ATM Cash Management 101

Optimizing their ATM cash management provides FIs and IADs with significant opportunities to generate savings.
As their bottom lines come under growing pressure, financial institutions and independent ATM deployers are increasingly looking to reduce operating costs and increase efficiencies. Optimizing their ATM cash management provides FIs and IADs with significant opportunities to generate savings.

According to ATM industry estimates, cash-related costs can account for around 30 percent of the cost of running an ATM network. North American banks often maintain as much as 40 percent more cash than necessary at their ATMs due to ineffective cash forecasting, which ties up cash that FIs could put to better use elsewhere.

For IADs, being able to keep costs low by accurately forecasting their cash demand is important, given that, unlike banks, dispensing cash at ATMs is their core business activity. Tying up excessive working capital in their ATMs prevents IADs from investing in expanding their business.

By moving from manual cash management systems to technology enabling automation of the forecasting and ordering process, ATM deployers will benefit from decreased cash-in-transit and interest costs, greater security and satisfied ATM customers, who are able to withdraw cash at their convenience.

The cost of cash unavailability at an ATM — not just in terms of expensive emergency cash replenishments, but also in terms of lost transaction revenue and potential reputational damage — makes it imperative to deploy effective cash management methods.

Based on interviews with cash management industry insiders, this report provides ATM deployers with guidance on the advantages and disadvantages of the various options available for optimizing ATM cash management.

These include developing a proprietary in-house cash management system; operating off-the-shelf systems on an in-house basis and outsourcing all or part of the cash management operation to third-party service providers.
CHAPTER 1

Introduction: the cash cycle end-to-end

“The cash cycle generally gets sufficient volumes of cash to bank branches and to ATMs – both at branches and off-site — where customers need it,” according to the Accenture report, “Taking Control of the Cash Cycle: Retail Banks’ Opportunity in Cash Management.”

“When the cash cycle fails, banks incur high costs both in terms of customer satisfaction and financial loss. In comparison to the integrated supply chains seen in other industries, the banking industry’s cash cycle combines high on-going costs with low efficiency, tying up more financial, real estate and human resources than it needs to,” the report says.

“Cost issues are multi-faceted: the cost of cash itself, cash-in-transit expenses, variable insurance premiums and security costs,” said Ron Delnevo, executive director for the ATM Industry Association Europe chapter. “Plotting a path to minimize overall costs while delivering industry-leading customer service demands complete focus and professionalism.”

According to the NCR white paper, “Delivering Cost-effective Choice, Cash Management Strategies,” total U.S. countrywide CIT costs are around $3 billion.

“Over $30 billion is borne across the U.S. financial sector and a slightly smaller amount in retail,” the NCR paper said. “Put in other terms, cash handling can represent 5–10 percent of a bank’s operating costs and is the equivalent of 1–2 percent of total retail sales.”

“Best Practices in ATM Replenishment in Europe,” a report by the ATM Industry Association in partnership with the European Payments Council, estimates that the cost of cash in the European Union, including the sourcing, preparation and delivery of cash to ATMs, the replenishment of ATMs and the handling of residual cash, is 1.3–2.6 billion euros ($1.7–$3.3 billion) per year.
ATM transactions in the U.S.

As the “2013 Federal Reserve Payments Study Detailed Report” demonstrated, despite the growth of electronic payments, cash isn’t going away.

The study said consumers made 5.8 billion ATM withdrawals with a total value of $687 billion at U.S. ATMs in 2012.

The volume of ATM withdrawals decreased by 0.9 percent per year from 2009 to 2012 in the U.S. However, during the same period, the total value of ATM withdrawals increased by 2.0 percent, and the average withdrawal value increased from $108 to $118.

In 2012, 68 percent of ATM cash withdrawals were on-us in the U.S., up from 64 percent in 2009. In terms of dollar value, 71 percent of 2012 ATM cash withdrawals were on-us.

At 1.63 billion transactions in 2012, over-the-counter cash deposit was the most common type of cash deposit in the U.S., followed by ATM cash deposit, with more than 1 billion transactions.
Global demand for cash

According to Wincor Nixdorf, the total volume of cash in circulation increased by more than 6 percent worldwide and as much as 24 percent in emerging markets in recent years. Reasons for the growth in demand for cash include the widespread availability of ATMs, along with political and economic uncertainties.

Wincor Nixdorf predicts that the total volume of cash withdrawals will grow by 9 percent CAGR worldwide between 2012 and 2018.

Monitoring

The first step in the cash cycle is for ATM deployers to monitor their ATM cash levels to determine whether the machines need to be restocked. If so, deployers need to decide how much cash and in what denomination(s).

ATM deployers may choose to restock their ATMs on a fixed or variable schedule.

“An ATM collects data, based on its cash withdrawal and other transaction history, which it supplies to the ATM processor,” said Mike Plante, head of business development at Cheshire, U.K.-based cash management services provider Cash Management Solutions. “The ATM deployer collects this transaction data from the processor and uses it to manage their ATM cash demand and forecasting.”

The ATM deployer enters the data gathered from the processor into a spreadsheet or a software application. Ideally, the software provides a Web-based interface that allows real-time visibility into the ATM deployer’s cash supply chain.

Sources of cash

Independent ATM deployers source their cash either from their own working capital or from vault cash suppliers, which are typically owned by banks.

Banks obtain their cash either from their country’s central bank, from other banks, or from business customers’ deposits. Once the cash arrives, banks store it in their branches and vaults.

If a bank uses deposits from its customers as the source of its cash, it might recirculate deposits made at a branch or use deposits held at its cash processing center.

In the U.S., banks return surplus cash to a Federal Reserve Bank.
Recirculation regulations

The ATMIA and European Payments Council report, “Best Practices in ATM Replenishment in Europe,” says that if a bank recirculates deposits at its branches or cash center, national recirculation regulations might apply. These regulations might include screening for counterfeit or unfit notes, including those stained by intelligent banknote neutralization systems.

“A banknote’s life depends mainly on its denomination: The higher the denomination, the longer the life,” said Ben Thorpe, director of global marketing and strategy at cash-handling technology vendor Glory Global Solutions. “New series of notes tend to be issued every seven to 10 years to ensure they use the latest state-of-the-art security features.”

Many countries have regulations for the quality of banknotes in circulation, according to Robin Angus, NCR product development director for cash management. In the European Union, for example, the European Central Bank issues guidelines for banknote quality.

In 2008, the Federal Reserve revised its guidelines for the quality of banknotes in circulation in the U.S.

“Depositary institutions (DIs) and other cash handlers are encouraged to use these guidelines to adjust sorting practices and/or work with equipment vendors and third-party service providers to make necessary adjustments in equipment to align with current guidelines,” according to the Federal Reserve guidelines. “Ensuring your equipment is accurately calibrated may help your institution correctly identify fit versus unfit $10 and $20 notes, potentially avoiding assessment of cross-shipping fees.”

DIs are expected to supply fit currency from customer deposits to meet other customers’ needs before requesting currency from federal reserve banks.

Cross–shipping fees are charged when a DI deposits fit currency with a federal reserve bank and orders the same denomination within the same business week and within the same Federal Reserve zone or sub–zone.

Ordering

“Once an ATM deployer has calculated the optimal load amount for their ATM’s next load cycle, they order cash from the funding bank, typically through a Web interface,” said David Crossan, channel manager at Newark, Delaware-based ATM cash services provider Cash Connect. “Cash is then sent to a money center near the ATM. The cash provider coordinates with the armored carrier to pick up the physical currency at the money center.”

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If an ATM deployer uses a cash provider such as Cash Connect or Elan Financial Services, which recycles cash in armored carrier inventories, the deployer can use existing cash from the inventory, said Mark Holland, vice president of ATM Cash operations and logistics at Pittsburgh, Pennsylvania-based Elan.

**Sorting**

Banknotes supplied by a central bank or a third-party cash supplier must be counted and sorted at a cash processing center or bank branch before being packaged to load into ATMs. This involves culling damaged or soiled notes, which are sold to the central bank at face value for destruction in a high-speed shredder.

