



BLOCKCHAIN TECHNOLOGY IN RETAIL BANKING

An exclusive report from CompStrat Consulting Inc.

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1. Executive Summary

Today's retail banking industry is in a red ocean and not taking advantage of new technologies to improve their services. They usually deliver value in areas where the customers' pain points are not: convenience in delivery and a large portfolio of offerings, rather than the simplicity of use and personalized services. Moreover, latest scandals showed that there is a growing number of trust and transparency issues with banking. Most customers feel ready to "jump off" the ship but do not because of the absence of a better offer.

But banks can pretend to a brighter future and disrupt their usual way of functioning, thanks to the blockchain. This new technology has the potential to unlock most of those issues and move retail banking towards a blue ocean. Blockchain provides transparency of each stakeholder's actions, quick transactions, and is more secure than ever. In this report, an analysis through a strategy canvas and six different paths provided concrete ways retail banking can transform for the best-using blockchain.

We used six paths to find out a way to get to a blue ocean. First, we looked at alternatives and substitutes to products and services offered by the retail banking. We analyzed the arena in which retail banking is operating to find the direct and indirect competitors to retail banking. We found out that the need for 3rd party providers in the payment chain can be erased and that an emotional component can be created through an increase in trust to banks.

We recommended four main actions for retail banks. Using blockchain, they should raise data protection and security, create lighter wallets and new e-wallets that can manage different external loyalty programs for the customer. They can create easier microfinance loans that do not require credit history, and above all, better personalize their offerings to the customer, which has been a growing concern in today's digital era. They should eliminate repetitive identity verification steps, third-party contract managers and influence society to eliminate physical checks and cash. They can finally reduce transaction time and fees, as well as complexity for mortgage loans.

Following those actions, retail banking will finally be able to provide value to customers where they expect it and enter a blue ocean. By improving most of trust and fees issues, it will convert every tier of non-customers into fully involved customers. We finally provided additional advice about the risks banks can still encounter in the future with blockchain.

2. Retail Banking Today

Retail banks today are striving for growth and attracting customers is one of their biggest challenges. Providing the best customer experience with the changing regulations and technology requires banks to strategize their horizons very intelligently.

A. Strategy canvas

To get a macro view of the retail banking industry today, let us draw the strategy canvas of a traditional company in this industry to understand their priorities across several factors.

