



**SAS** | 



## SAS Predictive Claims Processing

*Detecting Fraud, Increasing Recovery and Optimizing Workflow through Analytics*

**THE POWER TO KNOW.**

Stephen W Swenson, MBA – SAS Insurance Development Executive

Copyright © 2006 SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## Agenda

- Current Economic Market Issues
- Fraud & It's Impact on Loss Costs
- Claims & Insurer Profit Implications
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

Copyright © 2006 SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## Agenda

- **Current Economic Market Issues**
- Claims & Insurer Profit Implications
- Fraud & It's Impact on Loss Costs
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

Copyright © 2006 SAS Institute Inc. All rights reserved.

---

---

---

---

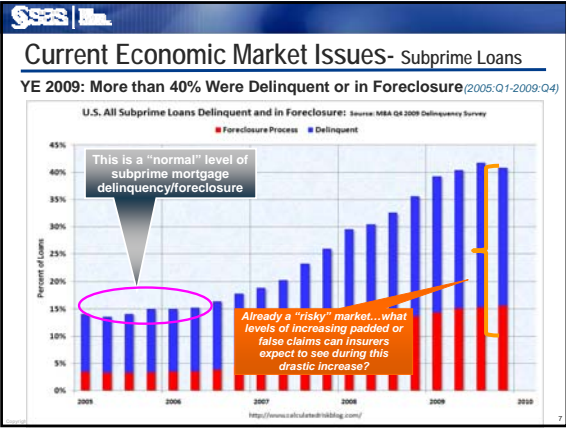
---

---

---

---






---

---

---

---

---

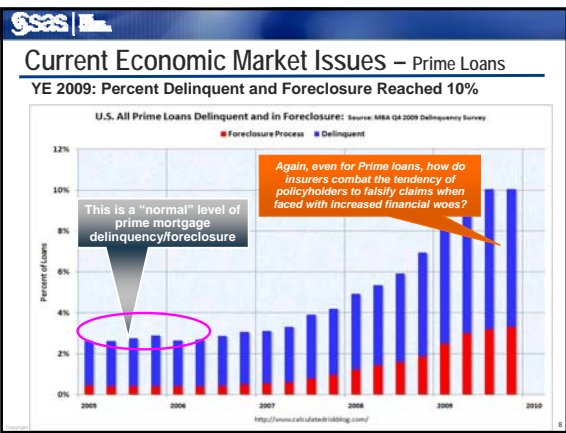
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

- SAS**
- ### Agenda
- Current Economic Market Issues
  - **Claims & Insurer Profit Implications**
  - Fraud & It's Impact on Loss Costs
  - Predictive Claims Processing
  - A Hybrid Approach to Fraud
  - Customer Business Case
  - Question & Answers

---

---

---

---

---

---

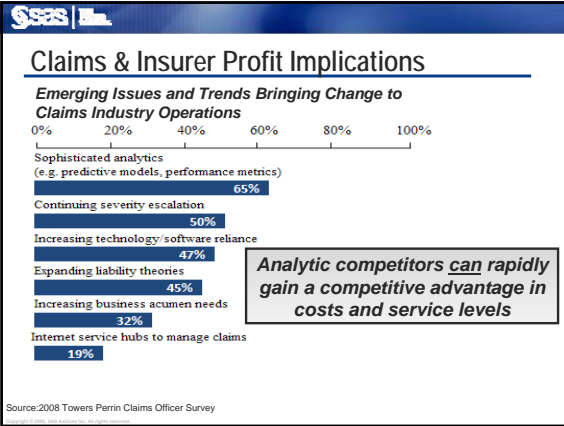
---

---

---

---






---

---

---

---

---

---

---

---

- 
- Claims & Insurer Profit Implications**
- Claims Operations – low number of predictive analytical models deployed in claim lifecycle
    - Legacy system infrastructures continue to hold insurers back from reducing costs and creating operating agility
    - Only ~30% of insurers operate a new generation claims transaction system – creates more flexibility of claims operations
    - Workflow improvements derived from basic claim file-type routings; statistical process control methodologies not applied
    - Minimal “real-time” integration of predictive analytics into claims lifecycles
- Given the operational constraints, how can insurers expect to aggressively manage total loss costs?**