Cash centers use bulk cash acceptors to process incoming notes. The machines simultaneously count and authenticate notes, separating them by denomination into individual containers.

FIs and IADs have two cash-packaging options. They can place the notes either in a tamper-proof ATM cash cassette or in a sealed bag that is then taken to an ATM.

**ATM replenishment**

There are two different ATM cash stocking models:

- The merchant/bank-fill model where a merchant stocks cash in an ATM in a retail store, or a bank employee replenishes an ATM at a bank branch.
- Third-party replenishment in which an armored carrier company stocks ATMs with cash from a bank vault or third-party cash center.

ATM deployers that don’t use their own cash to stock their ATMs must source their cash from a third-party supplier such as Elan Financial Services, which is owned by U.S. Bank, or Cash Connect, which is owned by WSFS Bank.

When an ATM needs to be restocked, the deployer places an order with the vault cash supplier, which sends an order to an armored carrier company.

Armored car staff use one of three cash replenishment methods:

- An ATM cash cassette swap. This involves replacing an empty or partially empty cassette with a preloaded cassette. The cassette containing residual — i.e., unused — cash is returned to the cash center for counting and reconciliation. As ATMs typically contain four cassettes,
a guard has to carry four new cassettes from the armored car to the ATM and then carry the four old cassettes back to the vehicle.

- Bag swaps. In this model, the armored car takes both an empty bag and a full bag of cash to the ATM. A guard places residual cash held in the ATM’s safe into the empty bag, which is returned to the cash center. The guard then restocks the ATM with the full bag.
- Top-up. This involves adding extra cash to existing notes stored in the ATM.

Each of these three methods has advantages and disadvantages, according to NCR’s Angus.

**ATM cassette exchange**

**Pros**

- Quick.
- Secure — CIT staff don’t need to touch cash in the cassettes.
- Convenient — ATMs can be balanced and reconciled at the cash center because all cash is returned there for counting.
- Simple to plan, as there is no need to take into account the amount of cash remaining from the last load.

**Cons**

- Cash cassettes can be damaged during shipping.
- Cash in cassettes takes up far more space in a truck or cash center than cash in bags.
- CIT must control which cassettes go to what ATMs to avoid mixing up customer cassettes or attempting to put a cassette from one manufacturer into the ATM of another.
- An ATM’s four cash cassettes are bulky to carry, which can be a problem if the CIT truck can’t park right next to the ATM, requiring the guard to walk some distance.
- Cassettes are hard to disguise, while a bag of cash can be carried in a nondescript shoulder bag.

**ATM bag exchange**

**Pros**

- Same simplicity of planning and balance and reconciliation benefits as cassette swap.
- No risk of damaging, losing or mixing up cassettes.
- Greater space-efficiency in trucks and packing centers.

**Cons**

- Time required to remove and bag the residual cash in the ATM and load new cash.
• Guards have greater access to cash than if it were sealed in a cassette.

**Top-up**

**Pros**

• Cash efficient; if cash withdrawals at an ATM were less than expected, less is required for replenishment.
• No risk of damaging/losing/mixing up cassettes.
• More space-efficient in trucks and packing centers, as the cash is carried in a bag.
• Quicker than bag swap, as there’s no need to remove remaining cash.
• No reverse logistics, as there’s nothing to bring back from the ATM and count, which costs money.

**Cons**

• Not as fast as cassette swaps at an ATM.
• Guards have greater access to the cash than if it were sealed in a cassette.
• Much more difficult to reconcile funds.

Cassettes are the prevalent ATM replenishment system in Europe and Asia, while bags are typically used in the U.S.

“The problem with the bag or cassette swap methods is that a lot of money is in transit to and from the cash center,” said Sandy Edwards, sales manager at Valuetec Financial Equipment, a Littleton, Colorado-based ATM equipment supplier. “It may be a day or two before the money goes back into the cash supplier’s account.”

The top-up method requires rigorous auditing so that an ATM can be balanced. “The person adding cash needs to count the cash already stored in the ATM before adding the extra money,” said Edwards. “But there’s a risk that they will be dishonest or make a mistake when counting the cash.”

**Interest**

The cash supplier starts charging interest from the moment cash leaves the vault until:

• Cash is withdrawn from an ATM by customers and the funds are settled — on a daily basis — to an account with the cash supplier.
• Residual cash is returned to the cash supplier.

**Reconciliation**

A key part of the cash management process is to reconcile ATM withdrawals recorded in the electronic log with cash stocked in an ATM and returned
to the cash supplier by the ATM processor and armored carrier. This involves investigating any discrepancies between the cash stocked in an ATM and the cash returned to the vault after allowing for cash withdrawn by ATM customers.

“For example, if an ATM deployer arranges for $10,000 to be put into an ATM and $5,000 is withdrawn by customers, then $5,000 should be returned to the cash supplier,” said CMS’s Plante. “But, if only $4,000 is returned, Cash Management Solutions’ system will spot this discrepancy and trigger an investigation on behalf of our client.”

Once the cash and activities at an ATM are accounted for, the ATM is in balance. This process includes considering the starting balance at the last balance point, counting the cash that is currently in the ATM, accounting for all cash dispensing activity since the last balance point, and considering any funds that were added in the interim.

As Paul Miniutti, software manager at Dallas, Texas-based ATM software vendor ProfitStars, wrote in a blog:

Reconciliation can get complicated. Without a thorough understanding of the day-to-day activities at the ATM, it’s easy for the ATM to go out of balance. Many times you are dependent on ATM cash reporting from the armored company. If this is inconsistent, one of two things usually happens:

- A lot of time and resources are spent reconciling the ATM(s).
- The out-of-balance warning is ignored and more cash is ordered — usually more than is necessary — which ultimately increases the costs of running the ATM(s).
Cash recycling

Cash recycling, the circulation of cash within a single environment, offers several benefits for FIs. Employed at ATMs, cash recycling can dramatically reduce the need to replenish cash supplies.

The fundamental function of a cash-recycling ATM is its ability to validate and sort notes, according to the Diebold white paper, “The Evolution of Self-Service Cash Deposits.”

Cash deposited at the recycling ATM is validated and checked for fitness before being sorted into individual cassettes by denomination. Suspected counterfeit and damaged notes can be sorted into an exceptions bin.

In addition to cash-recycling ATMs, banks are using teller cash recyclers. These units can quickly sort cash by denomination, check it for fitness and authenticity, and reduce time spent balancing the cash drawer.

With cash stored only in cash-recyclers and vaults, FIs can better judge how much should be sold or ordered each week, increasing the efficiency of branch change fund management and helping to keep the branch within its total branch cash limit, according to the ATM Marketplace guide, “Deposit Automation: Remaking the Consumer Experience,” sponsored by Diebold.

Cash can remain within a branch rather than being taken from the ATM by a CIT company, sorted, and returned to the branch, the guide said. “Now (banks) can have additional technology such as denomination and fitness sorting, a tracking system for the cash coming in and greater storage capacity. “It leads to one less trip ... back to the vault.”

According to Marco Goltz, product manager of global cash management services at Wincor Nixdorf, replacing manual processes with automated cash cycle-management systems can reduce cash-handling costs by more than 20 percent.

“There is also a decline in administrative costs for managing and monitoring the cash supply chain as cash passes from the branch to the CIT operator and

“Because branch staff are freed from cash handling duties, they have more time for selling more high-value services to customers.”

— Marco Goltz, product manager of global cash management services at Wincor Nixdorf
back,” Goltz said. “Because branch staff are freed from cash handling duties, they have more time for selling more high-value services to customers.”

According to Goltz, Wincor Nixdorf end-to-end cash management technology can improve system availability to more than 98 percent, leading to significant improvements in customer loyalty and use.

“We provide and service all system core components, including recycling modules, note recognition, firmware, platform software and application interfaces, which is critical in a state-of-the-art cash recycling environment,” he said.

**Cash-recycling ATM adoption**


However, U.S.-based FIs PNC Bank and Citi both favor cash recycling at ATMs.

