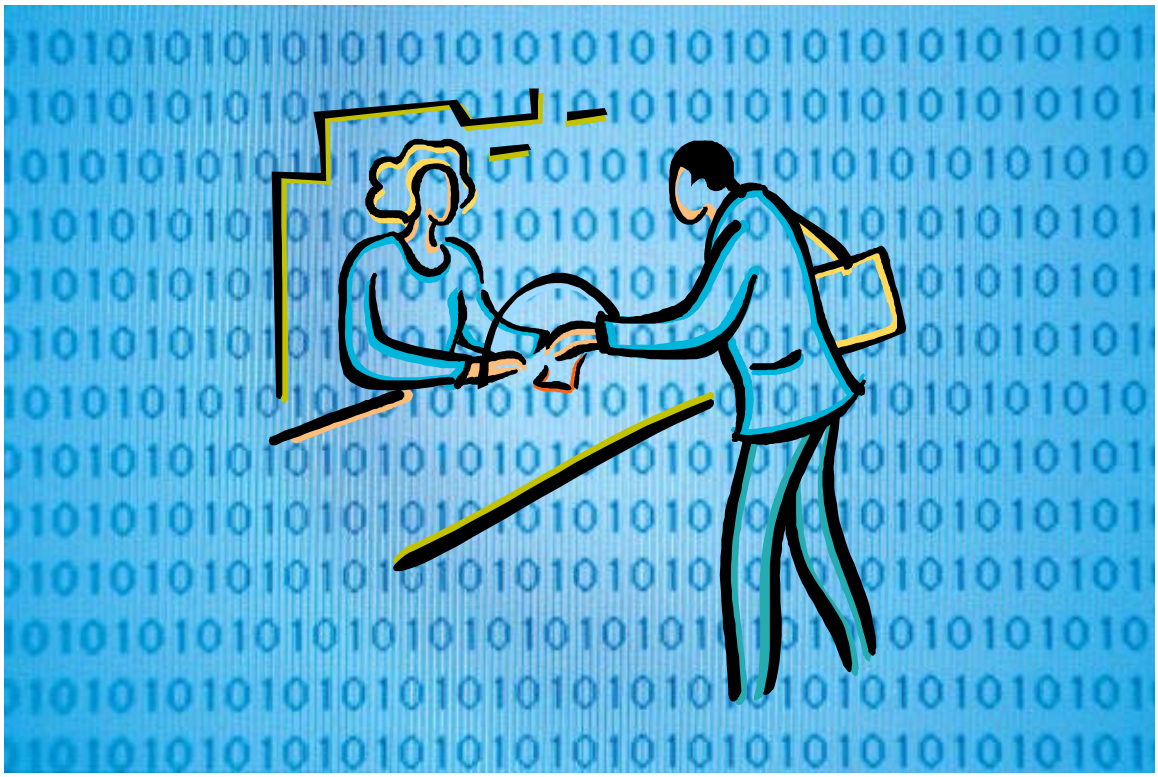

Distributed Check Processing in a Check 21 Environment

An educational overview of the opportunities and challenges associated with implementing distributed check imaging and processing solutions.

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EXECUTIVE OVERVIEW

The U.S. check payments system stands on the brink of a step-function improvement in the processes by which check transactions are captured, cleared, and archived. Traditional systems are paper-based, relying on expensive centralized systems, redundant data-entry and physical handling, with high overhead costs in the areas of transportation and staffing. This system is subject to fraud, incurs errors which create higher downstream processing costs, and creates limitations in the ability to bring new products and services to market.

Check 21, The Check Clearing Act for the 21st Century, is the catalyst for this significant opportunity. Effective 10.28.2004, this hallmark federal legislation enables banks to create, transmit, and utilize a digital image of the physical check. As a result, the industry has an opportunity for process improvement and savings unparalleled since the introduction of MICR.

Every new opportunity presents a myriad of challenges. It is the intent of this paper to present an objective and informative foundation of knowledge that may be applied to the intelligent design and implementation of the appropriate distributed check capture solution.

In Section I, we present the emerging, and compelling, financial case for implementing a distributed check processing solution. Data from recent research reports suggests that banks may realize significant savings. We will present a model that the reader may apply to their own operating environment to calculate savings potential.

In Section II, we offer insights to the various operational models that may be considered including front-counter capture, back-counter capture, hybrid capture, centralized operations center, and corporate deposit capture. For each model, we will offer the primary advantages and disadvantages so the reader may select the operational model most suitable to their own environment.

In Section III, we present the considerations that must be taken into account when selecting a distributed capture solution, along with key requirements that must be met or exceeded. We will explore this topic in three critical areas; 1) device (image capture) considerations, 2) software considerations, and 3) implementation considerations.

After reading this paper, the reader will gain significant insights that may be applied while pursuing the opportunities available via distributed check processing in a Check 21 environment.

SECTION I – THE BUSINESS CASE FOR DISTRIBUTED CHECK PROCESSING

Section Introduction

Traditional check processing systems are centralized and paper-based. Physical checks, along with the associated physical documentation, must be gathered at the point of presentment (i.e. branch teller station), forwarded to one or more collection points with manual processing at each stage, and ultimately processed at centralized operation centers using high speed reader/sorters.

The U.S. check processing market has an infrastructure that is primed for the benefits of distributed capture. The US leads the developed world in check usage with 144.6 checks per capita per year (the next closest is France with 71.2). According to the FDIC, the banking infrastructure has grown dramatically from 26,673 branch locations in 1973 to 66,775 today. With 539,000 tellers at these branches (Fortune, 7/26/04, pg. 108), the infrastructure represents an industry asset that must be leveraged to its maximum potential. Distributed check processing is a breakthrough application capable of lowering costs while creating leverage.

