Minimizing Liability When Imaging Checks

A Study of Production Check Image MICR Verification

Introduction

- **Who is this for?**
  - Anyone scanning checks to extract data
  - Anyone planning on printing IRDs
- **Why is it important?**
  - Traditional Redundant Verification Processes No Longer Apply
- **What will we discuss?**
  - A Study of Check Image Substitution Errors

Personal Introductions

- **Bill Lange**
  - Sales & Marketing for All My Papers
- **Larry Krummel**
  - Principal author of this presentation
  - President of All My Papers
  - X9 Committee Meeting Conflict

All My Papers

- All My Papers is the developer and distributor of software toolkits, applications and hardware that processes images, extracts data, and prints checks and documents.
- All My Papers products are used by thousands to process millions of images every day.

All My Papers Customers

All My Papers products are primarily sold to:

- Independent Software Vendors (ISVs) for incorporation in their own branded applications

- System integrators and value added resellers and large corporation for inclusion in custom developed applications.

Case Study Background

- Large U. S. Bank – wants to print IRDs
- Conix Systems Inc, an ISV, uses All My Papers technology to develop an IRD printing application
- Issues when attempting to print IRDs

Check Image Processing

- The Automated Clearing House (ACH) Network

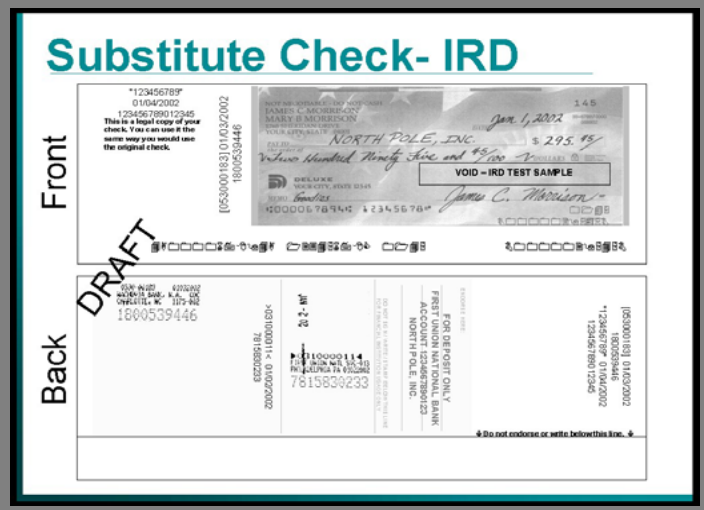
- Substitute Check (Check 21) aka Image Replacement Document (IRDs)

ARC Issues

- **Accounts Receivable Check - ARC**
- **Exclusions**
  - Business Checks
  - Government Checks
  - Money Orders
  - Checks over $2500
- **By agreement – liabilities accrue to truncator**

Substitute Checks aka IRD

- Negotiable Instrument
- MICR data on IRD must match original check MICR
- Check 21 Law - liabilities accrue to IRD printer



IRDs To Replace ARC Exclusions Process

- Remote capture of check images
- Extract check information for banks database
- Develop X9.37 files for Cash Letters
- Print IRDs from X9.37 files

The Problem

- **Capture Devices have a Hardware SUBTITUTION Error Rate of (1) % or More.**
- **One Check out of One Hundred Creates a Potential Liability.**

The Study

- Source of check images
- Define terms
- Methodology
- Results

Source of Check Images

- Image Cash Letters (X9.37) used as source
- Typically 500-1000 checks per X9.37
- Capture hardware varied or unknown
- Checks are ARC Exclusions
- Images are all Binary
- Total of 25 Image Cash Letters studied
- Approximately 19,000 check images

Substitution & Reject – Defined

- **Reject –** MICR magnetic scanner cannot read data, sends check to exception pocket
  - Scanner operator then rescans check
- **Substitution Errors –**
  - Wrong Character reported
  - Have much more serious consequences

Suspects - Defined

Suspect

- **Our definition of a suspect is:**
  - Data in database associated with check is different than the MICR OCR results.

MICR OCR Process

- MICR OCR results are obtained by first cleaning up the image
  - Automatically rotating so check image is in the correct orientation
  - Automatically rotating so the check image is right side is up
  - Removing Black edges
  - Straightening the skew
- Passing the MICR line data through multiple OCR engines and comparing the results
- Comparing MICR data to known database such as ABA routing numbers.