“Cash recycling performs best when paired with a solid cash supply chain management strategy and capability to maximize the value of the technology,” said James Trocmé, Citi global retail bank senior vice president and ATM channel manager. “Citi plans to leverage cash recycling technology and has already deployed terminals with recyclers in various configuration options based on inbound and outbound cash movements.”

“I’m a huge fan of using cash recycling technology, even if it’s only used for depositing cash,” said Ken Justice, senior vice president and ATM executive at PNC. “Cash-recycling technology jams far less and offers much greater capacity than traditional cash-deposit devices.”

Asian banks currently lead the world in the deployment of cash recycling ATMs.

“Japan has had cash recycling for 25 years, and 100 percent of Japanese ATMs now recycle cash,” said KAL CEO Aravinda Korala. “Just under 100 percent of Korean ATMs offer cash recycling, while 40 percent of Chinese ATMs recycle cash.”

Chinese ATM manufacturer GRG Banking estimates that the use of cash recycling can reduce the daily cost of operating an ATM by 18–25 percent. A cash recycling ATM could save a bank $948,000 per 100 ATMs annually, according to the ATM Marketplace white paper, “Four Questions Financial Institutions Should Ask about Cash Recycling,” sponsored by GRG.

“As cash management costs German banks 4 billion euros ($4.97 billion) [according to 2009 data], efficient cash management can save a lot of
money,” said Robert Heinz, CEO of Augsburg, Germany-based banking consultancy Stolle und Heinz Consultants. “For instance, by using cash recyclers, German banks could save nearly 1 billion euros ($1.24 billion), around 25 percent of their cash management costs.”

**European ATMs upgraded with cash recycling**

According to the RBR report, “ATMs in Europe 2014: Hardware, Software and Services,” European banks are increasingly improving their existing ATMs rather than deploying more.

RBR says that, with the exception of the Russian and Turkish markets, which saw significant growth, the European installed base shrank by more than 15,000 ATMs in 2013. However, the market saw a significant increase in the number of automated deposit ATMs featuring cash recycling technology, and in deployers using cash forecasting solutions.

<table>
<thead>
<tr>
<th>Automated note deposit and cash recycling ATMs in Europe, 2012 and 2013</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>nonrecycling</td>
<td>23,837</td>
<td>28,032</td>
</tr>
<tr>
<td>recycling</td>
<td>101,581</td>
<td>117,789</td>
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Source: ATMs in Europe 2014: Hardware, Software and Services, RBR

Higher purchase costs historically have made many banks reluctant to deploy cash recycling ATMs. And some have focused on placing them in locations that see a balanced volume of deposits and withdrawals. However, RBR says that banks are now viewing the potential savings in cash management as compensating for the increased cost of buying cash recycling ATMs.
In Europe as a whole, the number of ATMs featuring cash recycling rose by 18 percent in 2013 to 28,000, according to RBR.

Almost half of Europe’s cash-recycling ATMs are in Germany. The technology is much more common in Western Europe, where 7 percent of ATMs feature cash recycling, compared with less than 1 percent in Central and Eastern Europe. Russia accounts for almost half of all cash recycling ATMs in CEE, but this represents only a tiny fraction of the Russian installed base.

Cash forecasting

European banks aren’t looking solely at hardware solutions to make their ATM fleets more cost-effective, RBR says. They are also using cash forecasting and management software to improve the efficiency of their cash processes, and to reduce cash-handling and CIT costs. Such software was used on 370,000 ATMs in Europe in 2013, up 28 percent from the previous year.

Proprietary solutions are most common, while third-party solutions such as Cash Point & Transport Optimizer from Munich, Germany-based plan focus software, and Integrated Currency Manager from Fiserv also are commonly used, alongside those provided by ATM hardware vendors.

RBR expects cash processes to become further streamlined. “Banks will continue to look at ways to make their cash processes more cost-efficient,” it said in the ATMs in Europe report. “Expected future developments include increased recycling at the branch level, with banks implementing closed cash cycles to reduce CIT and cash-handling costs, and the use of more sophisticated cash management software.”

The benefits of cash recycling technology increasingly justify the costs.

Source: “ATMs in Europe 2014: Hardware, Software and Services,” RBR
Issues in cash management

ATM cash management is a balancing act. If a deployer’s ATMs don’t hold enough cash, customers are dissatisfied and frustrated. But if they hold too much, it can cost an ATM deployer thousands of dollars in annual interest and lost revenues.

An estimated 75 percent of an FI’s cash is dispensed through the self-service channel, according to the Diebold white paper, “ATM Currency Management.” Thus, it’s critical that FIs manage the cash inside their ATMs effectively.

If an FI maintains optimal cash levels throughout its self-service channel, this helps to reduce costly trips to replenish ATMs. Optimizing ATM cash management ensures limited residual cash levels at ATMs and frees idle cash for more profitable, revenue-generating opportunities.

“If your ATMs have high cash residuals, this is indicative of poor ATM cash forecasting,” said CMS’s Plante.

**Forecasting**

“Accurate cash forecasting is the top requirement for effective cash management,” said Plante. “Without accurate forecasting, ATM deployers pay too much interest due to having excess cash in their ATMs, or they pay for too many cash deliveries.”

An optimal replenishment schedule — one that balances the costs of cash and armored carrier services — becomes more important when interest rates or carrier fees rise.

“ATM owners must first decide what is most important to them: lowest cost loads or highest availability to cardholders, or some point in between,” said Elan’s Holland. “While some ATMs have consistent dispensing patterns, most don’t. The volatility of total cash dispensed for each load for a given ATM can be significant. To ensure the ATM is always up, a larger buffer must be added to make sure it dispenses through unexpected volume spikes. If a low residual is desired, there may be a higher incidence of emergency cash loads or out-of-cash situations.”

“The key issues in cash management are optimizing load frequency and load amounts, strong management of armored carriers, and having good processes in place to quickly deploy maintenance providers when needed. Doing these right requires well thought-through business processes, systems, and vendor agreements.”

—David Crossan, channel manager at Cash Connect.
The ability to manage and forecast each ATM individually rather than apply a rule across all the deployer’s ATMs is important for efficient cash management. “Each ATM has its own personality and should be treated as such,” Holland said.

“Cash forecasts need to be like weather forecasts that get regularly updated,” said NCR’s Angus. “They must be dynamic, with changes being fed back into an adaptive system. NCR’s cash management software calculates a forecast ranging from months to years, depending on the situation, but always refreshes the cash replenishment plan daily by adapting to changes in demand, evolving costs, changes in contracts, etc.”

An ATM operator that uses spreadsheets rather than software for cash forecasting will always tend to have too much cash, said Angus.

“People are risk averse, especially if they use manual methods,” he said. “Nobody gets fired for holding too much cash, but you will get fired if your ATMs run out of cash.”

**Holidays and events**

ATM deployers need to track and diarize specific events — public holidays, local cultural or sports events, religious festivals, local construction projects, etc. — that will affect traffic at their ATMs.

“Cash demand peaks at Christmas and Easter can be 40 percent higher than at normal operating times,” said Glory’s Thorpe.

Deployers also must factor in extreme weather conditions — hurricanes, blizzards and the like — that can affect cash demand.

“When a hurricane is on the way, you should add cash to your ATMs before it makes landfall and remove the cash the day before the hurricane,” said Gary Faulkner, executive vice president and chief marketing officer at Dallas, Texas-based ATM cash management software vendor Morphis. “This way, if the ATM is vandalized, people won’t be able to steal the cash.”

When assembling forecasts for extraordinary events, a deployer must consider many variables that will affect customer traffic, according to Plante.

“This can be daunting and time-consuming for ATM deployers to do internally, so they tend to over-order cash, as their forecasting methods aren’t sufficiently accurate. For example, they may lack the software tools to track local events in their area.”
An outsourced solutions provider, such as CMS, collects ATM transaction data history from the customer's processor and plugs it into a unique forecasting model, Plante said.