---

---

---

---

---

---

---

---

- 
- Claims & Insurer Profit Implications**
- “Negative premium growth for 2009...marks the first three-year sequential decline in premiums written since the Great Depression.” Dr. Robert P. Hartwig, CPCU
  - P/C Insurer Loss and Loss Expenses approximate 73% of total costs
    - Example - A \$5bl insurer with a 73% Total loss ratio is \$3.65bl!!
  - Technology is a disruptive market force
  - Future Combined Ratio implications are not bright
    - 2010 P&C combined ratios are anticipated to exceed 100%
    - Declining premiums
    - Increasing Loss costs and LAE
- Remember the “burning platform” analogy??**

---

---

---

---

---

---

---

---

**SAS**

## Claims & Insurer Profit Implications

- **Business Opportunity: Negative Premium Growth**
  - Keep current customers longer(claims satisfaction); know them at a deeper level
- **Business Opportunity: Increasing/constant loss expenses**
  - Integrate predictive analytics into claims lifecycle for improved:
    - ✓ Fraud detection across all lines of business
    - ✓ Enhanced customer claims experience via new treatment strategies
    - ✓ More aggressive medical payment management
    - ✓ More precision reserving to leverage greater capital impacts
    - ✓ Increase probability for recovery through subrogation/litigation

**Is this the new imperative for insurers(actuaries)?**

---

---

---

---

---

---

---

---

---

---

**SAS**

## Agenda

- Current Economic Market Issues
- Claims & Insurer Profit Implications
- **Fraud & It's Impact on Loss Costs**
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

---

---

---

---

---

---

---

---

---


---

**SAS**

## Fraud & It's Impact on Loss Costs

*Does insurance fraud = financial crime?*

- Research conducted in July 2009 showed that
  - 16% of adults would not rule out making an exaggerated claim
  - 44% believe that it is acceptable or borderline behavior to exaggerate an insurance claim
  - 30% stated that it was acceptable to overstate the extent of damages being claimed
  - 18% expressed that it was acceptable to add other items to a claim



Source: Survey by Assn of British Insurers

---

---

---

---

---


---

---

---

---


---

**SAS** | 

## Fraud & It's Impact on Loss Costs

### P&C Insurance Fraud Landscape

- **1 in 5 US** adults believe it is acceptable to defraud insurers under certain circumstances. (Coalition Against Insurance Fraud)
- Fraud accounts for 10% of the P&C insurance industry's incurred losses and loss adjustment expenses, or about **\$30 billion a year**. (Insurance Information Institute)
- A 2009 report shows an increase in **opportunistic fraud**, where a policyholder has a legitimate claim but pads it to produce a larger payment. (National Insurance Crime Bureau)
- NICB reports **double-digit growth** in questionable claims submitted from 2008 to 2009 in every line of business. (National Insurance Crime Bureau)



Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

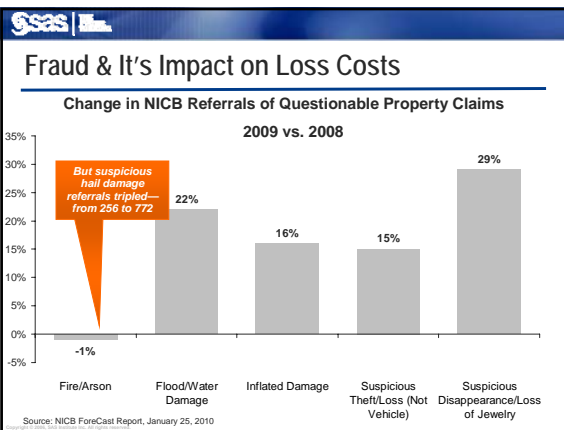
---

---

---

---

---




---

---

---

---

---


---

---

---

---

---

**SAS** | 

## Fraud & It's Impact on Loss Costs

### A growing business?

- **10% - 15%** of workers are misclassified by their employers, causing excess risk for insurers and resulting in millions in lost premium. (Coalition Against Insurance Fraud)
- Bogus slip-and-fall injury claims and related costs amount to nearly **\$2 billion a year**. (National Floor Safety Institute)
- Fraud and buildup in personal auto claims alone added **\$4.8 to \$6.8 Billion** in excess payments to auto injury claims in 2007, a 13 - 18% increase over 5 years. (Insurance Research Council)
- Auto insurers lost **\$16.1 billion**, due to premium rating errors in private-passenger premiums in 2007. Fraud accounts for a significant portion of these losses. (Quality Planning Corporation)