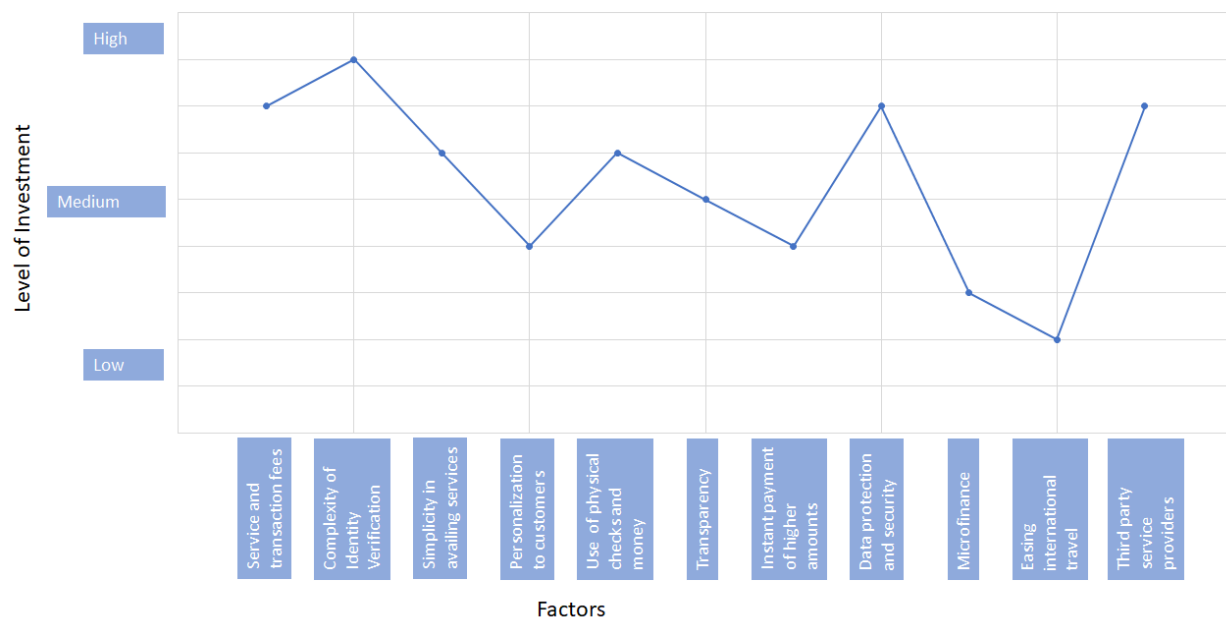


Fig 1: Strategy canvas of retail banking today

Given that all companies in the retail banking industry are working to make payments easier, every new improvement is quickly copied and becomes commoditized. Do these improvements really help these companies gain an advantage in the market? To differentiate itself, a player needs to seek to resolve these pain points in a unique and non-replicable way.

B. Why is it a red ocean?

Competition among companies in the retail banking industry is cutthroat. Whether the competition is based on price or differentiation, all companies try to obtain more profits by offering their products for lower price or by making their products more differentiated which increases their costs. In perfect competition, no company makes a profit as all the companies have the same offering. This is very analogous to a red ocean, where a company is bound by the market and its competitors. However, a company in a blue ocean enjoys little competition and is not bound by market, making it analogous to a

monopoly. To determine if the current retail banking industry is in red ocean or blue ocean, we are conducting a porter's forces analysis.

Industry Rivalry: Banks in the retail banking industry compete heavily. All feature innovations are quickly and easily copied by competitors erasing any differentiation created. This is a high threat to profits.

Threat of New Entrants: Initial capital investments and regulations create a barrier to entry but with those regulations going away and the rise of fintech firms, this could have a high threat to profits.

Threat of Compliments: An increasing number of banks are offering compliments like peer to peer transaction platforms (eg: venmo, zelle etc.) and simpler ways to transfer money, offer loans etc. These compliments reduce the use cases of the core offering, making it a medium to high threat to limit profits.

Threat of Substitutes: Threat of substitutes like PayPal, Apple Pay, and online peer to peer lending like Kiva or the Grameen bank which are increasingly adopted poses a high threat of limiting profits.

Bargaining Power of customers: Companies have to cater to customer's demands as they provide little incentive to the customers to stay. The switching costs are not significant and the offering is undifferentiated. Customers therefore have a high bargaining power and this is a high threat to limit profits

Bargaining Power of Suppliers: The suppliers in this industry besides the IT infrastructure providers and information security providers are the central banks who facilitate the funds. These central banks could limit these loans to smaller banks which could limit their profits. This force poses a medium to high threat.

Government: Government has the ability to regulate banks from increasing their interest rates and other offerings, also on issues of identity security. Furthermore, Government can also impose monetary policies. This poses a medium to high threat to limit profits.

Technology and Pace of Change: Modern technology has made the traditional banking much simpler and continues to do so. Banks have to adopt new technology to provide better offerings or they cannot compete. This poses a high threat to limit profits

Social and Cultural Shifts: Customers now want every banking operation available through their phones and with a single platform. Banking companies need to keep track of emerging trends to provide the right offering. This poses a high threat to limit profits

As we see from above, there are several forces which have a high impact on limiting profits, implying a retail banking company competing on undifferentiated offerings is in a red ocean.

C. Value provided by traditional banking

Buyer Utility Map: Let's look at the buyer utility map to determine where the value provided by the traditional banking today lies. This map will also enable us to look at all the other areas where value could be potentially created, if you're creating a blue ocean by modifying your offering.

