



Teller Cash Recycling

CubeIQ Ltd

Enabling Technologies for The Finance Services

A vertical strip on the left side of the slide showing a stack of Euro banknotes. From top to bottom, the visible colors and denominations are: pink (150), yellow (200), green (100), orange (50), and red (100).

Agenda

- ECB Regulatory Framework Backgrounder
- Lateral Issues involving the Retail Branch
- The Technology Response
- The Obvious Infrastructure Investment



ECB REGULATORY FRAMEWORK

Brief Backgrounder



Euro Banknotes Protection

- The **ECB** and the **National Central Banks (NCBs)** of the Eurosystem, being the issuing authorities for the Euro banknotes are tasked with maintaining public trust in the single currency. This is done, among other things, by ensuring the **integrity of the euro banknotes** in circulation.
Ref. EU Council Regulation (EC) No 1338/2001.
- For this reason, the Governing Council of the ECB adopted on 16 September 2010 the **Decision ECB/2010/14 on the authenticity, fitness checking and recirculation** of euro banknotes, which became applicable on **1 January 2011**.



Decision ECB/2010/14 details

- **Roles and Responsibilities**

- The **authenticity** and **fitness checking** shall be carried out either by a type of banknote handling machine successfully tested by an NCB, or manually by a trained staff member.
- Euro banknotes may only be **recirculated** via customer-operated machines or cash dispensers if they **have been checked for authenticity and fitness** by a type of **banknote handling machine** successfully tested by an NCB and classified as genuine and fit.
- Staff-operated machines, when used for the purpose of authenticity and fitness checking, and customer-operated machines may only be put into operation by cash handlers if they have been successfully tested by an NCB and listed on the ECB's website as laid down in Article 9(2). The machines shall be used with the standard factory settings, including any updates thereof, that have been successfully tested.
- Euro banknotes which have been checked for authenticity and fitness and classified as genuine and fit **by trained staff** members, but not by a type of banknote handling machine successfully tested by an NCB, may **only be recirculated over the counter**.



Decision ECB/2010/14 details

- **Roles and Responsibilities** *(continued)*
 - ECB emphasizes that cash handlers not checking euro banknotes for authenticity and fitness will not be allowed to recirculate these banknotes and may only put in circulation euro banknotes that they have received either directly from an NCB or from another cash handler, such as a credit institution or a cash-in-transit company, that has checked the euro banknotes for authenticity and fitness according to the procedures laid down in the original Decision ECB/2010/14



Decision ECB/2010/14 details

- **Roles and Responsibilities** *(continued)*
 - BoG will prohibit the recirculation of euro banknotes that are affected by non-compliance by a cash handler with Decision ECB/2010/14 and of the draft MPC¹ act when such non-compliance is detected during an on-site inspection.
 - ECB believes that the sanctioning regimes available in the Member States that have aligned their law with Regulation (EC) No 1338/2001 in conjunction with Decision ECB/2010/14 could merit some harmonisation insofar as the ECB procedures laid down in the Decision are equally applicable to all cash handlers located in the euro area. In this respect, the ECB considers it important for national authorities to contribute to the establishment of a level playing field among cash handlers falling within the scope of Regulation (EC) 1338/2001, without prejudice to:
 - the particularities of the cash cycle and the organization of cash handlers at national level, and
 - the consistency of the levels of financial sanctions available in their legal orders.

(1) Note: Draft MPC act = BoG Monetary Policy Council act



Decision ECB/2010/14 details

- **Roles and Responsibilities** (*continued*)

- Subject to national law requirements, NCBs are authorized:
 - to carry out **on-site inspections**, including **unannounced** ones, at cash handlers' premises to monitor their **banknote handling machines**, in particular the machines' capacity to check for **authenticity** and **fitness** and to **trace** suspect counterfeit euro banknotes and euro banknotes that are not clearly authenticated to the account holder; and
 - **to verify the procedures** governing the operation and control of the banknote handling machines, the treatment of checked euro banknotes and any manual authenticity and fitness checking.
- In order for the ECB and the NCBs to monitor the compliance of cash handlers with this Decision and to oversee developments in the cash cycle, NCBs shall be **informed in writing**, including by electronic means, by cash handlers **before** a type of **banknote handling machine** is **put into operation**.



