Check Fraud Prevention Webinar

Man vs. Machine: Who's Better at Preventing Check Fraud?

June 20, 2012, 1:00 - 2:00 pm ET
Hosted by
Joe Gregory, VP Marketing
Orbograph

Featuring
Greg Council,
Director of Product Mgmt
Parascript
For Attending Today’s Webinar!

(3) Prize Drawings
Livescribe 4GB Echo Smartpens

Whitepaper:
Increase Security Through Signature Verification Technology
Today’s presentation can be downloaded here. Brochures and other information also available.
Today’s Agenda

1. ABA 2011 Deposit Acct Fraud Survey analysis
2. Exploration: forgeries, counterfeits, alterations
4. Leveraging “the signature” for authentication
5. Challenges and solutions
Company: Orbograph

- Check recognition core competency
- Check image analysis
- Multi-Source Correlation Modeling™
- Sereno™ fraud prevention solution providers

Company
ABA Study
Fraud Types
Image Analysis
Man vs. Machine
Technology
Sig. Authentication
Workflows
Challenges
Closing
Image Analysis and Automated Signature Verification (ASV)

Payee & Payer Match:
- Serial # Matching: Counterfeits
- CAR/ LAR Comparison: Counterfeits
- CAR Style Analysis:
- Check Stock Validation (Field locations):
  - Counterfeits

Automated Signature Verification (ASV):
- Forgeries (Skilled & Unskilled)
Company: Parascript

- Software toolkits for automated
  - forms processing, check fraud prevention, medical imaging, Check 21, remittance processing and postal automation

- Captures all character types
  - variety of images, cursive, handprint (ICR) and machine print (OCR)
• **SignatureOnline™**
  – voted best performance for online signature verification at the 10th International Conference on Document Analysis and Recognition

• **SignatureXpert®**
  – awarded best performance for forensic signature verification at 12th International Conference on Frontiers in Handwriting
ABA 2011 Deposit Account Fraud Survey
Study “Check” Highlights

- 9th biennial study: check, debit, online, mobile, phone, ACH, wire
- 2011 (2010 data) vs. 2009 (2008 data)
- Statistical sampling: 117 full participants, 68 abridged survey
  - <500M - $500M-$4.9B
  - $5B - $49.9B - $50B+

- Attempts: $11B vs. $11.4 (↓ 3.5%)
- Losses: $893M vs. $1.024B (↓ 12.8%)
  - Consumer accounts (↓ 62% from 74%)
  - Small business accounts (↓ 21% from 16%)
  - ID Theft (↓ 16% from 4%)

Source: ABA 2011 Deposit Account Fraud Survey
ABA 2011 Deposit Account Fraud Survey Study “Check” Highlights

<table>
<thead>
<tr>
<th></th>
<th>Community</th>
<th>Mid Sized</th>
<th>Regional</th>
<th>Superregional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size (117)</td>
<td>22</td>
<td>58</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>Unabridged size (68)</td>
<td>51</td>
<td>14</td>
<td>3</td>
<td>0</td>
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<tr>
<td>% with Check Fraud 2010</td>
<td>68%</td>
<td>95%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>% with Check Fraud 2008</td>
<td>72%</td>
<td>97%</td>
<td>100%</td>
<td>100%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of cases 2010</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Median</td>
<td>6</td>
<td>17</td>
<td>207</td>
<td>4,425</td>
</tr>
<tr>
<td>Mean</td>
<td>19</td>
<td>67</td>
<td>352</td>
<td>14,077</td>
</tr>
<tr>
<td>Total losses ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>5,057</td>
<td>31,220</td>
<td>384,331</td>
<td>7,370,980</td>
</tr>
<tr>
<td>Mean</td>
<td>8,690</td>
<td>62,670</td>
<td>613,932</td>
<td>24,344,555</td>
</tr>
</tbody>
</table>

$893M still remains…but averages have dropped

Source: ABA 2011 Deposit Account Fraud Survey
### ABA 2011 Deposit Account Fraud Survey Study “Check” Highlights