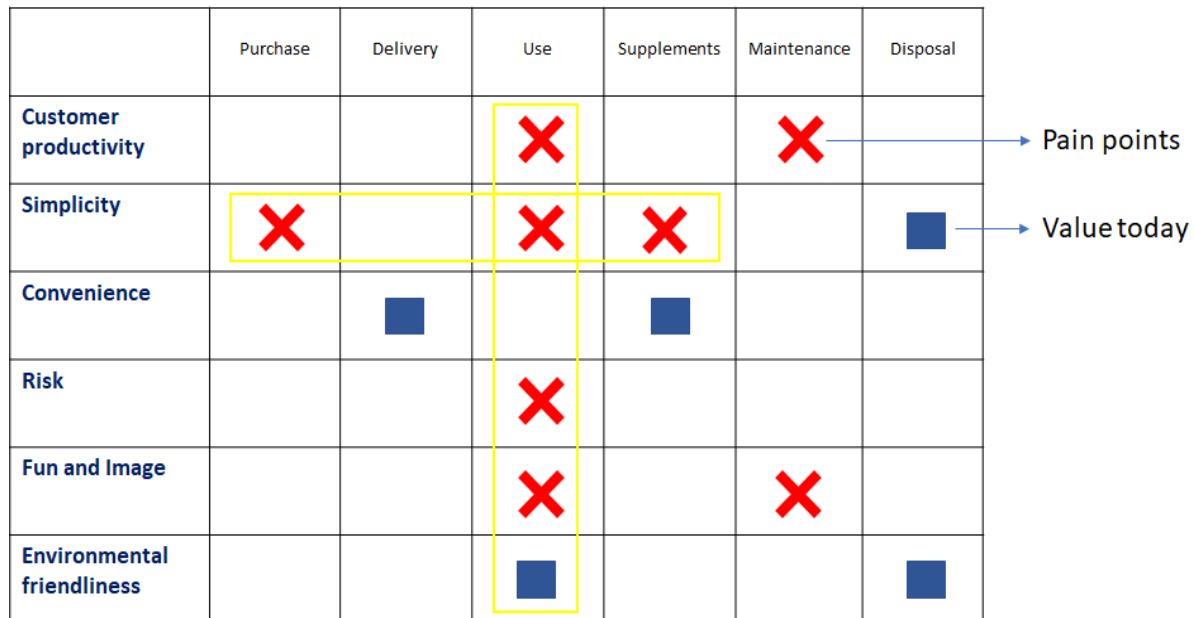


Figure 2: Buyer-Utility map of a traditional retail bank today

As we see, the value provided today by the retail banks are focused around convenience in delivery (mobile app, online banking, call transactions etc) and offering supplements to increase their own revenue. This is in stark contrast to the customer's pain points which are majorly around simplicity throughout the experience and utility in usage. All of these pain points, combined with the blank components of this map are the areas where there is a potential to create new or additional value.

D. Who is left out? Non-consumers

Now we have seen some of the customer pain points banks are not currently addressing, we will profile these customers being ignored by the retail banking industry. Using the three tiers of non-consumers model, we see that:

Tier 1 non-customers: are customers that are not trusting of the current status quo and long for a decentralized banking system with retail banks having little to no power. These customers are waiting for the development and prevalence of cryptocurrencies and other decentralized methods of payment. Some non-customers in this category are also looking for instant and painless trans-border payment systems.

Tier 2 non-customers: are customers refusing to enter the current retail banking system because the services offered by the industry are not convenient enough for them or they don't have an understanding of how the retail banking industry works and don't trust it. An example of this tier of

customers are merchants in rural parts of the developing world. They tend not to have bank accounts because they work long hours and don't have time to make deposits during banking hours.

Tier 3 non-customers: are customers in the most rural parts of the world that are yet to hear about retail banks. We believe these customers are a negligible share of the global market.

3. Blockchain in retail banking

A. What is blockchain?

Blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way¹. The five principles on which blockchain is based are: Distributed Databases (every participant on blockchain have access to the complete database and its complete history), peer to peer transmission (each transaction is forwarded to every participant in the blockchain network), transparency with pseudonymity (it means that with each participant can only see the transaction value and 30-plus character alphanumeric address of the parties involved) , irreversibility of record and computation logic. Blockchain is significantly affecting the financial industry and it is evident from the rise in cryptocurrencies. The cryptocurrency market valuation has just reached \$800B mark and is expected to cross \$1 trillion mark by 2018². Besides cryptocurrencies, there are some amazing work done by use of blockchain which includes but not limited to: use of blockchain in securing health records of one million Estonian citizens and India's Reliance is using blockchain based supply chain logistics platform using its own cryptocurrency Jiocoin³.