Decision ECB/2010/14 details

- **The Banknote handling machines**

- To qualify as a banknote handling machine, a machine has to be capable of **processing batches of euro banknotes**, **classifying** the individual euro banknotes and **physically separating** the euro banknotes according to their classifications without the intervention of the machine operator.
- Banknote handling machines need to have the required number of **dedicated output stackers** and/or other means to ensure the reliable **separation** of the euro banknotes processed.
- Banknote handling machines have to be **adaptable** to ensure that they are capable of reliably detecting **new counterfeits**. Moreover, they have to be adaptable to enable the setting up of **more or less restrictive fitness sorting standards**, if applicable.



Decision ECB/2010/14 details

- **The Teller Assistant Recycling Machines (TARMs)**
 - TARMs are cash recycling machines operated by cash handlers that check euro banknotes for authenticity and fitness.
 - For **withdrawals**, TARMs may **use genuine fit euro banknotes** that have been deposited by other customers in previous transactions.
 - In addition, they **keep** euro banknotes in **safe custody** and allow cash handlers to credit or debit the bank accounts of customers.
 - Types of banknote handling machines can be distinguished from each other through their specific detector systems, software and other components for the performance of their core functionalities. These are:
 - the **authentication** of genuine euro banknotes
 - the detection and **separation** of euro banknotes **suspected** to be counterfeit
 - the detection and **separation** of **unfit** euro banknotes from fit euro banknotes
 - the **tracing** of objects identified as suspect counterfeit euro banknotes and of euro banknotes that are not clearly authenticated



Decision ECB/2010/14 details

- **Mandatory Reporting**

- Data are reported by cash handlers in terms of **pieces** (volume), broken down **by euro banknote denomination**. For “remote branches” of credit institutions, operational data are reported separately.
- An NCB may decide, for monitoring reasons, to **collect** the data at **local level**, such as at **branch offices**.
- An NCB may decide to **exclude** from the scope of the reporting requirements euro banknotes that are processed on euro **banknote handling machines** and distributed **over the counter**.
- Cash handlers which have **outsourced** authenticity and fitness checking to other cash handlers may be requested to provide **detailed information to the NCB** on the latter.