A. Areas of Savings

In a distributed capture and processing environment, the check is scanned at the point of presentment to create a digital image (front and back) that may be electronically transmitted for clearing. This generates significant savings opportunities in the following areas.

1. ***Centralized Operations Center Cost Reduction*** – Centralized operations for check processing typically incur higher operational costs. This includes capital investment for high speed reader / sorters, operational costs for maintenance and support, and staffing requirements including 2nd and 3rd shifts for check processing. Distributed capture reduces or even eliminates these costs. This model leverages existing branch staff, utilizes equipment with lower capital and maintenance costs, and is fully integrated with existing branch automation software.

2. ***Transportation Savings*** – Transportation costs and back-office labor costs typically comprise 75% of total check processing costs. Research has found that up to 40% of this cost can be eliminated with a distributed capture solution. Transportation handling costs and freight costs associated with checks may be completely eliminated. The remaining transportation costs for inter-office mail (and select documents) may be lowered via fewer runs and/or the complete outsourcing of this function to third party carriers.

3. ***Elimination of Redundant Processes*** – Each step of the existing check process requires human handling and processing. With the use of a digital image, these redundant processes, such as downstream POD, may be completely eliminated.

4. ***Fraud Reduction*** – By capturing the digital image of the check at the point of presentment (i.e. teller window), related technologies may be incorporated to reduce fraud. For example the use of CAR/LAR (courtesy and legal amount recognition) may be combined with account and signature verification to prevent unauthorized transactions.

5. ***Reduction in Transaction Errors*** – By capturing, verifying, and balancing the transaction at the point of presentment, and by eliminating redundant processes during the clearing process, financial institutions can eliminate errors that create expensive downstream corrective transactions that incur cost and diminish customer service.

6. ***Earlier Processing*** – By capturing and processing the image at the point of presentment, funds are made available more quickly to the financial institution and/or the depositor, creating significant opportunity for float and/or service level differentiation.

7. ***Smoothed Workflow / Staffing Expense*** – In the traditional centralized system, checks are accumulated and processed in batches, often at the end of the day. This creates a spike in the demand for equipment and staff that can lead to 2nd and 3rd shift staffing requirements. In distributed capture, on the other hand, most transactions are imaged as they occur, creating a smooth workflow that lowers overall staffing requirements.

8. ***Transaction Time Reduction*** – While current processes can take days to clear an item, distributed check processing can reduce this timeframe to hours or even minutes. Tellers may perform the scanning/imaging function. While this has created concerns regarding additional customer wait time or even the potential need for additional tellers, initial implementations have found that distributed capture can reduce teller keystrokes by up to 90%. This model can actually decrease customer wait time while enabling the teller to perform additional service and selling functions. One major bank found that teller keystrokes were reduced from fifty-five to just five.

9. ***Customer Retention / Capture*** – Clients, particularly commercial accounts, will gravitate towards financial institutions that offer the benefits associated with distributed check processing. With client premise imaging or the use of ARC (accounts receivable conversion programs that convert consumer check payments to ACH transactions), commercial clients lower their own operational and transportation costs. In addition, with the use of real-time distributed processing,

cut-off times for deposits may be extended and funds may be made available more quickly.

10. ***Creation of New Market Opportunities*** – Financial institutions may be limited in their ability to expand into new markets (geographic or product/service) by the operational constraints of centralized processing. Expansion may not be economically feasible. With distributed capture and processing, the "bricks and mortar" limitations are eliminated. Financial institutions can more seamlessly expand their offerings by leveraging the efficiencies of a digital environment.

B. Areas of Investment or Incremental Cost

While distributed check capture and processing represents a tremendous portfolio of savings opportunities, there are costs that must be considered during the evaluation stage.

1. ***Teller System*** – A branch automation platform must be in place to fully realize the benefits of distributed check processing. It is important to note that the business case for implementing a branch automation or teller automation solution cannot be established solely on the application of distributed check capture and processing. Financial institutions should be able to build the case for branch automation on a comprehensive operational and strategic set of objectives that incorporate all aspects of the company's long term plans.

2. ***Network Infrastructure*** – The exchange of digital images requires network infrastructure and capacity that may not be in place. Financial institutions should calculate the number of imaged items per day, the file size of each digital item, and the network capacity required to encrypt and transmit these images. In many cases, this infrastructure is already in place due to modernized branch automation platforms, internet related services, and intra-company communications.

3. ***Distributed Capture Technology Investment*** – Capital costs must be considered for the deployment of technology to each branch to enable distributed check capture. Estimates place the cost of a front-counter (teller) image capture device at $500 to $2,800 per device and for back-counter at $2,500 to $7,500 per device (unit price is dependent on purchase volume). Software costs include imaging, CAR/LAR, and other applications integral to project objectives. Each model should include approximately 30% additional cost for implementation and 20% additional cost for maintenance and support.

4. ***Image Replacement Documents (IRDs)*** – It is not practical to believe that every financial institution and every imaged document may be exchanged in a completely digital environment. In some cases, the digital image will be used to produce a printed representation of the original check (called an IRD) that is then processed via existing methods. A higher level of IRDs will quickly erode the business case

for distributed capture, although it should be noted that this may be a short-term impact.

5. ***Implementation Costs*** – There are significant costs in the area of implementation including hardware, software, installation, maintenance, support, training, systems integration, infrastructure upgrades, and project management. These costs may be reduced via intelligent selections during system design, and we will offer insights into this area in Section III.

