# Working with Image Cash Letters

## Technology Solutions for

Check Image Exchange
ICL Interoperability Issues
Transaction Data Integrity Issues

# Contents

# The persistency of check use drives the need for financial institutions and businesses to efficiently process check images with Image Cash Letters

**A considerable monetary value of check payments is expected to remain within the U.S. well into the future.**

While the volume of check payments is declining, the average value of a typical check has steadily and significantly increased. The total value of commercial check payments collected by the Federal Reserve hit its lowest point in over 30 years in 2011 at $7.9 trillion. It has since increased to over $8.7 trillion in 2021 despite decreasing volumes.[1]

Checks are essential to many companies, especially small and medium sized businesses, and continue to be used by a large number of consumers for specific payment types.[2] They are still the predominant payment method for payroll, tax payments, and disbursements.

Image Cash Letters (ICLs) are the preferred vehicle for transmitting check payments electronically between organizations and systems.

This document provides detailed information about critical ICL processing issues as well as specific implementations of ICL technology to address those issues.

This information is applicable to:

- Financial institutions (Banks, Credit Unions, Federal Reserve Bank)
- Image exchange network providers
- Corporations, charitable organizations, retailers, merchants and other businesses who deposit and process checks
- Lockbox service providers
- IT departments implementing check clearing systems
- System and software implementers of check clearing systems

1 federaleserve.gov/paymentsystems/check_commcheckcolannual....

2 insight.harlandclarke.com/wp-content/...The-Risk-of-Writing-Off-Checks-Report....

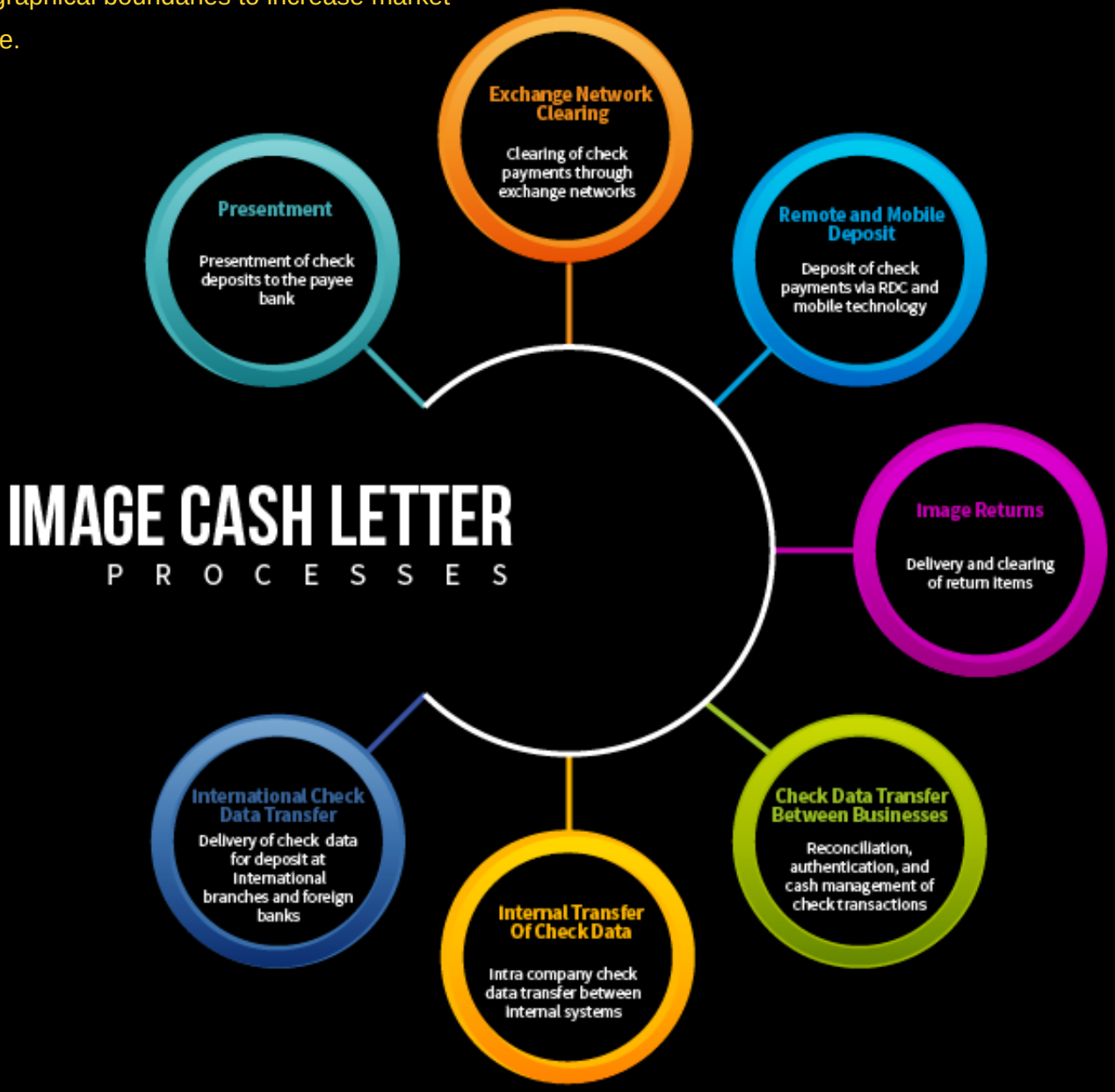
# ICL Uses

Due to the significant benefits of reduced operational costs and faster funds availability, financial institutions and many other businesses and organizations have applied ICL technology to all facets of check processing.

Following Check 21 legislation in 2003, banks and credit unions transitioned to ICL for check presentment, and networks evolved to facilitate their exchange.

Shortly after, remote deposit capture (RDC) and mobile deposit technology made it possible for financial institutions to offer deposit services outside their normal geographical boundaries to increase market share.

ICL technology quickly extended throughout other check processing areas such as returns and cash management, and eventually evolved to include data transfers between businesses as well as intra-company and international transfers.

