# CariPay Ltd, KYC Utility Proposal (DRAFT, 13/12/2018)

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# Background

CariPay Limited was founded as a financial technology company in Trinidad and Tobago, and has offices in Seattle and Port of Spain. Our corporate mission is to empower persons and organisations in the Caribbean to fully participate in the global digital economy. We do this by improving the ability of persons to access financial and other services through optimizing financial and business processes, and developing technology that can improve enterprise operations.

While working to realize this mission, the company developed financial technology solutions aimed at facilitating digital payments via a mobile platform, as well as optimizing the current paper-based KYC process. Our KYC utility was developed with the aim of making the current KYC process easier, quicker and simpler for individual consumers while improving the process for businesses and corporate entities to onboard customers and monitor their accounts.

According to KPMG "...we have found that use of blockchain in the creation of a KYC utility is a technologically viable solution that provides a method to safely and securely share customer information between parties."[1]

# Purpose and Objectives

The digital KYC utility was developed with the aim of creating a nationwide KYC utility that would reduce systemic risk, minimize cost, and give businesses and consumers a streamlined process for doing business. It will allow the banks ~~and other institutions~~ to reduce the direct cost of customer on boarding, ongoing monitoring, ~~as well as the risk of fines~~.

More specifically, this KYC utility will allow financial institutions and customers to interact digitally by creating a platform where individuals are able to share their personal KYC information with financial and other institutions digitally, have it be reviewed and their identities verified automatically. Furthermore it will enable individuals across the economy to share and reuse the same verified KYC information with any participating institution of their choosing with minimal effort on their part or the part of the business. It will allow individuals to more easily participate in online marketplaces which may require such verification.

# Business case

According to a KPMG report, financial institutions around the world spend more than US$25 billion annually on compliance and Knowing their customers. In Trinidad and Tobago, ~~between~~ software subscriptions and processes licensing fees, the cost of this compliance impacts more than just the financial bottom line and the foreign exchange reserves, it also impacts ~~on~~ the efficiency of the organization and the time spent acquiring and maintaining customers. By implementing the CariPay digital KYC utility, institutions can reduce costs and risk ~~associated~~.

[1] https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2018/03/kpmg-blockchain-kyc-utility.pdf

associated with ensuring compliance while optimizing and improving the efficiency of their KYC processes. Ultimately, they can accelerate the pace and ease of doing business.

## *Cost savings*

At present, cost of on boarding and maintaining a customer account incorporates the cost of the paperwork and storage fees that are required to ingest new customers, the upfront diligence costs of background, credit and AML/CFT checks as well as conducting a risk profiling. It also incorporates the cost of the constant ongoing monitoring of customer accounts annually or more frequently depending on the risk rating of the customer. These costs are mandatory for an institution to maintain compliance and are spread across departments and subscriptions.

By bearing in mind these costs multiplied by the time spent across businesses and customers, we find an assessment of the potential savings associated with using the CariPay digital KYC utility. This utility can help organizations attain cost savings by eliminating several categories of compliance costs such as the paperwork and storage costs, and those associated with reducing manual ongoing monitoring and AML/CFT checks. Additionally, by factoring in the duplicated cost of compliance related subscriptions across institutions yet more savings can be made.

Overall the opportunity for cost savings at core financial services firms alone are in excess of $20 million TTD annually, which can have a significant impact on an organization's bottomline.

## *Revenue generation*

In addition to enhanced cost savings, there exists the potential for significant recurring revenues from business verticals across not only Trinidad and Tobago but Latin America and the Caribbean region as well. It provides the opportunity to capitalise on the need of businesses to be in compliance with constantly evolving local and international regulatory and compliance frameworks.

The Banker's Association of Trinidad and Tobago can earn revenue domestically through a sub-licensing model, providing smaller business entities a subscription to use the CariPay digital KYC utility in their operations. The subscription could replace the need for compliance personnel in a number of categories, and give banks greater control of customer verification.

In such a model, entities could exclusively license the technology for a given jurisdiction, then charge smaller businesses an annual or monthly subscription fee to utilize it. Furthermore, to ensure that those who have taken the risk to verify a customer are compensated for that risk, it could be possible to automatically pay the original verifying institution a small amount each time a verified claim they issued is reused.

## *Time savings through optimization*

Under the current KYC process, the average customer typically spends between 30 minutes to an hour at an institution to access financial or other business services. This time spent at the

institution can increase significantly should the customer not have the correct KYC documents required to access the service or if there are a number of customers seeking to access the same services. In addition to the time taken to ~~ingest~~ customers, each customer generates between three (3) to ten (10) pages of printed or scanned documents which must be manually reviewed, filed, stored and maintained for the life of the customer's account.

These pages of printed or scanned documents must be correctly handled and processed by the audit, compliance and the risk management teams, to ensure that ongoing diligence is correctly applied. This may take between 10 and 30 minutes initially, but may increase since these documents must be retrieved, reviewed, and refiled periodically as account information is updated, or risk profiles change.

This time taken to ensure customer due diligence may also increase for each additional account or service that a customer acquires at an institution since each department must repeat steps to ~~ingest~~ the customer for the new service and maintain separate records. Ultimately a customer who may otherwise provide great value to your institution by opening several accounts, savings account, mortgage, credit card, may also end up costing your institution thousands of dollars to maintain due to the laborious process involved.

These duplications and inefficiencies in the process can be improved with the use of CariPay digital KYC utility. This system would remove the need for the customer to provide the same documents multiple times to access various services within the same institution or across institutions. The time taken to accept customers can be significantly reduced since a customer's identity documents would be verified quickly and accurately allowing for a simpler and more efficient KYC process. These time savings also result in real improvements to the customer experience, and the day to day job of customer service representatives.

## *Reduced risks*

Implementing a common KYC utility builds a trust framework where institutions have the power to implement strong KYC programmes and minimize systemic risk from the outset. Removing duplication of effort and improving accuracy of the process gives these institutions more time to focus on analyzing and mitigating risk in other areas of operation. Furthermore, the ability to implement strong controls and provide greater transparency reduces the risk and cost of correspondent banking relationships.

According to a November 2015 World Bank report, the need for strong KYC, AML/CFT and suspicious transaction monitoring is clear and evident. Inconsistency and cost of implementation have resulted in the inability of customers to access financial services, reputational damage, and significant upward pressure on the bottom line. By implementing strong, uniform KYC and AML/CFT controls across banking and related industries, the risk and cost for foreign correspondents doing business with you drops radically.

Beyond institutional risk, the technology and data management risks of individual institutions implementing stand alone utilities without collaboration or cross verification are significant. Bearing in mind the burden this may place on individual banks and businesses, the only way we see forward is together. While the risks may have originated with individual institutions, the ~~cure~~ solution is a unified approach which reduces systemic risk and cost across the economy.

