

**Case Study**

**NCDST Updates Legacy System**

**With X9 IMAGE CLEARING**

**For Check 21**

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## Introduction

The North Carolina Department of State Treasurer (NCDST) was mandated to upgrade their check clearing system to be Check 21 capable by January 2009. If they did not meet this deadline and upgrade their current system, the daily processing fees would double. NCDST selected All My Papers (AMP) to implement a software solution that would minimize impact on their existing processes, interface to their legacy payment systems and process the new file formats sent to NCDST by the Federal Reserve Bank (FRB) – all by the required date.

AMP implemented a solution based on its X9 IMAGE CLEARING server application. The solution processed and archived X9.37 Image Cash Letters (ICLs) received from the FRB. The software converted the data to the original FRB MICR format that was used by NCDST's core banking system for the posting of check items. The software solution also extracted the images from the ICL files and exported them to system folders used for importing images to NCDST legacy, Oracle based, image archive system.

X9 IMAGE CLEARING provided NCDST with a browser based user interface to research and mark items for return. The system generated certified Return X9.37 ICL files that were then sent back through the FRB exchange network.

The X9 IMAGE CLEARING solution was implemented on a Windows Server using a SQL database. The project was implemented in 9 weeks allowing NCDST to go live with Check 21 clearing on schedule in January 2009.

## The Challenge

NCDST processes almost 40,000 checks per day with peaks reaching over 200,000 checks in a single day. They manage \$75 billion in public funds and act as the banking agency for various state departments, universities, community colleges, school systems, boards and commissions.

The FRB is the agency responsible for clearing all checks drawn on the state treasurer's accounts. The FRB, in the process of upgrading its internal check clearing systems for Check 21, had announced to NCDST and similar institutions that it would discontinue the existing paper-based check clearing process and replace it with a Check 21 process. Starting in 2009 the fees for using the old process were going to escalate. NCDST needed to upgrade its check clearing payment systems to be compatible with Check 21 processing.

NCDST had already made large investments in their legacy payment systems, which included a core banking system and an image archive. The costs to upgrade these systems to process the Check 21 file formats were not within the department's fiscal budget. NCDST needed an affordable system that could convert the Check 21 formats to the existing interfaces of their legacy payment systems. They also needed a fast-tracked implementation. NCDST wanted to streamline their previous clearing processes.

## Objectives

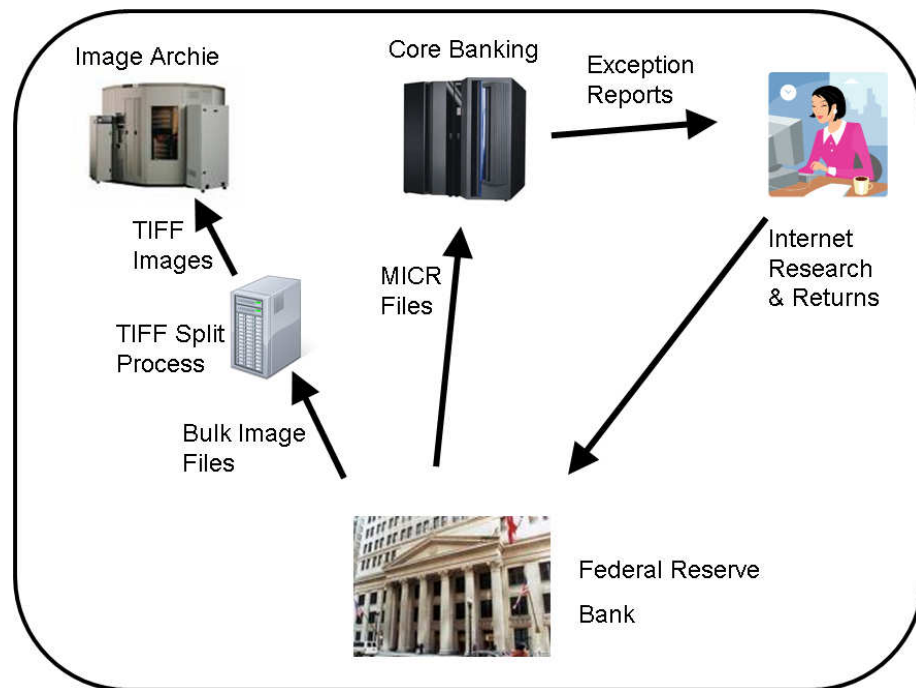
The objectives of NCDST for this project were to:

- 1) Implement a budget-acceptable and easy to use Check 21 Solution that would receive Check 21 formatted files from the FRB and reformat them to the existing interfaces of their legacy core banking and image archive systems
- 2) Implement the system before the January 2009 deadline directive by the FRB
- 3) Provide a defense against receiving duplicate ICL files or ICL files containing duplicate items
- 4) Provide a means to return non-payable items back to the FRB in the Check 21 file format
- 5) Streamline their existing check clearing processes

# Approach

NCDST's previous check clearing process required a high degree of operator intervention.

The FRB captured all NCDST items and provided a MICR file for posting and a bulk image file for image archiving. NCDST operators would download the MICR and image files on a daily basis. This process involved matching two files created by separate processes at the FRB. This was an error prone process which frequently required execution of manual recovery processes on the part of NCDST business users and IT staff. Corrected image files had to then be requested and recreated by the FRB. Re-posting these items was a labor intensive process since only the missing items needed to be processed. If the number of missing images was small, or if the items were not on a corrected file, the business users would request the original paper items from the FRB and scan them in with a counter scanner.



**Figure 1 - NCDST Workflow prior to Implementation of X9 Image Clearing**

The MICR files that were formatted for the X9.37-1994 Electronic Check Presentment format would be posted to the core banking system by the NCDST operators.

Exception reports were generated for items that would not post such as:

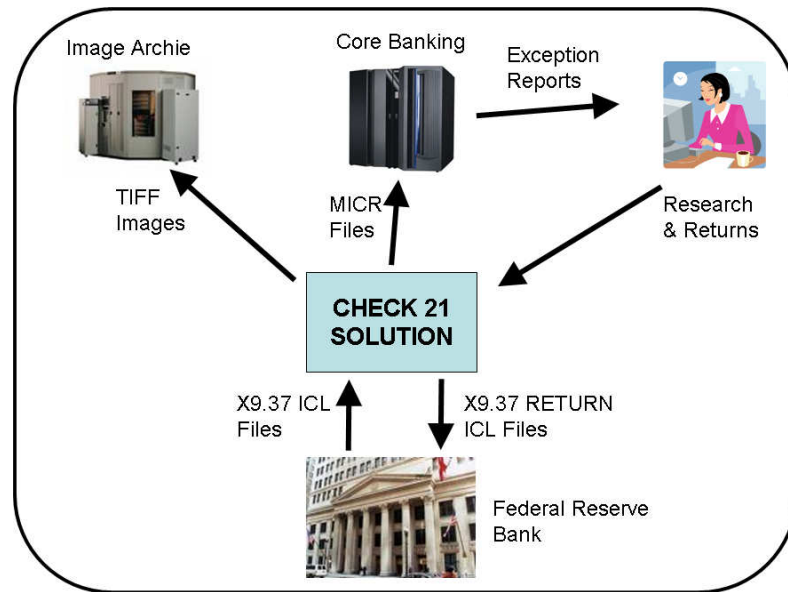
- duplicates
- stop pays
- invalid items
- MICR errors

NCDST operators would research these items on the FRB image archive system through the internet at a cost of 35 cents per item. Non-payable items would be recorded on the image archive. The FRB then handled all return processing with the original paper items for a fee.

The bulk image files were processed through a NCDST-developed “TIFF Split” process that extracted the individual TIFF images and populated image folders used to import the images to the Oracle based Image Archive. The same process populated the Oracle database with summary information of the images that was used to reconcile the image import process.