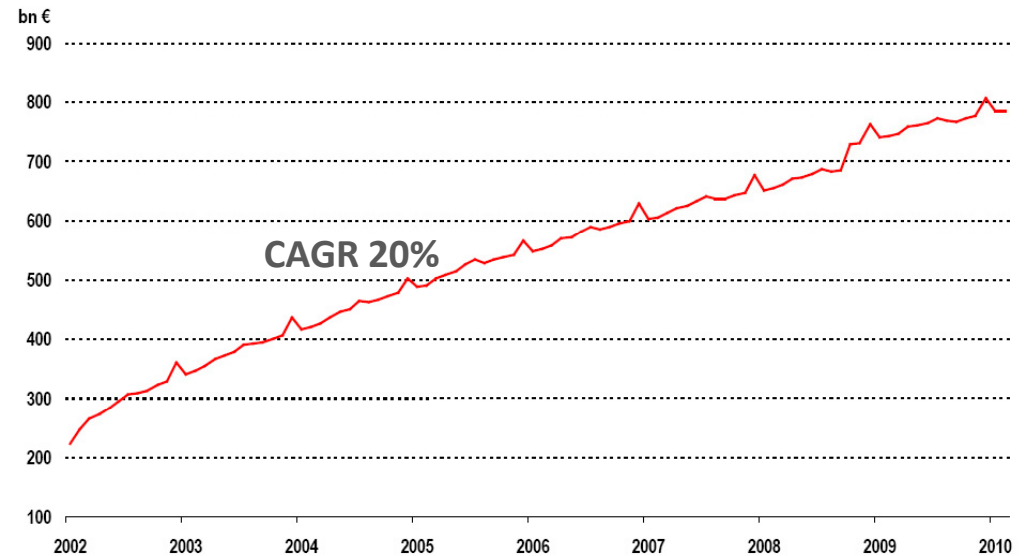
LATERAL ISSUES IN THE RETAIL BRANCH

Activity Based Cost Elements

Activity Based Cost Elements

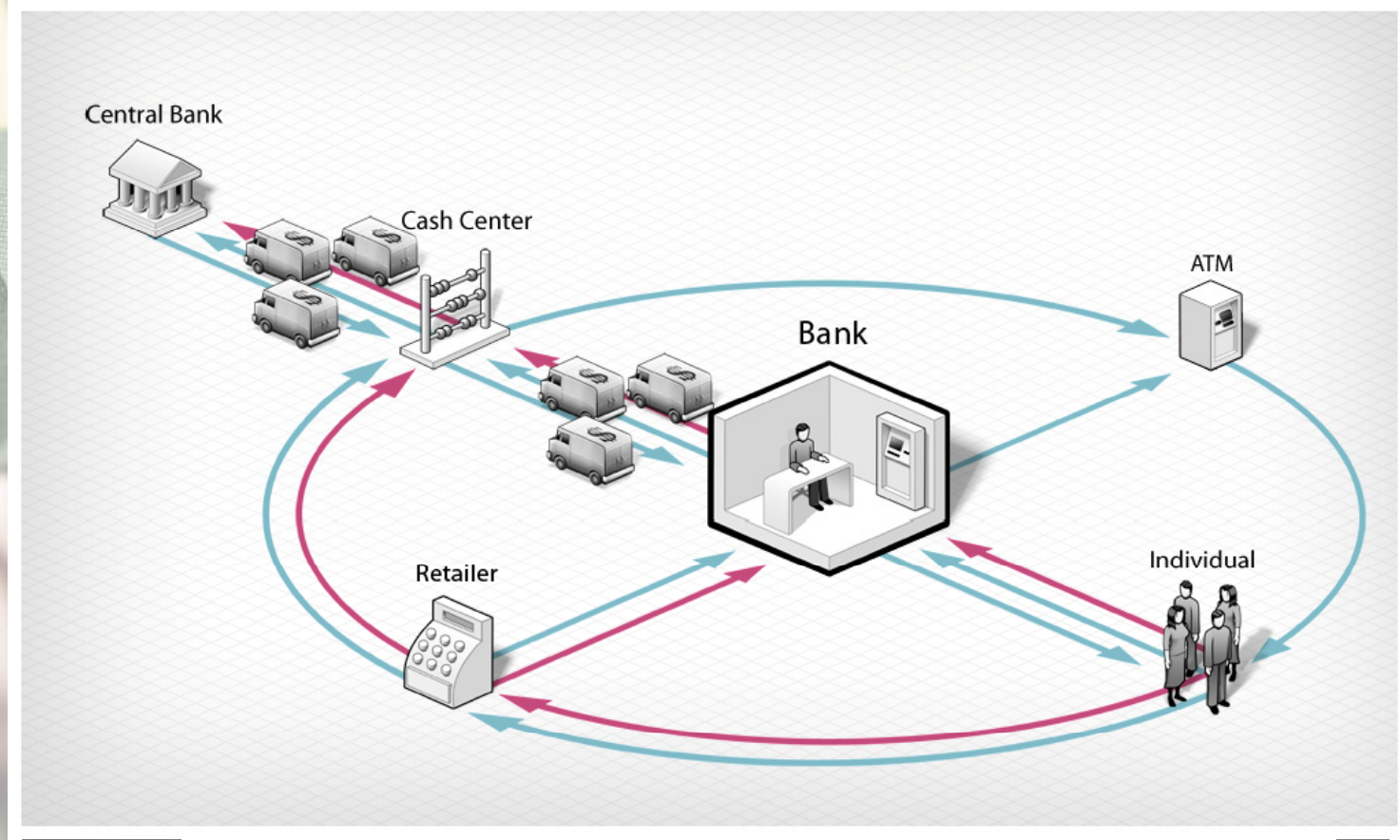
Prolongation of the “traditional” cash handling procedures in the retail branch, sustain a number of insourced or outsourced activities causing significant cumulative cost burden to the retail banking business. Among other they are:

- Cash-in-transit (CIT) services
- Banknotes fitness checking services
- ATMs cash replenishment
- Minimization of cash retained in the branch
- End-of-Day teller consolidation
- Bank End-of-Day processing procedures
- Regulatory cash handling reporting

