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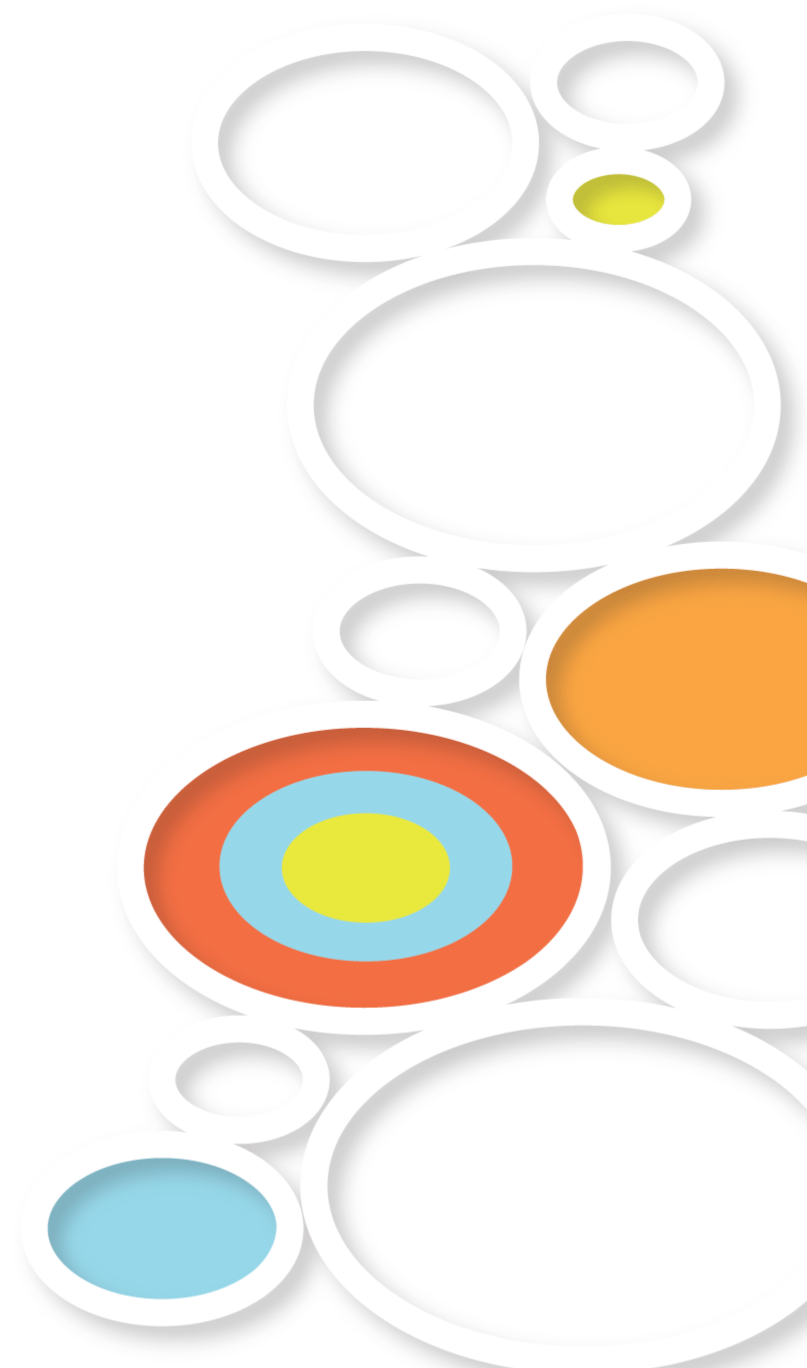

Fighting fraud in healthcare

Ross Kaplan, SAS Solutions Architect
Fraud and Financial Crimes Practice - Healthcare

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Health Care Fraud: An Industry at Risk

The National Health Care Anti-Fraud Association (NHCAA) estimates conservatively that 3% of all health care spending—or $68 billion—is lost to health care fraud (100 times credit card fraud estimates).