<table>
<thead>
<tr>
<th>Case Difference 2010 vs. 2008 Data</th>
<th>Community</th>
<th>Mid Sizd</th>
<th>Regional</th>
<th>Superregional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>(8)</td>
<td>(12)</td>
<td>(184)</td>
<td>515</td>
</tr>
<tr>
<td>Mean</td>
<td>(4)</td>
<td>(3)</td>
<td>(168)</td>
<td>(1,126)</td>
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<tr>
<td><strong>Total loss Difference ($)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>(7,497)</td>
<td>(15,791)</td>
<td>(300,129)</td>
<td>(953,317)</td>
</tr>
<tr>
<td>Mean</td>
<td>(6,529)</td>
<td>(44,046)</td>
<td>(127,292)</td>
<td>(6,363,448)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Difference 2010 vs. 2008 Data (%)</th>
<th>Community</th>
<th>Mid Sizd</th>
<th>Regional</th>
<th>Superregional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>-57%</td>
<td>-41%</td>
<td>-47%</td>
<td>13%</td>
</tr>
<tr>
<td>Mean</td>
<td>-17%</td>
<td>-4%</td>
<td>-32%</td>
<td>-7%</td>
</tr>
<tr>
<td><strong>Total loss Difference ($)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>-60%</td>
<td>-34%</td>
<td>-44%</td>
<td>-11%</td>
</tr>
<tr>
<td>Mean</td>
<td>-43%</td>
<td>-41%</td>
<td>-17%</td>
<td>-21%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>% of Check Fraud 2010</th>
<th>Community</th>
<th>Mid Sizd</th>
<th>Regional</th>
<th>Superregional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4%</td>
<td>6%</td>
<td>8%</td>
<td>82%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of Check Fraud 2008</th>
<th>Community</th>
<th>Mid Sizd</th>
<th>Regional</th>
<th>Superregional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8%</td>
<td>9%</td>
<td>7%</td>
<td>76%</td>
</tr>
</tbody>
</table>

Source: ABA 2011 Deposit Account Fraud Survey
ABA Study Highlights
Why The Decline in Check Fraud?

- Improved systems
- Product adoption
- Greater awareness
- Faster clearing/rules
- Other payment channels less protected?
- Volume decline? n/a
- Did the fraudsters go downstream or back upstream?
ABA Study Highlights
Why The Decline in Check Fraud?

- Did the respondents classify the fraud into the appropriate categories?
  - Check to ACH
  - Deposit fraud (% should be larger)
  - Debit card loss (How much was deposited by a check?)

“Fraud patterns have changed dramatically over the past several years. It’s no wonder large financial institutions are concerned about cross channel fraud. We need a more standard categorization system to better identify the buckets for control purposes.” Jodi Pratt of Jodi Pratt and Associates & The Santa Fe Group.
Fraud Type Losses 2010

Opportunities for ASV, CSV, automated endorsement & PNV

Source: ABA 2011 Deposit Account Fraud Survey
ABA Study Highlights
Top Risks Next 12 Months

- Threats against deposit accounts
  - Signature debit card fraud
  - Customer victimization scams
  - ACH origination
  - Cross channel fraud
  - Deposit, on-us fraud (larger banks)

- Duplicate posting/presentment in RDC

- in volumes all new channels
- New account fraud
- Does this mean we solved check fraud?

Source: ABA 2011 Deposit Account Fraud Survey
ABA Study Highlights
Predicting Higher Numbers 2012

Are checks at greater risk than other payments moving forward?

Source: ABA 2011 Deposit Account Fraud Survey
1. What check fraud is the highest concern for your organization in 2012?

1. Counterfeits
2. Forgeries
3. Deposit fraud (RDI)
4. Alterations
5. Insufficient funds
6. Not concerned
Drawing #1

(3) Prize Drawings
Livescribe 4GB Echo Smartpen
The Solution Starts with the Attributes of Each Fraud Type

- **Counterfeit**
  - Different check Stock
  - Serial Out Of Range or Duplicate
  - Many times different signature

- ** Forgery**
  - Different signature
  - Same check stock
  - Serial in range

- **Amount Alteration**
  - Fonts discrepancies or CAR ≠ LAR
  - Same check stock
  - Same signature
  - Serial in range
## Integration with Fraud Filters (Data Analytics)

<table>
<thead>
<tr>
<th>Fraud Types</th>
<th>Image Analysis</th>
<th>Man vs. Machine</th>
<th>Technology</th>
<th>Sig. Authentication</th>
<th>Workflows</th>
<th>Challenges</th>
<th>Closing</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Counterfeit</th>
<th>Forgery</th>
<th>Alteration</th>
<th>Return/Oper Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different check stock</td>
<td>✔</td>
<td>±</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similar check stock</td>
<td>±</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Different signature</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Same signature</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indications of Alternation</td>
<td>±</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>CAR≠LAR</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Duplicate</td>
<td>✔</td>
<td>±</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Serial out of range</td>
<td>✔</td>
<td>±</td>
<td></td>
<td>±</td>
</tr>
<tr>
<td>Serial in range</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Amount out of range</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Amount in range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre authorized Draft</td>
<td>±</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White list payee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black list payee</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature match</td>
<td></td>
<td>±</td>
<td>±</td>
<td></td>
</tr>
<tr>
<td>Signature mismatch (profile)</td>
<td>±</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Signature missing</td>
<td>±</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