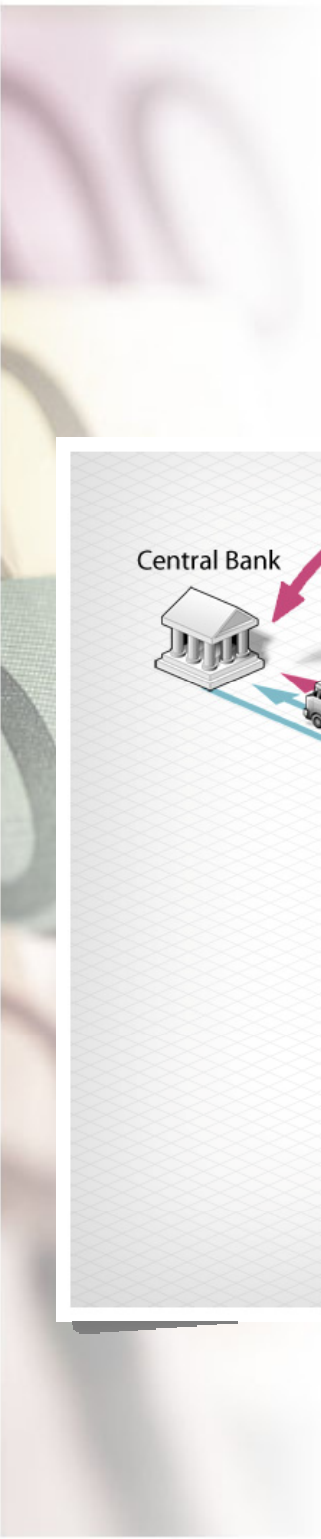


Increase in value of Euro banknotes circulation from 2002 to 2009

Cash lifecycle before TCR



A vertical collage of Euro banknotes. From top to bottom, the visible denominations are 150 (pink), 200 (yellow), 10 (green), 5 (orange), and 100 (red). The notes are partially overlapping and slightly blurred, creating a sense of depth and texture.





RCC - Remote Cash Capture

- The RCC process is an emerging opportunity for both banks and retailers.
- Merchants place their cash into **Cash Recyclers** (CRMs). The CRM's capture the denomination and the amount of each banknote, while simultaneously checking its authenticity. The financial totals are then transmitted, via a secure connection, to the bank for **provisional credit** posting.
- By receiving credit for their funds placed into their CRM smart safes, merchants and banks may **reduce** drastically the number of **CIT trips**, while other smart solutions, as ATM's **cash replenishment**, may be implemented.
- RCC enables the **centralization** of banking **relationships** since merchants no longer need to select banks based on proximity to stores.



THE TECHNOLOGY RESPONSE

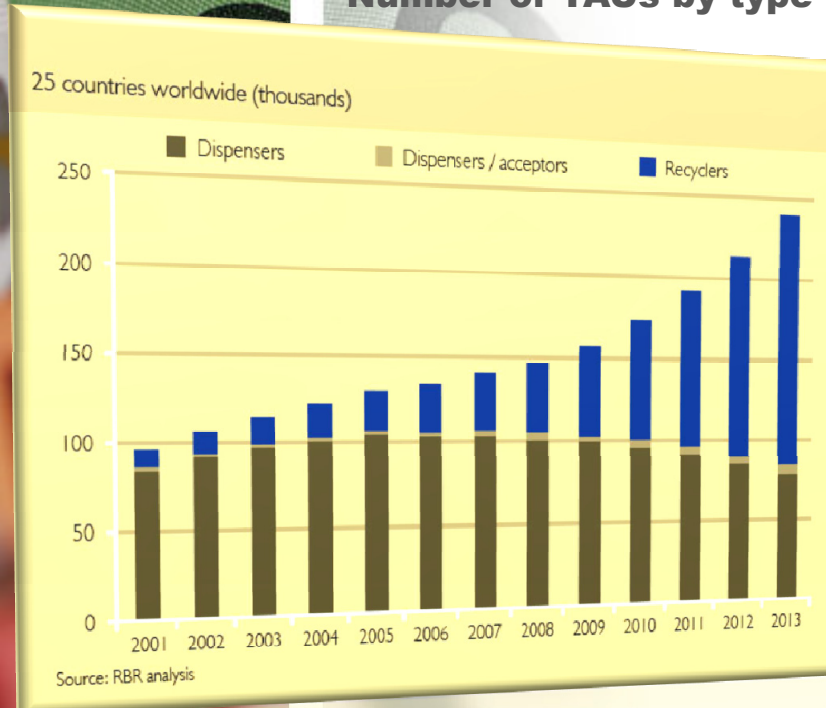
The Next Generation of Teller Cash Recycling System

Teller Assist Units and Cash Recyclers

A key reason for the growing investment in TAUs is the **increasing use of cash recyclers**. TAU recyclers accounted for 29% of TAUs in 2008, compared to just 10% in 2001.