Other estimates by government and law enforcement agencies place the loss due to health care fraud as high as 10 percent of our nation's annual health care expenditure—or a staggering $226 billion—each

…the potential losses to [healthcare] fraud and corruption could be at least €30-100 billion across Europe. [$39 - $132 billion]

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Perspective on Cost of Health Care Fraud

EHFCN Newsletter, March – April 2010 http://www.ehfcn.org/newsletter/2010/q1-2/articles

Estimated global dollars associated with health care fraud (£160 / €180 / $260 billion each year) is enough to:

- Provide clean, safe water around the globe
- Bring malaria under control in Africa
- Provide the Diphtheria, Tetanus and Pertussis vaccine to all 23.5 million children under one years old who are currently not immunized (2.5 million die each year from diseases preventable by vaccines)

- **AND** quadruple the budget of the World Health Organisation and UNICEF (the United Nations Children's Fund)
- …with more than £100 billion left over – enough to build more than 1,000 new hospitals at developed world prices

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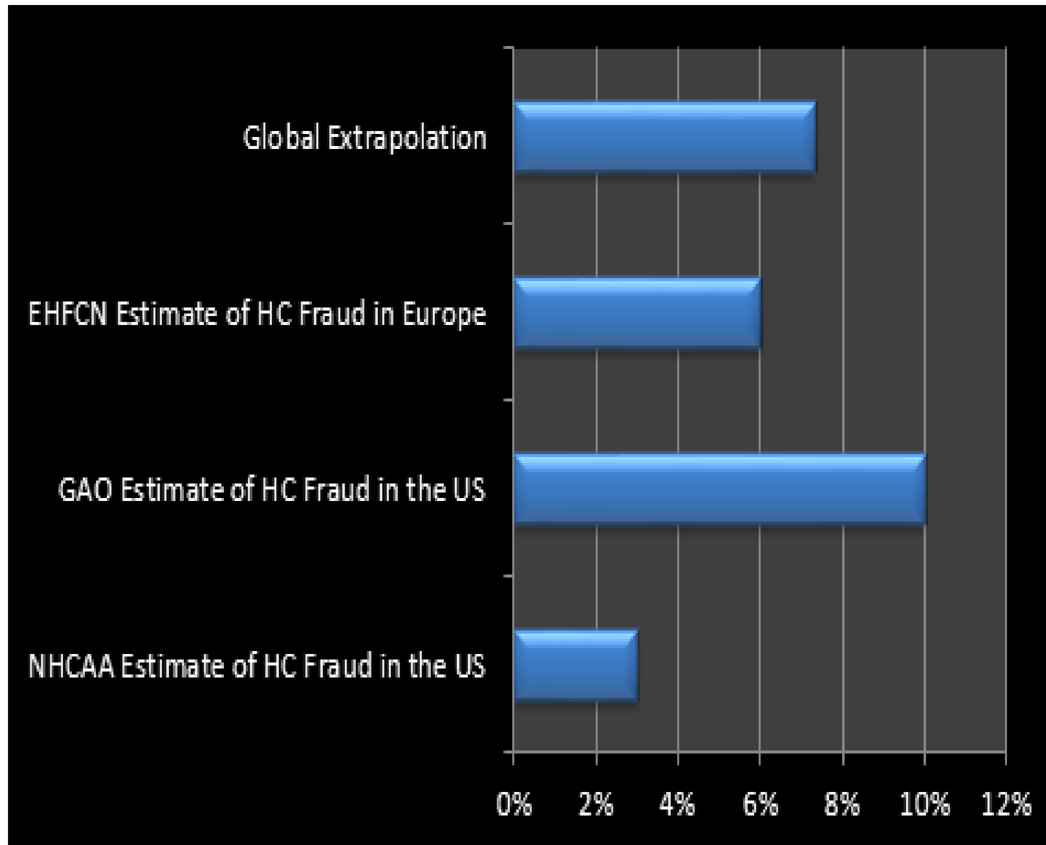
EXTERNAL VIEWPOINT

COST OF HEALTH CARE FRAUD GLOBALLY



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Scope of the Problem – Europe

Country	In €Bn
Germany	13,016
France	10,576
UK	8,554
Italy	7,021
Spain	4,328
Netherlands	2,687
Belgium	1,664
Sweden	1,527
Austria	1,394
Estonia	1,261
Greece	1,078
Poland	900
Portugal	839
Finland	722
Ireland	709
Hungary	398
Romania	235
Slovakia	168
Bulgaria	97
Lithuania	79
Latvia	57
Cyprus	48
Czech Republic	NA