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

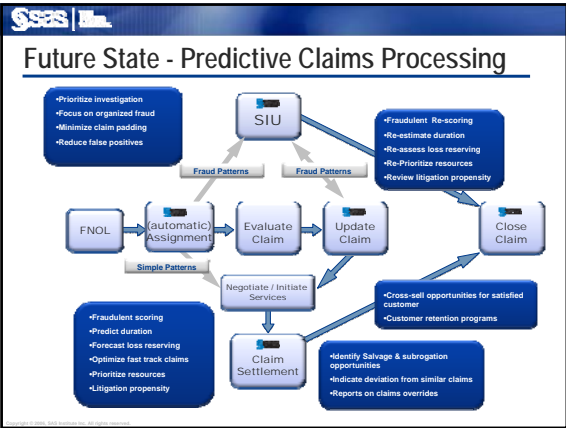
---

---

---








---

---

---

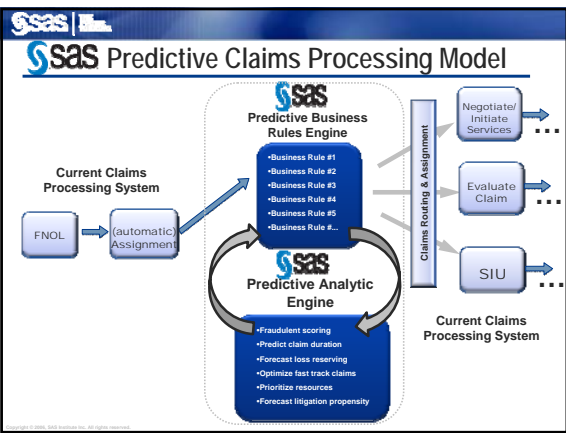
---

---

---

---

---




---

---

---

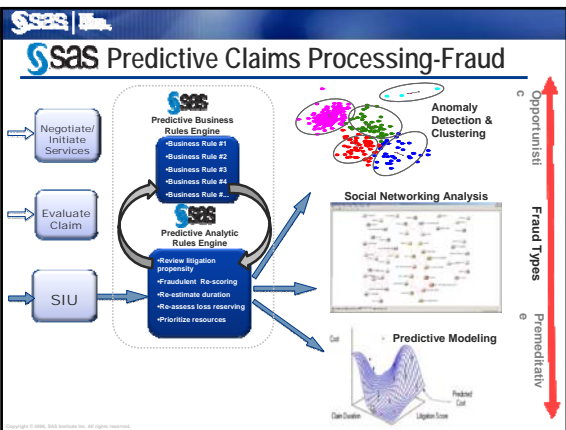
---

---

---

---

---




---

---

---

---

---

---

---

---

**SAS**

## Agenda

- Current Economic Market Issues
- Claims & Insurer Profit Implications
- Fraud & It's Impact on Loss Costs
- Predictive Claims Processing
- **A Hybrid Approach to Fraud**
- Customer Business Case
- Question & Answers

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---

**SAS**

## SAS History of Fraud Detection

*Enterprise wide capabilities span more than 30 years across many verticals, leveraging multiple statistical disciplines and detection methodologies*

- Thousands of global SAS customers spanning multiple industries and functions, e.g.,
  - Financial Services(insurance/banking) – Claims, payment fraud - credit card/check/debit, anti-money laundering
  - Health & Life Sciences – Provider, patient, networks
  - Retail – Credit/card, employee
  - Manufacturing – Warranty analysis & early detection
- Customers benefit from the multi-disciplined experience

**Key learning – fraud is a dynamic, ever-changing business issue, requiring an agile and comprehensive**

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---

**SAS**

## Types of Insurance Claims Fraud

The diagram illustrates the spectrum of insurance claims fraud. At the top, a horizontal bar transitions from 'Opportunistic' (left) to 'Premeditative' (right). Below this bar, three categories are shown: 'Average Insurance Fraud' (left), 'Criminal Offender' (middle), and 'Organized Criminal Gangs' (right). Underneath these categories, a series of circles represent different actor types: 'The Tentatives', 'Revenge Seekers', 'Game Players', 'Exploiters', 'Internal Fraud', and 'Third Party Fraud'. At the bottom, a scale indicates 'HIGH VOLUME LOW LOSS' on the left and 'LOW VOLUME HIGH LOSS' on the right.