They can handle **more transactions** than simple dispensers and also **redispense genuine fit deposited notes, reducing** dramatically the number of **CIT trips**.

Number of TAUs by type

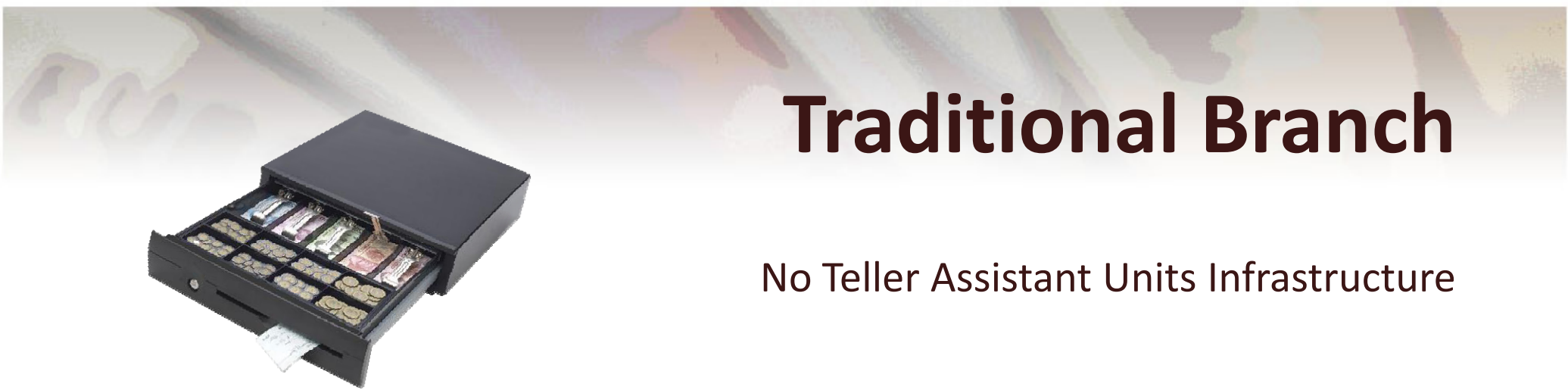


It is not surprising that TAUs are enjoying increasing popularity given the many advantages they provide banks in terms of improved accuracy and efficiency. One of the primary drivers of TAU deployment is its ability to **reduce transaction times by up to 75% at tellers**, thereby shortening queues.

TAUs also provide **accuracy in counting the notes** that are dispensed and deposited. Miscounts can be eliminated and furthermore, **customer service is improved**, as staff can focus on the customer's requirements rather than the amount of cash being handled.

TAUs are also an **efficient and secure way to store cash**. In traditional branches, cash is typically stored in drawers up to a maximum amount. Any cash above this threshold must normally be transferred to the vault of the Branch, during and at the end of the working day. In contrast, in branches equipped with TAUs, cash can be safely stored in the units.

The total number of TAUs in 25 countries surveyed is forecasted to increase by 65%, from 145,000 in 2008 to around 240,000 in 2013. The share of **recyclers** is forecasted to **grow from 29% to 66%** between 2008 and 2013.



Traditional Branch

No Teller Assistant Units Infrastructure

Customer



Retailer/
Merchant
Vault

CIT
Services



Central Bank



Cash Processing Center



CIT
Services



Fitness
Check



Branch Front Office



Teller



Deposit



EOD
Consolidation



Withdrawal



Branch Back Office



Teller



Cost Element



Branch Vault



CIT
Services





Branch with Next Generation Cash Management Automation

With Teller Assistant Units Infrastructure
and Automated Cash Recycling and Management

Customer



Retailer/
Merchant
TCR-Vault

CIT 
Services

Central Bank



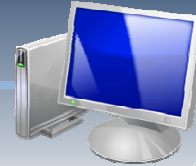
Cash Processing Center



CIT
Services

Fitness
Check

Branch Front Office



Teller
w/TCR



Deposit



EOD

Withdrawal

Consolidation



Branch Back Office



Teller
w/Virtual
TCR

Branch Vault



CIT
Services 

Cost
Element

The Next Generation of Teller Cash Recycling System

CubelQ is bringing to the market the next generation of Teller Cash Recycling System today.