Hardware Reader

- **Reject Rates Unknown**
  - Hearsay data suggests less than 1%
  - Operators were upset when over 1%
- **Substitution Error Rates varied from 0.5% to 1.5%**
- **Typical Substitution Error was 1%.**

The Method

- Software compared the results of a MICR OCR engine with the Magnetic read from the hardware
- Any variance was logged in a “suspect” file.
- All variances were manually reviewed.

Results - Substitution Errors

- **Hardware Substitution Errors 0.01 Typical**
- **Software Substitution Errors < 0.0001 Typical**
  - Checks with software rejects were not included in the software substitution figures.
  - Implicitly hardware rejects were not included in the hardware substitution figures.

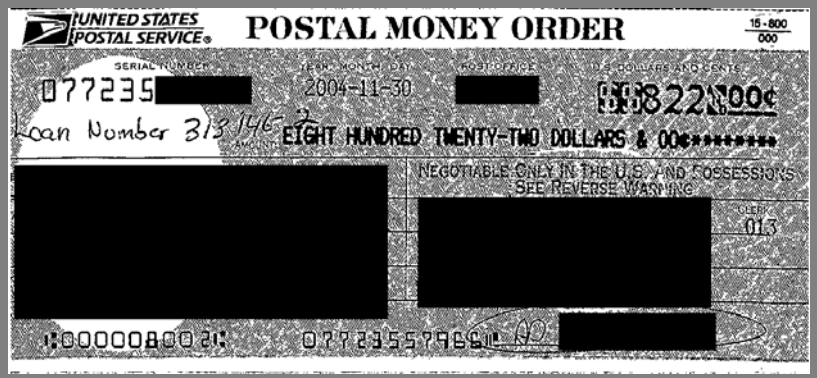
Results - Reject Rates

- **Hardware Reject Rate -** Unknown
- **Initial Software Reject Rate -** Ranged from 3 to 20 per cent
- **Current Software Reject Rate -** Ranges from 1.5 % to 3% and typically 2%. - **After Image Enhancement Installed**