*Overall*

Having examined the existing problems and reflected on the cost of current processes, we can see an impact across bottom lines at core financial institutions in excess of $20 million TTD annually. This ~~discounts~~ the impact felt by individual and business customers in time and dollars. ~~Figures rise~~ when we consider the other industries where KYC is an integral part of doing business, making potential cost and risk reduction across the enterprise and the economy difficult to understate. ~~The long term return on investment is in the billions of dollars.~~

# Rationale for selection the CariPay KYC Utility

While there are a number of KYC products which may provide a combination of identity verification, AML/CFT checking, and secure storage of data, no current ~~competitors~~ solutions offer the same combination of capabilities in Trinidad and Tobago. As a team of professionals we bring a unique combination of skills which allow us to deliver a leading edge product suited to the Caribbean context. Our knowledge and expertise gained from living and working inside and outside of Trinidad and Tobago gives us a clear appreciation of the problem, and the vision for how to help solve it.

Our team combines foreign and local experts in secure, enterprise scale cloud applications for financial institutions, with deep experience in regulatory frameworks, monitoring, and evaluating the implementation of national scale projects. As individuals we have worked on projects in service of the Government of Trinidad ~~and~~ Tobago, Deutsche Bank, Citibank, IBM, and Microsoft. Together we have developed and tested a secure, mobile digital payment system and this digital KYC utility.

We have chosen the best available standards and technologies, mature enough for a National scale solution and modern enough to be the future of digital identities. By building the system to meet global standards and protocols, we make the underlying technology less important and the data produced, interoperable. This means regardless what the future holds, the system will be nimble and adaptable enough to keep up ~~with these changes~~.

Our security and policies are based on recommendations from the Payment Card Industry Data Security Standard (PCI DSS), European General Data Protection Regulation (GDPR), and the Central Bank of Trinidad and Tobago (CBTT), among others. ~~The~~ Our standards ~~we have adhere to come from the~~ National Institute of Standards and Technology (NIST) in the United States, ~~who~~ which is ~~are~~ responsible for standardizing ~~a large percentage of~~ the technology we use today; the World

Wide Web consortium (W3C), an international community that develops open standards to ensure the long-term growth of the Web; and leading nonprofit groups like the Sovrin Foundation and Decentralized Identity Foundation who are focused on identity security and privacy in the 21st-century. ~~Together, these entities are shaping the future of digital identity.~~

To support this utility, we chose Amazon Web Services (AWS) to provide a level of security and reliability in line with global standards and frameworks for data protection. We can apply the same level of protections as used by the US Federal Government (FIPS-140), and multi-geographic region deployments, to deliver an uptime guarantee of 99.99+ percent. With AWS infrastructure, there is no upfront cost to purchasing hardware, and operating costs scale with demand. Furthermore we are able to benefit from innovations within Amazon which may add further value to the utility.

In addition, to ensure the security and trustworthiness of the system, we have chosen AWS cloud hosting and one of the best firms in the USA (Security Metrics) to conduct security audits. These are the same companies trusted by Visa, Stripe, and countless other high-value companies demanding high data security. Combining the use of these companies allows us to provide best in class service level agreements for security and uptime, with global availability. This reduces the risk of managing data and technology from the financial institutions and allows us, CariPay, to share this burden as part of our business.

*The advantages of Software as a Service vs Outright Ownership*

- We provide the customers with their own private Amazon Web Services cloud which they can either own and control outright or allow us to manage,
- No lengthy process of planning and provisioning systems, or employing experts
- You can benefit from continuous updates and integration to the platform without the need to employ a large team of engineers
- As a first licensee you could receive preferential rates and other considerations
- Licensee is able to mandate minimum requirements around risk management, etc.
- You may obtain an exclusive license for a given jurisdiction with the ability to sublicense the software within your territory
- While running a dedicated copy of the software you will have the ability to operate a separate testing environment to protect you from unexpected changes and authorize updates
- License would guarantee access to the software for the duration of the contract term
- Lower upfront cost of acquisition, development and deployment

# Product description

From the very foundation, the CariPay KYC utility was designed to address the KYC needs of Trinidad and Tobago and the Caribbean. We recognized the problems with the current process,

and identified process and technology improvements which could reduce the risk and costs associated with KYC. In developing this technology, we applied the leading edge of machine learning and distributed ledger technology to create a solution ready for 2020 and beyond.

The utility has two primary interfaces: one for the consumer user, and another for bank personnel. We have made every effort to enable integration with the technologies used everyday, so workflows become simpler. No more manual data entry or forgotten documents, just the speed, accuracy and security that we've come to expect in our modern connected world. Risk profiling and monitoring can be constant and proactive operating 24 hours a day with minimal staff intervention. ~~This allows for super serving customers to become the new norm.~~

Consumers will experience our KYC utility through the mobile interface that has an intuitive interface to navigate the process and allows them to complete verification of identity documents in under five minutes. Imagine photographing and submitting KYC documents through your phone, then arriving at the bank to see no line and a representative who knows your name. For current trusted customers, we help keep accounts up to date without them having to visit a branch. We enable all of this with better than human accuracy for data collection and fraud detection through proprietary technology and third-party integrations.

After being on boarded, customers can multiply the savings by securely re-using this verification across all participating institutions. The potential for new businesses and interoperability is central to the system's design, as we believe a utility's role is to support greater growth. From real estate to automotive and other high-value verticals, this utility can unlock potential on many fronts.

## ***Product Details***

The CariPay KYC utility relies heavily on machine learning and distributed ledger technology, all built with privacy by design.

At a high level, machine learning algorithms allow us to analyze documents and extract data much more quickly and accurately than a human ever could. Using a short video we can ensure that the person uploading documents is both alive (not a still photo) and matches the face on their provided national ID. It gives us the power to sift through massive amounts of data to verify identities and quickly analyze risk profiles. During ongoing diligence, machine learning makes the task easy by constantly monitoring activity for risky behavior, and notifying both parties when a customer's identity documents have expired.

A distributed ledger gives everyone access to the same underlying data in a secure and trustable way. It is distributed in the sense that each institution can host their own complete copy of the ledger, and all copies of the ledger must agree about the current state of information on the ledger through automated consensus. A primary advantage of this technology is that once added to the ledger, information cannot be manipulated or deleted. Data may only be

updated through a newer, traceable action. This provides an immutable audit trail and provable compliance, as well as the facility needed to securely share information among partially trusted parties.

Given the unique requirements of electronic know your customer processes, we have chosen IBM Hyperledger as the backbone of this utility. Their Indy framework, built on top of Hyperledger technology by industry experts, is the only blockchain framework built specifically for digital identity. It is engineered for universal compatibility with both legacy and ledger-based identity protocols.