Equates to approximately 5.5% of healthcare spend across Europe

EUROPEAN HEALTHCARE FRAUD & CORRUPTION NETWORK

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Worldwide Anti-Fraud Challenges

- Inconsistency/diversity of medical standards, regulatory oversight and enforcement actions across regions and countries
- Wide variances in procedure costs across regions and countries, with lack of centralized comparative cost data
- Lack of “boots on ground” investigative resources in many regions or countries
- Inevitable advent of fraud related to growing medical tourism trend
- Emergence of international marketing of health care services—e.g., adverts in U.S. in-flight magazines for South America cosmetic surgery clinics; Singapore surgical centers; European “Medical Tourism”

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The Perfect Storm Developing

- Fraud, Waste & Abuse Perpetrators
  - Far more sophisticated – organized, patient, sharing of rules
  - Leveraging multiple channels (providers & facilities) at the same time
  - Continuously evolving fraud strategies
- Current Health Care Fraud Systems
  - Most current detection systems act on claim level data alone
  - Investigations limited to individual members, providers and facilities
  - Focus on rules based approaches (linear and limited to known schemes)
  - Insufficient evidence to guide investigation
- Current Health Care Fraud Operations
  - Limited to 3rd party systems and rules
  - No real proactive steps taken to combat fraud, waste, and abuse
  - Inefficiencies driven by shear amounts of data and disparate sources

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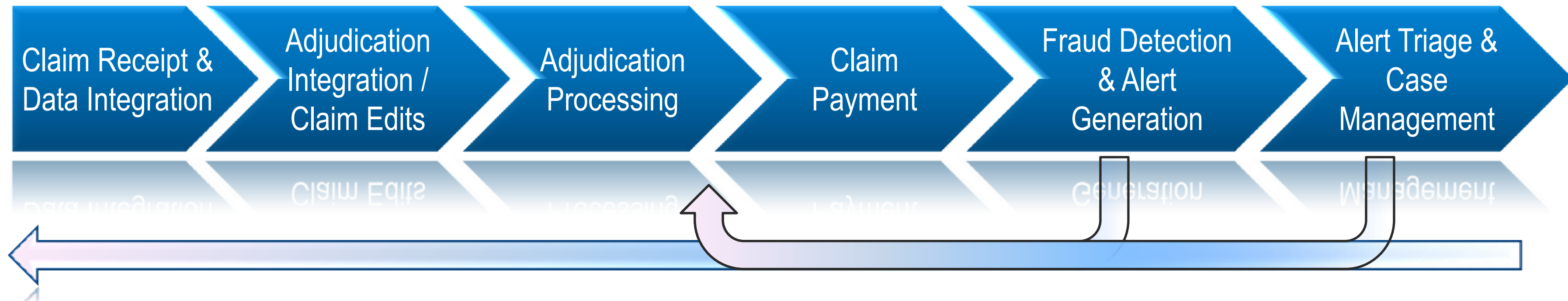
Trend in Health Care Fraud Management

The current SIU standard – "Pay and Chase"



Moving analytics and fraud detection upstream in the claims lifecycle to become proactive, versus "pay and chase"