The FRB was discontinuing the capture and generation of the MICR file and the bulk image file. Instead they would be providing DSTU-2003 X9.37 files. In addition, the FRB now required return items to be sent to them also using the same X9.37 format.

Check 21 processing was the first change in seven years for NCDST since implementing their core banking system. Their original system vendor declined to bid on the project after reading the requirements, because of the X9.37 ICL file complexity and the additional checks and balances required. The vendor could not provide the tools or products for this modification. NCDST had experience with the cost of modifications to their system, and required good value and reasonable pricing for customizations. Their research indicated that modifying an existing product that already had Check 21 capabilities would allow them to keep all of their current system processes, while costing 4 to 5 times less than upgrading their existing systems to add a Check 21 solution.



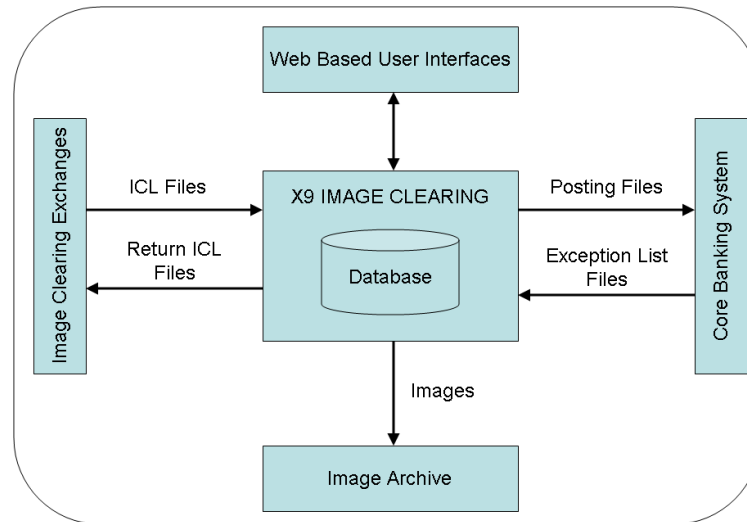
**Figure 2 - NCDST's Required Workflow under Check 21**

NCDST issued a Request for Proposal (RFP) for a Check 21 solution that would minimize the impact on their legacy systems and processes. This RFP specified the requirements for a system that would maintain NCDST's current system interfaces and processes.

NCDST awarded this project to All My Papers (AMP) in October 2008. They selected AMP as this vendor because:

- They could meet the deadline and budget requirements of the RFP
- AMP's technology could create, read, extract and convert X9.37 files
- AMP supported the conversion of X9.37 ICL files to the FRB MICR formats (SOP 4-8 and X9.37 1994 ECP) required by NCDST legacy systems
- They believed that AMP had the ability to implement this solution before the required January 2009 switchover date

AMP implemented the Check 21 solution using their X9 IMAGE CLEARING product. X9 IMAGE CLEARING provided a complete solution for interfacing legacy payment systems to Check 21 Image Exchange. The software was implemented on a Windows Server platform with a SQL database.



**Figure 3 - X9 IMAGE CLEARING Data Flow**

To implement NCDST's required workflow, X9 IMAGE CLEARING:

- Receives and stores X9.37 ICL files from image exchanges (in this case, the Federal Reserve Bank)
- Checks for duplicate incoming files and checks files for duplicate items.
- Extracts MICR and other transactional data from the ICL files
- Populates this data into a SQL database
- Formats the data for interface to NCDST's core banking system and legacy image archive

X9 IMAGE CLEARING provides NCDST with a browser based user interface for research on received items. The system can also execute against an exception list file from the core banking system containing items requiring research and possible return. Operators can review these items via a web browser, assign a return code and mark the items for return.