A major concern of the shared ledger system is privacy. Hyperledger Indy is built with privacy by design, which means automatically creating unique, private IDs for every interaction. These unique pairwise IDs make it nearly impossible for anyone to track or correlate activity, and render the system resistant to unwanted monitoring and data breaches.

Given this privacy, how can two, un-trusting parties trust the data they may share through the KYC utility? Hyperledger Indy works with two core concepts: **decentralized identities**, and **verifiable claims**.

A **Decentralized identity** is something like a national ID number, which also allows a person to digitally own and control data in a secure and private way. While an individual may have a public address on the Hyperledger blockchain, each interaction will be given its own private and unique ID. Some pieces of data we may own are facts about ourselves, such as our address, good standing with a bank, or the authorization to drive a motor vehicle. A decentralized identity may be owned by a company or individual, and hold any number of these facts.

In this context, these pieces of information are called **verifiable claims**. They are verifiable through cryptography and digital signatures. A claim is simply an assertion of truth. Therefore, a verifiable claim is an assertion that the piece of data I am presenting is true, based on the digital signatures it holds and the process of encryption it has undergone. A Decentralized identity may present the complete set of verifiable claims they hold, through purely digital means.

— refer to USE Case here.

Maintaining digital ownership of these verifiable claims gives individuals the power to share them with whom they desire. The authority assigned to a given claim i.e your National ID lies with and is backed by the entity which originally issued and signed it e.g. Elections and Boundaries Commission. For example, I may give much more weight to a passport than I would a university ID, based on the trust I place in the entity which originally issued it (Government vs. University), and optionally the information it contains. In this way, two parties who may have no knowledge of each other may still share and trust shared KYC data based on digital signatures.

Who else is using Hyperledger Indy? https://www.firstedfcu.com/, https://www.oasfcu.org/en/default.asp, https://laboratories.telekom.com/, https://www.cisco.com/, https://www.ibm.com

# Regulatory requirements

Every business under the purview of the F.I.U, Central Bank, and several other regulatory bodies are required to complete know your customer and customer due diligence processes. For certain transactions this only happens once, while for others it is a requirement for continued operation. The burden of these requirements can be felt both by businesses and individuals and seen clearly in the ease of doing business, especially with regard to financial products. Recognizing the rapidly changing regulatory environment, and noting the recently released Central Bank of Trinidad and Tobago draft policy on e-money businesses, the need for a simplified and streamlined KYC utility is evident and continues to grow. Responsibly storing customer information in line with data protection acts and guidelines, and maintaining that information over time has a cumulative cost and may not scale linearly with business growth.

Our KYC utility simplifies compliance with these regulatory mandates by placing responsibility for compliance on the utility, not those implementing it. This means the most qualified personnel can work from the core to guarantee that the system as a whole is safe and regulations are uniformly applied.

# Risk and Risk Management

CariPay has undertaken the process of assessing the risk profile of the company and has identified main areas of risk as well as activities and policies necessary to mitigate them. These findings and outcomes are covered in detail in several of our policies including: risk management policy, incident response policy, acceptable use policy, access policy, and terms of service. Key activities ~~are~~ undertaken in partnership with certified third-party experts to ensure the security of the system is maintained through regular audits.

# Milestones

Each milestone below is contingent upon previous milestones being met successfully:

1. Conduct feasibility study with participating institutions, 3 months and $XX (**Phase 0):**
    a. Collect business requirements and examine existing processes
    b. Determine system requirements and core capabilities
    c. Determine policy constraints and potential obstacles
    d. Engage regulators in relevant areas
    e. Engage stakeholders in relevant areas within institutions
    f. Scope of necessary process and tech integrations to support operation
    g. Develop monitoring and evaluation framework for impact and targets
2. Conduct security and other audits, as well as regulatory review as necessary to ensure proper functioning of the system for internal testing. 3 - 6 months and $XX (**Phase 1):**
    a. Review and update internal processes as needed

    b. Complete external audits and related modifications
    c. Scope, plan and select initial participants for private internal testing
    d. Deploy infrastructure and create accounts as necessary
    e. Ensure regulatory frameworks are in place
3. Conducted limited private trials with participating banks and internal customers then evaluate impact. 3 months and $XX. (**Phase 2):**
    a. Allow early volunteers to complete KYC using the utility
    b. Conduct thorough monitoring of process and implement corrective actions to improve operation of system
    c. Get feedback from internal customers and participants
    d. Analyze feedback, risk and cost reductions
    e. Scope and develop strategy for broader public beta
4. Complete limited public trials with participating banks and volunteer customers, evaluate impact. 6 months and $XX. **(Phase 3):**
    a. Allow participating customers to complete their KYC process with supervision using the KYC utility
    b. Begin discussions with related institutions regarding participation, feasibility (Insurance, licensing, health, car dealerships, and others)
    c. Begin discussions with potential users of the system, car dealerships etc.
    d. Get feedback from participants
    e. Analyze feedback, risk and cost reductions
    f. Scope and develop strategy for full public release
    g. Develop additional functionality to support public release (Online registration?)
    h. Complete additional system test and audits as necessary
5. Complete phased public rollout at participating banks with all willing customers. Evaluate impact. Ongoing development, and $XX. (**Phase 4):**
    a. Operate the system at the participating branches with a strategy to deploy a cross branches within X months
    b. Continue engaging related institutions and on boarding trust anchors
    c. Continue marketing and rollout across verticals
    d. Explore opportunities for additional functionality and utility, as well as integration across new and existing systems
6. Complete integration and phased rollout with other core institutions and their customers - insurance groups, etc. **(Phase 5):**
    a. Enable cross industry data sharing and reuse
    b. Begin recognizing additional revenues for the KYC utility (beyond BATT)

# Appendix I - Use Cases

## *Case 1 - Customer*

The first use case we will examine is that of the customer attempting to open a new savings and chequing account and three months later attempting to get a car loan with the same bank.

Today's customer journey might look something like this:

1. I find out about the bank's wonderful savings rate and the great perks that come with their chequing account.
2. I look online and find the list of documents that are required to open account, fortunately I already have recent versions of them all prepared.
3. Visiting the branch I'm greeted with no line, the customer service rep is great and only takes 20 minutes to enter all information.
4. I'm a low risk customer so the AML/CFT check and other customer due diligence processes are easy.
5. I've carried cash as well as a proof of source of funds so there's no issue with making an initial deposit, I still have to join the main line and wait another 10 minutes to do so
6. In less than an hour I'm able to open both of chequing and savings account as well as make an initial deposit.