Step 1: Pre-payment Fraud Detection

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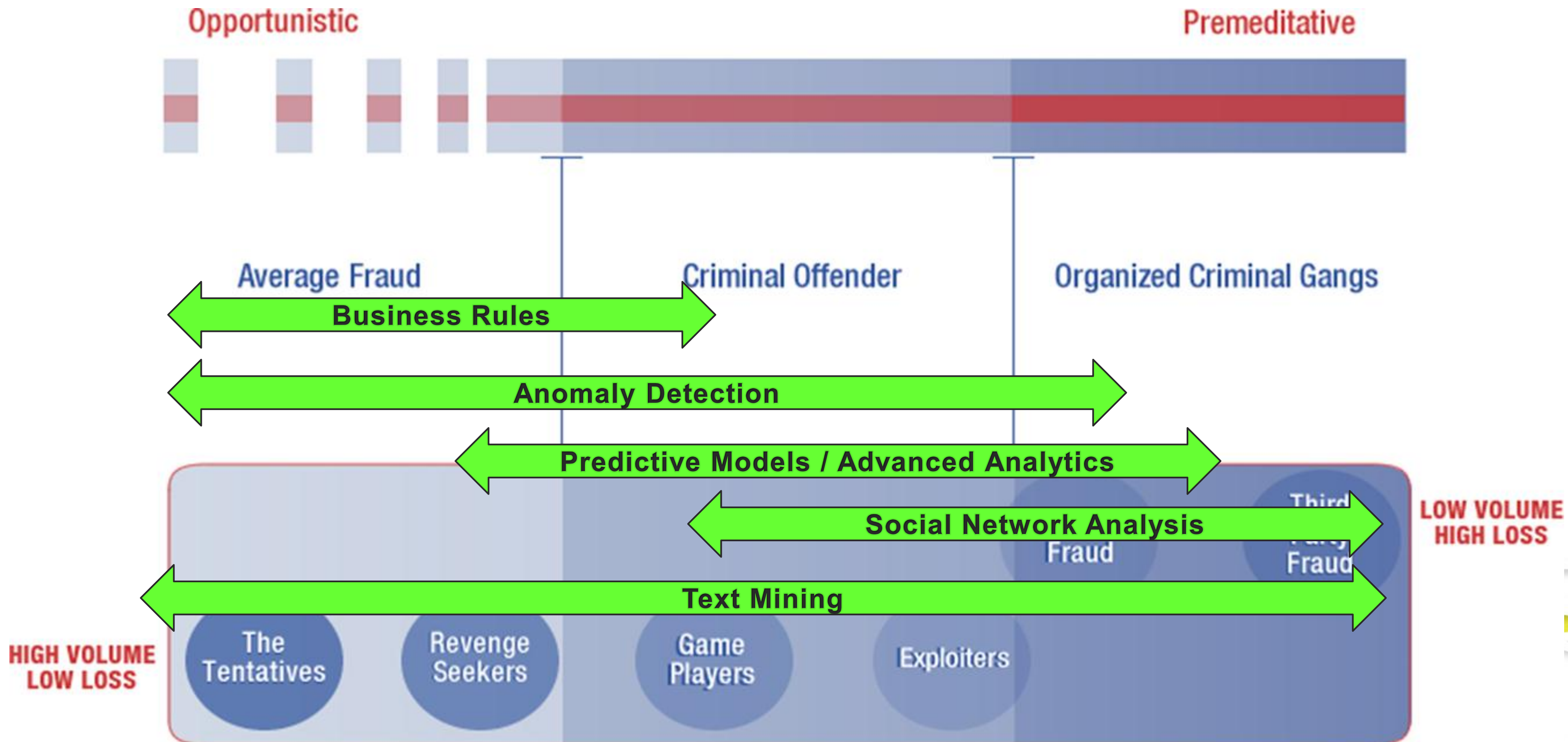
HIGH-PERFORMANCE ANALYTICS

END-TO-END CAPABILITIES



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HYBRID FRAUD DETECTION

SOCIAL NETWORK ANALYSIS

Establish connections between people and businesses through associative link analysis

ADVANCED ANALYTICS

Data mining and predictive assessment based on previous case outcomes

SAS Fraud Framework

TEXT MINING

Unlock the power of unstructured data within reports, staff notes and web sites

ANOMALY DETECTION - OUTLIERS

Identify individual and aggregate abnormal patterns that exist within your data

RULES

Automate rules based on known factors leading to improper payments and fraud

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Spectrum of Analytical Techniques

Past

Future

Mission Improvement / OUTCOMES

Business Focus & Decision Support Value

Technique	Question
Optimization	"What's the best that can happen?"
Predictive Modeling	"What will happen next?"
Forecasting/extrapolation	"What if these trends continue?"
Statistical analysis	"Why is this happening?"
Alerts	"What is happening?"
Query/drill down	"What exactly is the problem?"
Ad hoc reports	"How many, how often, where?"
Standard Reports	"What happened?"

Predictive Analytics

Descriptive Analytics

Now What?

So What?

What?

