Chelsea Matthews - cm58685
Alyson Brown - ab65225

**Homework 4: R3 Corda**

R3, originally named R3CEV, was started in early 2013 by David Rutter. R3CEV was a blockchain technology company that focused on investing in technology ventures and consulting on exchanges, with the initial CEV standing for "crypto, exchanges, and ventures." R3CEV's founding was centered around Rutter's revelation that blockchain could potentially alleviate serious pain points for large players in financial markets. He aimed to reduce frictions around clearing, settlement, and record keeping of financial assets.

During R3's first three years they did not partner with venture capitalists. Instead they created a consortium with banks. In order to avoid legal issues, banks would buy memberships at three different price levels: $1 million, $2.5 million and $5 million, in a joint venture with R3 to mutually develop a blockchain solution. In this way, Rutter was able build the business while maintaining control. R3, in collaboration with its network of banks, had three main goals: develop a platform that could handle billions of dollars in transactions, build a sandbox for experimenting with new blockchain and DLT tools, and experiment with the new technologies to determine where they could be best utilized. The initial nine banks in the consortium were global leaders including Barclays, BBVA, Commonwealth Bank of Australia, Credit Suisse, Goldman Sachs, J.P. Morgan, State Street, Royal Bank of Scotland, and UBS. This number continued to grow during 2015.

The major pain point facing banks and other investors is the expensive and time-consuming process of clearing, settlement and record keeping when trading financial assets. Financial assets can be divided into different categories, and each type has developed its own trading rules and settlement procedures. While these rules and procedures have many shared conventions, they also many idiosyncrasies. For example, there are issues with the lack of intermediary between buyer and sellers for over-the-counter trades, as well the multitude of financial assets that are traded across borders in different currencies and between countries with different regulatory and compliance requirements. Clearing and settlement is the process of transferring ownership of a financial assets from one holder to another. Clearing

and settlement problems were so pervasive that the financial service industry had named them settlement risk. This is the risk that a counterparty fails to deliver a security or transfer payment. DLT could help with this problem by reducing a bank's infrastructure costs related to cross-border transactions, securities trading, and regulatory compliance.

Banks might want to join the R3 consortium instead of developing their own DLT because R3 allows them to pool their resources and collectively develop an encrypted distributed ledger in the cloud. Otherwise, each bank would have to make significant investments in this new, unproven technology, and run the risk of developing a solution that may or may not be adopted by its counterparty.

Corda is a built from scratch enterprise-grade blockchain distributed ledger technology specifically designed for the financial services industry. Bitcoin Blockchain is permissionless, consensus-based, and has slow verification of transactions. Bitcoin Blockchain is transparent, meaning that every node on the network could see and receive all data. Additionally, bitcoin blockchain is self-contained, meaning that it records transactions for only one asset. The issues of untrusted nodes is that there was a lack of trust in the financial markets that causes costly transactions and difficulty in post-trade processes. Because one side's profit often came at the expense of the other side, there is a lot of distrust between counterparties. If the disagreements escalate, lawyers might have to get involved making it an expensive and time-consuming process for both parties involved. Corda is designed to reflect that counterparties did not trust one another. In contrast, Corda did not bundle transactions in blocks, but instead, each transaction was validated individually. This allowed for quicker processing time, more in tune with the needs of the financial services industry. Additionally, in Corda, only the nodes involved in the transaction or agreement are sent the data. This means that only the counterparties involved have access to the information and consensus only between the parties and not all participants is required for a transaction. Corda, unlike bitcoin Blockchain, is a permissioned distributed ledger. Trusted intermediaries record facts on an immutable ledger, making it easier for a consensus to be reached on transactions. Additionally, Corda features Smart

Contracts that help to facilitate trusted peer-to-peer transactions. Settlement can occur directly on the ledger, eliminating the need for intermediaries. Corda also allows for the enabling of regulatory and observatory nodes to meet the compliance needs of the financial services industry. Corda allows parties to interact freely while continuing to support private business networks and does not require a native cryptocurrency in order to operate, unlike bitcoin Blockchain.

Rutter explored three possible business models to monetize Corda. The first option was the traditional software product strategy in which they would sell or license Corda as a plug-and-play middleware software solution. The second option was to pursue vertical integration, in which R3 would provide an end-to-end back office solution for its customers. R3 would develop top-of-stack distributed applications, as well as a bottom-of-stack operating system and database. The third option Rutter saw was to pursue a platform-as-service strategy built around Corda. Using this strategy, R3 would build a technology ecosystem that would involve third-party developers, consultants and others that would interact with banks and other players in the financial services industry.

For several reasons, I recommend that Rutter use the second strategy, the full-stack vertically integrated strategy, to monetize Corda. This option allows Rutter to maintain control of the technology, updating as needed and acting as a distributor and repairman of the technology. This product already has a large demand given the number of banks that have joined the consortium, and so product adoption is not a significant consideration in my mind. This phenomenon would boost Corda to become the industry standard anyways (the benefit of option 3), while allowing R3 to maintain the rights and not be open source. Because of the fact that both counterparties have to adopt the same technology in order to interact, banks wanting to transact with any bank in the consortium would also benefit from adopting Corda, increasing the market share and adoption of the technology. In my opinion, this option is also best in that R3 would directly interact with customers, and therefore continue to develop consumer-focused products and applications. Continuous interaction with the end user better motivates companies to build high quality and effective products in the long run.