The experience was so great but a few months when I decide it's time to buy a new car, I come back for a loan. This process might look a little different:

1. I visit the car dealership to find the car you like
2. I visit the bank to start the KYC process and start the loan application process. I didn't notice my utility bill was beyond 3 months, so I have to make a second trip to provide an updated copy.
3. I go back to the car dealership to complete KYC and provide them with the 25% deposit and licensing fees.
4. I visit the insurance company to get a quote for car insurance, repeating KYC with the same documents I provided the bank. (two forms of ID, source of funds, and proof of address.)
5. I return to the bank to provide them with the insurance quote to get their funds to cover it
6. I wait for the car to be licensed, so I can provide a bill of ownership to the bank, the dealership calls when the car is licensed and I can go collect that document, then take it to the bank personally
7. I visit the bank for the remainder of the funds in the form of a cheque, this included a visit to the bank's lawyers to sign agreements.
8. I then personally carry the cheque to the car dealership to complete the transaction.
9. On the same day that I carried the final payment to the car dealership I went and paid for my insurance policy at the insurance company
10. After successfully completing payment and obtaining insurance I am able to finally go pick up the car and that completed the process

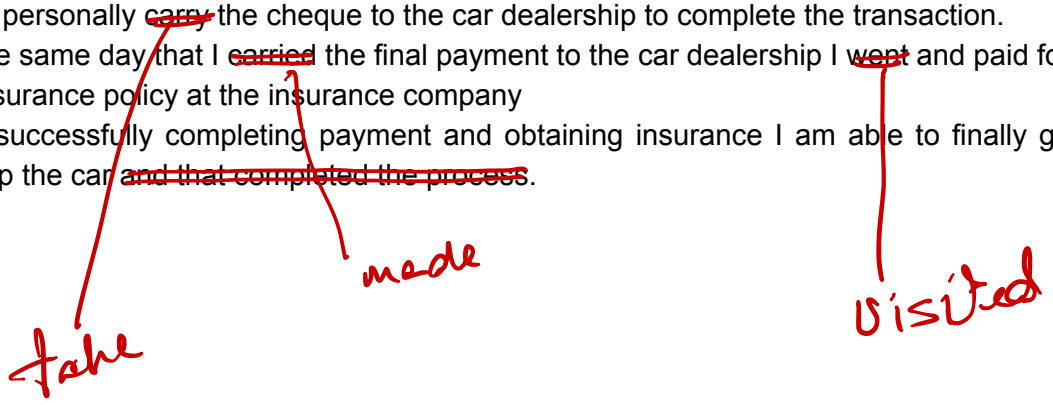
Now, let's reimagine this Experience after the deployment of the CariPay KYC utility, used only by members of the Bankers Association (**Phase 3 and 4**):

1. I find a bank with wonderful savings rates and great perks on a chequing account
2. I look online and find a list of documents required, fortunately I already have recent versions of the documents prepared.
3. Using my mobile phone I am able to complete the entire account application process from the comfort of my home, and schedule a time to visit a branch nearby. Using computer vision and mission learning the KYC utility is able to verify my documents and extract information with a better than human accuracy, simultaneously checking against global records for potential risks.
4. I reached the branch five minutes before my appointment, and was greeted by name by the customer service representative i'll be working with.
5. The process for opening my account has been simplified since my documents have been verified and my blacklist checks were done before I even entered the bank, and it's also known that I pose no risk
6. I join the line and again wait 10 minutes to make my initial deposit
7. In less than 30 minutes of combined time I have been able to open my accounts, make an initial deposit, and the bank is sure that I'm somebody they should be doing business with.
8. As part of my contract with the bank, I agree to provide them ongoing access to the verifiable claims relating to my identity documents which they have just issued. This will streamline future interactions.

Again the experience was great and I decide to come back for my car loan ~~in 3~~ months later!

1. I visit the dealership and find a car I like
2. I call my bank to ask about a loan. Because I previously authorized them to access my information, they're able to pull me up in the system right away. While we're on the phone they let me know my utility bill is outdated. They send me a request for this through the KYC app which I used previously. I find and upload a newer bill. I then securely share the requested documents with the bank
3. Monday the bank lets me know I'm approved, and gives me an appointment to sign and collect documents
4. I visit the car dealership Thursday afternoon to provide them with a cheque, wondering why I can't reuse the KYC information I used with my bank, but carry my papers and repeat the process
5. I visit my insurance company and get a quote for the policy on Friday, again carrying all my papers but wondering why I can't reuse my KYC information that I used with the bank.
6. I return to the bank to provide them with the insurance quote to get their funds to cover it
7. I wait for the car to be licensed, so I can provide a bill of ownership to the bank, the dealership calls when the car is licensed and I can go collect that document, then take it to the bank personally

8. I visit the bank for the remainder of the funds in the form of a cheque, this includes a visit to the banks lawyers to sign agreements.
9. I then personally ~~carry~~ the cheque to the car dealership to complete the transaction.
10. On the same day that I ~~carried~~ the final payment to the car dealership I ~~went~~ and paid for my insurance policy at the insurance company
11. After successfully completing payment and obtaining insurance I am able to finally go pick up the car ~~and that completed the process~~.