Operations & Administration / OUTPUTS

Reactive

Proactive

Response Type

Source: Adapted from Competing on Analytics: The New Science of Winning (Davenport / Harris)

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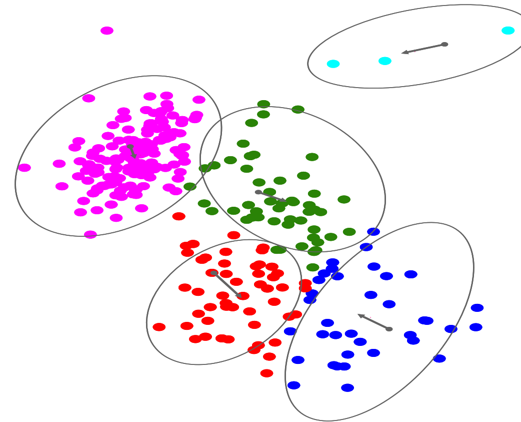
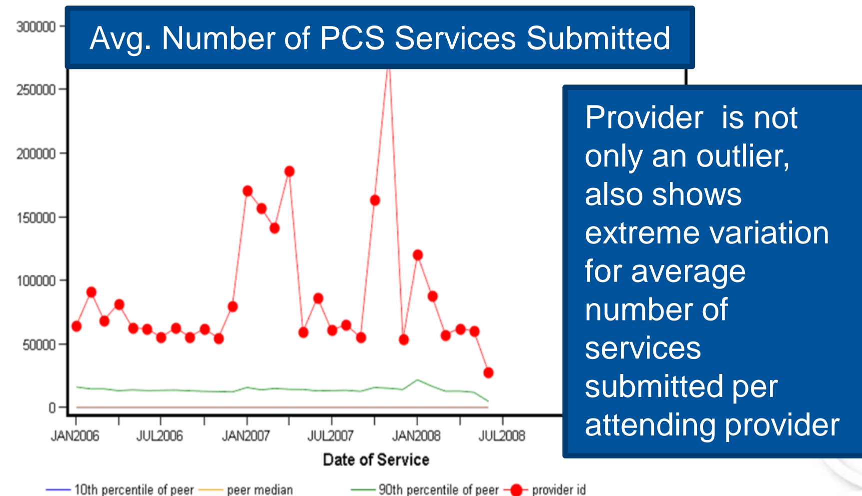
Analytic Approach: Unsupervised Methods

- Use when no target exists
- Examine current behavior to identify outliers and abnormal transactions that are somewhat different from ordinary transactions
- Include univariate and multivariate outlier detection techniques, such as peer group comparison, clustering, trend analysis, etc…





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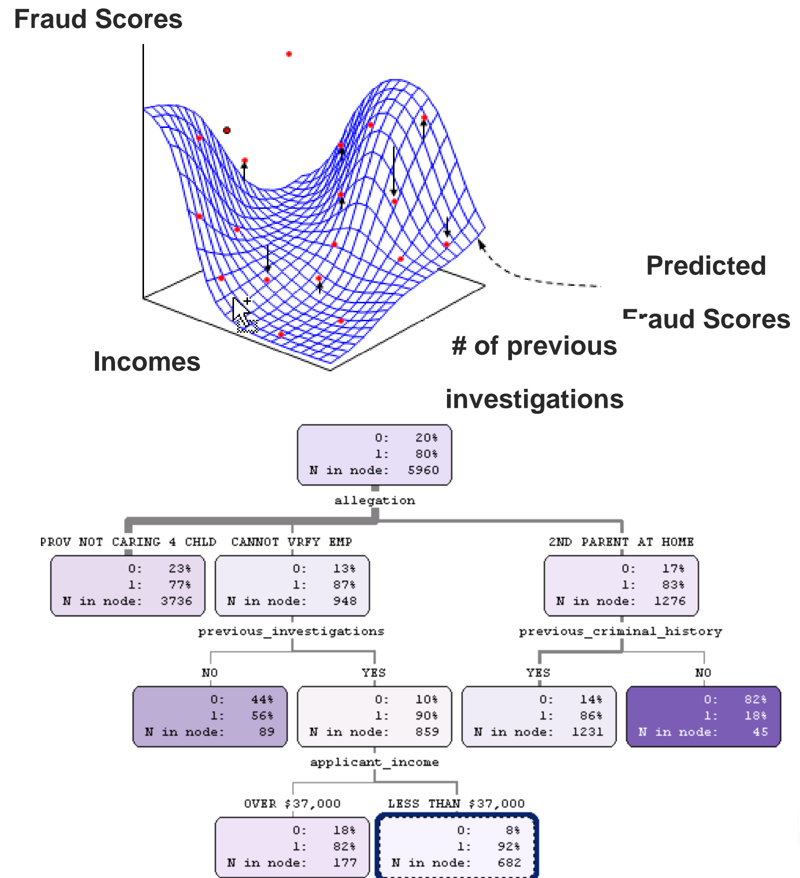
Analytic Approach: Supervised Methods