“Our team of mathematicians analyzes the output from the model and flags each specific event that will affect trade at the customer's ATMs. We remove one-off events that have already taken place from the forecast, and include regular events. If an ATM is located at a hotel, we track conferences taking place at that hotel, for example.”

As part of its forecast, CMS also analyzes other factors such as armored carrier reliability, the customer's contract terms, risk elements and interest rates.

Idle assets

NCR estimates that 80 percent of ATMs and bank branches hold more cash than needed to meet usual demand.

According the report, “Cost reduction: The next boost in bank productivity,” by Deloitte, North American retail banks often keep up to 40 percent more cash in their ATMs than required, when excess cash of 15 to 20 percent is considered sufficient.

“By reducing this differential, banks would have access to more excess cash that they could put to more productive use, rather than have it idling inside ATMs,” the report says.

“ATM cash balance reduction is important,” said Plante. “In the U.S., ATM deployers face a lot of costs over the next few years, such as migration to EMV and to contactless cash withdrawals. They need to free up capital to implement these upgrades over the next two to three years.”

According to Plante, smart cash management will release 30 percent of an ATM deployer’s working capital, which can then be used to upgrade or replace aging ATMs.

“An IAD may want to install extra ATMs, but can't get any further loans from their bank to do this,” he said. “If they can improve their cash management, they can release capital to reinvest in their business.”

Smart cash management will help free up an IAD’s working capital, which can be reinvested in the business.

“Cash demand peaks at Christmas and Easter can be 40 percent higher than at normal operating times.”

— Ben Thorpe, director of global marketing and strategy at Glory Global Solutions
Transparency

Effective cash management requires an accurate picture of cash use in an ATM network.

“A lack of transparency as to what is happening in an ATM network is a key problem,” Plante said. “ATM deployers often lack the ability to determine exactly where their cash is at any specific moment — for example, is it being transported in an armored car, or is it in an ATM?

“They may also lack good intelligence on the performance of their cash supply chain. A benefit of having good reporting is that it helps reduce the risk of internal theft of cash,” he said.

FIs need an accurate picture of how long it takes for a cash center to process the cash returned from their ATMs. The longer a cash center takes, the longer inventory is tied up and unavailable for use in ATMs.

“It’s very important to know when cash being deposited by commercial customers such as retailers will become available,” said NCR’s Angus. “If you know that, you can depend on the customers’ cash to meet demand. If you don’t know it, you have to order inventory as a contingency to cover that demand.”

According to Angus, a cash management solution can determine what cash will be available to meet demand, reducing the amount of contingency inventory required and driving down inventory and associated costs.

ATM deployers need to have systems in place to measure service level agreements with armored carriers as a way of managing their contracts.

“If you need cash to be delivered to an ATM at a certain time, and the delivery is six hours late, by which time the ATM is out of cash, you must be able to invoke your SLA and only pay for the service you actually received,” Angus said.

Banknote fitness

One key to the availability of an ATM is the quality of the banknotes within it.

According to the report, “Taking Control of the Cash Cycle: Retail Banks’ Opportunity in Cash Management” by Accenture, “Old or torn notes are more likely to get jammed in the exit slot and put the ATM out of service. By controlling the supply chain more tightly, banks can gain greater control
over note quality, thereby delivering a further boost to availability and cutting maintenance overheads."

“While notes with a few small tears are acceptable for use in ATMs, soiled or damaged notes degrade the performance of an ATM,” Angus said.

In the run-up to major holidays such as Christmas, cash demand increases. “Banks and cash processors will either reduce their standards for the quality of notes or order more cash,” Angus said.

**Delivery logistics**

By outsourcing cash operations to third parties such as CIT providers, banks can incur savings of 15 to 20 percent says the Booz & Company report, “Managing Cash for Less: Improving the Efficiency of Banks’ Cash Operations.”

However, managing relationships with armored carriers poses a special challenge for ATM deployers, due to the relatively low tech, labor intensive nature of the CIT business. This is particularly the case for larger FIs that use multiple armored carriers. Keeping track of the various load schedules, chasing down reports and filing claims can be a burden on the FI’s back office.

ATM cash management software vendors such as Fiserv and Morphis and NCR offer applications to help customers manage the operational issues associated with CIT.

**Conflict**

“The logistics of delivery can conflict with the optimal day that cash should be delivered to a cash point,” said Dennis Boyle, director of integrated managed services for Brink’s global financial institutions group.

“Ideally, ATM cash deliveries would operate on a just-in-time model, where an ATM would only be replenished when it was just about to run out of cash,” said Morphis’ Faulkner. “But armored carriers don’t like the just-in-time approach. As they have huge fleets, they have to know the delivery schedule in advance for their clients. Deliveries need to be spread out, otherwise, they would have a lot of clients all wanting deliveries on the same day.”

“Many ATM owners get the CIT company to fill their ATMs once a week, for example on a Monday or a Friday,” Faulkner said. “If demand for cash turns out to be higher than expected at an ATM, to prevent the machine running
out, the ATM owner will have to request a special, unscheduled cash run. CIT companies charge a premium for this.”

Holidays and weather events such as hurricanes put particular pressure on CIT companies.

“Planning for holidays and for special local events that only occur in one place such as Mardi Gras in New Orleans requires detailed coordination between the ATM operator and the CIT firm,” Faulkner said. “For example, if there is a holiday or local event that occurs on a Tuesday, then all the local ATM operators will want to have cash delivered to their machines the day before.”

This can be a problem for CIT companies that have to find a way to fulfill orders already scheduled for Monday, as well as those that have been moved up.

“They have to talk to their ATM clients and get them to agree to not have all their deliveries on the Monday and push some of them back to the previous Friday, when they have their pre-weekend delivery,” Faulkner said. “The Friday deliveries will then need to include extra cash to allow for the holiday.”

According to the CMS white paper, “Ten Rules of Effective ATM Cash Management,” armored carrier companies can have a huge influence on the performance of an ATM fleet:

There is often little competition in most armored transport markets, and the replenishment process can be very manual. This combination means that lots of things can go wrong and, when they do, costs can be high. ... Modeling and operating each ATM efficiently — from ordering to withdrawal from the bank, packing, transporting, loading, unloading residuals, transporting back to the bank, depositing — leaves plenty of room for error.

It’s important to manage every armored carrier location, since each is different, Elan’s Holland said.

“There isn’t a single armored carrier in the U.S. that has all its branch locations operating at a high level. Each has certain locations that have individual issues needing to be tracked and managed.”

These issues might include internal theft resulting in armored carrier claims; currency room operating issues that result in fit currency issues; replenishments not completed on schedule; reporting accuracy and timeliness; claims management and payment; and overall risk for each carrier.

“Everyone’s dream is to have an ATM dispense its final bill just as the armored carrier arrives with the next replenishment. Unfortunately, this is a pipe dream.”

—Mark Holland, vice president of ATM cash operations and logistics at Elan Financial Services
A cash provisioner that regularly communicates with armored carriers might be in a better position than an IAD to resolve these types of issues; in fact, Elan deals with armored carriers that service more than 50,000 ATMs on behalf of the company’s clients, Holland said.

**Cash Connect**

Cash Connect operates an ATM managed services outsourcing program in the U.S. that manages every aspect of the armored carrier relationship on behalf of IAD and FI clients. The service, which uses Morphis software, combines below-market armored carrier rates along with cash forecasting and settlement tools, according to Cash Connect Vice President Mary Kay Eisel.

“ATM Managed Services is a turnkey service that includes managing vault cash, optimizing load amounts and schedules, managing armored carriers and first-line maintenance providers, as well as providing insurance coverage. Outsourcing these functions enables an FI to focus on core competencies instead of spending lots of time administering their ATM program. Properly managing the back office of an ATM program is critical, but it’s labor-intensive and doesn’t generate revenue for an FI.”

Cash Connect maintains relationships with nationwide armored carriers such as Loomis, Brink’s and Garda, and regional carriers and maintenance providers such as Pendum and Bancsource.

“Because of our buying power, we’re able to negotiate volume discounts with these service providers,” said Cash Connect President Tom Stevenson. “Individual banks and credit unions can find it difficult, if not impossible, to negotiate such good rates for these types of services. These reduced rates are passed along to our clients.”