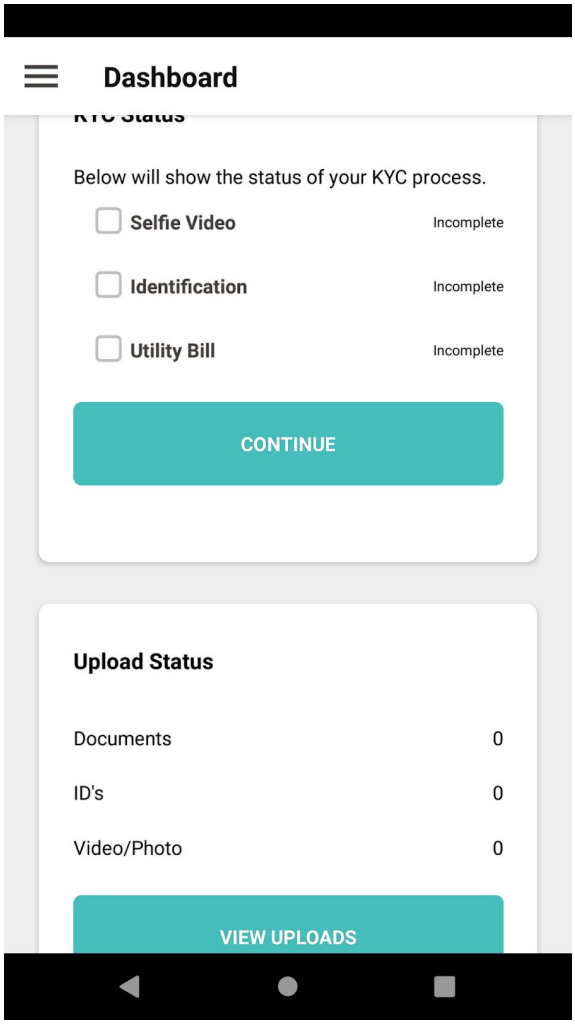


## Customer mobile App preview

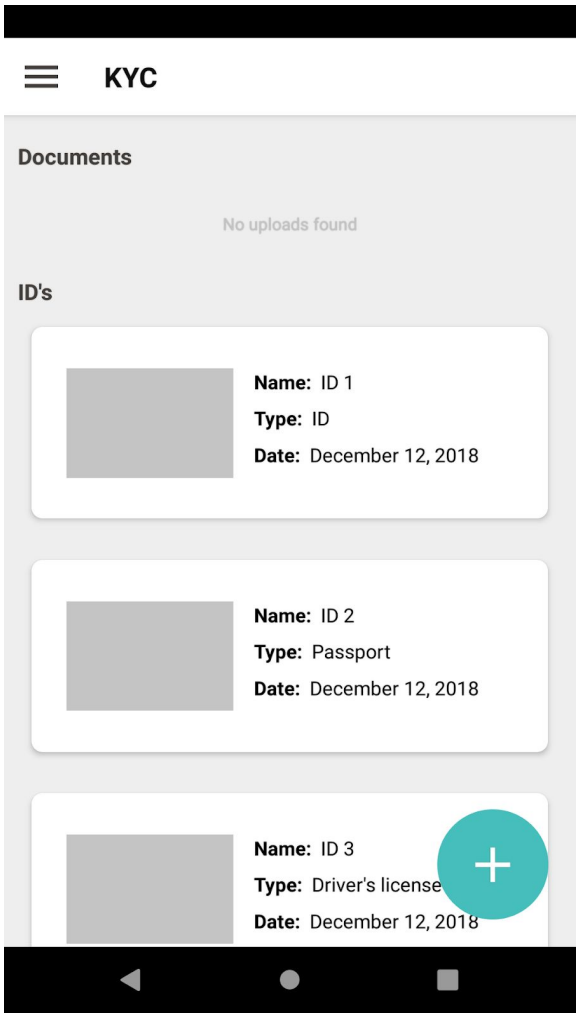
The following screen captures from our existing mobile application outline what a typical customer flow might look like.

**NOTE:** This application has not received its final polish or design aesthetic, and grey boxes are in place of images which would represent the given document / data. This Application is functional and usable today.

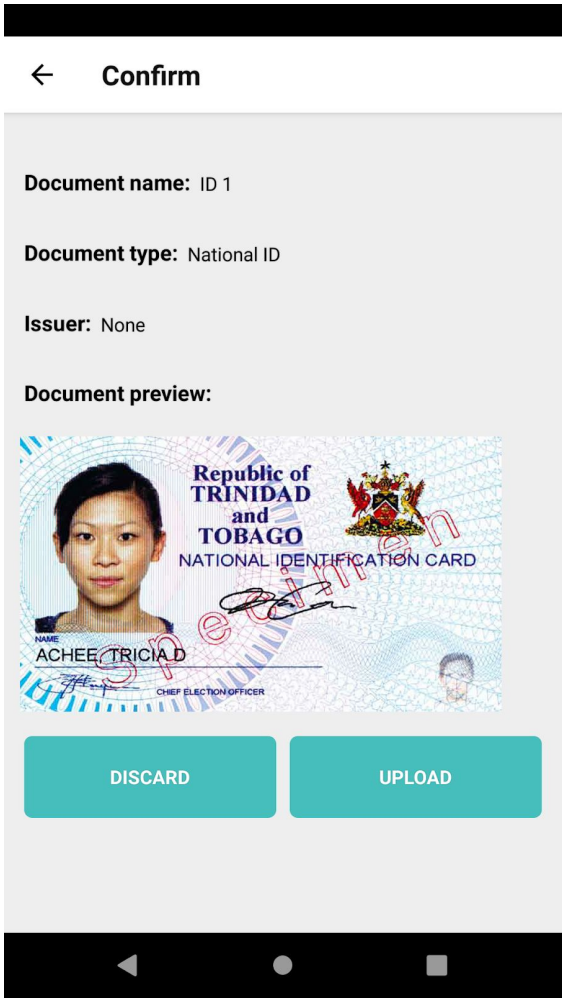
A customer has received a request for their KYC information which has a checklist for what's required, and what they already have -



If the user already has existing documents, the following screen is what they would see in order to select which document to share:



If a user were to upload a new document, the following is an example of what they would see to confirm the information we extracted is accurate before submission:



## Possible future use case

With participation in the system limited to only members of the Bankers Association we've been able to recognize savings, and reduction in processing time for both the bank and the consumer, potentially saving 3 to 4 hours, and increasing our confidence in this customer. ~~Their~~ risk and cost to banks has been reduced, ease of business increased, and their process made simpler ~~in the future~~. This state of affairs would represent Phase 3 and 4 of a limited public rollout. Phase 5 would see the utility rolled out to a broader range of business verticals including but not limited to: insurance providers, real estate agents and car dealerships.

Under **Phase 5** and beyond the process of a car loan might look more like this:

1. I visit the dealership and find a car I like
2. I call my bank to ask about a loan; while we're on the phone they send me a request for the necessary KYC information through the app which I used previously. My utility bill is outdated, so I find and upload a new one, then securely share the requested documents with the bank. They trust my new utility bill because the CariPay's machine learning has verified this utility bill, in addition, all my previous documents were verified successfully.
3. Monday the bank lets me know I'm approved, and gives me an appointment to sign and collect documents *OR* sends them to me digitally where I can sign and return them from my mobile device.
4. When I sign the documents the bank sends me a request for the required insurance policy quote, through the KYC utility.
5. I visit the car dealership to provide them with the cheque, and while I'm sitting at their desk they use the KYC utility to request the information which my bank had previously verified.
6. I go to my insurance company's website and find their online auto policy application. As part of this application, I can use the KYC utility to share the same verified information from my bank.
7. I get the quote and policy approval digitally, and send it directly to my bank through the KYC utility. They trust this quote because it is digitally signed by my insurance company. My bank then sends the funds directly to the insurance company on my behalf.
8. I simply visit my agent to collect the original copies OR have a digital copy of my proof of insurance emailed to me that I can now print out and keep in my car.
9. The car dealership calls when the car is licensed and I can go collect bill of ownership to provide the bank. OR The Ministry of Works and Transport, Licensing Office digitally issues bill of ownership through the KYC utility, which the dealership can share with me and I can share with the bank.
10. I then visit the bank for the remainder of the funds in the form of a cheque, this Included a visit to the bank's lawyers to sign agreements. OR The bank sends me a digital copy of all necessary contracts and documents, as well as 15 minute appointment spot to video

chat with their lawyers. During the video call, we both digitally sign and agree to the contracts, then share them as a legally binding agreement.