There is growing interest in how blockchain can be used in retail banking and it is evident from the fact that 9 out of 10 bank executives have said their banks are actively exploring implementing blockchain technology for payments⁴. Banks are actively investing in finding ways of using blockchain to speed up transactions, increasing security, transparency and cut costs. In the coming sections, we will dive deep into how blockchain can be used to make retail banking a blue ocean.

4. Creating a blue ocean

In this section, we will go through tools banks in the retail banking industry can use to figure out how to get to a blue ocean and actions they need to take.

¹ <https://hbr.org/2017/01/the-truth-about-blockchain>.

² <https://www.cnbc.com/2018/02/13/cryptocurrency-market-to-hit-1-trillion-valuation-in-2018-kraken-ceo.html>

³ <https://www.forbes.com/sites/bernardmarr/2018/01/22/35-amazing-real-world-examples-of-how-blockchain-is-changing-our-world/2>.

⁴ <https://www.accenture.com/us-en/insight-blockchain-technology-how-banks-building-real-time>.

A. Six Paths exploration

Path 1: Looking Across Alternative Industries and Substitutes

Some alternatives to traditional banking are:

- Credit Unions: similar to traditional banks but are non-profit; members of the union share something in common like they are a member of same institution or organization; higher interest rates on deposit than traditional bank; minimum fees and minimums. Customers are increasingly moving toward credit unions because credit unions are able to provide better loan rates because they aren't beholden to profits.
- Market Money Market Mutual Funds: offered by big mutual fund companies such as Fidelity, JP Morgan. These funds are not insured against loss by FDIC⁵ and require a minimum opening balance.
- Cash Management accounts: these are offered by brokerage companies. It is a combination of a brokerage account and checking account. These accounts usually require a hefty minimum deposit.
- Non-Consumption: about 8% of americans do not have bank accounts. These non-customers either do not have money to put into an account or don't have the required documentation or credit to open an account. Some non-customers also have a dislike of retail banks and no trust them⁶.

Path 2: Looking Across Strategic Groups Within Industry

We applied the concept of Arena to the traditional retail banking to identify the players who are solving the same problem as solved by the traditional banks. Most of the banks focus on the direct competitors such as other banks, but the banks are in also in competition with other institutions such as Technology companies like google, facebook, and retailers such as Walmart and Starbucks. Alarmingly for traditional banks, global fintech adoption is rising and has increased from 16% in 2015 to 33% in 2017⁷. Recently, Walmart partnered with Green dot bank to open checking account for those who may not open an account with traditional banks, i.e. Walmart is targeting non-consumers. People can deposit money in Walmart and use ATMs at Walmart for free⁸. Walmart has also started its Bluebird service marketing it as an alternative to debit and checking. Many technology companies are offering serious competition to traditional banks, for example in developing countries such India and China, use of mobile based apps (Paytm in India and Ant Financial in China) for transactions is on rise. Telcos are also coming up with innovative ways such as M-Pesa in Kenya to solve the same problem as done by banks.

⁵ "Alternatives to traditional banks - May. 28, 2015 - CNN Money." 28 May. 2015, <http://money.cnn.com/pf/money-essentials-bank-alternatives/index.html>. Accessed 29 Mar. 2018.

⁶ "AlternativestoTraditionalBanks-Kiplinger." <https://www.kiplinger.com/article/credit/T005-C000-S002-alternatives-to-traditional-banks.html>.

⁷ <https://www.forbes.com/sites/rogercrook/2017/08/16/the-race-is-on-to-disrupt-traditional-banking-2/>.