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## PoV for Fraud Approach in Insurance

*Enable Multiple Analytical Techniques...*

- Prioritized business rules (red flags)
- Database searching – internal & third party
- Exception reporting
- Query and analysis
- Text mining
- Unsupervised analysis (e.g., anomaly detection, clustering)
- Supervised analysis (e.g., predictive modelling)
- Social Network Analysis

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## SAS® Fraud Analytics

*Using a Hybrid Approach for Fraud Detection*

Enterprise Data	Suitable for known patterns	Suitable for unknown patterns	Suitable for complex patterns	Suitable for associative link patterns
Policy Claims Providers Applications Referrals Payments NCR Alerts 200 Claim History	<b>Rules</b> Rules to filter fraudulent claims and behaviors Examples: • Claim within certain period from policy inception • Delay in reporting claim • No witness	<b>Anomaly Detection</b> Detect individual and aggregated abnormal patterns vs. peer groups Examples: • Ratio of BI to APD exceeds norm • % accidents in off peak hours exceeds norm • # claims / year exceeds norm for policy or network	<b>Predictive Models</b> Predictive assessment against known fraud cases Examples: • Like staged / induced accident indicators as known fraud • Soft tissue injury patterns across claims • Like network and claim growth rate (velocity)	<b>Social Network Analysis</b> Knowledge discovery through associative link analysis Examples: • Claim associated to known fraud • Linked policies & claims with like suspicious behaviors • Identity manipulation

**Hybrid Approach**  
Proactively applies combination of all 4 approaches at the claim, entity, and network levels

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## Agenda

- Current Economic Market Issues
- Claims & Insurer Profit Implications
- Fraud & It's Impact on Loss Costs
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---

**SAS**

## Customer Business Cases

*Does analytical fraud detection scoring work?*

**Insurer 1**

Estimated \$9.5m+ of savings

70% cases identified now fraudulent

**Insurer 2**

Major national fraud ring broken

Multi \$m of savings

**Insurer 3**

\$1.3m+ of savings in first phase

Hit rate improved from 27% to 60%

**Insurer 4**

Estimated annual savings \$18.2m per annum on auto book using data and text mining

Significant increase in hit rate.

Customer/SAS under NDA - real cases where the customer has asked us not to share their name.

---

---

---

---

---

---

---

---

---

---


---

---

**SAS**

## Customer Business Case

### Worker Compensation – Case Study



**Business Problem**

Large U.S. commercial insurer was incurring significant fraud losses across their lines of business. The insurer engaged SAS in a pilot to determine the solution that would provide the most lift over their current rules and models and enhance effectiveness of the triage and fraud investigation teams.

**SAS Approach**

SAS subjected 4 years of historical data from 4 different data sources (including claims, medical bill payments, claim payments, and fraud case data) to the predictive capabilities of the SAS Fraud Framework. Client investigators evaluated the solution results during a 3 week validation period to identify incremental fraud detection at the claim and network levels, reduction in false positives, and enhancements to investigative efficiency.

**Results**

The pilot resulted in a business case and deployment roadmap for full implementation.

