

Cash Visibility Through the Internet of Things (IoT)

Introduction

The movement of cash within the U.S. is done primarily between banks, retailers, ATM machines, competitors, and the Federal Reserve Bank. Many of these transactions happen through armored truck companies (ATCs). ATCs are mired in traditional paper-based and barcode-based technologies that are inefficient and lack visibility to their customers.

Hypothesis

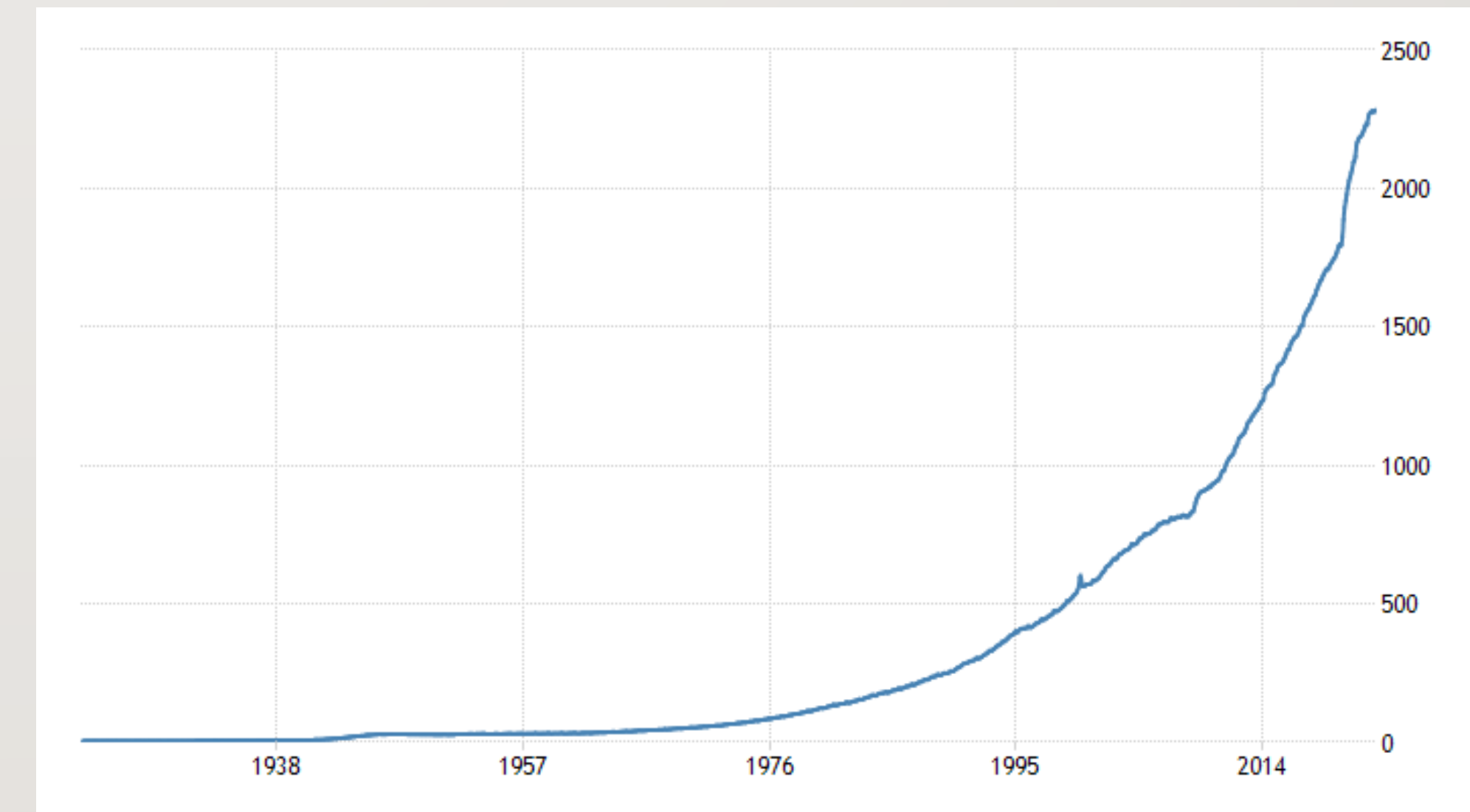
The addition of an IoT technology into the cash movement ecosystem will reduce costs, improve capacity, and provide visibility to all parties involved in the movement of cash.

Methodology

- Process mapping inside ATC
- Developing current business model
 - Constraints
 - Opportunities
- Simulation of current business model
- Validation of current business model
- Evaluation of IoT technologies
 - Bluetooth, Wiliot, RFID
- Developing future state design
- Model and simulate future state design
- Evaluate change in business model
- Develop business case and return on investment