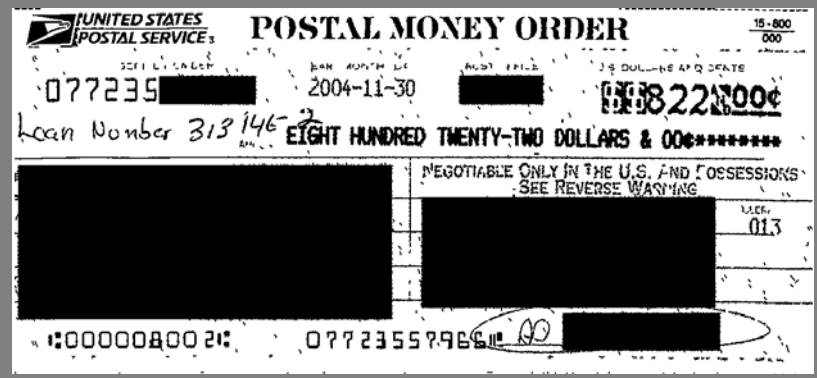
Sample Images

Automatic Check Image Repair

- Too dark
- MICR read impossible

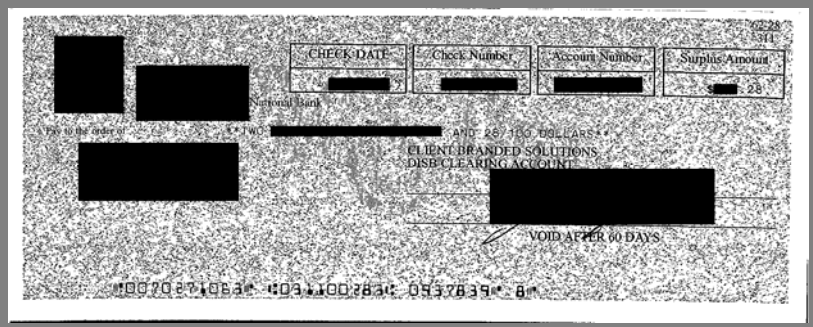


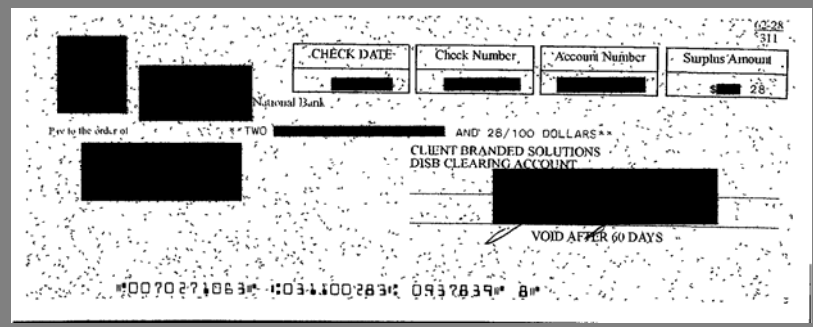
- AMP automatically removes background



Automatic Check Image Repair

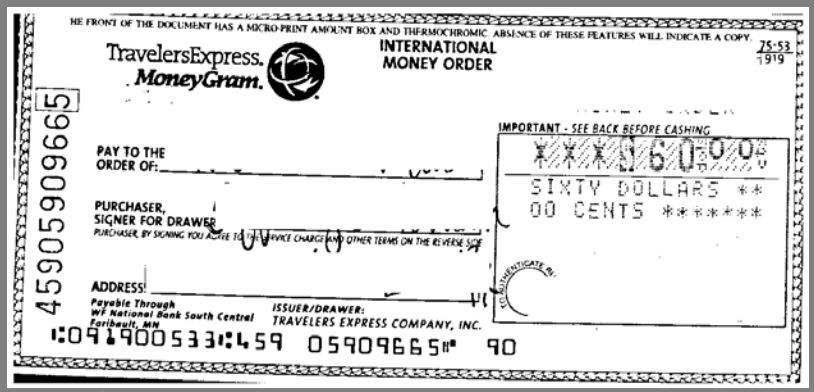
- Background patterns
- Normal de-speckle processes will not fix this image
- AMP background removal
- Ready for MICR OCR



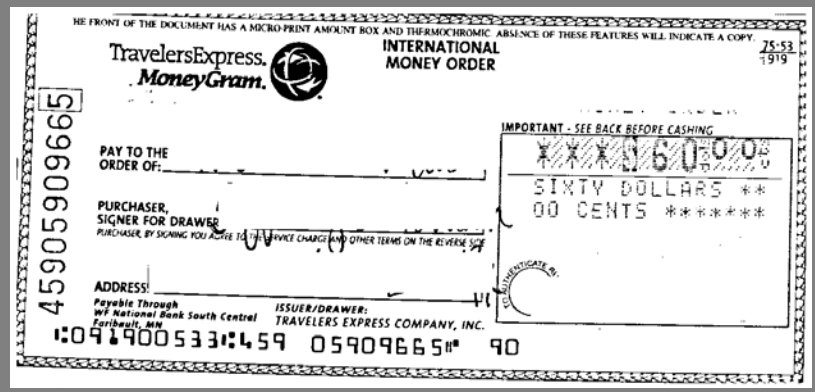


Automatic Check Image Repair

- Black edge removal
- AMP Removes black triangle



- Black triangle shows improper de-skew



- Black triangle removed so image can now be de-skewed

Statistics

- Numbers don’t lie, but you can lie with numbers

Lies, Damn Lies and Statistics

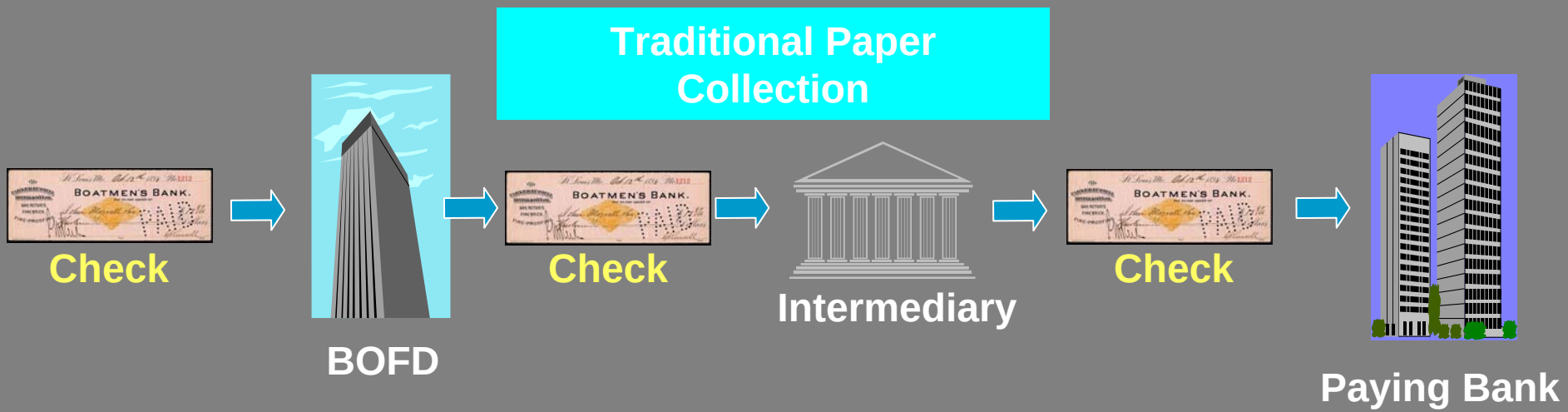
- **Automatic Correction**
  - Rule: Use good OCR result when it does not compare with hardware result.
  - Probability of substitution error if not done is 0.01 (one out of hundred).
  - Probability of creating substitution error if MICR Verification is done is 0.01 x 0.0001 = 0.000001 (one out of million).