⁸ <https://mobilebusinessinsights.com/2017/03/competition-in-the-banking-industry-comes-from-an-unexpected-source/>

Path 3: Looking Across Chain of Buyers

In the retail banking industry, the purchaser (customer) is usually the same person as the user. That is, the customer of a financial services product is usually the person benefiting from the value created by that product. Influencers are usually trusted people in the network closest to users. For example, a close family member or a mentor. Influencers are also a trusted authority that can impact the decision making of the user like a school official or a financial advisor. Banks in the retail banking business want to have products with a good reputation that influencers organically recommend them to potential users.

Path 4: Looking Across Complementary Offerings

Customers of today's retail banks rely on various platform providers to fully utilize the bank's offerings and access the money in their bank account⁹:

- Credit and debit cards like Visa or Mastercard
- Payment portals, to secure the information transferred by the bank (like 3D Secure) to the merchant
- E-wallets, like Apple Wallet, Paypal, that act as (i) a payment portal (ii) the transfer of non-banking customer information such as their address and (iii) prepaid account

To create value for customers by making it easier to make payments, retail banks can leverage blockchain technology to eliminate the need for those complimentary services. Blockchain makes the exchange of information between a bank and a merchant more secure and simple, therefore it reduces the need for e-wallets and payments portals. By investing in making sure businesses and merchants (SMEs and larger businesses) are able to accept payments from a blockchain backed account, retail banks will reduce their customer's need for third-party payment applications and reduce the fees they pay to these third-party applications. This system is also more intuitive to customers and will increase the rate of adoption.

Path 5: Rethinking Functional and Emotional Appeal

Functional appeal

With the evolution of customer needs, there is growing need for the industries to reshape and innovate to meet the customer expectations. Today, we see drastic changes shaping the financial industry.¹⁰ New technology, globalization, change in regulations and digital platforms are creating tremendous opportunities for retail banks. With a high level of competition created by substitutes for financial transactions, it is essential for retail banks to enhance the value provided to the customers based on their expectations to prevent losing customers. The conventional offerings of retail banks are tedious to both the customer and the banks. Services with minimal costs and time are key. Features that provide a great user experience and eliminate redundancy of work help in removing frictions from the customer's journey.

⁹<http://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2017/jan/The%20State%20of%20the%20Financial%20Services%20Industry%202017.pdf>

¹⁰ <https://www.bai.org/banking-strategies/article-detail/top-retail-banking-trends-for-2017>

Emotional appeal

Companies these days work very strategically in creating an emotional appeal for their product. It not only increases the trust the customers have in your company, but it has proven to improve businesses substantially. It creates a win-win environment. Over the decades, banks have been instrumental in securing its relationship with the customers by emphasizing on trust and security.¹¹ But with technology easing every aspect of a customer's life, they are looking forward to increased transparency and reduced complexity in the retail banking segment too. Giving the customers the ability to monitor their cash flow during transactions, simplifying their onboarding and increasing the availability of loans are few ways of showing that you care for them and is invested in providing them a better quality service.

Path 6: Participating in Shaping External Trends Over Time

Rather than trying to predict the future of the retail banking industry and what customer needs might be with current customer and technology trends, companies can work to shape that future. Like the famous Henry Ford quote ("If I had asked people what they wanted, they would have said faster horses."), current customers don't know what they'll want in the future and the pace of technology is too fast to try and predict what can be used to deliver value to customers. What retail banks should do instead, is to anticipate various areas of growth they can get into based on their insights into how customer value could migrate. Using tools like the Three Horizon model, banks can anticipate how to deliver value to the customer of the future, figure out business models and technologies that can satisfy customer needs, thus, creating a blue ocean.

B. Four Actions

In this section, we will outline specific actions companies in the retail banking industry can take to get to a blue ocean.

B.1: Raise

Data Protection and Security

Currently, the retail banking industry invests a significant amount to ensure that the transactions are secured, and the customer data is safely stored. However, customers are growing increasingly wary of sharing their data with banks¹².

Due to the transparent nature of the blockchain technology and the control it provides to individual users, digital transactions can be made more secure if banks would adopt the technology. Furthermore, blockchain technology can also offer multiple cybersecurity to retail banks. Blockchain technology can

¹¹ <https://magenic.com/thinking/solving-customer-pain-points-key-to-banks-future>

¹² <https://www.mobilepaymentstoday.com/news/study-uk-consumers-wary-of-sharing-data-with-banks-as-services-increase/>

be used to protect sensitive records and authenticate user identity by using Keyless Security Infrastructure, which can easily spot any data manipulation¹³.