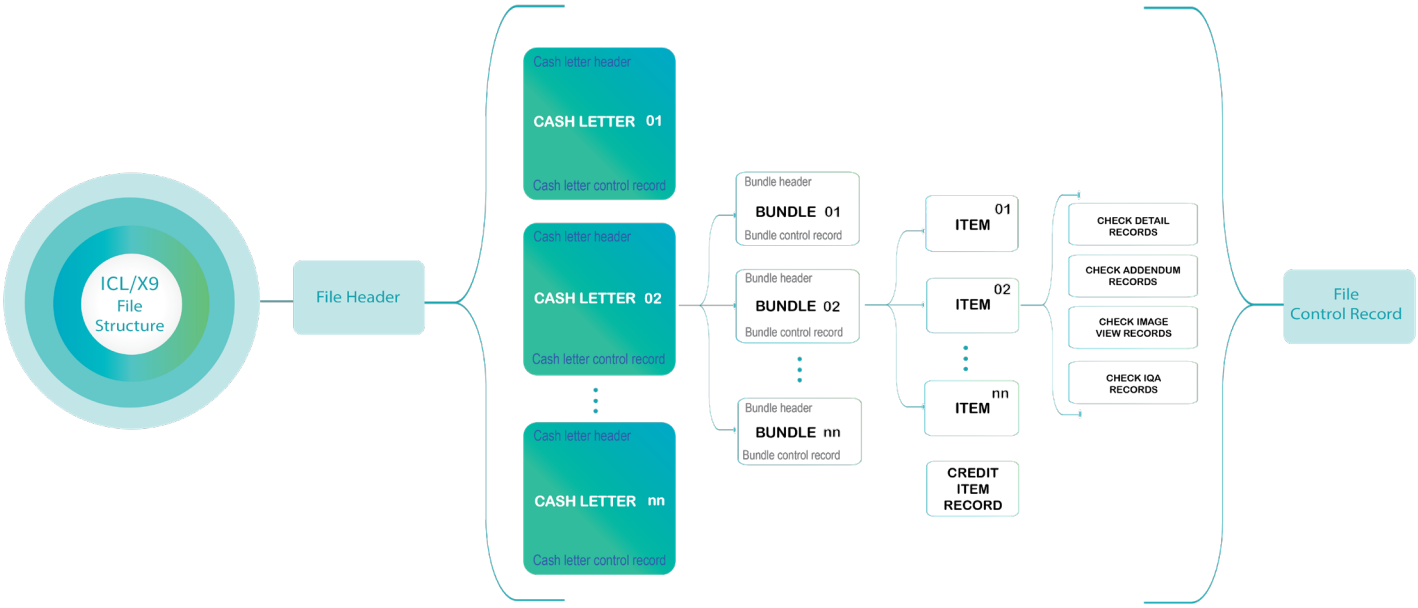


# Image Cash Letters Explained

The Check 21 law allows for images of both sides of a check to serve as a legal substitute for the original paper check. The main objective of this law is to eliminate the need to physically transfer checks between institutions. The standard for the structure and exchange of check images is ANSI X9.100-187.

## ICL File Structure

The following outlines the basic structure of the ICL format:




**The ICL file contains:**

- File Header with routing origin and destination information and creation date
- Cash Letter Records (one or more)
- File Control Record with summary control totals (number of cash letters and items and monetary value)

**Cash Letter Records contain:**

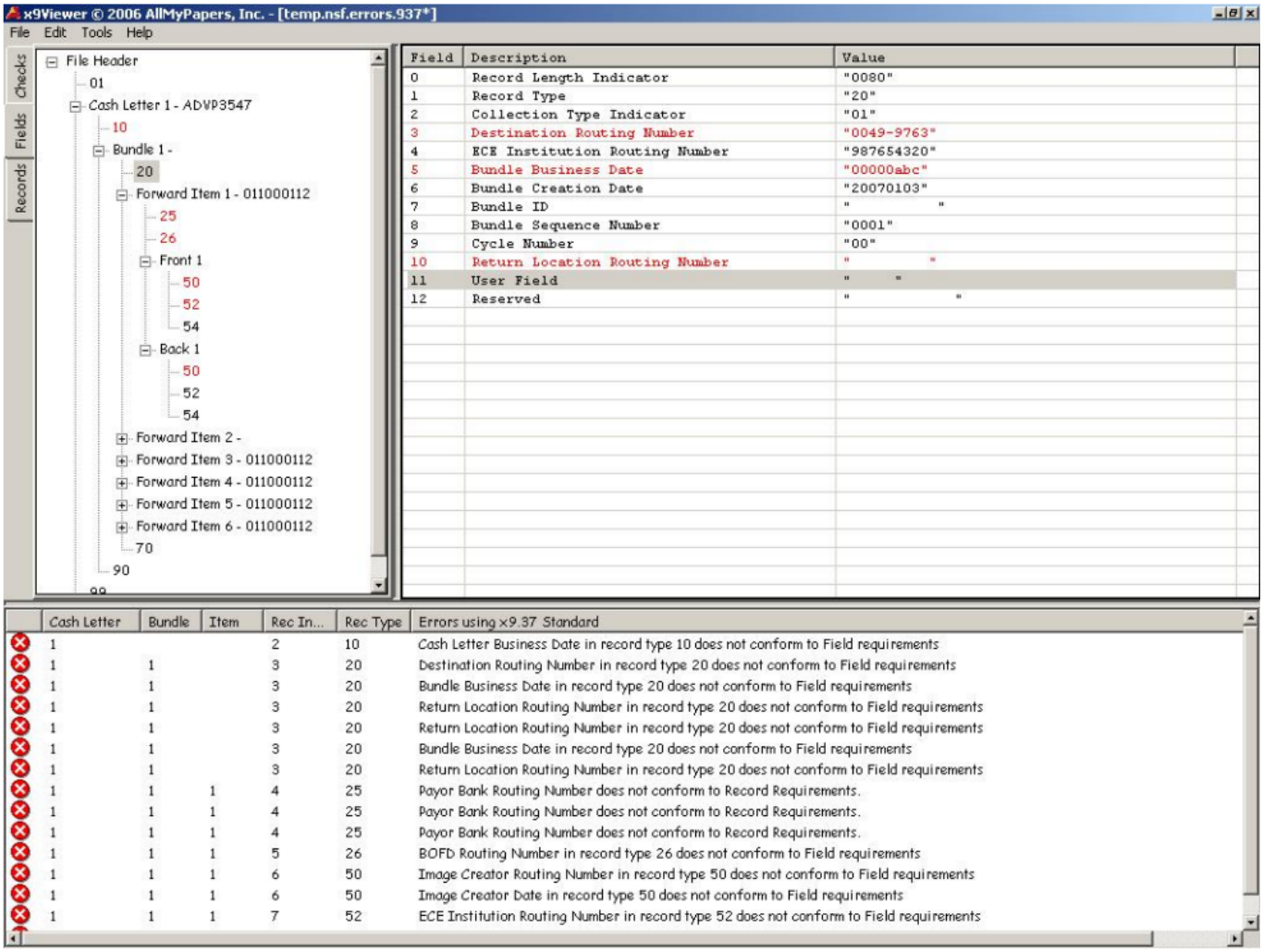
- Cash Letter Header with routing origin and destination information and creation date
- Bundle Records (one or more)
- Cash Letter Control Record with summary control totals (number of cash letters and items and monetary value)