C. Net Savings Model

We recently compiled industry data from multiple sources including research data from the report "Branch and Remote Image Capture Analysis" published July, 2004 by Global Concepts Payment Systems Consulting. Our intent is to objectively present the financial costs and savings associated with distributed check capture in the form of a model that the reader may apply to their own organization.

The financial models are presented in two formats; Front-Counter and Back-Counter. Front-Counter assumes that check capture/imaging occurs at the teller station. Back-Counter assumes that check processing occurs within the branch on a single, higher speed device. Both models utilize a "per item" basis for calculating costs and savings.

The Front-Counter and Back-Counter formats are each divided into three scenarios; 1) a Tier 1 bank with approximately 2,500 branches, 2) a Tier 2 bank with approximately 500 branches, and 3) a Tier 3 bank with approximately 100 branches.

It is important to note that the models assume 100% truncation without the use of Image Replacement Documents (IRDs). While banks may need to utilize IRDs, this is expected to be a short-term consequence during the transition to full image exchange. In addition, note that larger banks are able to realize higher levels of savings in some areas due to purchasing economies of scale.

The base cost to process an item has been calculated at 4.01 cents per item (consistent with industry figures and referenced in the Global Concepts research report).

1. Front-Counter Savings Model

a) Investment per Item (Front-Counter)

Global Concepts has found that the investment for a front-counter solution has a range from 1.82 cents to 2.24 cents per item, depending on the size of the bank. The investment components are depicted below, along with an investment summary which assumes 2,250 items processed per day over 265 business days per year.

Front Counter Investment
(Cents/item, except Investment)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Investment Per Item	1.82	1.94	2.01
Investment Components:			
Branch Capture HW	0.93	1.03	1.05
Branch Capture SW	0.43	0.43	0.43
Branch Servers & PCs	0.14	0.14	0.14
Operations Center Servers	0.05	0.07	0.12
Telecommunications	0.20	0.20	0.20
Help Desk	0.07	0.07	0.07
Total Investment Estimate	$27,129,375	$5,783,625	$1,198,463

b) Savings per Item (Front-Counter)

Front-Counter Savings are estimated in the Global Concepts research report, and range from 3.44 cents to 3.36 cents per item, depending on the size of the bank. The savings components are depicted below.

Front Counter Savings
(in cents per item)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Savings Per Item	3.44	3.41	3.36
Savings Components:			
Labor	2.05	2.05	2.05
Operations	0.79	0.76	0.71
Transportation	0.60	0.60	0.60

c) Net Savings per Item (Front-Counter)

Front-Counter net savings per item range from 1.62 cents to 1.12 cents per item, depending on the size of the bank. The net savings per item is calculated below.

Front Counter Net Savings
(in cents per item)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Original Cost Per Item	4.01	4.01	4.01
Plus Investment Per Item	1.82	1.94	2.01
Less Savings Per Item	3.44	3.41	3.36
New Cost Per Item	2.39	2.54	2.66
Net Savings Per Item	1.62	1.47	1.35

d) Front-Counter Savings Model

Finally, we present a summary savings model for the front-counter scenario.

Front Counter Savings Model

	Tier 1	Tier 2	Tier 3
Number of Branches	2,500	500	100
Items Per Day Per Branch	2,250	2,250	2,250
Total Items Per Day	5,625,000	1,125,000	225,000
Business Days Per Year	265	265	265
Total Items Per Year	1,490,625,000	298,125,000	59,625,000
Net Savings (cents/item)	1.62	1.47	1.35
Total Annualized Savings	$24,148,125	$4,382,438	$804,938

2. Back-Counter Savings Model

a) Investment per Item (Back-Counter)

Global Concepts has found that the investment for a back-counter solution ranges from 1.07 cents to 1.14 cents per item, depending on the size of the bank. The investment components are depicted below, along with an investment summary which assumes 2,250 items processed per day over 265 business days per year.

Back Counter Investment
(Cent/item, except Investment)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Investment Per Item	1.05	1.09	1.15
Investment Components:			
Branch Capture HW	0.25	0.27	0.28
Branch Capture SW	0.30	0.30	0.30
Branch Servers & PCs	0.18	0.18	0.18
Operations Center Servers	0.05	0.07	0.12
Telecommunications	0.20	0.20	0.20
Help Desk	0.07	0.07	0.07
Total Investment Estimate	$15,651,563	$3,249,563	$685,688

b) Savings per Item (Back-Counter)

Back-Counter Savings are estimated in the Global Concepts research report, and range from 2.12 cents to 2.05 cents per item, depending on the size of the bank. The savings components are depicted below.

Back Counter Savings
(in cents per item)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Savings Per Item	2.12	2.10	2.05
Savings Components:			
Labor	1.01	1.01	1.01
Operations	0.51	0.49	0.44
Transportation	0.60	0.60	0.60

c) Net Savings per Item (Back-Counter)

Back-Counter net savings per item range from 1.05 cents to 0.91 cents per item, depending on the size of the bank. The net savings per item is calculated below.

Back Counter Net Savings
(in cents per item)

	Tier 1 (2,500 Branches)	Tier 2 (500 Branches)	Tier 3 (100 Branches)
Original Cost Per Item	4.01	4.01	4.01
Plus Investment Per Item	1.05	1.09	1.15
Less Savings Per Item	2.12	2.10	2.05
New Cost Per Item	2.94	3.00	3.11
Net Savings Per Item	1.07	1.01	0.90

d) Back-Counter Savings Model

Finally, we present a summary savings model for the back-counter scenario.