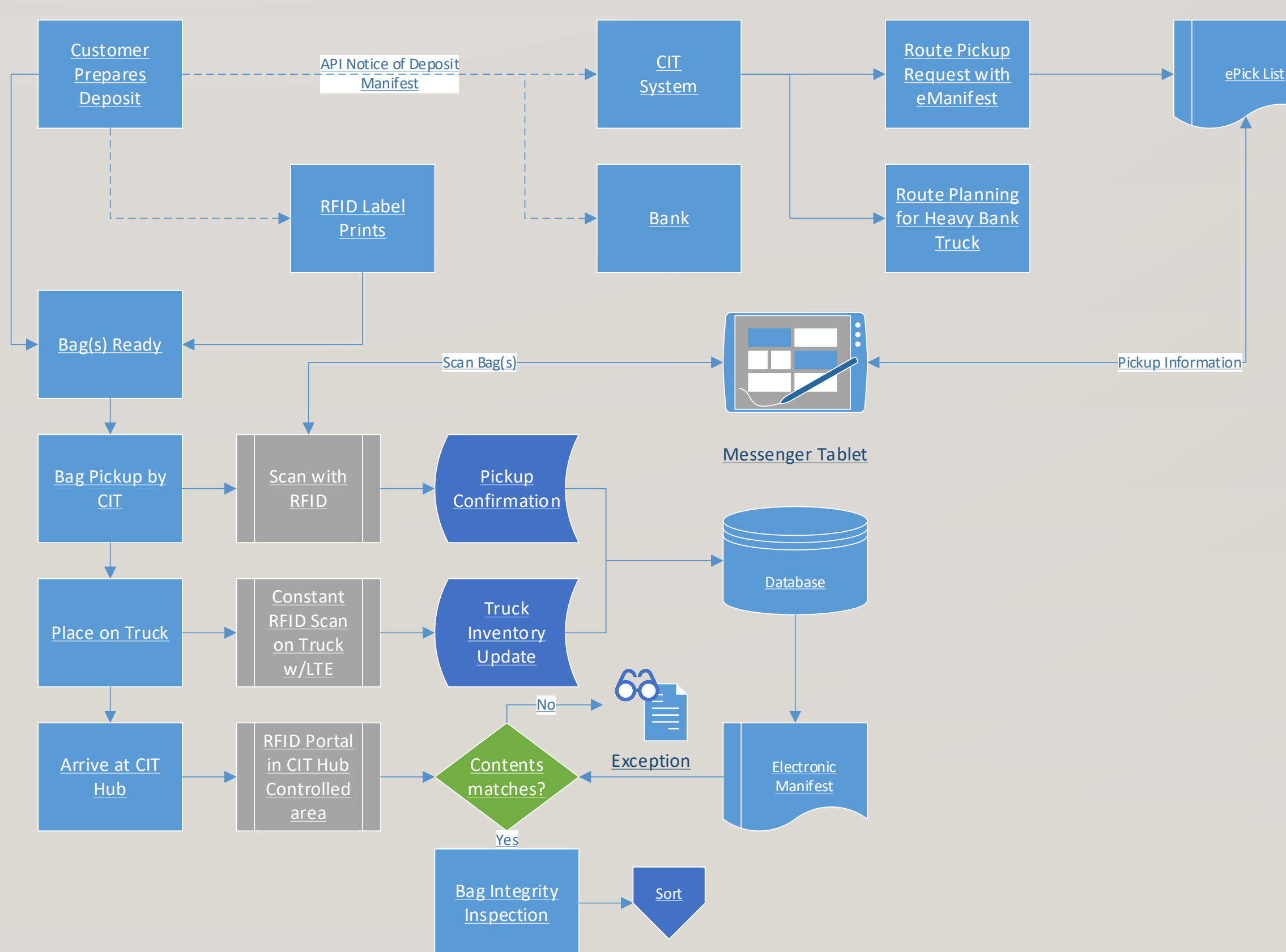
Current Situation

- Cash in circulation continues to increase in the United States.
- ATCs move billions of dollars of cash each day
- Cash movements within ATCs use barcode readers to scan cash bags in traceability applications or paper receipts as proof of a transfer of custody.
- ATCs operate inefficiently with out technology solutions
- There is no visibility of cash bags in transit between banks or customers
- Banks, retailers, and ATCs lack systems integration and visibility of the flow of cash into, through and out of ATCs.
- Cash transferred in tamper evident clear plastic bags.



Future State

- Integration of API connectivity between all entities in the cash cycle
- IoT tags on cash bags
- IoT in branch (portals, RTLS, shelf/desk)
- IoT in armored trucks
- 100% bag visibility throughout the ecosystem
- Foreknowledge of bag preparation
- Robotic Sorting
 - Inbound bags (deposits, ATM residuals)
 - Outbound bags (change requests, ATM replenishment)



Results

- Tangible Benefits
 - Increased truck route efficiency by eliminating stops at locations that do not have deposits
 - Reduced processing time during transfer of custody at retailer, bank, and competitor facilities
 - Increased operational capacity for ATCs
 - Reduced insurance rates
 - Reduced shrinkage/loss/theft
- Intangible Benefits
 - ATC operations with increased visibility
 - Awareness of multi-truck operations understanding exact contents and liability in transit for every truck
 - Compliance with policies and laws concerning maximum transport liability on vehicles
 - Customer visibility of assets in motion
 - Awareness of deposit/change request status
 - Amazon-like notifications
 - Instant validation of ATM service completion
 - Increased customer satisfaction
 - Instant historical records for every bag
 - Bank awareness of incoming deposits
- Return on Investment
 - Given a 40-truck branch
 - System CapEx = \$504,965.34
 - Annual OpEx = \$157,458.48
 - Savings/year = \$318,597.40
 - Payback Period = 25 months
 - Annual operational savings after ROI recovery = \$161,138.92



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