Images are retained and stored in a file archive directory. Indexes pointing to the location of the images are stored in a database along with the MICR and other ICL data. The system's incoming files are checked for duplicate items, with duplicate files being rejected. The system will then generate a file compatible for posting to legacy core banking systems. Images are also extracted out of the ICL files and exported to system folders for import to the image archive.



AMP provided complete installation, integration and training services to support NCDST's migration to Check 21 check clearing. AMP's project team numbered 5 people. NCDST's project team consisted of 5 people from the IT staff and 8 from the business user group.

## Results

NCDST went into live production with Check 21 check clearing processing on schedule in January 2009, avoiding the increased processing fees. They were able to continue to use their legacy core banking system and streamline their internal processes. This was all accomplished within their budget constraints and with minimum impact on their daily operations.

The Check 21 requirement had been anticipated by NCDST as a troublesome and even traumatic switch. Users who have begun using the AMP system have remarked how much they prefer using this new system over the old non-Check 21 method. Previously the MICR files were received from the FRB by website and the image file via secure transport. This process was subject to error and at times the MICR transactions had to be reversed.

With the AMP system, the receiving and processing of the ICL files from the FRB was now completely automatic and showed the totals. Operators only needed to wait until the files were loaded into the X9 IMAGE CLEARING systems databases and then generate MICR files compatible with their core banking system. The X9 IMAGE CLEARING user interfaces provided status of files received as well as any duplicates detected.

Users previously relied on the online FRB image archive to research MICR errors at 35 cents per image; now there was no charge since the items could be viewed directly from within the X9 IMAGE CLEARING product. The X9 IMAGE CLEARING browser based Research and Returns pages enabled the NCDST operators to locate and review the exception items. The exception item list was generated from their legacy system. X9 IMAGE CLEARING imported this list and provided the list to the operators. They were able to research the item's images as well as MICR and endorsement data contained in the ICL files. Item reports with images could also be printed. Once return items were marked in the core banking system an exception list file was generated and imported into X9 IMAGE CLEARING. Operators were then able to quickly review these items and mark "Reason for Return" and "Return Location RT" if not already determined from the ICL items' endorsement records. The system then generated a Return ICL file that was automatically transferred to the FRB.

To prepare the images for transfer to the image archive an operator would initiate an image export process with a simple click. This process extracted all the images from the ICL files received for the day and transferred them to system folders used for the image import process. X9 IMAGE CLEARING also transferred summary item data to the Image Archive's Oracle database. This summary data was used to reconcile the image import process.

At the time the contract was awarded the project timeline had to be compressed by about three weeks. AMP was able to implement the solution by the required FRB deadline. The project was completed successfully in 9 calendar weeks, a period that spanned the seasonal holidays.

## Lessons Learned

X9 IMAGE CLEARING complemented the existing NCDST banking package, enabling the achievement of a difficult change without replacing current systems or duplicating services. X9 IMAGE CLEARING allowed implementation of only what was needed.

During the project, NCDST realized that there also were long term research needs for the received ICL data. The ICL files included endorsement records that were not transferred to the NCDST image archive system. From time to time, NCDST needed to research these endorsement trails. To meet this requirement, AMP demonstrated that the X9 IMAGE CLEARING solution could export imageless ICL files containing the day's received items. NCDST could then save these into a long term file archive system. Whenever it was necessary to research an item, the file could be located and researched using AMP's X9 VIEWER product. This AMP product enabled NCDST operators to open the file, search for the item using DIN information and review

In the interest of completing the project in a timely manner, NCDST deferred the detailed definition of the user process and a thorough analysis of the AMP product. AMP accommodated the NCDST schedule but some additional steps could have been automated if NCDST had done these things at the outset.

Although large files were obtained from the FRB for testing, many of the same items were contained in every file. This prevented the testing from being as thorough as would have been possible with a larger sample of valid test files.

After executing the contract, NCDST studied the full AMP product line and found others, such as X9 QUALIFIER, that were beyond the scope of the original project and which could be applied to solve additional problems.