Back Counter Savings Model

	Tier 1	Tier 2	Tier 3
Number of Branches	2,500	500	100
Items Per Day Per Branch	2,250	2,250	2,250
Total Items Per Day	5,625,000	1,125,000	225,000
Business Days Per Year	265	265	265
Total Items Per Year	1,490,625,000	298,125,000	59,625,000
Net Savings (cents/item)	1.07	1.01	0.90
Total Annualized Savings	$15,949,688	$3,011,063	$536,625

Section Conclusion

In this section we offered insights to the costs and savings associated with implementing a distributed check capture and processing environment. Industry data and empirical models have demonstrated the significant opportunities, as a result of Check 21, associated with a distributed capture solution. The reader is encouraged to apply the data and model to their own organization to estimate required investment and savings potential.

SECTION II – OPERATION MODEL OPTIONS

Section Introduction

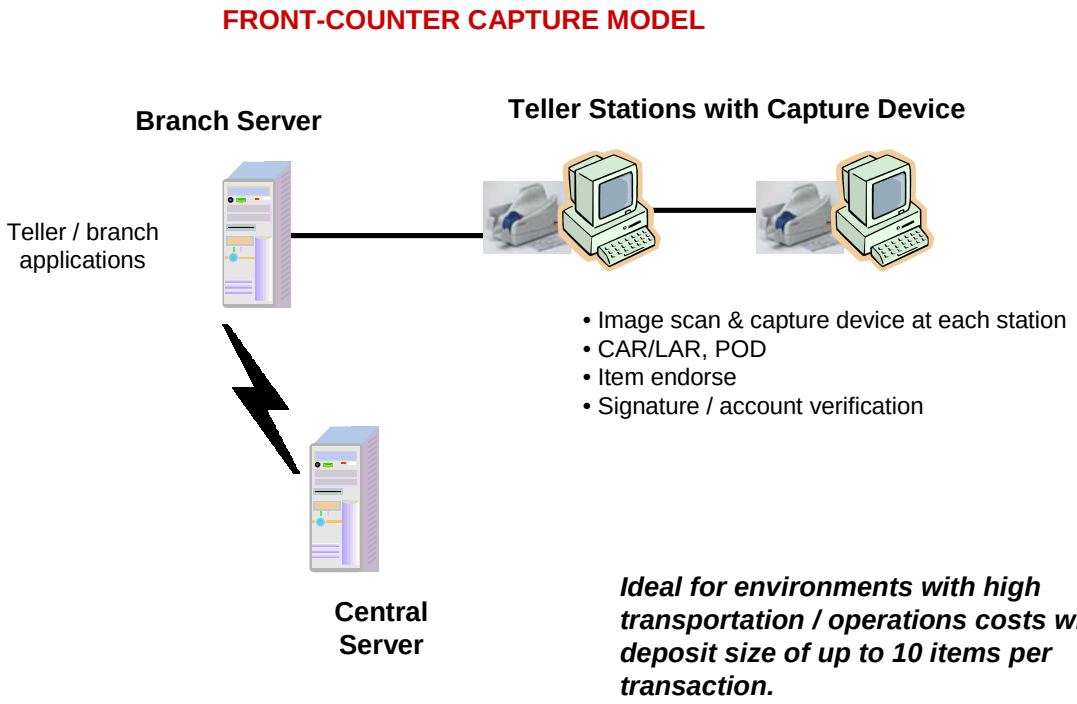
In the first section of this paper, we presented a compelling financial scenario that outlined the economic and competitive advantages of implementing a distributed check capture solution. There are several distinct operational models that may be considered, each with its own advantages and disadvantages. The intent of this section is to overview the five most common options, graphically depict each model, and present the key considerations for each scenario. The operational models to be considered are; 1) Front-Counter Capture, 2) Back-Counter Capture, 3) Hybrid, 4) Central Operations Center, and 5) Corporate Deposit Capture.

A. Front-Counter Capture Model

In a front-counter capture model, a scanning device is integrated with each teller station. The device is used to scan items (such as checks) to create a digital image that may be utilized for processing. The device may perform other important functions such as endorsing, and may be integrated with additional software functionality including CAR/LAR (Courtesy Amount Recognition / Legal Amount Recognition) to improve teller transaction times and customer service while decreasing fraud and transaction errors.

Capital investment is typically higher with this model (compared to other distributed models) due to the number of devices that are implemented. The model also assumes that the scanning device can be integrated to a modern teller platform. However, most experts agree that this model, when implemented with full digital truncation and POD at the point of deposit, offers the greatest opportunities for operational cost reduction and ROI. The ideal environment for this model is one where the branches are geographically distributed (low proximity to the operations center), creating high transportation and operations costs. In addition, the greatest benefits are derived from an environment where the branch experiences high deposit volume, peak volumes (i.e. end of day), and the deposit size is typically up to ten items.

The front-counter capture model is depicted below.