**Bundle Records contain:**

- Bundle Header routing origin and destination information and creation date
- Item Records (one or more)
- Bundle Control Record with summary control totals (number of cash letters and items and monetary value)

**Item Records contain:**

- Item Detail Record with ECE sequence number, amount, payer bank routing number and the ON-US field containing unparsed account, serial number and auxiliary ON-US
- Items Addendum Records used to apply electronic endorsement information by institutions involved in the truncation, routing, IRD printing and returning of the item
- Item View Records with the front and back images of the check
- Image Quality Analysis (IQA) Records containing flags and results of any IQA analysis of the images
- Optional Credit Item Record that provides depositary bank information for remote deposit ICLs




**X9 Viewer view of an ICL file showing hierarchal structure, field-level data, and analysis results**

# Data integrity and interoperability are essential to secure and accurate clearing of ICL transactions.

ICLs encapsulate image and MICR data captured from paper checks. The accuracy and usability of these data elements is essential to error-free clearing and processing of the transactions.

The ICL standard ANSI X9.100-187 allows for variations in formatting to accommodate the specific needs of different institutions and networks. Most financial exchanges use a companion document to define specific rules of exchange.

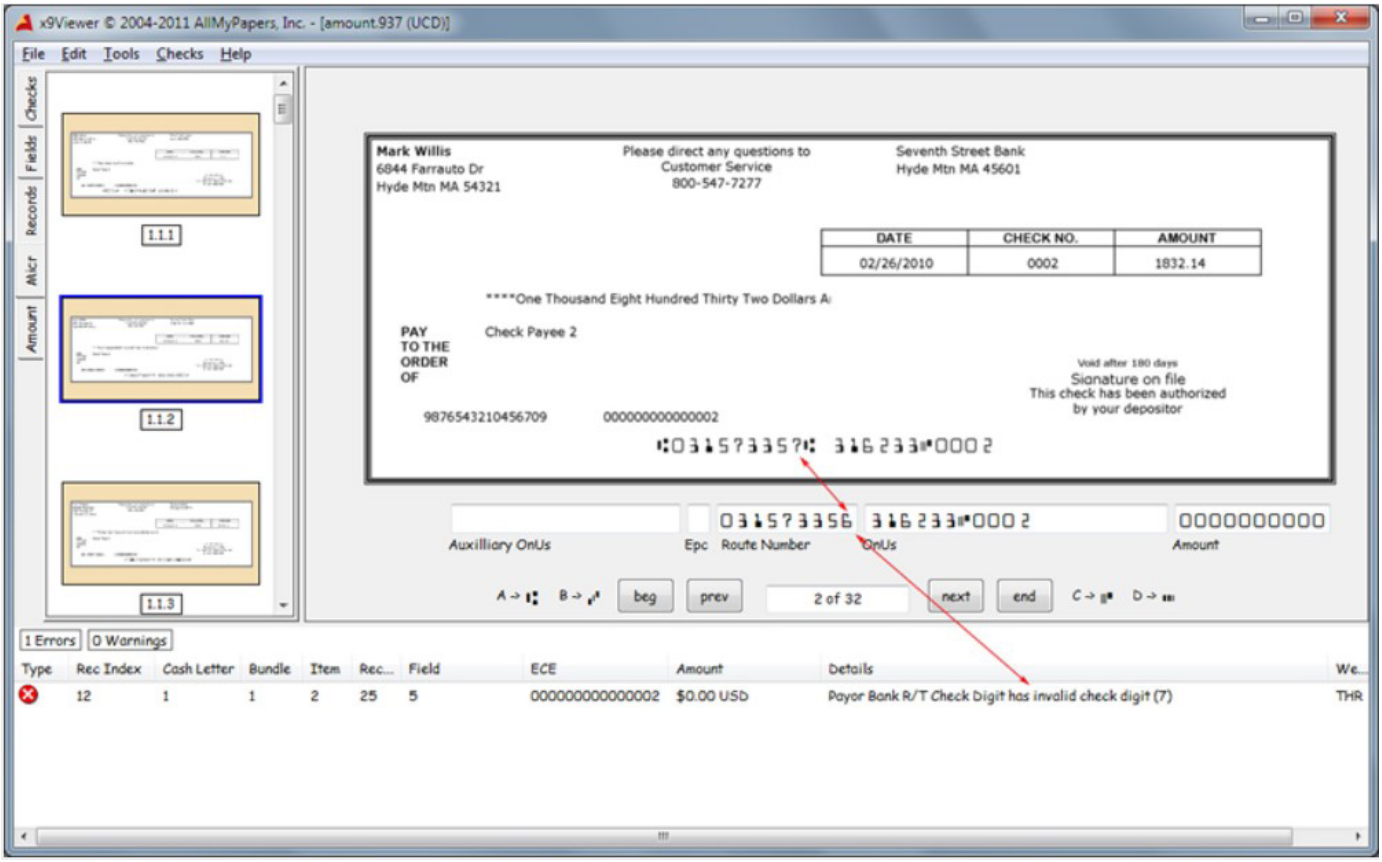
Implementers of an ICL system must be aware of the major problems typical with ICLs to incorporate technologies and processes that will minimize the associated risks.

**Improper formatting** - This can take many forms including missing records, fields, or field contents; missing or wrong images, and invalid data types.

**Data integrity issues** - Non-compliant image formats, poor quality or unusable images and MICR misreads adversely impact the integrity of the ICL data.

**Duplicates** - Items, bundles or entire cash letters or ICL files can accidentally be duplicated. Items may also be fraudulently presented more than once for payment. In recent years, the Federal Reserve has noted an increase in mobile deposit capture duplicates resulting in adjustments for items that have already been paid.