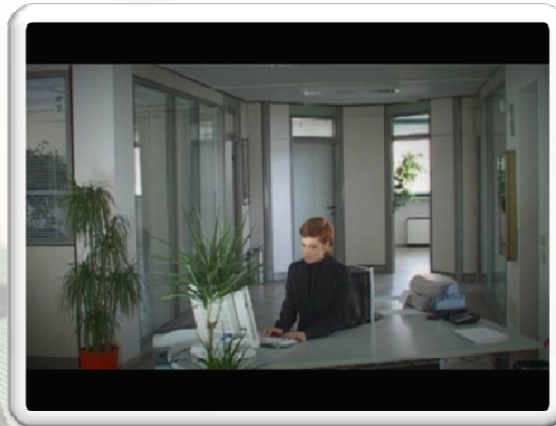
This is the CTS's model CM18 which represents the most advanced TCR available today.

- Advanced sorting capabilities
- Counting
- Selection
- Authentication
- Fitness
- 1 cash-in slot and 2 cash-out slots
- operations on top of the normal deposit and withdrawal transactions
- Up to 12 deposit modules with 500-note capacity each, for a total of up to 6,000 banknotes
- Strong box UL291, CENIII safes w/floor anchor
- Up to 16 currencies with 32 denominations each

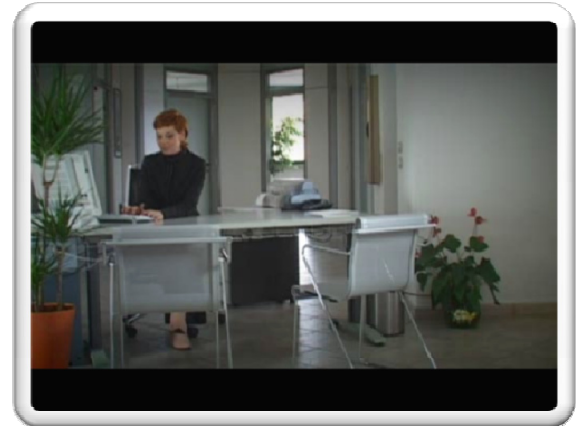


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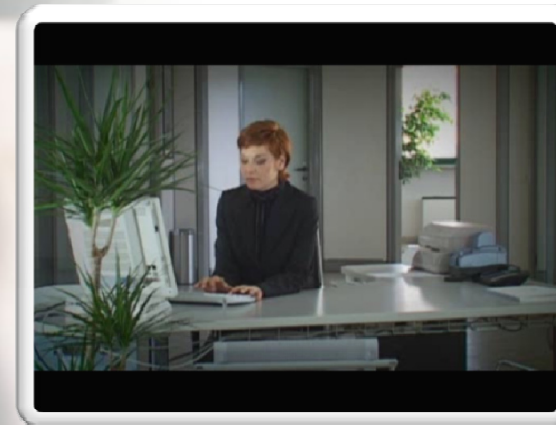
A New Teller Experience in Cash Handling