B. Back-Counter Capture Model

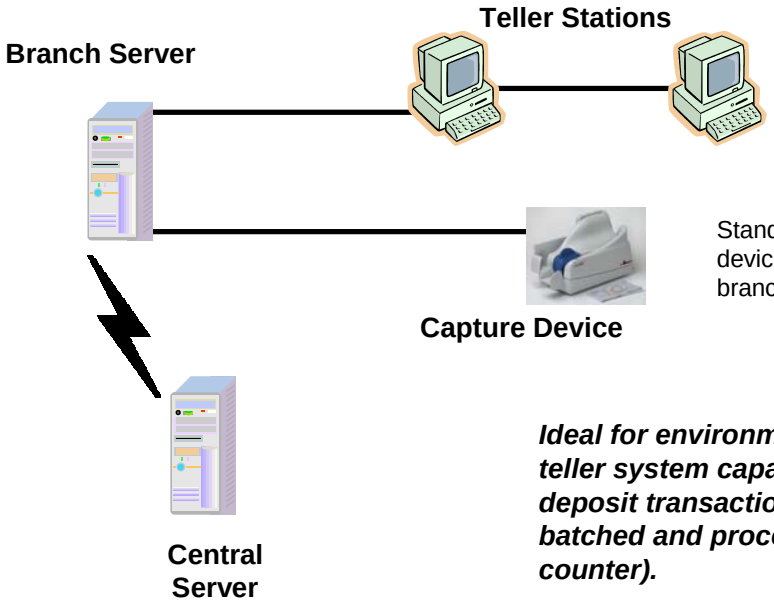
In a back-counter capture model, paper-based transactions are accumulated at the teller station. Later, as time and resources permit, these transactions are processed on a scan/read/sort device located inside the branch. This device will have larger capacity and higher throughput than the device used in the front-counter model.

Capital investment is typically lower in back-counter models (compared to front-counter), and this model is less dependent on modern teller platforms. However, significant benefits are lost, particularly in the areas of customer service (batch vs. real-time transaction processing and funds availability), and transaction validation (signature, account, amount, and POD).

The ideal environment for this model is one that lacks a modernized teller platform, transaction intensity is low (fewer retail and commercial deposits), and there is close proximity to the operations center.

The back-counter capture model is depicted below.

BACK-COUNTER CAPTURE MODEL



Stand-alone image capture device connected on network to branch server.

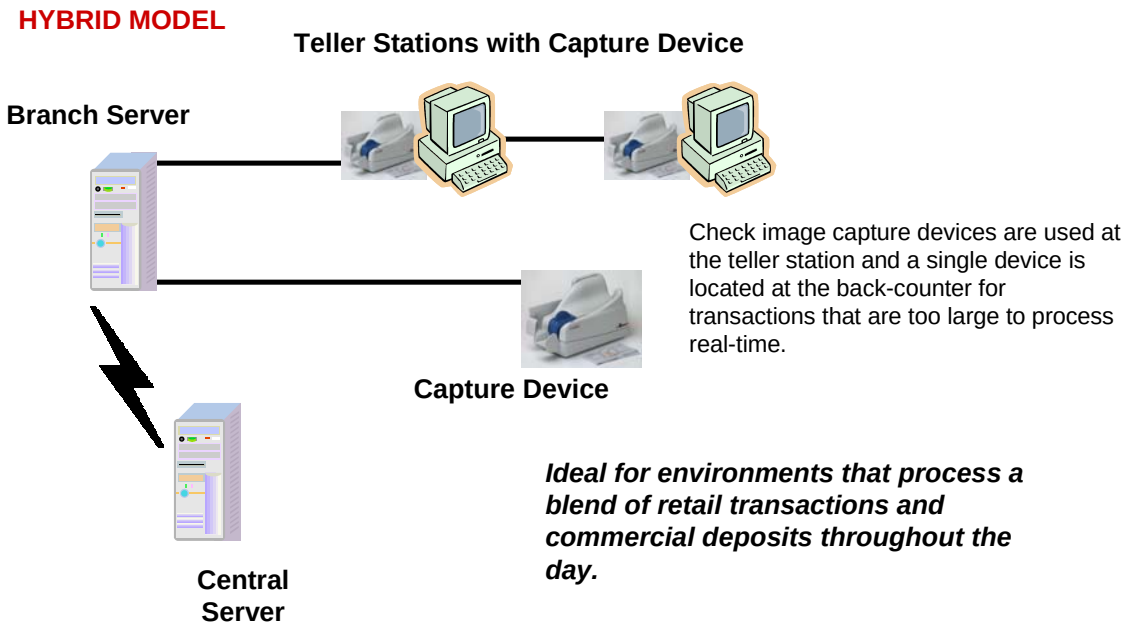
Ideal for environments with limited teller system capability and lower deposit transactions (may be batched and processed at back-counter).

C. Hybrid Model

A hybrid model combines characteristics of the front-counter and back-counter capture models. In this model, a scan/imaging device is integrated with the teller station and teller platform to allow for real-time capture and processing of transactions. In addition, a separate (typically higher speed) device is implemented inside the branch. This "back-counter" device is used for those transactions that are too large to process at the teller station (i.e. large commercial deposits) or for periods in which the volume is too great to handle efficiently at the teller station. The financial institution may set a "threshold" for determining where the transaction is processed (i.e. less than 10 items are processed at the teller station, more than 10 items at the back-counter).

The ideal environment for the hybrid model is one that has an equivalent amount of retail deposits and high volume commercial deposits. This model allows each customer segment to realize the advantages of distributed check processing without diminishing any aspect of customer service. Capital costs are higher in this model due to equipment, software, and implementation costs for front-counter and back-counter operations. This model may also be used to target specific regions or even branches where the infrastructure costs (i.e. transportation, labor) are excessive or where there is low proximity to the central operations center.

The hybrid model is depicted below.