**Building ICL systems requires knowledge of different format specifications and companion documents published by clearing organizations and major financial institutions as well as image quality standards and practices.**




**X9 Viewer identification of a MICR mismatch in the Routing Transit check digit**

# The Costs of Errors in ICL Transactions


MICR misreads and image quality exceptions that are not corrected prior to clearing or exchange result in returns and exception processing for incorrect postings and misroutings. Manual correction and other exception handling procedures incur delays that can result in missed deadlines.

Missed clearing deadlines increase the risk of non-payable items that can no longer be collected through standard procedures. Missing the deadline on a high value ICL impacts float and incurs a loss in investment income.

According to a joint 2022 report by the Federal Reserve and ECCHO, financial institutions are seeing an increase in returns being sent after the legal deadline. The paying bank must then either write off the returned items or use adjustment channels to redeem the loss.

Correcting ICL errors before customers are affected is critical to preserving customer satisfaction and avoiding liabilities. The following are examples of the potential for uncorrected ICL errors to affect the customer:

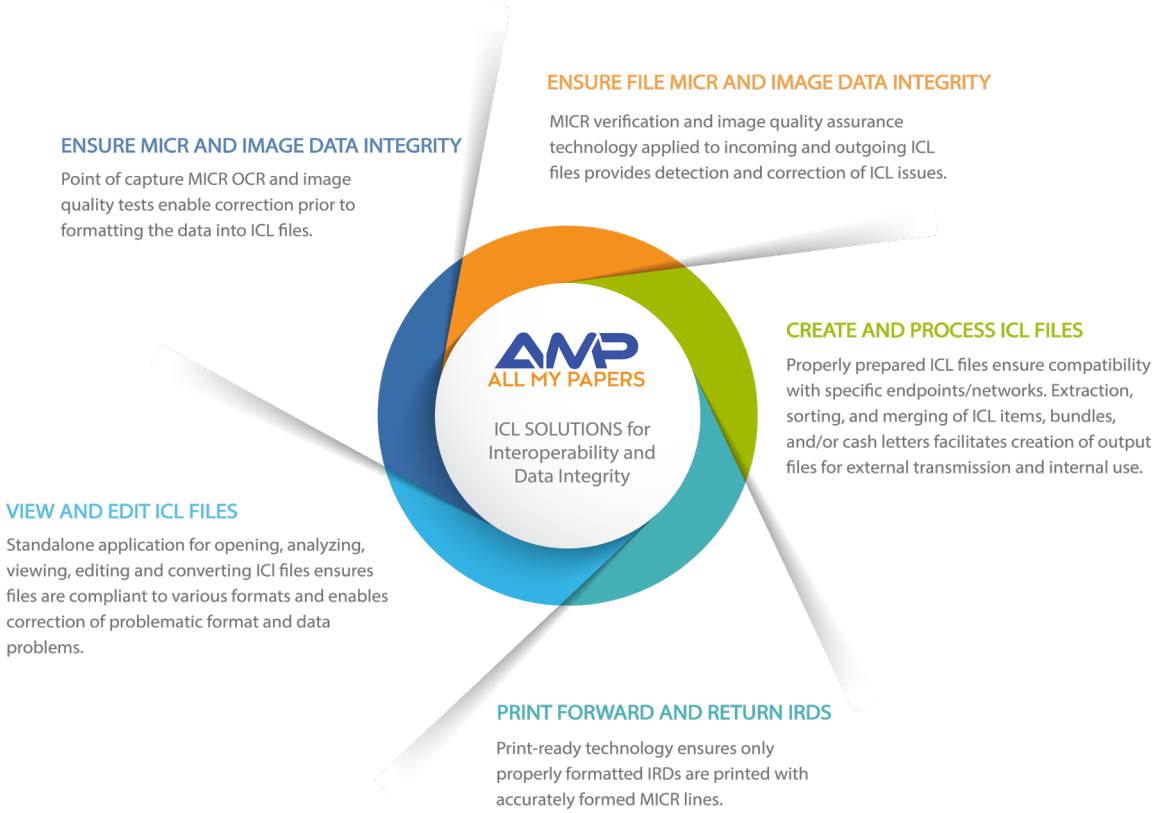
- MICR misreads can result in checks being posted to the wrong account
- Duplicates can result in double postings
- Poor quality images can result in illegible images being presented to the customer

# All My Papers ICL Solutions

**All My Papers provides technology solutions for all possible ICL processing points. Interoperability and data integrity safeguards are built in at every stage.**

All My Papers' solutions encompass the following ICL processing needs:

- Testing and correcting image and MICR data prior to building ICL files, and within incoming and out-going ICL files
- Building ICL files from captured data to various industry and proprietary standards
- Processing ICL files sent/received through exchange networks and directly with other organizations
- Processing received ICL files from remote deposit customer (corporate, correspondent banks, and international deposits)
- Internal processing of ICL data within the organization
- Generating return ICL files from forward ICL files
- Creating and printing forward and return Image Replacement Documents (IRDs) from ICL files



## AMP Technology for Ensuring MICR and Image Data Integrity

When creating ICLs, considerations for data integrity need to start in the capture system. To ensure good MICR data is captured, the system needs to employ technology for automatically correcting rejects and misreads as the items are scanned. Point of capture is also the best time to ensure high quality images are captured. Detecting image quality problems early in the process provides the best opportunity to rescan the original item for a better image.

**AMP MICR OCR and Verify** technology significantly reduces reject and misread levels in high-speed capture environments. This technology provides full MICR data extraction from check images and applies OCR technology to recognize all MICR fields. The MICR line is read from the image using multiple OCR engines and the results are analyzed along with the MICR line. Multiple engine voting on a character by character basis and OCR read retries with image enhancement and repair techniques provide high read rates with exceptionally low error rates.

**AMP Exchange Ready** technology tests every image for conformance to exchange standards ensuring that all images are formatted in compliance with X9 TIFF specifications. It also provides automatic correction of many common defect types.

AMP MICR OCR and Verify and AMP's Exchange Ready technology can also be applied to incoming and outgoing ICL files to detect and correct data integrity issues. These functions are available in All My Papers' **X9 Qualifier** application.

# AMP ICL

**AMP ICL** provides a simple and efficient solution for creating Image Cash Letters quickly and efficiently from any platform.

