 1.4	Refer	472-1	Joan	Theresa	Jones		F	83 Dur
134	100%	30	Rule 1.2   Rule 1.6	Refer	158-3	Lillian	Diana	Johnson		F	24 Eas
135	100%	20	Rule 1.2   Rule 1.4	Refer	3128-3	Jeremy	Victor	Jackson		M	100 Sp
136	100%	25	Rule 1.2   Rule 1.3	Refer	717-2	Jean	Carol	Kelly		F	28 Has
137	100%	15	Rule 1.2	Refer	2226-1	Peter	Victor	Lopez		M	79 App
138	100%	15	Rule 1.2	Refer	4276-2	Howard	Jesse	Simmons		M	60 Bra
139	100%	15	Rule 1.2	Refer	2069-2	Joe	Scott	Bailey		M	77 Hac
140	100%	15	Rule 1.2	Refer	838-2	Julie	Marilyn	Hughes		F	63 Abl
141	100%	15	Rule 1.2	Refer	4295-1	James	Raymond	Bell		M	38 Alp
142	100%	15	Rule 1.2	Refer	1933-3	Eric	Jimmy	Harris		M	74 Dur
143	100%	15	Rule 1.2	Refer	3724-2	Kathy	Mildred	Foster		F	8 Bank
144	100%	15	Rule 1.2	Refer	4270-1	Anna	Karen	Murphy		F	12 Rid
145	100%	15	Rule 1.2	Refer	815-2	Jack	Steven	Clark		M	26 Ant
146	100%	15	Rule 1.2	Refer	1822-2	Eric	Peter	Robinson		M	66 Vik
147	100%	15	Rule 1.2	Refer	2731-2	Ronald	Wayne	Walker		M	97 Noi
148	100%	15	Rule 1.2	Refer	2918-3	Melissa	Louise	Mitchell		F	30 Spr
149	100%	15	Rule 1.2	Refer	2829-3	Lori	Maria	Mitchell		F	36 Gre



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