11. I then personally carry the cheque to the car dealership to complete the transaction. OR The bank can electronically transfer funds to car dealership and provide digital proof on my behalf so I save a trip to the dealership.
12. On the same day that I ~~carried~~ the final payment to the car dealership I ~~went~~ and paid for my insurance policy at the insurance company OR At the same time the bank paid the car dealership, they also electronically transferred funds to my insurance company.
13. After successfully completing payment and obtaining insurance I am able to finally ~~go~~ pick up the car ~~and that completes the process~~ OR After funds transfers are complete, I arrive at the car dealership with digital proof of both and drive away with my car

In **Phase 5** and beyond, we are able to remove a significant number of physical trips and paper-based processes from our transaction. Beyond the digital sharing of KYC, we could use the same system to exchange bills of ownership, proof of insurance, and instructions to our bank to electronically move funds on our behalf. We can further leverage technology to trust and agree to legally binding documents, removing the necessity of customers to physically come into a branch to sign these documents.The customer experience is dramatically improved.

## *Case 2 - CSR and Loan Officer*

Is our second case study, we look at the the same process as above, from the perspective of a customer service representative. We see the myriad ways they are better able to serve customers and provided a higher level of service, greatly improving the human side of what we do. Worth noting also is the number of physical touch points for customer data and the associated risk which can be removed from these processes.

As the front line of risk prevention I've spent time in training, and maintain constant diligence throughout my day. I work hard to provide every customer the level of service and respect I would want in their shoes.

This is the same customer process which we imagined above, reimagined from the perspective of the CSR:

1. I greet the customer and double check that they have all of the required documents to open a chequing and savings account.
2. I open the workflow on my computer and begin the process of creating a new profile. This includes reading and typing in all of the information from customers documents.
3. After I've entered all of the information, I carefully review and double check my work.
4. To complete the data intake, I take the scans of all of the provided documents and upload them into our internal system as images or PDFs.

5. After verifying the accuracy of all the information, I print out paper copies and ask the customer to sign
6. At this point I asked the customer to get back in line for a regular CSR to make an initial deposit to their chequing and/or savings account
7. The customer comes back a little bit frustrated, 30 minutes later, and I am able to program and pin their new debit card.
8. The customer leaves in approximately an hour.
9. I now take this completed file, full of paper and store it in a drawer in the file room
10. I also ensure that the risk audit team has this new account on the radar for review
11. For me the process has taken hour and a half

When the customer comes back to the bank for an appointment to apply for a loan, they are directed to a Loan Officer. This is the perspective of the loan officer:

1. The customer comes in for his appointment to apply for a car loan and I asked if they brought their KYC documents. Unfortunately, the utility bill is more than three months old and I have to ask them to come back with a new one
2. On the customer's second trip, I open a new workflow on my computer, and again type in all of the customers relevant information from their documents
3. After I've entered all the information I carefully review and double check my work
4. Again I take scans of all the documents and upload them to the system as images or PDFs
5. After completing these documents, I print them out for the customer to sign
6. This visit has only taken the customer 20 minutes because I was extra diligent.
7. I call them when they have obtained approval for their loan, they come in to sign their loan agreements and they leave happy with their initial cheque for 25% deposit
8. I print all these documents, add them to a folder, and store them in the file room
9. I also make sure this transaction is on the radar of the risk audit team
10. After the vehicle is registered and the customer brings paper proof of registration. They also provide me with a quote for their insurance at which time I give them a cheque to pay for the insurance as part of the car loan
11. I take them upstairs to meet the bank's lawyers and sign final agreements
12. Finally we provide the customer with a cheque which they can take to the dealership and drive away with their car

With the introduction of the KYC utility again this process gets simpler (**Phase 4)**

1. Monday morning I reach in the office and check my calendar, on it I see appointments with a few customers who have applied for accounts over the weekend

2. For each appointment, I can see a link to review this application digitally, and I can get to know each customer before they come in for their appointment. so when they come in I am able to greet them by name
3. When we sit down, I open the customer's account in my workflow, and compare the physical copies of documents they brought me with that which was uploaded to the KYC utility
4. As I verify and approve these documents, the KYC utility analyzes the customer against a comprehensive suite of blacklist and other risk profiling engines. By the time I'm done, on screen I see they pose no risk to the bank. When I save the customer's profile, my system automatically sends digital and verified copies of this data to the customer through the KYC utility.
5. The customer is able to quickly join the line and make their initial deposit while I retrieve a debit card to pin for them.
6. The customer is satisfied and leaves within 30 minutes, in possession of a new bank account as well as the digital ID they can reuse with me.
7. Since risk profiling was automated and all the information was digitized, it's a simple process for the risk audit team to review this file and ensure the accuracy of information.

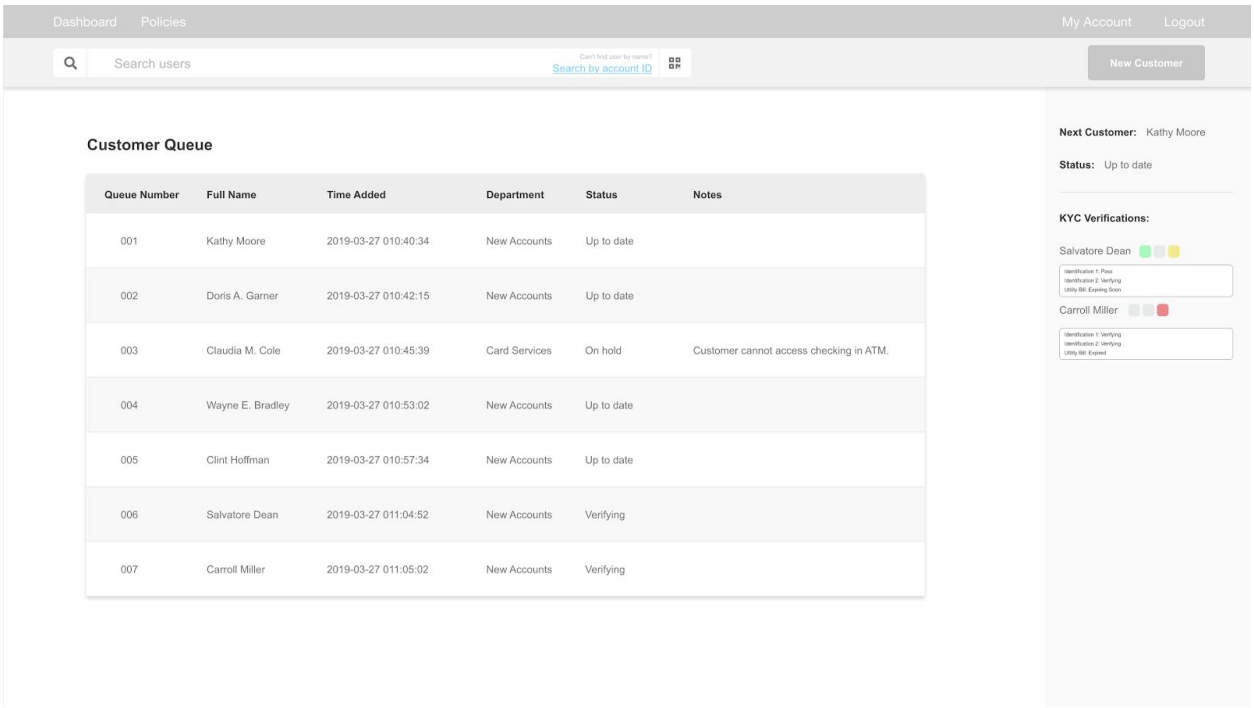
In a few months when the customer decides it's time to buy a car, I refer the customer to a Loan Officer who makes an appointment with them. The interaction between the loan officer and the customer would probably go something like this:

1. Monday morning I reach in the office and check my calendar, I see several appointments for loan applications
2. Within my workflow I see a list of customer accounts which need my attention. I'm quickly able to review their account activities since opening, review their KYC documents which are provided digitally and up to date, several that I previously verified, and I make a decision on whether or not the loan make sense.
3. I'm quickly able to forward the loan to Head Office for approval ~~of the loan~~
4. When the loan is approved, I am able to schedule an appointment with the customer for them to come in, sign their loan agreements and collect their cheques
5. The customer visits my branch at the scheduled time, I greet them with a smile by name, and hand them a cheque for deposit after they have signed their loan documents.
6. The customer leaves very satisfied in less than 10 minutes
7. The customer later returns with a quote for the car insurance which is being covered by the car loan after they have made a deposit for the car and received registration from the Licensing Office.
8. After the vehicle is registered the customer brings proof of registration, at which time I provide them with a cheque for the insurance.
9. When they have returned with the insurance policy, I take them upstairs to meet the bank's lawyers and sign final agreements.
10. Finally we provide the customer with a cheque which they can then take to the dealership ~~and drive away with their car~~

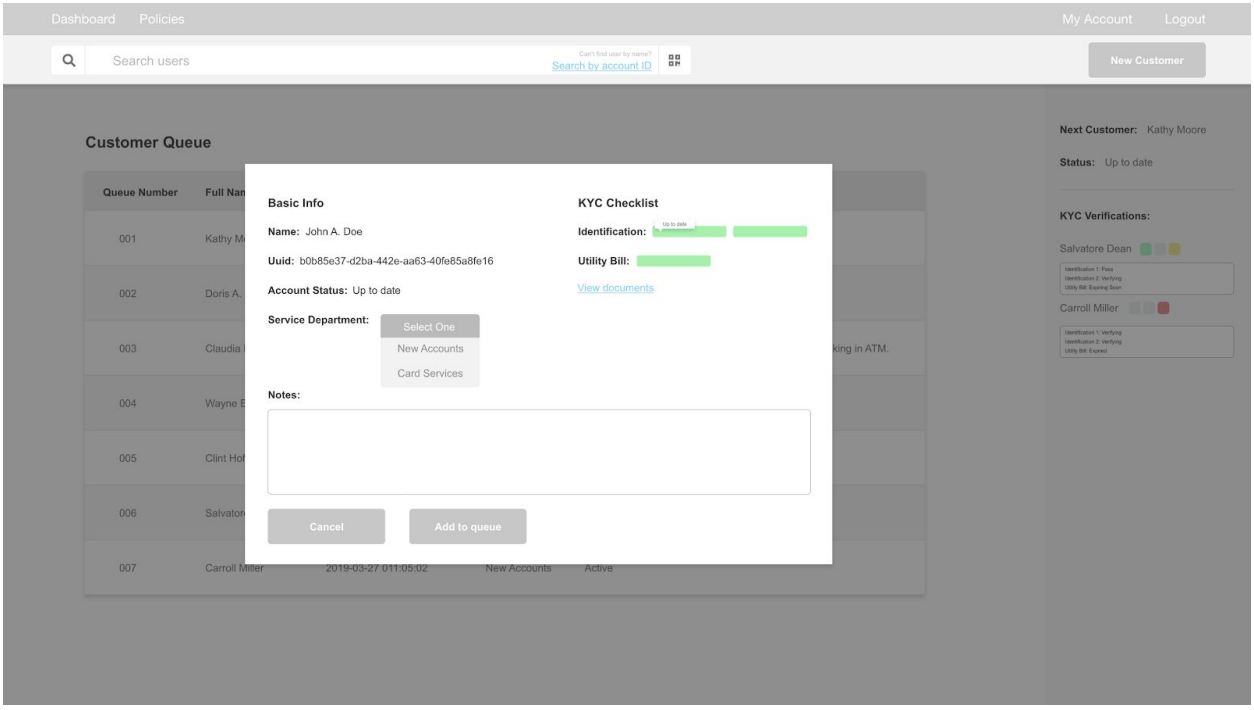
## Customer Service App preview

The following screens represent the typical workflow which a customer service representative would follow to review and accept a customer's KYC information. In phases 3 and 4, this workflow may be necessary, however we would expect by phase 5 and beyond this data would be integrated directly into the banks existing system and the CSR's existing workflow. The most streamlined this process could be is through direct integration between core banking systems and the KYC utility.