- Use when a known target (fraud) is available
- Use historical behavioral information of known fraud to identify suspicious behaviors similar to previous fraud patterns
- Include parametric and nonparametric predictive models, such as generalized linear model, tree, neural networks, etc…



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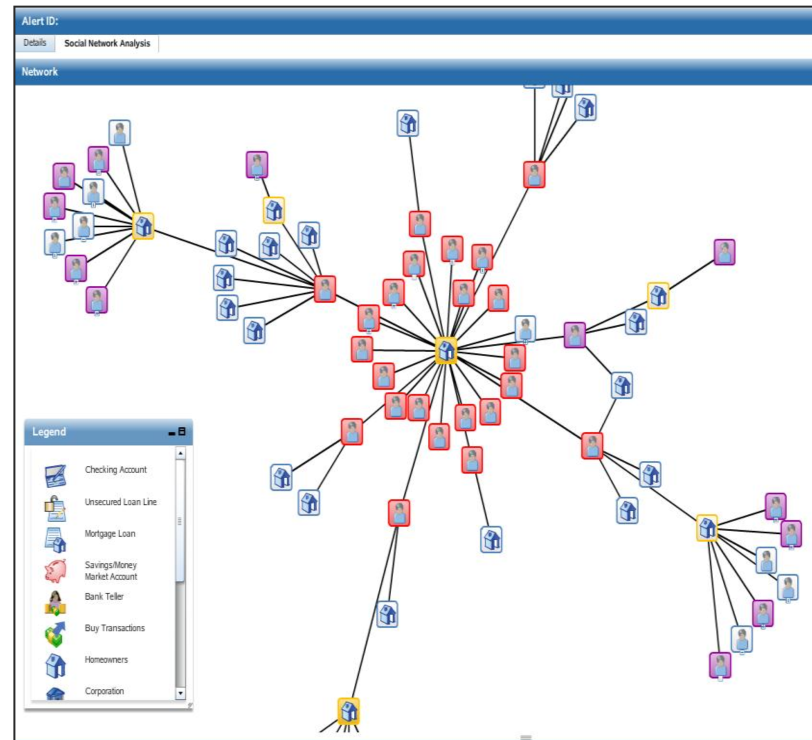
Social Network Analysis – Link Analysis

- Network scoring
  - Rule and analytic-based
- Analytic measures of association help users know where to look in network
  - Net-CHAID for local area of interest (node) in the network
  - Density, Beta-Index (network)
  - Risk ranking with hypergeometric distribution, degree, closeness, betweenness, eigenvector, clustering coefficients (node)
- Modularity (sub-network)



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Healthcare Data sources

Claims	Most analysis of adherent behavior is associated to claims information
Pharmacy Claims	Can be independent of regular claims and stored in a separate system, however in most case are received as regular claims.
Member/Beneficiary	General member data: age, region, gender, etc.. However, it can be severally limited. For example no information on medical information (i.e. weight, diet, medical issues, etc.)
Provider/Physician	General provider/physician data: specialty, license number, address, name, etc.
Call Center	This is generally more useful in member/beneficiary fraud, and requires text mining to put free-form text in a structured format
Facility	This could apply to any physical facility. Such as a hospital, clinic, provider's office, or DME supplier
Nurse Notes	Notes written by either a nurse on-site with the patient or over the phone. This information also and requires text mining to put free-form text in a structured format. Many institutions (fed, local & private) do not have this type of data available.
Provider/Physician Notes	Same as above, except for providers.
External sources	Data can come from external sources (other agencies, customers, private carriers) or data can be purchased.

