APPLICATIONS OF BLOCKCHAIN TECHNOLOGY IN CP

Blockchain technology not only helps streamline online identity verification and authentication (using cryptography), it also promises a stronger and more secure infrastructure (a distributed, decentralized and 'public' ledger).

At a high level, blockchains store data (e.g. customer data or transactional data) into blocks, and those blocks are linked together sequentially to make up a secure blockchain *(details in book excerpt below).*

Data Breaches & Cyberattacks

- Because blockchain data is encrypted, it's extremely difficult to hack. On top of that, each entry on the distributed ledger is linked to the entries before and after it (each block in the blockchain references the hash of the previous block and builds on it) so hackers would have to change the entire chain to change a single record.
- A major security process where blockchain can help protect is in detecting fraud and cyberattacks. A rise in cyberattacks is a big cause for concern right now, global plans of which have been alluded to with the 2022 Russian and Ukraine situation.
- Since most banks have centralized ledger systems that store all customer information, it becomes easier for hackers to attack and access that information.By decentralizing the storage of information, blockchain technology helps prevent a hacker from gaining easy access to all information at once.
- Another example of using blockchain to combat breaches could be found in credit reports. Obtaining customer credit histories under legacy systems is tedious and costly - but a necessary step in avoiding financial fraud. A 'smart contract' could easily verify a customer's identity through records maintained on the blockchain and trace down an individual's credit history.

Online Identity Theft & Verification

- Blockchain technology can help significantly reduce the risk of identity fraud taking place when onboarding customers or processing transactions as it uses cryptographic keys (public/private keys) for advanced encryption.
- Typical identity theft is when fraudsters take over genuine accounts for illegal purposes - it works by asking customers to do something only they can do - which oftentimes is reliant on customers supplying this information when opening an account and remembering it - Blockchain solves for this by one-way hashing its data, a cryptographic technique.
- An example of this technology in banking is a 'smart contract', a computer-coded application, which is a great solution because they require a 'digital signature' - meaning customers use their private/public keys to get and give access - which in itself is huge in preventing and restricting identity theft.

Backend Fraud monitoring - KYC

- Blockchain smart contracts would really help with monitoring and the backend work banks do for customer protection as well. The KYC process takes time and effort, and complying to KYC rules also costs banks money (e.g. due diligence).
- Blockchain technology can reduce the human effort and cost involved as customer information is stored on a blockchain, which by design is decentralized, meaning the nature of the platform would allow all institutions that require KYC to access that information.
- Since data can be stored on a KYC smart contract, we don't need to double check all the data and perform extra validations - it's one source-of-truth of data - so it's going to be a faster process and more accurate.

Payment Processing & Transactions

- The ability to couple payments with smart contracts (guaranteed "if-when-this" condition) allows banks to connect multiple data points, follow pre-set conditions or utilize data to navigate transactions that require interdependencies. This creates an avenue for banks to manage complex transactions in a much more streamlined and secure way.
- Blockchain technology makes transactions more secure due to its decentralized structure. For instance, if hackers want to change the dollar amount in a transaction or payment, they would need to control at least more than 50% of all computing power on the blockchain (that's a lot, lol).
- An example of this technology would be tracking a customer's suspicious transactions - with blockchain you could trace those far more easily (due to how it's set up) and they could even be traced back to the point of actual origin (where in the blockchain, i.e. transaction history, it originated).

Future Outlook: Disruption doesn't happen overnight lol, and much of blockchain technology has yet to be perfected or widely tested (technically, blockchain technology does not make the system unhackable, but it's *way* harder). Blockchain will most certainly transform traditional financial infrastructure in the future, regardless of the degree at which Capital One (and other banks) embrace this technology!

ATTACHED BOOK EXCERPTS* from "Creation of Bitcoin & Blockchain" Children's book for Adults (1/22 Laura Cox)

**Note: some sections refer to the Bitcoin Blockchain specifically (vs Blockchain in general), but the framework of the technology is still applicable (read as transactions = customer data)*

OVERVIEW: Process of Bitcoin & Blockchain — From Start to Finish