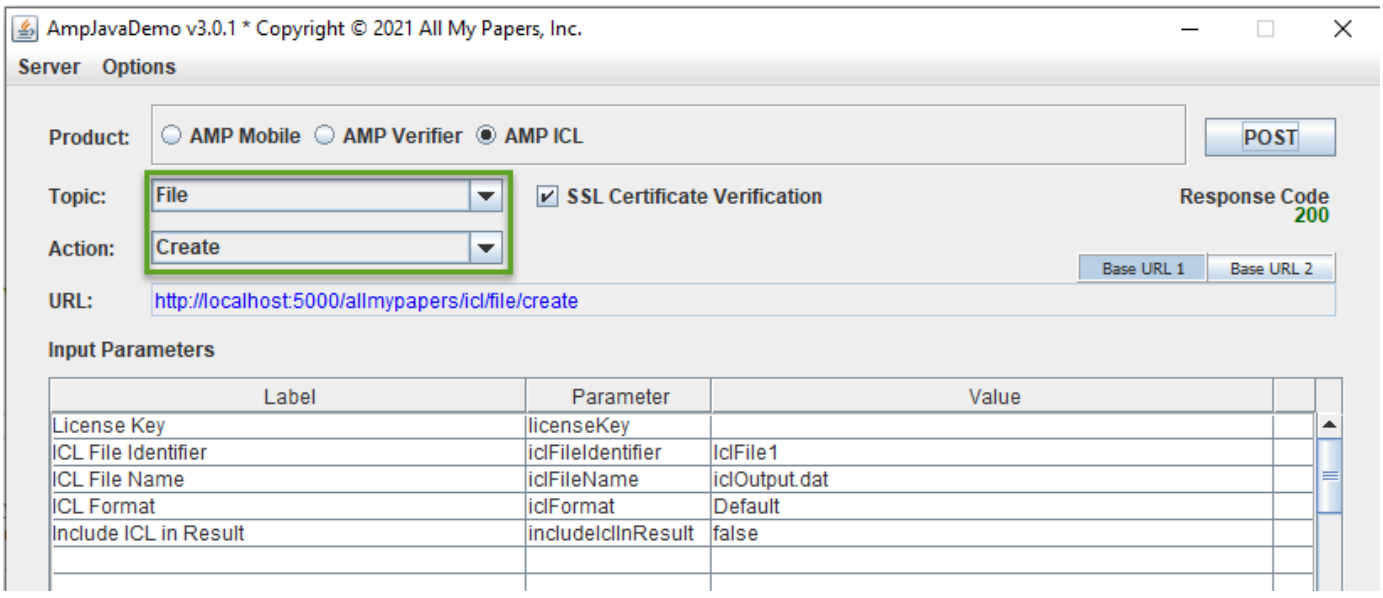
The application insulates the user from the intricacies of ICL formats by ensuring proper formatting and compatibility to the specific format required by the target endpoint or exchange network. It frees the programmer from needing detailed knowledge of the specifications, companion documents or rules associated with the endpoint or exchange network.

AMP ICL composes ICL files from check images, MICR line data and dollar amounts. The ICL File Creation allows groups of conforming check images to be combined with MICR line and dollar amount data for each item into a fully compliant ICL File ready for deposit, image exchange or other processing. All major US and Canadian exchange format are supported as well as over 50 proprietary RDC formats including Wells Fargo, Bank of America and JPMC.

AMP ICL capabilities include:

- Image validation
- Image processing (cropping, MICR OCR, and CAR/LAR)
- Creation of ICL files using prepared items

AMP ICL offers both a file/folder interface and RESTful API, enabling you to integrate AMP ICL into your workflow in the most efficient way. In addition, it includes demo programs with source code to expedite deployment and greatly reduce ongoing support efforts.