Deployers that sign up for Cash Connect ATM managed services gain a single point of contact for their cash delivery and armored carrier needs. Other benefits include the ability to charge penalties to carriers that miss service levels due to load errors or missed loads; consolidated and reconciled billing; dispute management for carrier-related cash differences; and proactive verification of every load through Cash Connect Web and mobile ticketing service.

“Every service performed is logged and, at the end of the month, the carrier invoice is generated from our system,” said Stevenson. “This allows us to compare the correct charges to the invoice from the carrier and identify billing errors. As many as 60 percent of the invoices carriers send their cus-

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**Cost-savings from outsourcing ATM cash management**

<table>
<thead>
<tr>
<th>Organization managing its own armored carrier relationship</th>
<th>Organization using Cash Connect ATM Managed Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Off-premise ATMs: 100</td>
<td>• Off-premise ATMs: 100</td>
</tr>
<tr>
<td>• Average loads per month: 1.5</td>
<td>• Average loads per month: 1.5</td>
</tr>
<tr>
<td>• Est. average carrier cost: $75/load</td>
<td>• Average carrier cost: $65/load</td>
</tr>
<tr>
<td>• Full-time employee (vendor mgmt/forecasting/invoice reconcile): 1</td>
<td>• Cash forecasting fee: $10/order</td>
</tr>
<tr>
<td>• Salary and benefits: $50,000</td>
<td>• Total operating expense: $135,000</td>
</tr>
<tr>
<td>• Total operating expense: $185,000</td>
<td>• Annual savings: $50,000</td>
</tr>
</tbody>
</table>

Source: “Why banks and credit unions should outsource their ATM back office,” ATM Marketplace white paper sponsored by Cash Connect.
customers contain errors, which can cost clients a lot of money. We only send our clients their carrier invoice after we have cleaned it up.”

**Internal theft**

Losses from internal theft hurt the ATM industry more than most other types of ATM-related fraud, according to “ATM Vault Cash Management: Five strategies for optimizing a cash program,” an ATM Marketplace guide sponsored by Cash Connect.

When employees become disgruntled or experience hard times, it’s easy for them to skim cash — especially from a busy IAD that doesn’t have time to make cash monitoring its primary business.

Poor ATM cash management reporting can lead to undetected internal cash theft resulting from a lack of transparency on the status of cash in the network.

“Cash Management Solutions’ service will spot any discrepancies in ATM cash balances between the amounts loaded and the amounts returned to the bank, and detect any fraud,” Plante said.

Heinz, of Stolle und Heinz, recommends that ATM deployers outsource cash management in order to ensure that their service provider gives them high-quality reports, along with checkpoints for confirming or denying transactions recommended by the service provider.

Cash Connect ATM managed services uses remote monitoring and predictive cash management tools to reconcile the amount of cash loaded and dispensed. By reconciling each cash order down to the transaction level, the company is able to identify any discrepancies and take the necessary steps to mitigate potential losses, it said.

To reduce the risk of theft by armored carrier staff, Cash Connect requires that clients’ ATM cash cassettes be swapped every 30 days. Balancing ATMs every 30 days ensures that any theft by armored carrier personnel is detected quickly.

“The longer you leave it to change the cash in an ATM, the harder it is to spot any problems,” said Cash Connect’s Crossan.

“A lot of problems occur when you’ve got turnover in the armored car offices,” said Cash Connect senior auditor and compliance officer Jaimee Williams, Cash Connect senior auditor and compliance officer

“We require, as a safety net for all of our ATMs, that new cash be sent out every 30 days. Once you let something go on for 60 or 90 days, the chances of missing money greatly increase.”
Williams. “If you wait even 40 days to settle the ATM, you might find out that the driver who left the company last week had a nice lunch on his last day with the company, after taking some extra cash for himself from your ATM. So having a swap every 30 days ensures that we can catch fraud sooner rather than later.”

**ATM safe locks**

There are two approaches to securing the ATM’s internal safe:

- A combination lock requiring two people with dual access.
- An electronic audit lock controlled by a smart key and a one-time authentication code, eliminating the requirement for dual access.

Since it is impractical to require two people to open an ATM safe, Valuetec’s Edwards recommends that ATM operators use an electronic audit lock such as the Cencon lock from Lexington, Kentucky-based Kaba Mas to protect their ATM safes from insider theft.

“Before using the Cencon lock, the ATM cash handler has to phone up the dispatch center to get a one-time authentication code,” Edwards said. “Cencon’s software provides an audit trail of who has accessed the ATM safe.”

“Cash Connect requires its clients to either use the Cencon lock or the Sergeant & Greenleaf A Series audit lock, which also uses a one-time code,” said Crossan.

“The other security advice Cash Connect gives its clients is to alert merchants and staff to watch for suspicious activity around their ATMs; to change the ATM cabinet key from the standard key that comes with the ATM to a unique key; and to consider installing a level 1 ATM safe. This is much sturdier than the business-hours safe, which comes as standard in most retail ATMs,” he said.
Options in cash management

ATM deployers have the option to employ in-house staff to manage their entire ATM cash cycle, or to outsource their cash management — either fully or in part — to a third party.

An FI might choose to operate their own cash processing centers, to use a third-party cash center, or to implement some combination of the two approaches.

“There’s definitely a sweet spot where it makes sense to outsource your ATM cash management operation — for example, if you only have a small department to run a large ATM network,” Valuetec’s Edwards said.

“My view, having run both an ATM operator and a CIT company, is that it’s possible to assemble a strong internal cash management team, which in conjunction with using a customized cash management software package, can provide a very efficient cash management service,” said the ATMIA’s Delnevo. “I achieved this in my own company. Vertical integration can be very strong with an in-house cash management operation.”

However, many ATM deployers might not wish to devote scarce internal management resources to cash management.

“In these circumstances, it may well be best to outsource to an organization committed to delivering a high quality service,” Delnevo said.

In-house cash management

“The advantages of in-house cash management include having more control over your business; being able to prioritize projects and issues based on your business, not someone else’s; and being able to better manage expectations,” said Brink’s Boyle. “You can maintain security and confidentiality based on your policies and procedures. Any process or systems enhancements are kept within your business, giving you a greater opportunity for a competitive advantage in the marketplace. There is also less risk due to not depending on outside parties and their product roadmap.”
Elan’s Holland ascertains that one argument for keeping things in-house is that, usually, no one knows the behavior of an individual ATM location and the special circumstances and events associated with that location better than the IAD.

“While an outsourcing partner can load special events, etc. into their tools, the IAD will know the community better than someone who isn’t in the community,” he said.

According to Boyle, the disadvantages of in-house cash management are that it involves capital expenditure as opposed to operating expenditure, and in-house cash management is typically more costly than outsourcing.

“You will incur up-front infrastructure costs and associated support costs,” he said. “In-house cash management may not be considered a core competency, yet you will have to dedicate resources to processes and systems. Also, subject matter expertise is typically limited depth-wise.”

Heinz of Stolle und Heinz says the problem is the amount of time you have to put into in-house cash management, especially if you have ATMs at off-premise locations,” said “There has to be at least one employee to organize the CIT, asset management, maintenance, procurement, etc.”

Internal cash management program development

“The advantage of in-house development is that you can build a system that suits your environment,” said NCR’s Angus. “But when your environment changes, you have to redesign your system, and this is when NCR gets a lot of customers coming to us for our cash management solution.”

If a bank is using a system that was developed in-house 15 years ago, for example, the chances are that the developers no longer work for the bank. The bank might also now be operating multifunction ATMs that accept cash deposits, along with cash recycling units. “So the bank’s in-house cash management system will no longer be adequate for the more complex environment in which it now operates,” Angus said.

“An in-house-developed forecasting solution will likely not be capable of the sophisticated analysis that the advanced forecasting algorithms in the cash management industry’s best applications can deliver,” said Elan’s Holland.