- False positive reduction: 46% correct hit rate
- Over \$6.5 Million additional saving in Top 1% of claims identified
- 67% of networks identified as fraudulent activity
- Investigative efficiency: Over 30% increase

**Highlights**

- +100% of WC claims processed
- +46% correct hit rate on flagged claims (combined)
- Over \$6.5 Million additional savings in Top 1%
- +4 years of historical data from 4 data sources

---

---

---

---

---

---

---

---

---

---

---

---

**SAS**

## Fraud Proof of Concept Approach

**Approach:** Evaluated 800,000 claims covering a 4 year span with data from multiple systems

- Build predictive models for Workers Comp & General Liability lines of business
- Provide a list of 400 claims (200 GL & 200 WC) chosen via a random sample of the top 1% highest scored claims, removing all KNOWN previously referred claims
- SAS also to provide up to 15 "social networks" for evaluation

**Results:**

- **67% acceptance rate** for Social Network Analysis
  - 10 out of 15 network based cases accepted
- **57% acceptance rate** for Workers Compensation
  - 113 out of 200 WC claims were accepted
- **33% acceptance rate** for General Liability
  - 66 out of 200 GL claims accepted
- **42% acceptance rate** projected for production

---

---

---

---

---

---

---


---

---

---

---

---

**SAS** | 

## Agenda

- Current Economic Market Issues
- Claims & Insurer Profit Implications
- Fraud & It's Impact on Loss Costs
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---



Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---

**SAS** | 

## P&C Industry Trends

- The overall state of the economy and a soft pricing market limits top line growth
- Declining sales and payroll from commercial businesses deteriorates premium
- 2010 P&C combined ratios are anticipated to exceed 100%. Controlling loss costs is critical.
- Litigation and medical costs are rising
- Economic pressure provides incentive and justification for insureds and claimants to commit insurance fraud

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

---

---

---

---

---

**SAS** | 

## Fraud & It's Impact on Loss Costs

*"In this economic environment, both businesses and individuals are more tempted to commit fraud."*

Steven Nachman,  
Deputy Superintendent NY State Insurance Dept.

Source: "Hard-up Investigators Battle Against Rise in Comp Fraud," *Business Insurance*, November 9, 2009.

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---


---

**SAS** | 

## Fraud & It's Impact on Loss Costs

### *Cost effective insurance fraud detection*

- Estimated that 'fraud' adds an additional 5 to 10% to final premiums paid worldwide
- Main argument against is 'cost effectiveness' of insurance detection
  - Can be an expensive process 'proving fraud'
  - Need to 'warn off' potential fraudsters
  - Early mover advantage
- For low cost frauds - automate
  - 'Firm but fair' letter
  - 'Refer' list



44

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---


---

---

---

---

---

**SAS** | 

## Agenda

- Current Economic Market Issues
- Claims & Insurer Profit Implications
- Fraud & It's Impact on Loss Costs
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- **Fraud Framework Demonstration**
- Customer Business Case
- Question & Answers

Copyright © 2006, SAS Institute Inc. All rights reserved.

---

---

---

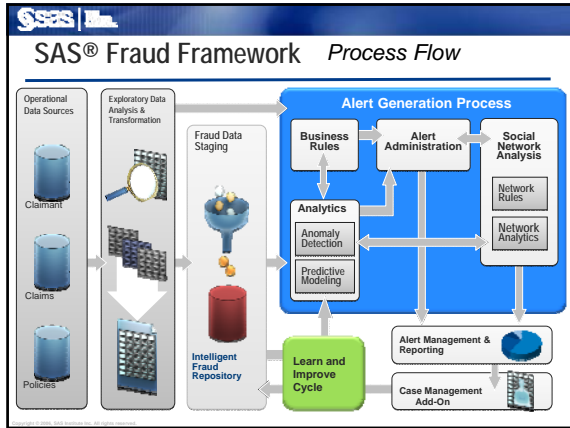
---

---

---

---

---




---



---



---



---



---



---



---

**Predictive Claims Processing**

The screenshot shows the SAS Fraud Framework interface in a browser. The main window displays a configuration page for a predictive project. The left sidebar shows a tree view of the system components. The main content area includes sections for **Alerts**, **Alerts List**, and **Alerts List**. Below the main content, there is a table with columns for **Name**, **Type**, and **Description**.

**Alerts List**

Name	Type	Description
...	...	...
...	...	...
...	...	...

**Alerts List**

- Multiple (predictive) Projects can be integrated into claims workflows (e.g., fraud, subrogation, nurse case management, customer retention, litigation propensity)
- Scenarios, rules and routing assigned to Projects to speed claims disposition
- Individual model values generate predictive insight to proactively manage associated alert-type generation to the right adjuster
- Predictive claim alerts integrate directly into claims workflows

---



---



---



---



---



---



---