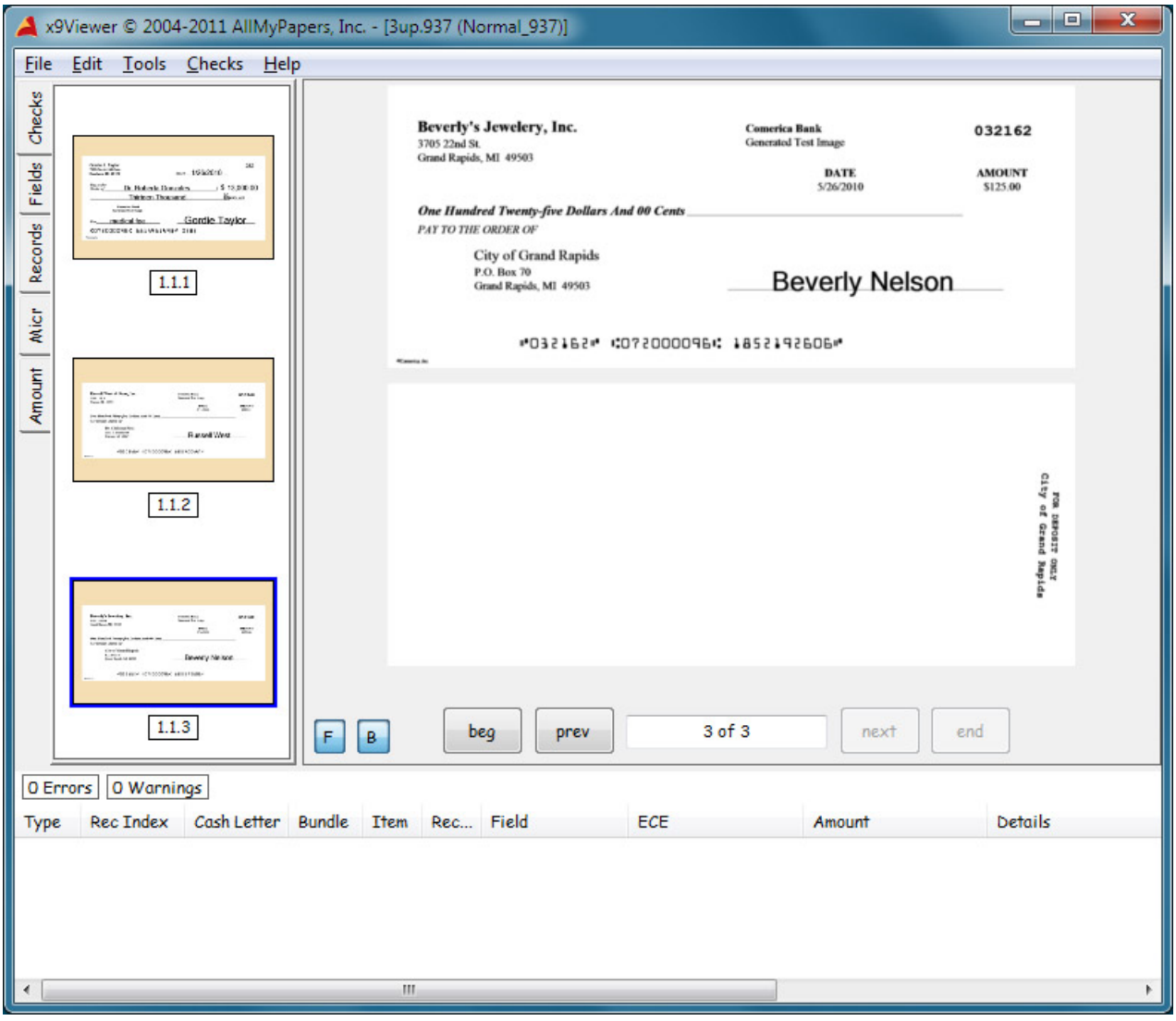

**RESTful API File Create Method**

# X9 Viewer

When one “bad” item can stop the transmission or reception of an ICL representing millions of dollars, it is imperative to employ technology to identify problems and take corrective actions. **X9 Viewer** is a standalone application that enables opening, analyzing, viewing, editing and converting ICL files.

X9 Viewer functionality includes:

- Viewing of check images and associated data
- Analysis of ICL files for conformance with U.S. and Canadian standards and identification of formatting and data type issues
- Correction of format and data problems via entry and editing of check data, dollar amounts and MICR line information and re-balancing the ICL
- Support for U.S. and Canadian standards and over 50 interbank exchange and RDC formats
- Printing of Image Replacement Documents (IRDs)
- A powerful search capability
- Disassembly of ICL files to extract check image and associated data




**X9 Viewer Check View**

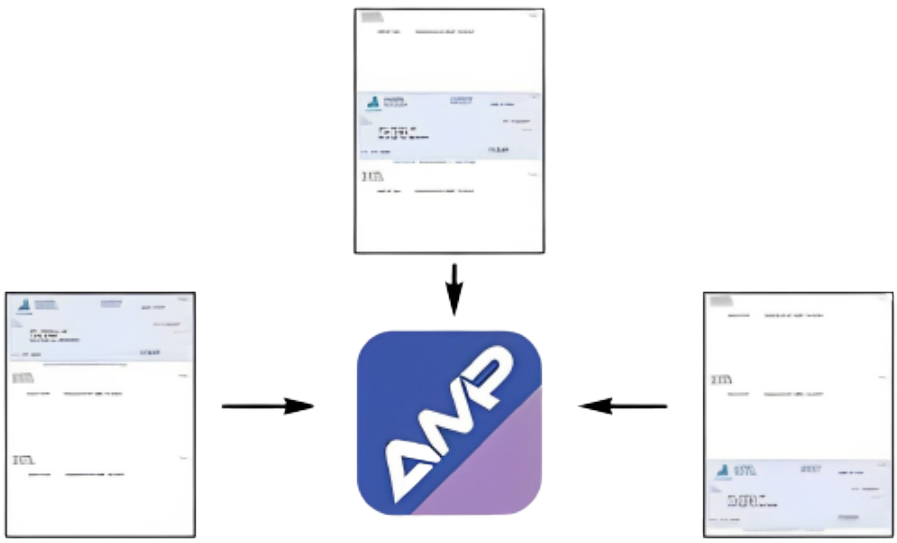
# All My Checks

**All My Checks™** converts check images or other scanned mixed business documents (such as contracts, EOB, coupons, remittances) into ICL files for remote deposit capture applications.

The application provides automatic processing of a folder of scanned documents or direct control of a Panini check scanner to:

- Find check images mixed within business documents
- Extract check images from larger documents
- Read MICR information with very low substitution error rates
- Recognize amount field data via CAR/LAR and provide confidence levels
- Prepare compliant check images for exchange and RDC
- Output exchange-ready front and back check images, parsed and formatted MICR data, dollar amount and other information

All My Checks works with images from flatbed scanners, automated document feeder scanners, mobile cameras and specialty check scanners. It eliminates the need to scan checks separately by locating images within a stream of documents. The application also identifies images at any orientation or placement within the document. For example, the application finds and extracts check images from the top, middle or bottom of a remittance voucher.



**All My Checks finds checks anywhere in a document**

An optional **All My Coupons** license finds and reads coupon information such as account numbers in OCR A/B fonts, dollar amount and barcode information such as customer address and customer information.

| FEATURES |
| --- |
| Automatically processes document images from a designated folder |
| Accepts images from any scanner<br>- Flatbed scanners<br>- Dedicated check scanners<br>- Automatic Document Feeder (ADF) scanners<br>- Mobile phone cameras |
| Finds checks on a page or in a mixed stream of scanned documents<br>- Remittance documents, check images or partial page scans |
| Finds checks anywhere on the document<br>- Top, middle or bottom of scanned document or at any angle |
| Extracts check images from background |
| Preps and processes check images for exchange standards<br>- Thresholds, crops, deskews, rotates and registers as needed<br>- Correlates front and back images<br>- Converts to black and white TIFF format<br>- Adjusts to banking standard resolution (200 DPI) |
| Extracts MICR information from check image |
| Parses MICR information into routing number and ONUS fields |
| Command line callable for "lights out" functionality |
| Electronic endorsement |
| Capture Dollar amounts and other data from input CSV file |
| Outputs directly to image cash letter (ICL) file remote deposit capture applications |
| **COMPANION PRODUCT** |
| X9 VIEWER - For entry or editing of MICR or amout data<br>- A Windows™ based application for viewing, editing and printing Image Cash Letter (ICL) files |

**Download the All My Checks data sheet**

# AMP Mobile Web Services

**AMP Mobile Web Services** provides check image processing technology as web services to expedite the development of mobile and remote deposit capture applications.

This technology ensures that accurate data is captured from check images, that the images are legally negotiable instruments and that the data is properly formatted for processing.

## Image Recognition Services

AMP Mobile Web Services provides the following image recognition services:

- MICR OCR – Provides full MICR data extraction from check images and applies OCR technology to recognize all MICR field data. Combining multiple proprietary MICR OCR engines with algorithms specifically designed to recognize MICR fonts and characters from images captured from mobile devices, All My Papers' MICR OCR technology provides high read rates with exceptionally low error rates.
- Identification and verification image fields – Automatically recognizes check field data and verifies the contents and presence of various fields of interest. All My Papers capitalizes on OrboGraph's high-performance OrboAnywhere recognition engine to provide technology essential to authenticating deposited items. This technology includes
  - CAR/LAR – Automatic recognition of the courtesy and legal amounts from check images and identification of mismatches between the two
  - Payee and payor name verification
  - Identification of money orders and other cash-equivalent items
  - Identification of payable to "cash" items

Confidence metrics are available for most recognition values so you can tailor workflow decisions to meet your organization's policies.

