Computing in Banking and Security/Fraud

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Our Topic at a Glance:

Since the advent of the computer, computing and algorithms have been used in banking, finance, accounting, and related fields to predict market patterns and make more well informed business decisions.

Algorithms also exist to prevent and detect fraud in financial markets and banks. High profile security measures and advanced cryptography methods must be used in order to ensure security of investors' money and that Wall Street can function smoothly.

These algorithms are crucial in the wellbeing of the economy and prevention of financial disasters. The economy and Wall Street is dependent on their functionality.

In researching this topic, we've explored some of the history behind computing in banking...

Banks Before Computers

What banks do:

- Deposits
- Loans
- Hold money digitally and physically

History of Banks:

1700s

- Banks hold physical money
- Lends in form of bank notes but not much lending
- Close to everything we do now just on paper
- Open more to the elites

1800s

- Banks more widespread open to more people
- Accept more deposits
- Give out more loans

Overall everything took longer

- Loans - multiple appointments
- Bills, checks
- Account info

The Introduction of Computers in Banks

- First introduced in the early 1950s
- Large computer was built for Bank of America
- Used for processing transactions through magnetic ink character recognition
- 1950s credit cards were born but not used widely until 1960s when the big banks adopted it
- 1969 magstripe technology was invented
- This led to POS system which allowed businesses to electronically capture and send credit card information
- 1970 EFT - this made atm possible

How Banks Use Computers Today

Credit Cards:

Magstripe

- Each stripe contains magnetically encoded data
  - Account info
- When you swipe through the reader the magnetic particles induce voltage
- Voltage converted to binary data
  - Sends data to bank

Chip Cards

- Chip card is a tiny computer that has a CPU that runs logic and commands
- When you tap the terminal generates a radio frequency that boots up the chip.
  - The terminal sends data to chip card
  - Chip card sends responses back. ex) account number, routing number.
- The chip creates a one-time cryptogram using a secret key
  - To prevent fraud
- Terminal takes that data and sends it to the bank and the bank decrypts it

How Banks Use Computers Today cont'd

Cirrus Banking Network:

- Allows people to access money from anywhere in the world
  - Using Cirrus ATM and have credit card on the cirrus network
- ATM reads your card and sends the data through the cirrus network back to your bank
- Your card contains data
- ATM reads this and stores it as a byte array
- Network is sent to the home bank server
- Bank server checks it and sends approval message back to ATM
  - Runs fraud checks
- Whole process takes 1-3 seconds

What Computers Mean for Banks and Security

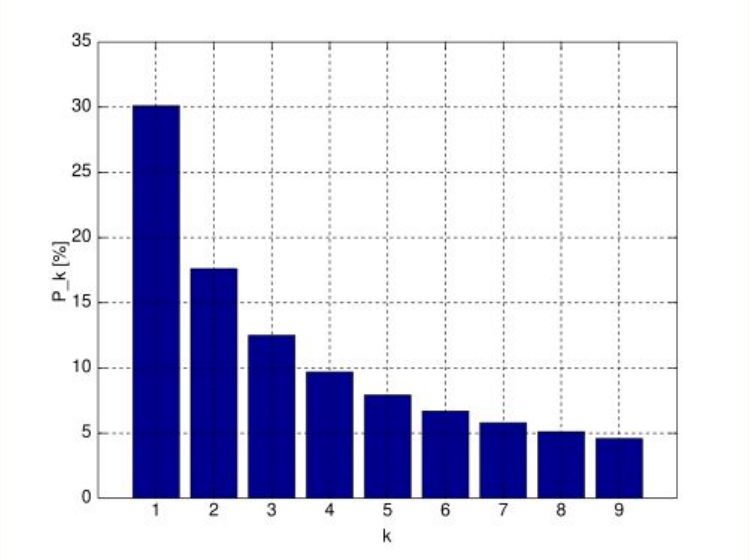
Fraud detection and cybersecurity is crucial to banks' operations and reliability.

With computers holding personal data (i.e Social Security, account info, passwords, etc.), it's obvious that computers need to be secure, and computer science concepts such as algorithms and cryptography can help ensure that security

- 1987 Stock Market crash

Computing in Banking and Fraud Detection

- Banking systems, networks for banks
- Computer systems have been used widely on Wall Street since the desktop computer became available
- Forensic Accounting and the Investigator's use of the computer
  - Benford's Law
  - Enron Scandal: algorithms/data helped in lawsuit as evidence



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