- Attribute supports fraud: suspicious
- Evidence present: highly inconclusive
Challenge: $31,759.23
Amount out of range
Solution: Merge with Image Analysis
Opportunities for Image Analysis

- 42% apply random signature verification
- 88.5% apply large dollar signature verification
- Although 53.8% of Super Regional's use CSV
  - Only 17.4 Regionals and 27.6% overall
- Payee Verification
  - 78.6% Super, only 41.8% overall

Source: ABA 2011 Deposit Account Fraud Survey
Summary
Realities of On-Us vs. Deposit Fraud

- On-Us fraud prevention is easier than Deposit
- Build up your On-Us defenses
  - Inclearing, OTC cashed checks, ATM and RDC
- Use Reg. CC availability schedules to your advantage
  - Returns 1-3 days (disadvantage for Depositing FI)
- Leverage technologies of On-Us for Deposit
- Jodi: Exchange partnerships

“Your deposit is my on-us fraud”
Polling #2

1) What is your largest check fraud system concern?
   1) Create too many false positives.
   2) Do not catch enough fraud (false negative)
   3) Antiquated
   4) Modest concerns: more features
   5) Modest concerns: add image analysis
   6) No concerns
Man vs. Machine:
Who's Better at Preventing Check Fraud?

Featuring
Greg Council,
Director of Product Mgmt
Parascript

(Representing the Machine)
### Examples of Signature Fraud

**Person 1**

<table>
<thead>
<tr>
<th>Genuine Signature (Profile Image)</th>
<th>Charity M. Sawyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random Forgery</td>
<td>Horner Stanford</td>
</tr>
<tr>
<td>Blind Forgery (Unskilled)</td>
<td>Cassidy Sawyer</td>
</tr>
<tr>
<td>Skilled Forgery</td>
<td>Cassidy M. Sawyer</td>
</tr>
</tbody>
</table>
Signature Scenarios
Importance of the Profile Images

- There are often more deviations in genuine signatures than in skilled forgeries
  - There are other unstable elements that may be present or omitted in genuine (profile) signatures
  - Middle initial is often skipped in genuine signatures
- Deviations depend on the environment where the signature is signed
  - At the bank vs. grocery store
  - Local business person in the field
Two largest problems/errors
By The ASV Machine

Accepted Forgery

Rejected Genuine

Customer Genuine Profile Image

Customer Genuine Profile Image

Man vs. Machine
Technology
Sig. Authentication
Workflows
Challenges
Closing
• Two tests were conducted:
  1. College-educated reviewers trained to understand and analyze key areas to examine with skilled forgeries.
  2. Trained operator test using random and unskilled forgeries.
• The objective: Identify and reject as many forgeries while accepting genuine signatures.
Man Vs. Machine – Skilled Forgeries

Verification Results on Skilled Forgeries

Perfection!!
Verification Results on Random Forgeries

Perfection!!
Real Operation Examples

Rejected Genuine

Accepted Random

Man vs. Machine

Technology

Sig. Authentication

Workflows

Challenges

Closing
Man Vs. Machine – Why the Difference?

- Machine performs better. Why?
  - Mathematical calculations
  - Probability of deviation
  - Uses confidence levels
  - Compares to multiple profile images: statistical representation of the account attributes

Result: Superior, consistent performance

- Visual verification (manual) fairs worse.
  - Reasons: expertise, fatigue, mood, state of health, working conditions (light, noise), etc.
Technologies Galore
(Illustrate the Top 3)

1. Parascript’s proprietary, patented special descriptive language
2. Analytical method:
   - Signature segmentation and correlations between fragments of reference and suspect signatures.
5. A verifier that employs 2D matching of vectorized signature images.
6. Fourier analysis of shape and pen width variations of signature elements.
7. Radon transform verifier.
Signature Technologies/Techniques

Technology

Sig. Authentication

Workflows

Challenges

Closing

XR Interpretation – 2 sigs

Fragments comparison
Signature Technology Improvements

- Technology continues to improve
  - 25% detection boost
  - 50% reduction in false positives
- Signature types:
  - European vs. North American
- Regional styles:
  - One signature, two signatures?
- Image processing:
  - Detection with non-standard forms
  - Image pre-processing
Benefits of the Machine

- Process higher volumes in shorter periods of time
- Target all items
- Reliability
- Set tighter dollar thresholds
- Increase productivity
- FTE reduction vs. coverage
And the Winner Is!

