Collusion Detection
Las Vegas Style

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“… employees steal approximately $400 billion from American businesses each year.”

*U.S. Chamber of Commerce*
GAMING SCAMS
Opportunists Converge!
“Mini-light” Cheating Device
Bill Validator Defect

Credit
100

[Image of a slot machine and a $100 bill]
Roulette Past Posting
## Card Counting - 101

<table>
<thead>
<tr>
<th>Card Value</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 6</td>
<td>+1</td>
</tr>
<tr>
<td>7 - 9</td>
<td>0</td>
</tr>
<tr>
<td>10, J, Q, K &amp; Ace</td>
<td>-1</td>
</tr>
</tbody>
</table>

The table above shows the counting value for different card values in a game. The counting value is used to determine if the game is favorable to the player or the house. A positive count indicates a favorable game, while a negative count indicates an unfavorable game. The cards shown below illustrate the counting values for each level.
Card Counting Bet Strategy

Count
-2
$5

Count
+1
$5

Count
+4
$5

Count
+6
$1,000
Count Teams
No Big Bets?
The "Chip Cup"
The “Cooler”
Camera on the Game

Camera fits in a coat button.
Camera on the Game

Button is attached to a man’s jacket.
Camera on the Game

Strapped to the man’s body.
Camera on the Game

Images are transmitted to a vehicle in parking lot.
Camera on the Game

Slow motion video is used to identify card values.
Camera on the Game

Player is radioed with knowledge of next card.
SURVEILLANCE
INTELLIGENCE & FACIAL RECOGNITION

(Griffin GOLD, another strategic SRD system)
Surveillance
Surveillance Room
Griffin Investigations

World-wide tracking, investigations, and reporting of counters and cheaters.
Global Activity Monitoring
(Griffin 2000)

Puerto Rico
Game Integrity Protection

- Hiring standards
- Policies and procedures
- Training
- Surveillance/Security
- Shared intelligence
- Internal audits
- Background check updates
COLLUSION DETECTION
“Collusion”

“A secret agreement for fraudulent or illegal purpose; conspiracy.”

Webster’s New World College Dictionary
Consolidated Database

Desired Entities
- Applicants
- Employees
- Vendors
- Customers
- Prospects

Undesired Entities
- Griffin Subjects
- Incidents
- Organized Crime Digest
- Black Book
- Intelligence
Rule-Based Alert Reporting

**Alert Rule #1**

Employee relationships to undesirable entities

**Collusion?**

Marc Nelson (Arrested cheater)
Sue Brinkley (Roulette dealer)

*Share same phone number!*
Rule-Based Alert Reporting

**Rule #2**

Employee relationships between cash handlers and security

**Collusion?**

Brenda Delayne (Surveillance)  
Kevin Oswald  (Softcount)

*Shared residence  
*June 92 - May 95!*
Rule-Based Alert Reporting

**Rule #3**
Different employees determined as the same

**Fraud?**
Jose Galvin Jr.  (Cook)
Victor J. Galvin  (Dishwasher)
V. J. Galvinger  (Food Server)

*Share same tax ID, address, and phone!*
Rule-Based Alert Reporting

**ALERT RULE #4**
Vendor relationships to supervisor or higher level employee

**Collusion?**
Kirk Preston (A/P Manager)
Acme Paper ($1.2M Contract)

*Acme contact was a reference on Kirk’s application!*
Collusion Analysis Processing

HR Systems  A/P Systems  Sales Systems  Arrests/Incidents  External Systems

Address Hygiene
Name Standardization
Data Quality/Enhancement
Match
Merge

Consolidated Entity Database
Address Hygiene Node
Address Standardization

460 Oak Street
Mill Valley, Ca 94914

460 South Oak Ave
Mill Valley, Ca 94941

4737 Simeron Drive
Easton, Ma 02334

4737 Cimarron Drive
Easton, Ma 02334
Data Quality Node
Name Standardization

Dick, Dickie, Ricardo, Rich, Richie, Rick, Rickey, Ricki, Rickie, Ricky, Rikki, Ritchie

Ruhullah, Ruh-ul-Amin, Ruh-ul-Haqq, Ruhul Qudus

Richard

Ruh
Data Quality Node
Formatting Standards

(602) 731-1370  →  (602) 731-1370
7074121234  →  (707) 412-1234
557-672061  →  557-67-2061
897656  →  000897656
Alexander, Mark A. Jr. PHD

Last Name = Alexander
First Name = Mark
Middle Name = A
Generation = Jr
Suffix = PHD
Data Quality Node
Quality Standards

Phone Numbers
(213) 543-  Rejected (Length)
(800) 555-1212 Rejected (Generic)
(000) 000-0000 Rejected (Invalid)

Last Names
^%@$  Rejected (Symbols)
U  Reject?
Data Quality Node

Area Code Splits

Area Code Split
(702) -> (702)
(702) -> (775)

Area Code Correction
(702) 746-1052 -> (775) 746-1052
Data Quality Node
Data Source Confidence

Confidence Scale 1-10

Payroll System - 9.1
A/P System - 8.8
Hotel Resrv - 6.5
Arrests/Incidents - 7.6
NCOA - 9.8
Match/Merge Node
Relationship Testing