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Value is leaking

▪ Causes

- Customers pretend to be somebody different
- People pretend that things happened that didn't happen
- People create teams to exploit loopholes in your system
- People gaming the system and getting their way
- People pay too little for what they get from you
- People get too much from you compared to what they are entitled to.
- You're spending too much effort on closing the holes
- You're spending too much time finding the culprits
- You're hurting customers you're chasing who are not "robbing" you

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Priorities

- Billing fraud
- Over charging
- Over Servicing
- (Up)coding
- Unbundling
- Misrepresentation
- Collusion
- Unnecessary services
- Doctor shopping for Rx
- Member compromise
- Identity theft
- Card fraud
- Bust-out fraud
- Internal fraud

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Approach ▪ Devise a strategy

▪Change Management:

- Create awareness/urgency
- Organize
- Set goals
- Adapt the culture
- Develop capability
- Find and Deliver quick wins
- Communicate progress and wins.
- Be ready to overcome obstacles

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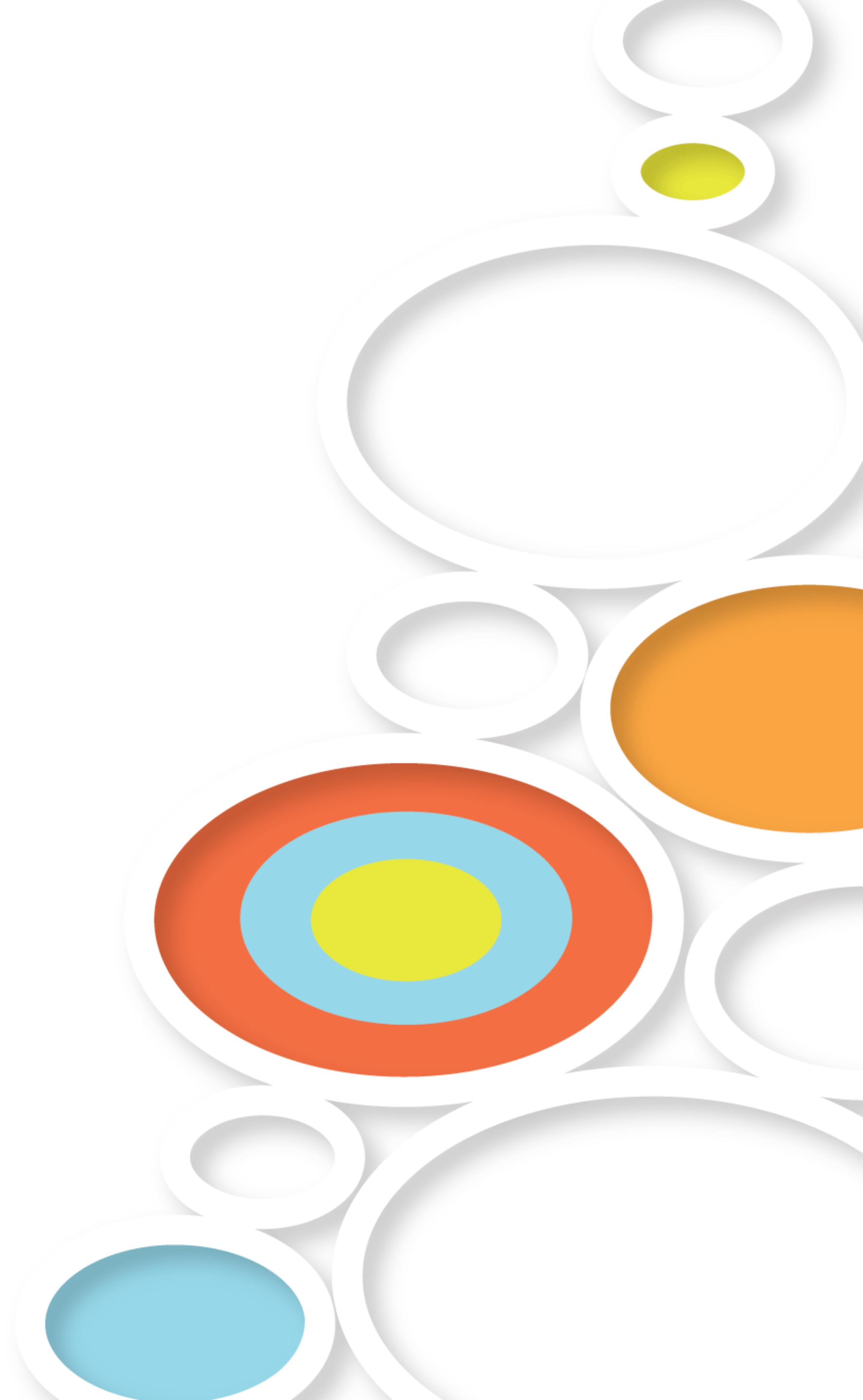

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