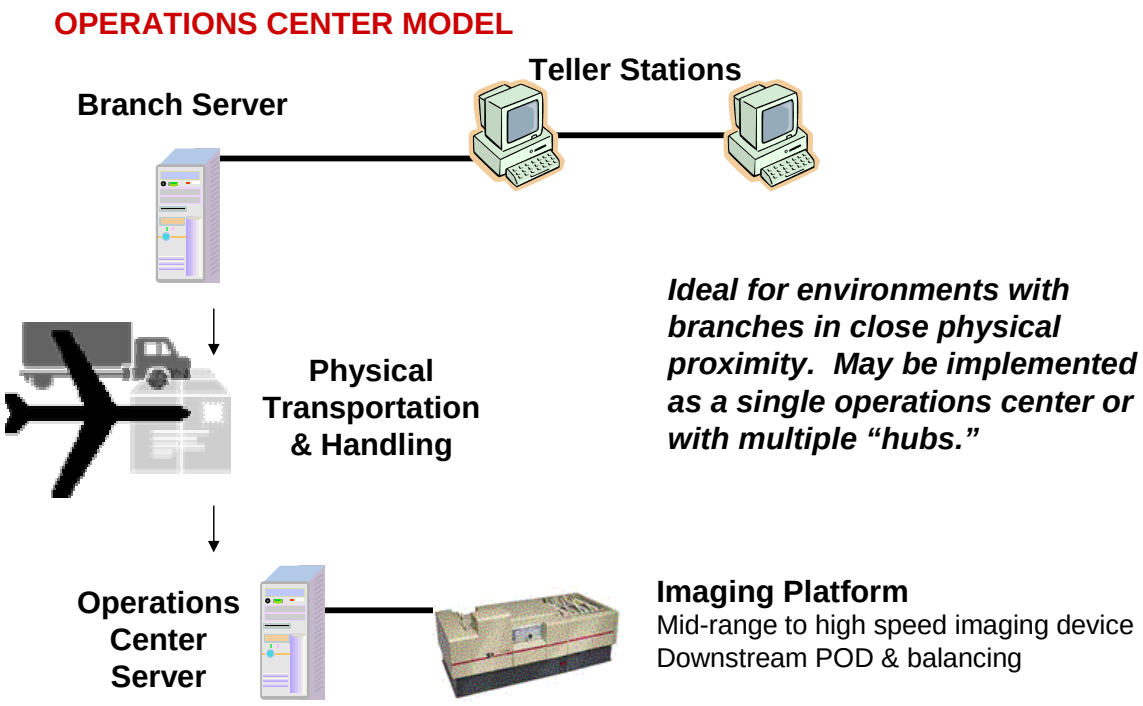


D. Central Operations Center Model

The central operations model is the traditional process by which check transactions are accumulated, processed, and cleared. It is a paper-based model with high operational costs involving redundant human handling and physical transportation of items to the center. This model does not offer the customer benefits or transactional efficiencies associated with distributed capture, and often employs high speed equipment that requires high capital investment and on-going maintenance / support costs.

The central model may be implemented to support the entire network of branch locations. Alternatively, the model may be implemented in multiple locations or "clusters." In the cluster environment, a single branch may act as a "hub" to process and clear the transactions of branches in close proximity.

The central operations model is depicted below.



E. Corporate Deposit Capture Model

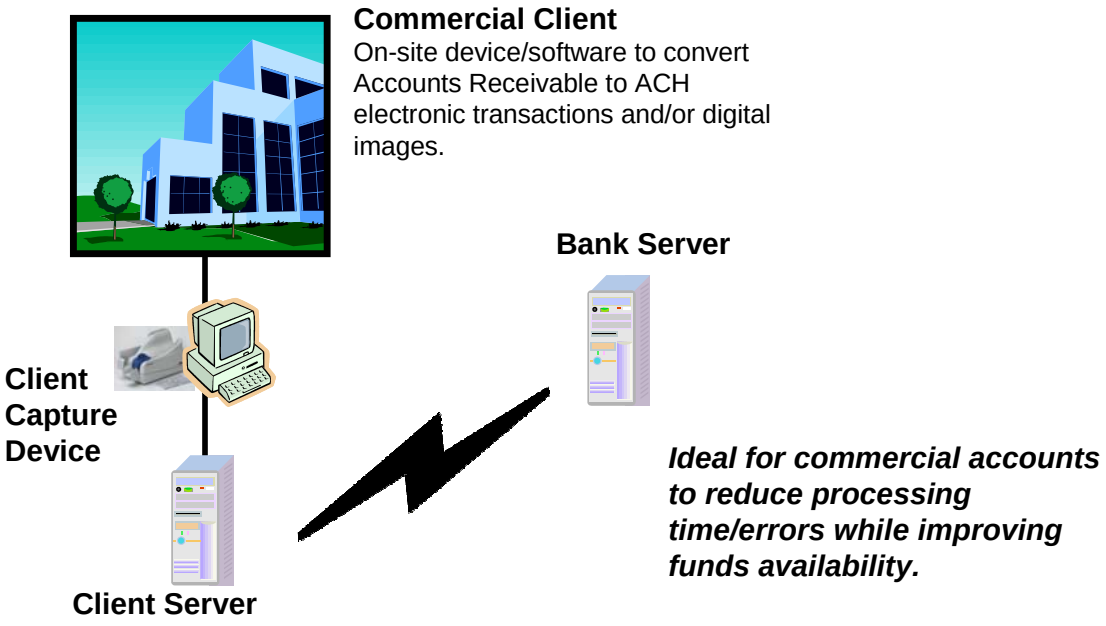
The corporate deposit capture model may used in isolation or in conjunction with any of the models previously described. In this model, commercial clients utilize hardware and software to convert their deposit transactions to either a digital image (for Check 21 image exchange) or to an electronic payments transaction (i.e. an ACH or Automated Clearinghouse Transaction for processing via the NACHA network).