- **Machine wins:**
  - 1: Random Forgeries
  - 2: Skilled Forgeries
  - 3: Complete review

- **Human wins:**
  - 1: Escalation for skilled forgeries

- **Is full automation possible?**
- **We need each other!**
"It is interesting to note that the handwritten signature lives a life of contradiction. On one hand, it is a primary authenticator used millions of times daily in finance, health-care, government, and elsewhere and is culturally accepted, non-invasive and lacks all the privacy fears of biometrics. On the other, there is little to no verification in place for practical use in many of these applications. There has never been a better time to fully incorporate automated signature verification (ASV) that assigns full accountability and eliminates identity theft."

Robert Siciliano  IDTheftSecurity.com
Endorsement Detection ≠ Signature Authentication

- OTC Deposits
- Teller operation
- Back office
- Inclearings
- Exception processing
- Special cases, other workflows
- High dollar focus
Workflow Opportunities
Leveraging the Signature

Check Workflows

- Check Image Analysis: Inclearing, POD
- RDC, ATM, RPS other
- Teller capture
- Inter-bank

Non-Check

- Customer Authentication (OTC)
- Loan and Credit Card Applications
- Contracts, Notaries
- Online Verification

Robust Signature DB for Enterprise Authentication and Verification
Polling Question #3

Has your org. considered extending ASV from checks to loans, applications or other business areas?

1. Yes – we do that now
2. Yes – we are evaluating
3. No – it would be ideal
4. No – it is not a consideration
## Challenges & Solutions

### Map Capabilities...Consider Silos

<table>
<thead>
<tr>
<th>Challenges</th>
<th>On-Us Fraud</th>
<th>Teller Fraud</th>
<th>Deposit Fraud</th>
<th>Kiting</th>
<th>Loan/CC Authenticate</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Analysis</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(Signature)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-Check Stock</td>
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<td></td>
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<tr>
<td>-CAR Style</td>
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<tr>
<td>Data Analytics</td>
<td>X</td>
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<td>X</td>
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<td>x</td>
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<td>- AOOR, SOOR</td>
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<tr>
<td>Account Monitoring</td>
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<tr>
<td>Endorsement</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Payee Recognition, Matching, or PNV</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payer</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Challenge: Integrated Functions

Fraud Detection

- Image Analysis
  - Automated Signature Verification
  - Check Stock Validation
  - Check Style Analysis
  - CAR/LAR Matching
  - PAD/RCC Detection
  - Payee Matching / PNV*

- Data Analytics/Transaction Analysis
  - Serial Out of Range
  - Amount Out of Range
  - New Account
  - Watch List (Account Level)

Deposit Operations Functions

- Image Review
  - Missing Signature Detection
  - Dual Signature Detection
  - Image Quality/Usability/Integrity
  - Automated Endorsement Analysis*
  - Amount Verification

- Transaction Monitoring
  - High Dollar Review
  - Duplicate Detection
  - Closed Account
  - Inactive Account
  - Dormant Account
Inter-Bank: Same Day Exchange Partnerships

Depository Institution
BoFD

Vendor XYZ

In-House
Sereno

Paying Bank #1

11am

Items Cleared

1pm

Items Cleared

Items Cleared

Hold Funds!
(Doubtful Collectability)

In-House Sereno

Paying Bank #2

In-House Sereno

Paying Bank #3

orboGraph
Strategy for Check Workflows

- Cashed Checks
- Split Deposits
- Selective Deposits
- PNV (Module)

- Loan Apps*
- CC Apps*
- Customer ID*
- Deposit Ticket ASV*

- ACH Converted*

- establishing ATM, RDC On US

- Real-Time Teller

- Signature Verification with Image Analysis

- Inclearing
- Day 1 & Day 2
- Payee Hotlist
- Amount Verification (AV-Module)

- Kiting
- Payer Recognition
- Payee Match of Account Holder*

- Deposit Fraud
- High Risk Transit
- Targeted Local Customers
- PAD & AEA
- Cashier Checks

- ACH, Electronic

- Deposit Operations

- Dual Threshold/Missing Sig
- High Dollar
- Endorsement
- Closed/Inactive/Dormant
- Hot Lists

*Updates required
• The signature is underutilized
• Man and machine together
  – Credit card example: call and verify
  – Many ways to implement and optimize
• Test it out?
• Questions
• Polling & prize drawing
Polling #4

Please rank today’s webinar based on how beneficial it was for you.

1. Awesome: Made my day
2. Very good: I really enjoyed it
3. Average: Not a life changing event
4. Below average: A bit disappointed
5. Poor: The prize drawing was best
Drawing #2, #3

(3) Prize Drawings
Livescribe 4GB Echo Smartpen
Thank You!

- Q&A
- See our business partners
- Add’l Questions?
  - Joe.gregory@orbograph.com
  - 800-995-2502 x 5046
- Email tomorrow with white paper!