Step 1.
Locate Possible Matches

Step 2.
Confidence Evaluation

Matches
Relationships
Match/Merge Node

Confidence Evaluation

Robert I. Ashley Jr.  
1024 Mexcal 
Las Vegas, Nv. 89110 
132-42-1776 
(702) 401-0008 

“Known Felon”

Bob Ashley 
1024 Mescal Way 
Las Vegas, Nv. 89110 
133-42-1776 
(707) 459-5678 

“Employee Address Change”
Entity ID# 00034256

Names
Sue Loudin
Susan Fran Miller
Sue Miller-Loudin

Addresses
460 S. Oak Ave.
4737 Cimarron Dr.
POB 17454
1101 Princeton #31

Numbers
(702) 555-2091
(916) 342-6721
012-34-5678
5021 1111 2391 1231

Relations
Spouse: John Loudin
Ref: Mary Miller
Ref: Jason Miller
Ref: Kelly Jones
EXTERNAL DATA ENHANCEMENT
External Data Enhancement

- Human Resources
- Accounts Payable
- Trans. Data
- Arrests & Incidents
- External Data

Address Hygiene
Name Standardization
Data Quality/Enhancement
Match
Merge

Consolidated Entity Database
External Data Enhancement

- Last 10 years of addresses
- Address latitude/longitude
- Aliases
- Phone number
- Date of birth
- Social Security Number
- Property ownership
- Bankruptcies
- Lifestyle indicators (Income, purchasing power, etc.)
RESULTS ...
SUMMARY OF FINDINGS ...

Information received July 13, 2000 that Kelly Smith, an agency accounts payable employee, may have a relationship to ACME Chemical, an agency vendor.

SOURCE DATA OF FINDINGS ...

Kelly Smith has been employed since December 1998 at the agency in the position of "Accounts Payable Manager". Agency human resource records indicate her emergency contact's residential phone number is (702) 892-0987, identical with listed business phone number of ACME Chemical.

Kelly Smith, Employee #30203 Emergency Contact: Tony Smith (702) 892-0987 ACME Chemical, Vendor #84-961452 (702) 892-0987

RECOMMENDED ACTION ...

Based on the above information indicating a possible relationship between Smith and ACME Chemical it is recommended that an appropriate investigation should be conducted determining the principals in ACME Chemical and relationships, if any, between the principals and Smith.
Collusion Testing at a Large US Retailer

• Extent of Analysis
  – 800,000+ employees including emergency contact information
  – Vendors including up to 8 alternate addresses
  – Arrests

• Findings
  – 564 Employee who have vendor or criminal relationships
  – 26 Employees who are vendors
Collusion Testing at a Major Strip Casino

• Extent of Analysis
  – 20,000+ employees (current and terminated)
  – All vendors
  – All slot club and table games rated players
  – In-house arrests/incidents database
  – Griffin database

• Findings
  – 24 active players were known Griffin subjects
  – 23 players had relationships to prior arrests/incidents
  – 12 employees were themselves the player
  – 192 employees had possible vendor relationships
  – 7 employees were the vendor
Federal Agency Findings (during a 3 day pilot)

- **Extent of Analysis**
  - 20,000+ employees (current & Northeast only)
  - 75,000+ vendors
  - 400,000+ security risk entities

- **Findings**
  - 140 employee relationships to vendors
  - 1451 vendor relationships to security risks
  - 253 employee relationships to security risks entities
  - 2 vendors were the security concern
  - “n” employees were the security risk/vendor
TOO LATE!
NEAR REAL-TIME DATA WAREHOUSING & ALERT ESCALATION
Near Real-Time Analysis

HR System
A/P System
Trans System
Mktng System
Incident System

Address Hygiene
Name Standardization
Data Quality/Enhancement
Match
Merge

(<8 seconds to page!!!)

ALERTS
Data Warehousing Style

Architecture

Source Systems

IN

Master Files & Config.

Enterprise-wide Data Warehouse

Message Log

Message Registration

Address Hygiene

Data Quality Management

Match/Merge

Administration
Data Warehousing Style
Architecture

Consolidated Entity Database
System Integration

Source Systems
Serious Dependencies

Source Systems
Central Messaging Engine (CME)

Source Systems

NODE

PIPELINE
(Universal Message Formats)

NODE

NODE

NODE

NODE

Source Systems
CME Routing Rules

Source Systems

NODE

PIPELINE
( Universal Message Formats )

NODE

NODE

NODE

Source Systems
Near Real-time Warehouse

Source Systems

NODE

NODE

NODE

NODE

PIPELINE
(Universal Message Formats)

Message Registration

Address Hygiene

Data Quality Management

Match/Merge

Enterprise-wide Warehouse
Near Real-time Alert Escalation

Source Systems

PIPELINE (Universal Message Formats)

Message Registration
Address Hygiene
Data Quality Management
Match/Merge

!!!
FINAL THOUGHTS
Special Considerations

- Size of data set changes tuning
  - Match/merge rules
  - Proximity derived relations (latitude/longitude)
- Adjust alert rules for creating actionable output
Critical Success Factors

- Always load the good guys and the bad guys
- Need rich data sets
  - e.g. Emergency contacts, employment references
- Need volumes of data
  - Small entity data sets have limited returns
- Use data enhancement techniques for military grade results
  - e.g. address histories, latitude/longitude, bankruptcies, lifestyle indicators, etc.
what might you find?
QUESTIONS?
Collusion Detection
Las Vegas Style

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