Large commercial billers have recognized the tremendous efficiencies associated with transitioning paper-based check remittance processing to a digital format. This is evidenced by the explosive growth of the ARC (accounts receivable conversion) application, which grew by 816% from 2002 to 2003. The fundamental driver of this conversion is economic. The typical charge for processing a paper-based check is $0.26, while the charge for an ARC (ACH) transaction is only $0.10. Most industry experts believe that Image Exchange will ultimately provide even greater efficiency to all parties, and will likely displace a great percentage of ARC transactions.

Financial institutions that package and offer these digital conversion solutions to their commercial accounts will gain substantial market share at the expense of slower moving competitors.

The corporate deposit capture model is depicted below.

CORPORATE DEPOSIT CAPTURE MODEL



Section Conclusion

In this section we defined five operational models that may be considered when developing and implementing a distributed check capture solution. The reader is encouraged to compare their own organization's environment and strategies to each of these models to make the most appropriate and advantageous architecture selections.

SECTION III – SOLUTION CONSIDERATIONS

Section Introduction

Selecting the right hardware and software providers and implementing a complete image enabled distributed check processing solution requires an overall understanding of each critical area.

A. Hardware Considerations

The image capture device for distributed check processing must be able to support each of the operations models discussed in Section II. The device must contain the fundamental capabilities listed below to maximize the effectiveness of a Check 21 image enabled, distributed check processing environment.

1. ***Image Quality*** – To be considered an "acceptable" image, the digital image must conform to the Federal Reserve's ANSI X9 standards (American National Standards Institute). These standards specify black and white (bitonal) images at 200 or 240 dots-per-inch (dpi) resolution. They are designed to maintain a standard for check exchange formats and file formats. In a distributed check processing environment, original checks are replaced by their image at the very beginning of processing. As a result, all the clearing and processing activities rely on these images. If the image quality is poor and elements of the check are not readable, this can jeopardize the security, time and cost of the process.

   In a recent report, a sub-committee of the FSTC (Financial Services Technology Corporation) identified and defined 16 metrics that can be used to ensure overall image quality. This report may be downloaded at www.fstc.org/projects/.

2. ***MICR Read*** – MICR (magnetic ink character recognition) is a technology used to specify information about the check and the associated account. To be effective, the device should be capable of at least 97% first pass read and 99.9% error free read rates. In a distributed check processing environment, banks incur a higher cost when a reject / misread occurs. Any manual intervention required to correct a reject / misread is an increase in cost and a delay in the processing of the checks.

3. ***Device Size*** – The size of the device must be as small as possible to fit a variety of locations such as teller window, back counter and corporate locations.

4. ***Transaction Speed*** – It is important to determine how quickly the device performs under specific performance specifications. A minimum of 30 dpm (documents per minute) capture speed is required to support a distributed capture environment.

5. ***Scalability*** – The device must have the ability to increase capacity or capabilities without requiring the purchase of entirely new units. To enable use at different locations within the branch, (teller counter, back counter, corporate locations) it is important to have the flexibility to upgrade the speed of the device based on the volume of checks being processed. The device must be upgradeable to higher processing speeds (such as 60 and 90 dpm), and the upgrade should be software based, not hardware based. This will allow for network-based upgrades versus an expensive and time consuming upgrade at each physical device.

6. ***Document Autofeeder*** – It is important to consider the number of checks that can be inserted into the device during a transaction. In a distributed check processing environment, the ability to insert the entire deposit for processing is critical. It is important for the autofeeder to feature double document detection capabilities to prevent check misreads and jams. The autofeeder should have the ability to process a single transaction, or process in batch mode (up to 100 checks). This provides the ability for the operator to multi-task, spending their time focused on the customer, not the device.

7. ***Rear Endorser*** – The device should offer single-line high resolution rear ink jet endorsement. The endorsement enables the creation of an audit trail and downstream research on an item without retrieving the physical paper. The endorser must be placed before the image camera ensuring the endorsement is captured on the check image.

8. ***Exit Pocket*** – The device must have an exit pocket at the end of the transaction with the ability to hold up to 100 checks. One pocket is ideal given the ability to sort through the images of checks captured by the software application. Additionally, one pocket provides the ability to maintain transaction integrity (keeping checks in the same order received), while keeping device size to a minimum.

B. Software Considerations

The software for a distributed environment must be able to capture, validate and balance the transaction at the first point of capture into the bank's check processing system. Additionally, the software must work with the financial institution's existing application to leverage fraud detection capabilities and to provide account and item related information that supports validation and exception processing.

1. ***MICR Line Capture*** – The software must capture the MICR (magnetic ink character recognition) on the check. When the MICR line is captured, the software performs a wave form analysis of the individual characters to obtain a "true read" of the check.

2. ***Image Capture*** – The check image captured must conform to the image quality standards to prove it is a good image. In addition, the ability to capture imaged information is critical to support item fraud or special handling procedures. The software should be able to perform image manipulation (zoom, crop, rotate, etc.), and should be capable of processing and using image "snippets" captured by the image device.

3. ***Validation*** – The software must be able to validate the MICR line on the check that is captured by the hardware. There are six legal fields on the check that determine whether the check is usable (i.e. payee, date, memo line, CAR (Courtesy Amount Recognition), LAR (Legal Amount Recognition) and signature, as well as endorsement information on the back of a check. The software must be capable of flagging suspect items for review by the operator. Unusable items must be selected for rescan or return processing.