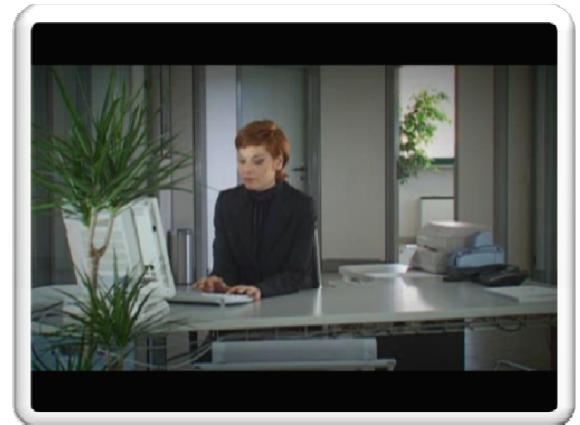
Deposit w/ Fitness
Sorting



Withdrawal Deposit



ATM Fitness Sorting



Cassette unloading



THE OBVIOUS INFRASTRUCTURE INVESTMENT

Ensure compliance, Reduce costs and
Get Capital Gain over your Expenditures

Value Proposition

**Increase cash process
transparency**

Enhance Quality

Ensure Compliance

Solidify Security

**Cost Reduction
more than 20%**

Reduce branch operating costs and get a high return on the investment

Case Parameters Input

A. Bank branch profile		for value of...
1. Teller monthly gross salary	€1,150	
2. Teller cash management bonus (%of salary)	4.5%	
3. Teller nominal working hours / day	8	
4. Value deposited / day	€130,000	
5. Value dispensed / day	€90,000	
6. Max. sorted/chkd cash in branch	€100,000	
7. Max. accumulated cash for recycling	€200,000	
8. Branch ATM banknotes capacity	2,000	
9. Branch ATM banknotes denomination	€20	
10. Branch ATM cash contents total value	€40,000	auto calc field
11. Branch ATM withdrawals value / day	€16,000	
12. Branch insurance fees (ref.value)/ teller / yr	€90	€15,000
13. Interbanking interest rate	4%	
14. WACC (Weighted average cost of capital)	8%	

B. Cash-In-Transit (CIT) profile		for value of...
1. Cost per trip - branch to cash center	€40.00	
2. Cost per batch (ref. value)	€6.00	€10,000
3. Cost of fitness & sorting / banknote	€0.0035	
4. Storage cost per month (ref.value)	€400.00	€1,000,000

C. Recycling Equipment	
1. Purchase value	€20,000
2. Annual maint/nce fees (%of purch value)	10%

D. Standard Assumptions	
1. Working days / year	250
2. Working days / month	22
3. Working days / week	5
4. Working hours / day	8

ROI Performance

E. Savings		with 1 TCR
Annual Savings	€59,082	
Number of tellers (as is situation)	1	

F. ROI Indices	
Project Internal Rate of Return (IRR) - 8yrs	
Project Net Present Value (NPV) - 8yrs	

Savings estimation sheet...

Savings Estimation

A. Labor factor	Traditional teller	w/Cash Recycler
1. EoD reconciliation time (min)	29	7
2. Daily deposits total transaction time (min)	199	23
3. Daily withdrawals total transaction time (min)	120	11
4. Total daily teller activity time (hours)	6	1
5. Teller daily standard labor cost	€85	€81
6. Branch tellers activity based cost	€61	€7
7. Number of tellers required (nominal)	0.7	0.1
8. Number of TCR units required	-	1
Total labor cost savings per year		€13,614

A. Interest factor	Traditional teller	w/Cash Recycler
1. Amount of cash in branch (daily avg)	€198,182	€178,258
2. Interest paid on cash in branch	€7,927	€7,130
Total interest savings per year		€797

A. CIT factor	Traditional teller	w/Cash Recycler
1. Number of trips per month	20	7
2. Number of batches per month	530	96
3. CIT cost per month	€3,980	€856
4. Fitness & Sorting per month	€536	€0
5. Storage & Administration /month	€53	€0
Total CIT savings per year		€44,551

A. Security Cost	Traditional teller	Teller w/Cash
1. Branch Insurance Fees	€1,189	€1,070
Total security saving per year		€120

Grand total annual savings **€59,082**





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APPENDIX



Banknote Handling Machines

Customer-Operated Machines

CIM Cash-In m/c

CRM Cash recycling m/c

CCM Combined cash-in m/c

COM Cash-Out m/c

Staff-Operated Machines

BPM Banknote processing m/c

BAM Banknote authentication m/c

TARM Teller assistant recycling m/c

TAM Teller assistant m/c



Classification of Euro Banknotes

- Objects not recognized as Euro banknotes
- Suspect counterfeit Euro banknotes
- Euro banknotes that are not clearly authenticated
- Euro banknotes that are identified as genuine and fit
- Euro banknotes that are identified as genuine and unfit



Fitness Sorting Criteria

Defect

Soil
Stain
Graffiti
De-inked note
Tear
Hole
Mutilation
Repair
Crumples
Limpness
Fold
Folded corner(s)

Definition

general distribution of dirt
localized concentration of dirt
added image or lettering written or marked
lack of ink on part or whole
-
-
part missing along the edges
banknote parts taped or glued together
multiple random folds
structural deterioration – lack of stiffness
-
-



Operational Data Reporting Template

Denomination	Total number of Euro banknotes processed	Unfit	Recirculated
EUR 5			
EUR 10			
EUR 20			
EUR 50			
EUR 100			
EUR 200			
EUR 500			