## ICL File Creation

AMP Mobile Web Services also include All My Papers' leading technology for creating and manipulating Image Cash Letters to prepare deposited items for processing. ICL File Creation allows groups of conformant check images to be combined with MICR line and dollar amount data for each item into a fully formed ICL file ready for exchange with banks and other financial organizations. All major US and Canadian exchange format are supported as well as over 50 proprietary RDC formats including Wells Fargo, Bank of America and JPMC.

# X9 Image Clearing

**X9 Image Clearing** facilitates the upgrade of legacy payment systems for Check 21 clearing processing. The application enables:

- Posting
- Archiving
- Generation of check image return ICL files

X9 Image Clearing receives and stores ICL files from image exchanges including the Federal Reserve Bank. MICR and other transactional data is extracted from the files and stored. Incoming files are checked for duplicates and output files generated for interfacing to core banking systems and legacy image archives.

The system also facilitates item research by processing exception item lists from the legacy system. Operators can review items via a web browser, mark items for return and assign return codes.

| STANDARD FEATURES |
|---|
| **X9 CLEARING Application Service Component** |
| Watch Folder and configurable landing zone for automatic processing of incoming ICL files |
| Import of ICL files into an SQL and file system database |
| Support for X9, CPA and remote deposit formats |
| Duplicate file and item detection by either MICR data or duplicate check images |
| Browser based user interface for operational management, item research, duplicate Item research and reports |
| Item research, image review, ICL data review and item status |
| Return research |
| Operational control and monitoring |
| Notification system |
| Presented summary report |
| Runtime licenses for test and disaster recovery system |
| **Options** |
| Return ICL file generation |
| X9 EXPORT creates a standard X9.37/ICL file for forwarding items |
| Exception file import |
| Export image files to legacy archive |
| Posting formats such as FRB MICR, FRB SOP 4.8, CSV with image and X9.37-1994 (Electronic Check Presentment) |
| Legacy or host system interface module |
| Data integrity testing for standards and IQA conformance such as TIFF testing and correction as well as MICR mis-match |
| File format conversion (e.g. X9.37 to X9.100/187) |

**Download the X9 Image Clearing data sheet**

# X9 Returns

**X9 Returns** facilitates inclearing of ICL items drawn on your financial institution and the return of ICL items through the exchange system.

Functions include:

- Automatic ingest of inclearing ICL files
- Generation of posting files compatible with core banking systems
- Automatic ingest of Auto Return files from core banking systems to automatically flag items for return
- Export of images to legacy image archive systems
- Research via web browser application
- Automatic generation of check image return ICL files
- Detection of duplicate files and items received

# AMP Lockbox

AMP Lockbox provides leading technology to deliver a highly efficient remittance processing solution.

AMP Lockbox processes incoming check images and remittance documents from a wide variety of sources and in a wide variety of formats. It then converts the images and corresponding data into deposit-ready Image Cash Letter files.

Check images are automatically located within streams of different scanned document types, extracted, and prepared for exchange, eliminating the need to scan checks separately from other documents. Data from the images is extracted using MICR and CAR/LAR recognitions well as bar-coded data from remittance coupons. A reject and repair interface enables data correction and check rescans.

Exchange-ready Image Cash Letter files compatible with the U.S. and Canadian financial institutions of your choice are prepared along with a variety of reports. Custom data files are optionally created for integration with core accounting systems and other downstream interfaces.

# All My Papers' ICL Solutions In Action

All My Papers has helped numerous financial institutions and other organizations deploy ICL technology to meet processing requirements and address problems related to check processing. Following are several real-world applications of AMP ICL solutions.

## Viewing, Conformance Testing and Editing of ICLs

### Client

Large national service provider of check clearing services

### Opportunity

Service Provider seeking to fulfill a market need for financial services to clear ICL files using exchange services

### Problem

The Provider needed to mitigate the risks associated with receiving ICL files with interoperability and data integrity issues. Requirements were:

- To build in safeguards to ensure problematic ICL data was prevented from being cleared and/or creating catastrophic failures of the clearing system
- To ensure that the output formats it created to send to financial institutions conformed to the current ANSI standard for check image exchange as well as its own rules
- To certify that the ICL files created by customers conformed to the required standards and companion documents
- To assist its customers in implementing their ICL processing systems by being able to diagnose problems that their ICL files produced
- To validate the safeguards built into the clearing system using test case samples for system testing

### Solution

The Provider deployed All My Papers' **X9 Viewer** application to certify that ICL formats conform to the ANSI standard and supporting companion documents for its check image exchange system. In addition, the All My Papers' **X9 Qualifier** application proved useful as a front-end to X9 Viewer to accelerate identification of non-conforming items.

To certify that a customer's system is producing compatible ICL formats, the Provider inspects ICL samples provided via X9 Viewer to analyze ICL formats immediately upon opening and highlight any issues. This enables the Provider to quickly confirm conformance and provide a diagnosis of any issues discovered during the certification process. It is also able to certify its own output formats using the same tool.

The Provider built many safeguards into its clearing system to ensure that ICLs with interoperability and data integrity issues are detected and prevented from entering the clearing system. To test these safeguards, the Provider uses the X9 Viewer Edit capability to create non-conforming test files. For example, records are deleted, fields erased, and/or incorrect data entered. Using X9 Viewer, the Provider is able to create test cases to ensure that its system is able to detect and reject problematic ICL files of all types.

In addition, when its system does detect and reject a non-conforming ICL file, it is able to diagnose what is wrong with the file and provide feedback to the Provider's customers, enabling them to make the necessary corrections to their ICL processing systems.

X9 VIEWER minimizes the risks of interoperability and data integrity issues for this Provider and provides valuable tools for testing and analysis.

# ICL Returns Processing

## Client

Mid-size national bank

## Opportunity

The Bank wanted to implement an ICL returns clearing system to capitalize on the operational benefits and improve its competitiveness in the marketplace.