   The software should incorporate CAR/LAR. This compensates for the unpredictable location of the amount field on commercial checks. Utilizing table lookups and default search algorithms, CAR solutions determine the amount field for most commercial checks. The "courtesy amount" is the numeric amount that the payer writes or machine prints on the check. If the amount is read successfully, it can be compared to the deposited amount, often balancing a transaction with no further operator intervention. The "legal amount" is the written or printed amount in words. If there is a difference between the legal amount and the courtesy amount, the legal amount is considered binding. Many CAR engines have LAR software available as an add-on product that can read this amount. When LAR is used in combination with CAR to compare results, it can increase the confidence level of the CAR result, enhancing the read rate by 10-15% and increasing the likelihood a transaction will be automatically balanced.

4. ***Balancing*** – Software should include the capability to balance the transaction at the first point of capture. This reduces account errors and the need to make adjustments in the downstream processes. Data and images must remain synchronized when transferred for processing. The operations center will never need to inquire about an item if the software adequately performs the capture, validation and balancing of the transaction in a distributed check processing environment.

5. ***Fraud Prevention Software*** – It is important for the software application to detect fraud at multiple stages, from the teller station to the back office. The software should identify suspect checks which are reported to a secure application where account data is accumulated into a report. This report is used to assess the risk of a check. Financial institutions can set specific criteria, such as dollar limit thresholds, or automatically receive reports on checks with a high return

probability. This structure allows institutions to quickly respond to fraud trends by modifying the criteria that they monitor.

6. ***Exceptions Software*** – Exceptions software streamlines and automates virtually every process related to exceptions, including pay/return decisions, BOFD (Bank of First Deposit) input, and the handling of image and physical items. It allows for the ability to correct and repost "account not found" items all within a single system. This software enables institutions to have a quick and efficient response mechanism for daily exceptions.

C. Implementation Considerations

In a distributed check processing environment, it is important recognize the range of activities that must be addressed to achieve successful implementation. Most vendors will offer a portfolio of services to assist with implementation. It is imperative for the implementation services team to work closely with staff resources. The overall implementation plan should address each of the following areas.

1. ***Systems Integration*** – How will the hardware and software integrate with your existing environment? Is there an Application Program Interface (API) which will allow the new components to easily integrate with existing applications, or will custom software need to be written or modified? What type of interface will be utilized between the image capture device and your PCs?

2. ***Maintenance and Support*** – The cost of a check capture device and the associated software must include an amount for on-going maintenance (and software updates). This annual figure is typically 12 - 30% of the initial capital investment, and several maintenance options should be available.

    a) Depot Repair – An important consideration is the service offered when a check capture device is not performing. When a problem arises, the device is shipped to the depot service provider. The depot service provider normally ensures a three day turn time to repair the device.

    b) On-Site Maintenance – In a distributed check processing environment, there will be a need for some level on on-site maintenance and support. This includes the availability of field engineers from the vendors, as well as clearly defined operator maintenance procedures (those activities the customer can perform).

    c) Help Desk – The vendors should offer access to a trained support staff. This should include escalation procedures that result in rapid resolution of support and maintenance issues.

3. ***Training*** – Each financial institution is going to require hardware and software training, and some level of operator maintenance training. Because of the size and simplicity of the device, the hardware and software provider will usually assume the role in providing training to the financial institution's implementation team. The implementation team will then train their employees. The amount of training will vary depending on the needs of the financial institution.

4. ***Documentation*** – The hardware and software should arrive with clear and concise instructions for operation and maintenance. There should be some form of general help instruction for basic issues (i.e. replacing the ink cartridge or a feeder roller), to the more difficult operator maintenance tasks such as removing a paperclip or performing system backups.

5. ***Project Management*** – One organization or person should have clear overall responsibility to schedule and maintain progress on the implementation of the distributed check processing solution. Normally, the Project Manager is from the financial institution, and takes the lead on project coordination. The Project Manager will typically have a single point of contact for the hardware and software providers.

6. ***Rollout*** – Depending on the agreement between all parties involved, the rollout of the hardware and software can be done through a variety of channels. In most instances the components ordered will be shipped directly to the financial institution's address. In other instances the device components will be shipped to a designated city with a central location, and then the implementation team deploys the parts to the financial institution. The rollout plan and schedule should be coordinated by the overall project manager.

Section Conclusion

Understanding the hardware, software and implementation requirements in a distributed check processing environment is the key to making critical decisions regarding solution design and deployment.

SUMMARY

After reviewing this white paper, we hope the reader has gained critical insights into three important and related areas.

1) The financial case for implementing a distributed check capture solution including an economic model with associated metrics. The model may be applied to the reader's own organization for an initial assessment of investment, savings, and return on investment.
2) The primary operational model options that may be considered, including a depiction of each model, a definition of the ideal environment for each model, and the primary considerations associated with each model.
3) The key factors that must be taken into account when defining the solution including critical considerations in the areas of hardware / device selection, software selection, and overall solution implementation.

Armed with this knowledge, the reader now has a foundation upon which to design, develop, and deploy solutions to position their own organization to seize the early market advantages made possible via Check 21.

About Panini

Panini SpA, located in Turin, Italy, develops, manufactures and distributes its check processing solutions through a worldwide distributor network. Panini North America was established in 1995 as a wholly owned U.S. subsidiary located in Dayton, Ohio. Panini North America delivers a complete range of scalable products designed for branch image capture and item processing, offering financial institutions the Panini My Vision X and Panini S1 Vision products for many application solutions including Teller/Back Counter Image Capture, Corporate Treasury, Microfilm Replacement, Remittance Processing and Cash Vault Processing. Panini products and devices are supported by a world-class system of quality and support.

For more information about Panini, please visit the Web site at www.panini.com.