More Lies, Damn Lies and Statistics

- **Total probability of Substitution Error**
  - Unverified because of OCR Rejection
    - 0.01 x 0.02 == 0.0002 (two in ten thousand)
  - Probability of creating substitution error
    - 0.01 x 0.0001 == 0.000001 (one out of a million).
  - Total Probability of any Substitution Error
    - 0.000201 (a little over two in ten thousand)

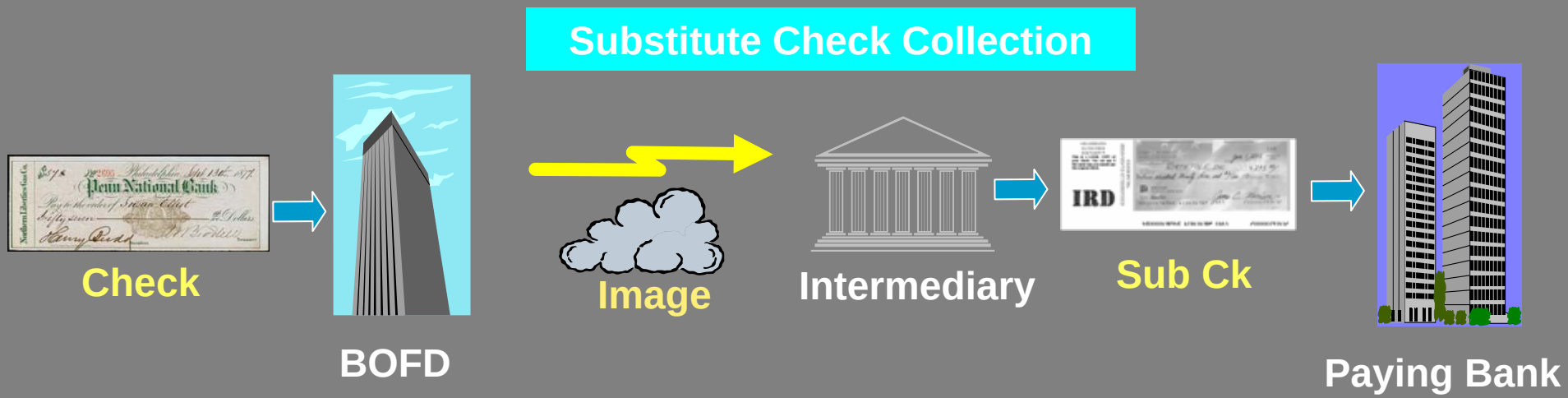
The Current Verification Process

- Paper checks are sorted and the data verified multiple times during the standard check clearing process



The New Verification Process

- The only time the check data is verified is at the time of original scan.



Check Imaging Means Verification Only Once

- Check imaging is changing our processes
- Data is only verified at the time of original scan
- Can you afford a 1% substitution rate?

Conclusion

- Without MICR verification and automatic image repair your liability is 1 in 100
- With MICR verification and automatic image repair your liability is 2 in 10,000

Trust But Verify

Contact Information

- All My Papers
- www.AllMyPapers.com
- 408-366-6400

- Conix Systems Inc.
- http://www.conixsystems.com/index.shtml
- 800-332-1899

Contact Information

- **Bill Lange**
  - Phone: 408-366-6400 Ext 802
  - Email: Bill@AllMyPapers.com
- **Larry Krummel**
  - Phone: 408-366-6400 Ext 801
  - Email: Larry@AllMyPapers.com
- **Bob Merkle**
  - Phone: 610-347-2214
  - Email: ram@conix.com

The End