B.2: Create

Lighter Wallets

The retail banking industry can work together in simplifying the customer's journey with the industry and unlocking a new value proposition. Today the customers use multiple credit and debit cards from different banks. Handling these cards are definitely easier than handling money, but yet there is potential to simplify this into carrying just one card or even just a unique key. By integrating all the associated banks using blockchain and providing the necessary authentication, the customer is able to integrate every party into a simple card. The technology provides the required security and transparency. This key/card will enable the customer to select the desired bank from which a payment is to be made from a screen and eliminates the hassle of handling multiple cards.

Managing membership of loyalty programs

Airlines and hotels have created their own credit card for their customers to buy online while using automatically the loyalty program, reducing the hassle of entering their loyalty program number. What if banks provided this service, thanks to blockchain?

Blockchain should be used to ease the access to multiple loyalty programs for a customer¹⁴. As a decentralized technology solution, it can centralize the customer's loyalty programs of airlines, hotels, grocery stores, etc. All rewards from the merchant could be credited to a single e-wallet, and on the other side, paying with one's own credit card on a merchant's website would also give access to the loyalty program benefits the customer has subscribed to. That would create less friction in the payment chain and accelerate and secure the reward process as well.

Microfinance, loans without credit history

The success of microfinance institutions like the Grameen bank shows that there is a large set of qualified customers not served by traditional retail banks. As mentioned earlier, these customers remain unserved by these banks because the banks do not have enough data on them to access their risk profile. This issue is especially prevalent in the developing world where most of the population are entering the retail banking system. These banks can leverage blockchain technology to verify ownership of the assets of potential customers, cash flow of their businesses and transaction habits and patterns to access their risk profile. Access to all this data will allow banks to extend services like microloans and credit to a substantial number of customers they don't have access to today.

¹³ <https://economictimes.indiatimes.com/small-biz/security-tech/technology/how-blockchain-technology-is-changing-the-security-landscape-in-the-banking-sector/articleshow/61502873.cms>

¹⁴ <https://www2.deloitte.com/us/en/pages/financial-services/articles/making-blockchain-real-customer-loyalty-rewards-programs.html>

Personalization and tailoring to each customer

Today, retail banks do not have enough data to advertise personalized financial service offerings to potential customers at scale. For example, international graduate students in the US get mail from banks offering mortgage loan services when these international students cannot legally own property in the US. Leveraging blockchain technology, banks in the retail industry will have access to accurate transactional and asset ownership data. This will allow these banks to create better-targeted offerings to potential customers. Consumers in the market are also exposed to services that are more pertinent to them and have an easier time searching for financial products.

B.3: Eliminate

Identity management - Eliminates repetitive identity verifications

The retail banking sector which is in a continuous relationship with its customers, requires conducting a series of tasks to authenticate customer identities. Banks are not only required to conduct these identity verification tasks for new customers but are executed at different times during the tenure of the customer's association with the bank. These frequent reviews of the existing customer are very essential to keep the anti-money laundering standards in check. The current procedures involving manual clerks, hard copies of documents and frequent visit to banks is neither ideal for the customer nor the bank in terms of management efficiency. This becomes a bigger challenge while being a customer of multiple banks since the identity verification systems are not integrated. This is where the power of blockchain can be utilized.

¹⁵How can this be done? An authorized party such as an approved third-party company, a public authority or even a bank can authenticate and verify the personal details of a customer. By using blockchain technology, this data will be recorded in the ledgers and can be accessed and verified by all the members of the blockchain using a public/private key. This opens one of the broadest applications of blockchain in retail banking. It simplifies opening of accounts and



Figure 3: identity management

¹⁵ <https://www.bankinghub.eu/innovation-digital/blockchain-retail-banking>

other processes for the customer without having to fill multiple forms and questionnaires. It also eases the identity management system for the banks by improving the efficiency of assessment and tracking and in providing quality service to the customer.