## Problem

When receiving forward items in an ICL, the options for return are:

- Printing a return image replacement document (IRD) and sending for return clearing
- Print a return IRD, then capturing the image of the IRD and creating a return ICL
- Creating a return ICL using the item records in the forward ICL

Creating return ICLs eliminates the need for further paper processing, providing significant costs savings for all parties involved. However, the Bank did not have an existing system that could be modified to perform this function, nor the ability to perform research on the images of the exception items.

## Solution

The Bank implemented an image-enabled return ICL processing system easily and quickly using All My Papers' X9 Returns application. With a list of the posted exceptions, the Bank uses All My Papers' X9 VIEWER to research the items and generate a list of items to be returned with the associated reason codes.

The application copies the return item records from the forward ICL, builds a new ICL, then creates and adds the required return records for the items in the return list.

The Bank was able to implement a complete end-to-end ICL clearing system in less than 30 days without having to get involved with the intricacies of ICL formats.

X9 Returns produces comma separated text file inputs and outputs to its ICL processing systems, making it easy for the Bank to interface to its existing posting system.

X9 Viewer provides an effective research tool for the Bank to inspect image and transaction data in the received ICL files.

# RDC Data Integrity and Interoperability

## Client

Remote Deposit Capture (RDC) solution provider

## Opportunity

The Provider wanted to expand its customer base by establishing a third party remote deposit clearing service. The service would use a web-based client to receive the images and MICR of customers' deposits and send the formatted data to the customers' designated financial institutions for deposit.

## Problem

Since the Provider would have no control over the capture environment, the challenge was to be able to ensure the integrity of the MICR and image data. Also, as the Provider needed to accommodate interoperability with any number of different depository institutions, it needed to be able to support multiple remote deposit format variations.

## Solution

All My Papers AMP ICL product was used to solve both the Provider's data integrity and interoperability challenges and accommodate the various RDC formatting requirements.

- MICR Verify applies MICR OCR technology to extract MICR data from the check images and automatically correct rejects and misreads in MICR data received from the Provider's customers. CAR/LAR technology extracts amount data from the images.
- Exchange Ready functions ensure images are captured in correct formats and without image quality issues.
- Formatting capabilities provides the means to combine scanned images and transaction data into fully compliant ICLs ready for deposit by the designated depository financial institutions.

The Provider benefited from an efficient, accurate, reliable and cost-effective solution for its customers. Also, since the provider was able to dedicate its programming resources to the features of the application without concerning itself with the intricacies of ICL processing, it gained a competitive advantage by being quick to market with its service offering.

The Provider was also able to extend the following benefits to its customers:

- Reduced time, cost and risks of transporting checks for deposit and clearing
- Expedited funds availability
- Mitigated collection risks with accelerated returns
- Assured quality control with technology and automation

# Automation of Inclearing Return Items

## Client

Large regional bank

## Opportunity

The Bank wanted its transit returns system to be faster, more accurate, more cost-effective and provide better fraud detection. These goals needed to be achieved in less than a year, within a limited budget, and incur minimal disruption to existing workflows.

## Problem

Even though the Bank had adopted check imaging for exchange, its transit item return processing was still largely paper-based. The existing system involved printing and re-imaging of checks, physical routing of paper, and various in-house applications that could not be easily scaled to handle the Bank's increasing volume due to the time required to print, route and rescan items.

In addition, the growing volume of potentially fraudulent items was creating a bottleneck in the system forcing the Bank to write off many of the smaller value items. The Bank needed to accelerate the process so that identification and resolution took place while the fraudulent trail was current and in compliance with regulations and clearing agreements.

## Solution

After soliciting bids from several vendors, the Bank selected All My Papers' X9 Returns solution. X9 Returns and its interface with the Bank's core and item processing systems significantly reduced the labor-intensive and redundant steps that challenged the Bank's ability to achieve a cost effective and efficient environment.

All My Papers provided the Bank with a feature-rich item return processing system that worked seamlessly with the Bank's core and item processing systems and adhered to the Bank's existing workflows. As a result, the time and cost of implementation were minimized; the system was put into production in under 7 months within budget; and the following benefits were realized by the Bank:

- Reduced fraud
- Reduced time to process returns and exposure to loss
- Increased accuracy of the return process
- Minimized organizational disruption by using historical workflow patterns
- Simplified processing
- Enhanced security
- Reduced technology risks by utilizing an industry standards based solution
- Reduced reserve requirements

# Update of Legacy Check System for Image Clearing

## Client

NC Department of State Treasurer

## Opportunity

As the agency responsible for clearing all checks drawn on the state treasurer's accounts, the Federal Reserve Bank planned to discontinue paper-based check clearing. The Department was thus mandated to upgrade their check clearing system for image clearing in order to avoid a dramatic increase in processing fees imposed by the Federal Reserve Bank (FRB).

## Problem

The Department had made large investments in its legacy payments systems, including a core banking system and an image archive. The cost to upgrade these systems to handle image clearing was outside of the Department's fiscal budget. The Department needed to deploy an affordable system that could convert the new file formats sent by the FRB to be compatible with the existing legacy payment system interfaces in a very short time frame.

## Solution

After issuing a request for proposal, the Department selected and implemented a solution based on All My Papers' X9 Clearing application to process ICLs received from the FRB. The solution was deployed in 9 weeks within budget and included the following capabilities:

- Conversion of the data to the original FRB MICR format to interface to the Department's core banking system for the posting of check items
- Extraction of the images from the ICL files for import by the Department's image archive system
- Identification of duplicate incoming ICL files and duplicate items within ICL files
- Research and identification of items for return via a web-based application
- Generation of return ICL files for transmission back to the FRB

With the X9 Clearing solution, the Department was able to expeditiously accommodate check image clearing of incoming FRB ICL files with minimal impact to legacy payment systems. The receiving and processing of ICL files from the FRB was completed automated, enabling the Department to realize significant efficiency and cost reduction benefits.

The intent of this document is to provide a clear understanding of the issues involved in implementing ICL solutions and provide information about All My Papers ICL technology and solutions for your consideration.

All My Papers is able to rapidly implement efficient and cost-effective systems that will isolate you from the intricacies of ICL processing, saving you time and money.

Please contact us with any questions or comments.

# Connect with us

(408) 366-6400

sales@allmypapers.com

allmypapers.com

All My Papers develops and distributes software for creating, manipulating, and processing Check Image Cash Letter (X9/ICL) files used in Check Image Exchange based on the X9-100.187 ANSI standard and the FRB Reg. CC Rules.

ALL MY PAPERS

All My Papers, Inc.
Katy TX 77494