Case study

In an ATM Marketplace blog “Should you develop your own currency management software?” Toshiba banknote solutions group regional sales
manager Brendan Burge describes an encounter with a vault manager who decided to develop his own currency management software.

The manager made this decision after examining all the off-the-shelf vault management software solutions and weighing benefits versus cost. He believed that developing proprietary currency software in-house was much less expensive than buying off the shelf, and that the project would result in customized functionality suited to specific requirements.

After seven years of continuous development, the manager’s organization had implemented a basic solution allowing for simple deposit processing, cash-in and cash-out transfers, and vault inventory reporting.

Burge was told that the organization was still developing advanced features such as customer order integration (via telephone or Web portal), currency sorter integration, desktop counter integration, counterfeit reporting, receiving and shipping controls, and customer account memo posting.

According to Burge, some of downsides of in-house development identified by the manager during his organization’s seven-year development cycle included:

- Outdated development tools that ultimately required starting certain projects over again.
- Software developer turnover that resulted in lost intellectual property and redundant effort.
- Poor version control methodology resulting in failed revision rollouts with less than appropriate quality assurance testing.
- Legislation and central bank policy infractions.
- Customer dissatisfaction.

“I can say from my own experience that I’ve never met a vault manager who lived with an in-house solution and was happy with it in the long term.”

—Brendan Burge, regional sales manager for Toshiba banknote solutions group
**Off-the-shelf cash management programs**

“Several major banks and banking data centers in the markets which we serve, had developed their own in-house solution,” said planfocus software managing director Dr. Joachim Walser. “But eventually they found they couldn’t maintain a competitive solution over the years, so they had to switch to a commercial solution.”

Walser said the reasons were that higher savings are possible using commercially developed software; the technologies they had developed in-house were no longer up-to-date and could not properly support cash recycling ATMs, for example; and continued in-house maintenance was a real problem in terms of availability and cost.

“If a bank uses off-the-shelf cash management software, 90 percent of the ATM cash management process can be done automatically,” Heinz said. “The bank receives recommendations from its cash management software for each ATM’s cash requirements. A bank employee just has to confirm or change the cash delivery orders recommended by the software.”

Using cash management software provides much more accurate cash demand forecasts than using manual spreadsheets, Heinz said.

For example, planfocus offers banks a test installation where a bank can compare its own staff’s cash forecasts with forecasts by planfocus CPTO software. The bank supplies historical data to planfocus, which then forecasts when its cash deliveries should take place. In most cases, planfocus says it provides more accurate predictions than the bank’s own staff.

“If a bank is using Excel and telephone calls for managing its cash, it faces a compliance risk, as this method isn’t adequate for providing accurate cash reporting,” said NCR’s Angus. “FIs should opt for an off-the-shelf solution that has good customization and configuration capabilities and is flexible.”

Using off-the-shelf ATM cash management software can help a bank improve its internal security.

“If you use manual cash management processes, you introduce the risk of fraud by branch staff,” Heinz said. “Because cash management software almost completely automates the cash management process and offers check points and reports, it offers much better security than manual methods.”

"If a bank uses off-the-shelf cash management software, 90 percent of the ATM cash management process can be done automatically.”

— Robert Heinz, CEO of banking consultancy Stolle und Heinz Consultants
Hybrid solutions

ATM deployers have the option of running a hybrid solution involving both in-house-developed systems and off-the-shelf software. However, this is inefficient, said Milton King, director of sales for ProfitStars ATM Manager Pro solution.

“It is best to run all your ATMs on the same cash management platform,” he said. “If you use different systems, you could end up with some ATMs not having the best technology. Once you start rolling out a single cash management platform across your network, adding extra ATMs to the system is a minor incremental cost.

“Also, if you use different pieces of software for different processes — for example one system for forecasting and one for monitoring — you’ll disconnect your central cash management. Forecasting is linked to monitoring, so you need to keep all your processes within the same system.”

The “Best Practices in ATM Replenishment in Europe” report by ATMIA and EPC recommends the use of a single integrated cash management solution. An integrated solution optimizing all aspects of the cash supply chain can achieve significant, measurable cost-savings, and increase efficiencies throughout the ATM-branch-CIT network, the report says.

“True cash supply chain software solutions can significantly reduce logistics costs for cash, unleash internal resources, reduce cash inventories tied up in ATMs, branches and vaults, and compute cash levels to minimize the overall costs for cash handling,” the report says.

“Our ATM Manager Pro integrated cash cycle management software typically enables our clients to reduce their cash runs from three to four a week per ATM to just one,” ProfitStars’ King said.

King stressed that banks need to centralize their cash monitoring and ordering functions:

“This will enable them to have an overall view of cash demand and usage at all their branches and achieve economies of scale through centralized ordering. Allowing individual branches to order cash could lead to excessive cash levels.”

Outsourcing

“The benefits for banks from outsourcing their cash management are saving money and time,” said Heinz of Stolle und Heinz. “Banks save time because
their CIT management, cash load monitoring, maintenance, etc., are looked after by the service provider, which is the bank’s outsourcing partner. If this service provider also provides cash management services for other FIs, the bank saves money due to the leverage effect the service provider has from its other clients.”

“When you outsource your ATMs and your cash management to an end-to-end managed service provider, you get a single point of contact for everything, instead of having to deal with different companies,” said Paul Gooch, Elan Financial Services’ assistant vice president and senior solutions consultant. “For its managed service clients, Elan is the single point of contact for CIT, maintenance, servicing and Americans with Disabilities Act compliance verification.”

As an alternative to end-to-end outsourcing, ATM deployers may opt for partial outsourcing — for example, by retaining the forecasting function in-house and contracting out the CIT management function.

“One often-used hybrid approach is that an IAD determines what the load will be for each ATM and uploads that to a cash provisioner,” said Elan’s Holland. “The cash provisioner handles the remaining steps in the cash cycle, and looks after all claims research and collection from armored carriers and processors.”

In this hybrid model, the cash provisioner would be responsible for researching and responding to disputed transaction claims under Regulation E of the U.S. Electronic Funds Transfer Act, such as someone requesting $100 and receiving $80.

“I don’t see any advantage to not outsourcing all the cash management processes,” Heinz said. “Banks should focus on their customers and not on operational processes that other companies can look after for them.”

“I think all the processes should be kept within one system, either an outsourced or in-house platform, so that they can all work together effectively,” said ProfitStars’ King.

IADs

“Using a vault cash provider to supply capital from a bank instead of using their own cash gives IADs the ability to redeploy their time and working capital toward more productive uses such as business development,” said

“It frequently becomes expensive for smaller banks to develop and operate an in-house IT environment-supporting state-of-art business processes in the self-service channel and efficient cash logistics. Scaling to an optimal level of efficiency isn’t achievable due to the small size of their ATM networks.”

— Marco Goltz, product manager of global cash management services at Wincor Nixdorf
Crossan of Cash Connect. “An IAD that ties up its working capital in its ATMs faces an opportunity cost.”

Full outsourcing of the cash forecasting and armored carrier management functions frees the IAD from having to build infrastructure to manage the vault cash process.

“The downside of outsourced cash management is the hard costs involved,” Crossan said. “You must ensure you’re funding higher-volume ATMs that can support the costs of vault cash. These higher-volume ATMs are more profitable and typically consume the most time and capital for deployers. So it tends to be a win-win to fund those from vault cash and low-volume ATMs from working capital.

If an IAD manages its vault cash supplier in-house, it requires systems for calculating the optimal load amounts, processes to track load schedules, cash balance monitoring tools and integration with multiple vendors.

"Most of all, it requires time," Crossan said. “Buying or developing good systems and processes take time and money to build and manage. Some outsourced cash providers have developed robust infrastructures to handle these functions on behalf of IADs. This ensures high-efficiency management without the need to build and manage in-house systems.”

Cash Connect takes care of a client’s complete cash management needs, and provides a Web interface that allows clients to monitor performance, Crossan said.

“We have teams of employees, each of whom focuses on one aspect of the cash supply cycle,” he said.