Contract Management - Eliminates third party contract managers

Another broad application of blockchain in retail banking is for contract management. The blockchain is not only capable of storing data like personal information, account balance, etc. but can also store functions. This introduces smart contracts with important components that can be triggered by the system automatically. By doing so the banks have better control over the contracts and can increase the number of contracts.

For example: A car that was purchased by availing a car loan will get auto-locked in the event of failure to pay installments or any such action that violates the contract agreement. This can be implemented in collaboration with the associated industries using internet of things and blockchain technology. This provides great leverage for banks to avoid the third parties for installment collections and management of contracts.

Physical checks, invoices, ATMs

With the use of blockchain in retail banking, we will be able to eliminate physical checks, invoices, and ATMs. Using physical checks for transferring the money is a slow method and so with blockchain people will be able to send/receive money in more secure, fast and efficient manner. The function of the invoice is to keep track of the transaction, and it also acts as a proof for the transaction. With blockchain, the transaction will be verified by numerous participants on the blockchain and the record of the transaction will be permanent and irreversible. Thus, it will eliminate the need for invoices. ATMs are required to deposit and withdraw money, but with people using blockchain, the need to carry physical currency will be eliminated, thus eliminating the requirement of ATMs.

B.4: Reduce

International Transactions - Reduces transaction time and fees

¹⁶Cross border payments and transactions continue to hinder the working of the businesses and individuals who mark a global presence due to the time taken and fees involved. Several tech companies including the giants are now working on incorporating blockchain technology into their platform which will enable retail banks to process faster transactions with minimal fees.

How is this done? *When a Customer X permits and authorizes a bank to make a particular transaction to Customer Y, an algorithm evaluates for the shortest path between these customers and fulfills the transaction. This transaction is then updated in the blockchain.*

¹⁶<https://www.retaildive.com/news/ibm-taps-blockchain-to-ease-cross-border-payments/507411/>

Recently, ¹⁷American Express and Santander have partnered with Ripple for providing faster cross border payments by using Ripple's blockchain platform. This also enables the customers to trace their payments. Ripple has also announced its plan to incorporate its cryptocurrency XRP to fasten these exchanges in the near future. While the substitutes for banks that provide cross border transactions are moving faster in this area to acquire the customers, banks with its wider customer base and broader portfolio should incorporate blockchain into their business model.

Mortgage Loans - reduces complexity

¹⁸Mortgage loans take a substantial amount of time for verification and process as it has to go through the buyer, seller, solicitor and valuation firm individually.



Figure 4: Network of blockchain in loans

By having the identity details, property details and security information available on the blockchain, it provides the required credibility and transparency for the customer to process the mortgage across different parties through simultaneous transfer of title and payment. This accelerates the release process.

5. Being in the Blue Ocean

A. Creating new customers

After carrying out these actions and getting to a blue ocean, the bank will be able to tap into a substantial share of previous non-consumers and will also provide significantly improved services to its existing customers. While its old competitors are locked in a red ocean battle and copying each other's features, the bank in this blockchain backed blue ocean is able to access customer segments that were

¹⁷<https://www.cnn.com/2017/11/16/american-express-santander-team-up-with-ripple-on-blockchain-platform.html>

¹⁸ Images-<https://www.pwc.co.uk/financial-services/fintech/assets/blockchain-in-retail-consumer-banking.pdf>

previously unbanked or were suspicious of traditional retail banking. The bank in the blue ocean is also able to provide more significantly improved and personalized services to the market traditional retail banks are fighting over. This blue ocean bank will be able to connect on an emotional level with its customers.

B. New Buyer Utility

	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Customer productivity			✗		✗	
Simplicity	■		■	✗	■	■
Convenience	■	■	■	■	■	
Risk			■		■	
Fun and Image					✗	
Environmental friendliness			■			■

Pain points
 Value today
 Value by incorporating blockchain

Figure 5: Buyer Utility map after incorporating blockchain technology

This new buyer utility map illustrates the value created for customers by implementing blockchain technology. While some pain points still remain, significant value has been created around ease of use and maintenance - major pain points for current banking customers and non-consumers.