**Pros and cons**

According to Boyle, the benefits of outsourcing ATM cash management include a competitive advantage gained through the use of industry-leading tools, subject matter expertise and best practices.

“There are no up-front infrastructure or ongoing support costs. You will incur operational expenses as opposed to capital expenses, and you can focus on your core business,” he said. “In addition, the outsourcing company will have the ability to leverage economies of scale to reduce costs.”
The disadvantages include the fact that the ATM deployer must trust another entity with part of its business.

“It may also be difficult to find vendors that meet your needs, and you may face union or human resources issues,” Boyle said. “You still have to deal with your customer issues, only with less visibility to those issues. Also, you will lose control over security and confidentiality.”

According to Plante, outsourcing involves relinquishing a lot of control to a third party, which could be a concern to an ATM owner.

“For banks, outsourcing is a tradeoff between reducing overhead and losing control,” said NCR’s Angus. “Many banks won’t hand over control of their vaults to a third party as they don’t want to lose control. If a bank decides to outsource its vault functionality, it needs to know how much cash the contractor is holding on its behalf.”

NCR provides remote management software, which tells banks how much of their cash is being held in a third-party vault. Banks can also see, according to Angus, how long the vault operator takes to sort cash deposits, and whether they need to tell the operator to speed up its processing.

“If the outsourced service provider lets a bank down and one or more of its ATMs are unable to give cash to customers, this will damage the bank’s reputation,” said Stolle und Heinz’s Heinz. “Even if the service provider is contractually obliged to pay SLA fines for any failures, this won’t compensate for damage to the bank’s reputation.”

A potential issue with end-to-end outsourcing is conflict of interest.

According to Plante, many value-added ATM service suppliers also supply cash to ATM deployers. A conflict of interest might arise if the end-to-end outsourcing supplier wants to supply more cash than the ATM deployer actually needs. It wouldn’t be in their interest to optimize their client’s cash supply.

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**Outsourcing pros**

- Access to industry-wide best practice in scheduling, forecasting and reconciliation, which can lead to:
  - Improved cash availability in ATM networks.
  - Reduction of ATM cash returns.
  - Cost reduction.
  - Process improvements.

- Reduction of physical risk and risks to service.

- Access to the latest industry trends such as process automation.

- Reallocation of internal resources to focus on core business.

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**Outsourcing cons**

- Loss of internal expertise.

- Loss of control.

- Potential service failure.

- Internal resistance to expected headcount savings.

Source: Ben Thorpe, director of global marketing and strategy at Glory Global Solutions.
In 2008, German savings bank Oldenburg Landessparkasse became one of the first financial institutions to deploy the Cashmanagement-Comfort solution from Finanz Informatik, the data center of the German savings bank finance group.

Finanz Informatik serves more than 400 banks, more than 25,000 ATMs and 15,000 branches, with more than 100 banks using Cashmanagement-Comfort as of 2014.

Cashmanagement-Comfort is entirely based on the Cash Point and Transport Optimizer solution from planfocus software.

According to planfocus, CPTO controls, optimizes and monitors all cash points such as ATMs, cash recyclers, teller-based cash recyclers and standard teller stations, in order to analyze cash stocks and CIT replenishments. It predicts an FI’s cash requirements using advanced forecasting algorithms based on the FI’s data history, and computes optimal replenishment cycles based on patented optimization technology.

Prior to deploying Cashmanagement-Comfort, Oldenburg Landessparkasse conducted several pilots. In its first trial, which involved 14 ATMs, the FI found that using Cashmanagement-Comfort, it could save an average of 1,200 euros ($1,491) in interest and service costs monthly, according to Finanz Informatik’s IT magazine.

Finanz Informatik hosts Cashmanagement-Comfort centrally as a Web application, handling the entire cash management process, from monitoring cash inventories and automated cash ordering to delivery. The system can analyze up to 24 months of historical data, and takes all organizational criteria into account, including month-end, public holidays and regional events into account — and not just per ATM, but even per bill denomination.

In the first six months using the solution, Oldenburg Landessparkasse migrated from its internal, decentralized cash management system, which also used CPTO to Finanz Informatik’s software-as-a-service solution.

“In-house cash management may not be considered a core competency, yet you will have to dedicate resources to processes and systems.”

— Dennis Boyle, director of integrated managed services for Brink’s global financial institutions group
Ninety out of the 184 cash points migrated to the centrally hosted cash management system, cash holdings were reduced by about 20 percent, or about 120,000 euros ($149,104) a month, while service costs fell by 15 percent, or 24 fewer CIT trips a month.

Following its rollout of Cashmanagement-Comfort, Oldenburg Landessparkasse redeployed employees previously engaged in cash optimization to other activities such as sales, while a central cash manager looks after cash orders.

According to planfocus, its large customers have found that a single cash manager can handle over 2,000 ATMs or cash-recycling devices in a two-hour time period using its software.

<table>
<thead>
<tr>
<th>CUSTOMER TYPE</th>
<th># ATMs</th>
<th>INTEREST RATE</th>
<th>% SAVINGS</th>
<th>SAVINGS/ATM/YEAR</th>
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</tr>
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Quoted savings do not include: savings in staffing costs for personnel involved in cash planning, reduced cash counting and savings in branches.

Source: planfocus software

**Erste Bank, Croatia**

The Croatian subsidiary of Austria’s Erste Bank wanted to improve customer services and the operating performance and costs of its ATM network.

Overstocking ATMs and relying on high numbers of emergency cash runs to resolve cash outages was not a sustainable operating model for the
bank, due to growth in customer numbers and ATMs, according to a 2014 NCR case study.

Erste Bank Croatia operates 619 ATMs, which handle in excess of 13 million transactions and 1.3 billion euros ($1.65 billion) per year, representing more than 50 percent of the cash distributed through its retail banking operations.

According to the case study, 23 percent of the cash delivered to Erste Bank Croatia ATMs was returned undispersed to the CIT firm on the subsequent replenishment visit. Despite the high level of unused cash returned, cash outages were still a significant contributor to ATM downtime and, over the year, nearly every ATM required an emergency cash run.

In order to reduce the amount of cash in its network while also reducing the number of emergency cash runs and out of cash incidents, Erste Bank Croatia deployed the NCR APTRA OptiCash cash optimization system.

APTRA OptiCash forecasts individual cash requirements for each cash point in a network. It then generates cost optimized individual replenishment strategies for each cash point based on its unique cost factors, servicing constraints and capacities.

NCR says that APTRA OptiCash works with existing data within a bank’s infrastructure or by interfacing directly to ATMs to gather the necessary cash data to generate forecasts and replenishment recommendations.

After deploying APTRA OptiCash, Erste Bank Croatia saw its cash utilization improve dramatically, with the return rate dropping from 23 to 14 percent. Emergency cash deliveries were cut by 88 percent, and out-of-cash events were reduced by 86 percent.

ATM availability improved by 40 basis points from 98.7 to 99.1 percent in the first quarter after deployment.

According to NCR, the APTRA cash management software can help an FI save up to $1,000 per ATM per year, $2,000 per branch per year, and $500,000 per vault per year.

**U.K.-based IAD**

In 2011, Cash Management Solutions started providing outsourced services to a large (unnamed) U.K.-based IAD whose issues included:

- Very high costs of transporting cash.
- ATM balances that didn’t match customer requirements.
• Industry-standard software that it had previously used wasn’t sufficiently dynamic for volatile cash demand.

CMS’s team of mathematicians developed a dynamic forecasting model for the client, which predicted cash demand for each individual ATM on a daily basis. The cash cycle was then fully managed by CMS on behalf of the client, and its ATM balances were continually optimized.

“This new mathematical approach to managing cash enabled the client to automatically generate cash orders based on CMS’ recommendations, saving huge amounts of, otherwise, unnecessary administration time,” CMS says.

CMS began to achieve savings for the client almost immediately after implementation.

“A significant reduction in the costs of cash resulted in savings of over 30 percent in CIT, interest and banking costs,” it said. “Residuals were reduced while also increasing cash availability at the ATM. The client’s existing in-house staff resources were reallocated to focus on other core areas of business.”

The features of the service provided by CMS to the IAD comprised:

• Dynamic ATM models for each individual ATM site.
• Weather and seasonal variations.
• Creation of unique real-time reports.
• Event management system.
• Web-based live reporting dashboard.

### ATM Deployer cost per ATM Before and After CMS

<table>
<thead>
<tr>
<th>Month</th>
<th>Cost per ATM</th>
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</thead>
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</tr>
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CMS Started
Conclusion: the benefits of efficient cash management

The benefits of efficient ATM cash management include reduced costs, enhanced end-user satisfaction and increased security.

“An efficient cash management system reduces the amount of cash in the supply chain; optimizes transportation and money processing costs; minimizes emergency cash requests and reduces instances of out of cash ATMs,” said Brinks’ Boyle.

“Having an efficient cash cycle benefits everyone, including central banks, ATM operators, cash center operators, retailers and consumers,” said Glory’s Thorpe. “The benefits are increased security and confidence, reduced costs for all parties, and maximum availability in good times and periods of crisis. Efficient cash cycles mean everyone gets on with other work or leisure and doesn’t worry about cash.”

Profitability

According to the ATM Marketplace white paper, “Accelerating Branch Transformation with Integrated ATM Life Cycle Management,” sponsored by Cupertino, California-based ESQ Business Services, if a bank’s cash supply chain isn’t optimized, this can severely impact the profitability of its ATM channel.

“It’s not uncommon for banks to have their high-transaction ATMs out of service due to low cash, while ATMs with low transaction volumes have an excess of cash sitting inside them,” the white paper says. “A 5-10 percent reduction in cash requirements for an ATM estate of 10,000-20,000 ATMs can translate to significant cost-savings and improve ATM channel profitability.”

Because IADs typically operate on tight margins, making maybe 5-6 cents per transaction, effective cash forecasting can boost their bottom line.

“If their forecasts aren’t precise, their margins could drop by 20-30 percent,” said ProfitStars’ King.

“The cost of running out of cash at an ATM is immeasurable. How do you count the cost of customer dissatisfaction?”

— Gary Faulkner, executive vice president and chief marketing officer at Morphis
Automation

“Cash is costly, needs to be accounted for within a bank’s internal processes and won’t be replaced in the foreseeable future,” said planfocus' Walser. “Only consistent automation of cash processes based on a true optimization solution for the entire cash supply chain can sustainably reduce costs and permanently increase process efficiencies.”

Solutions offering advanced forecasting and planning algorithms are essential to successful on-target planning, Walser said. “True cash supply chain solutions can significantly reduce cash logistics costs; release internal resources; reduce cash inventories tied up in ATMs, branches and vaults; and automatically compute cash levels so as to minimize overall cash handling costs.”

Security

“Because of the risk of crime, you don’t want to have more cash in your ATMs or in transit than you need,” King said. “Otherwise you’re presenting an attractive target to criminals. Having an efficient cash management system helps with security, as you will be able to see your exact cash positions and not take unnecessary risks with stock levels.”

Using effective cash management technology will give ATM deployers greater control and visibility into their cash cycle, which will help prevent internal theft.

Determining which approach works for your business

ATM deployers need to decide whether the cost-savings and efficiencies to be gained from outsourcing management of their cash supply chain outweigh the loss of control.

If a deployer decides to manage their cash supply chain in-house, whether or not they use an off-the-shelf solution will depend on the size of their IT budget and their in-house software development expertise. For all but the largest banks, due to the high cost of developing internal cash management systems, it makes sense to use a commercial-developed solution.

“Using third-party solutions enables ATM deployers to take advantage of the latest developments in scheduling tools and in forecasting and reconciliation models,” said Glory’s Thorpe. “Managing the business risk is a high priority for most ATM deployers. “So finding a solution provider who is flexible to changing market conditions is very important.”
Priorities

ATM deployers need to decide their priorities for their cash management strategy.

“ATM owners must decide what is most important to them: lowest cost loads or highest availability to cardholders, or some point in between,” said Elan’s Holland. “Efficient cash management requires a balance between providing quality service to cardholders using your ATMs, risk management and effective cost management. If you totally focus on only one of these factors, the others will likely suffer.”

Cash Connect’s Crossan recommends that IADs adopt a balanced approach to sourcing their cash. “IADs should use a vault cash supplier for higher-volume and remote ATM sites that consume most of their cash and time, while continuing to load the lower volume sites in-house,” he said.

“ATM owners must decide what is most important to them: lowest cost loads or highest availability to cardholders, or some point in between.”

—Mark Holland, vice president of ATM cash operations and logistics at Elan Financial Services

About the sponsors:

Wilmington, Del.-based Cash Connect is the ATM division of Wilmington Savings Fund Society (NASDAQ: WSFS), one of the oldest financial institutions in the United States. Cash Connect specializes in ATM vault cash, armored-carrier management and cash forecasting solutions. Cash Connect provides more than $400 million to more than 13,000 ATMs across the United States. It also operates the largest bank-branded ATM network in Delaware.

ATMmarketplace.com, owned and operated by Louisville, Ky.-based Networld Media Group, is the world’s largest online provider of information about and for the ATM industry. The content, which is updated every business day and read by business and industry professionals throughout the world, is free.
**GLOSSARY**

Source: Morphis Software

**Actual run-out**  
The date when an ATM is anticipated to run out of cash to dispense based on forecasted withdrawal activity. This run-out date is calculated based on the last recorded actual terminal balance and the forecasted withdrawals.

**Average run-out**  
The estimated date when an ATM is anticipated to run out of cash for dispensing based on average dispense activity. This date is calculated by using the last recorded actual terminal balance and the recent average of dispensing activity in a specified prior period of time.

**Balancing an ATM**  
The process where, at a given point in time, the cash and activity at an ATM is accounted for. The process includes considering the starting balance from the last balance point, counting the cash that is currently in the ATM (often removed and transported to a secure location for counting), accounting for all dispense activity since the last balance point, and considering any funds that were added in the interim. When the starting balance and all other activity match the funds counted, the ATM is in balance.

**Bulk cash acceptora**  
Electro-mechanical equipment designed to receive and process loose currency by drawing notes into a secure device and, depending on its sophistication, simultaneously counting, authenticating and/or separating by denomination into individual containers.

**Bundle**  
A unit of measure of packaged currency, consisting of 1000 notes packed in 10 straps of 100 and secured in a wrapper.

**Carrier cost**  
The fees charged by an armored carrier service for the pickup and/or delivery of items of value. Typically refers to the cost of adding/removing cash to/from an ATM.

**Cash forecasting**  
The act of estimating the net cash demand of an ATM or bank branch during a specific future time period. Effective cash forecasting utilizes historical data and applies predictive analytical tools or algorithms to recognize trends and thereby improve accuracy.

**Cash handle**  
The total value of currency and/or coin under management in a given period, whether at a central bank, financial institution, armored carrier service, ATM owner/operator or retailer.

**Cash management**  
The combined process of forecasting cash demand, ordering cash to fulfill such demand, confirming fulfillment has been completed as requested, balancing and reconciling activity at the cash object, and other such functions that facilitate the efficient business management of coins and currency.
Cash object
Any location in the currency supply chain where currency changes ownership. Examples include an ATM, bank branch or retail checkout stand. (See also cash point)

Cash order
A request or set of instructions sent to the participants in a supply chain to pick up or deliver cash to/from a service location.

Cash point
Any place in the currency supply chain where currency changes custody. An example includes transfers made by an armored carrier service from truck to delivery location. (See also cash object)

Cash-recycling ATM
A cash-recycling ATM diverts banknotes deposited at that ATM for use in future withdrawal transactions.

Cost of cash
The time value of the use of funds expense (usually referring to a managed ATM) calculated by applying a specific rate of interest over a given period of time on the average outstanding balance each day in the period.

Switch
A node that can route data from one point to another. In a shared ATM/POS environment the switch receives transactions from an acquirer processor and routes them to the required issuer processor, and then returns the response from the issuer processor to the acquirer processor.
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