C. New Strategy canvas

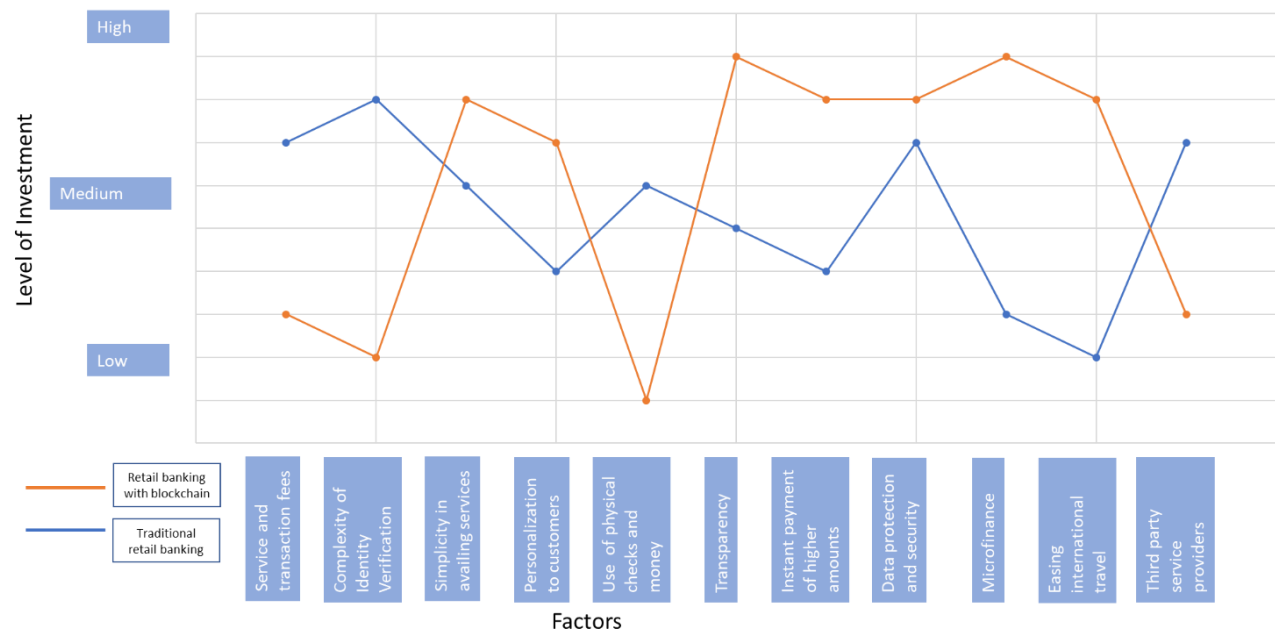


Figure 6: Strategy Canvas after incorporating blockchain technology

From this new strategy canvas, we can see that blockchain technology has improved the simplicity in providing services to the customers, facilitates comfortable international travel and has a huge impact in fastening the payments across borders.

6. Risks and Challenges implementing blockchain tech

From our analyses, we found that retail banks can employ blockchain technology in a multitude of ways to eliminate redundancy and create additional value. However, as with any technology adoption, the blockchain technology also comes with few associated risks and challenges. We recommend that retail banks need to strongly consider these risks and perform a risk analysis before adopting this technology.

1. Even though blockchain technology can raise the information security, it comes with a significant risk. It can prevent any corruption of data, but it cannot prevent accounts from account takeovers. Furthermore, if a user takes up more than 51% of the network nodes, there can arise several cybersecurity issues.
2. The use of blockchain technology could be regulated in the future, depending on type of participants and nature of transactions. Regulation could inflict serious damage on banks which would have already adopted the technology into their core operations.
3. Since most retail banks do not have the expertise in this domain, they will have to outsource these services from external vendors which makes them susceptible to third-party risks

4. Implementation could be a significant issue. Banks need to update their policies and be mindful of concerns revolving around speed, scalability and transition to new unregulated technology¹⁹.

¹⁹ <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-blockchain-risk-management.pdf>