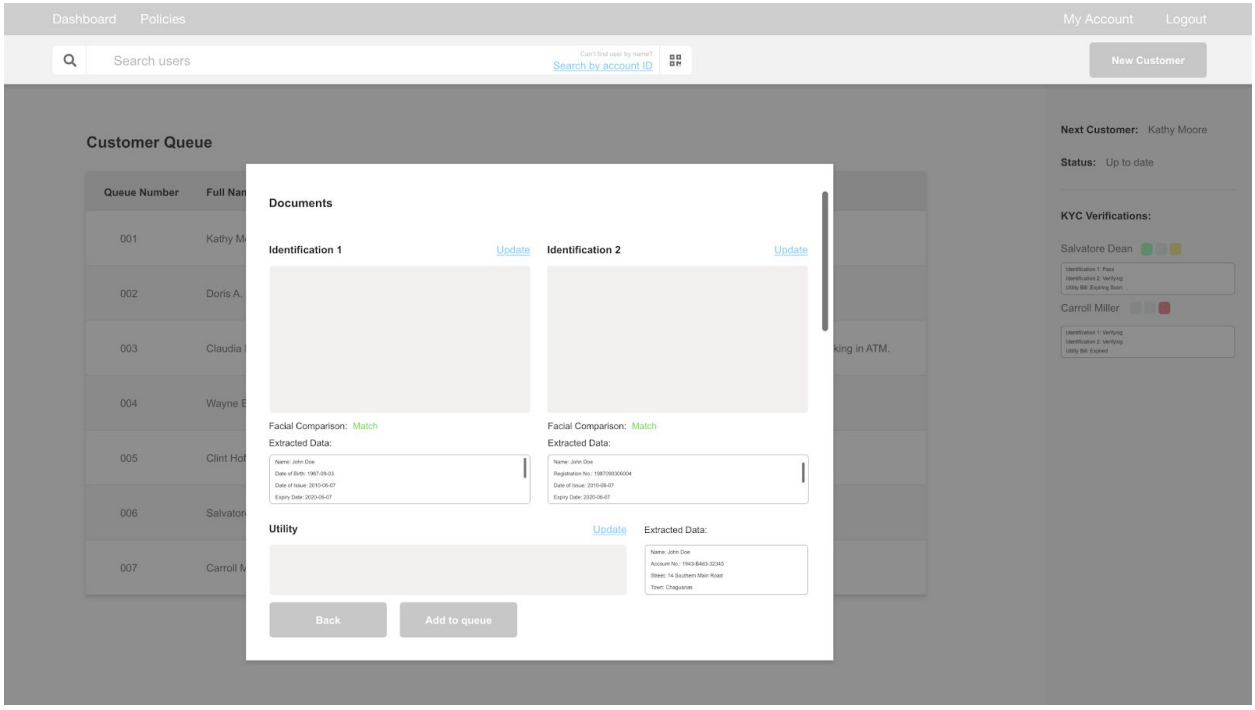
This screen is a simple queue of customers whose requests or data I need to review:



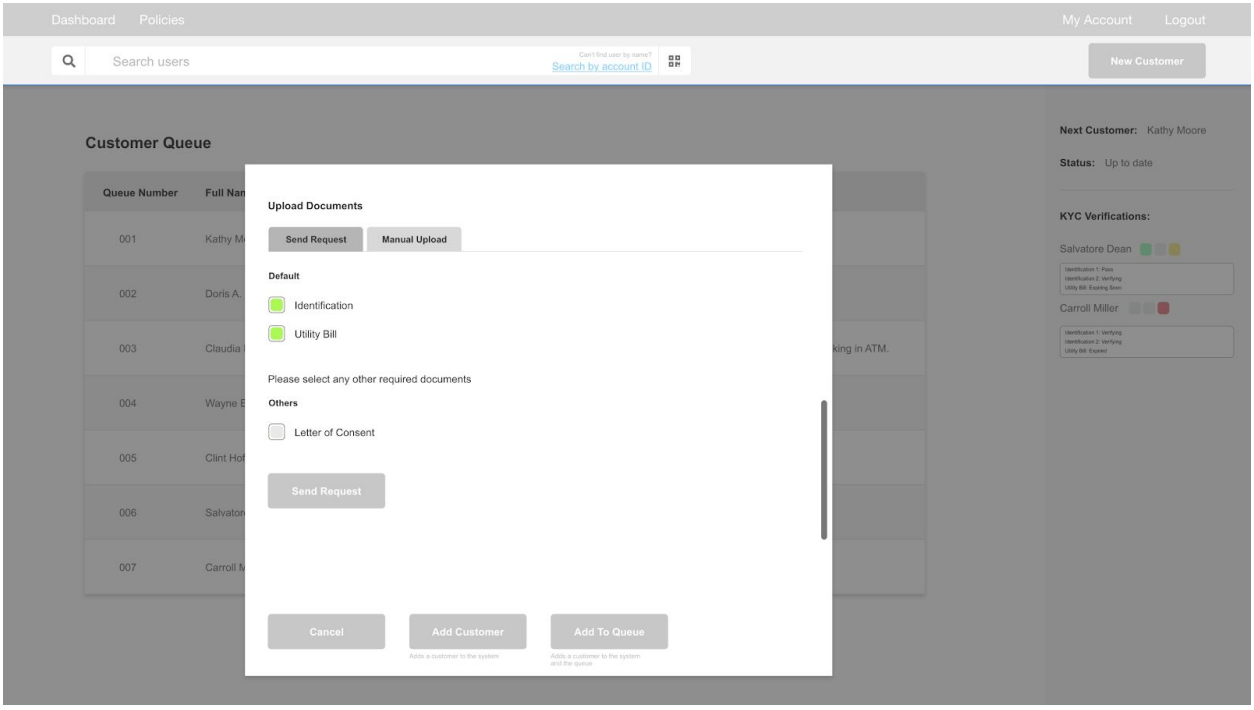
Upon clicking a name from the queue CSR could review the data in the format below:




Original images shown of the documents in high-resolution, similar to existing scanned copies



When the CSR needs to make a request for KYC or other documents, they would use this:




## Possible future use cases

With broader adoption across verticals in **Phase 5** and beyond, the initial bank account opening process would become more streamlined~~, despite the banks as the core institutions inherently having to verify every new account~~. Real improvement to the process would be seen with the ongoing monitoring of accounts and when existing customers seek to use other services. Improvements will also be seen by other industries, like insurance and car dealerships. This utility could also facilitate secure exchange of insurance quotes and policy information, as well as ownership documents from the Ministry of Works and Transport Licensing Office.

Depending on appetite for innovation, many of the transactions requiring electronic funds transfers as well as transfers of ownership could be more efficiently completed using smart contracts and integration with core banking systems to maximize efficiency. This level of innovation and efficiency would be largely dependent on the ability of participating institutions to connect to their existing systems and processes. This creates the potential for new revenue streams and further cost reductions.

# Appendix II - Opportunities

Recognizing the potential scope of improvements by simply automating and securing the KYC process to its simplest form gives some insight to the potential savings and revenue generation created across the economy. As this utility grows and becomes a trust framework akin to the department of licensing, or National IDs, a whole range of new opportunities are created for the Banker's Association to monetize and stimulate economic activity.

These include but are not limited to:

- Real estate transactions,
- Motor vehicle transactions and licensing,
- Other high risk categories (Lawyers, jewelers, etc.),
- Automated business to business interaction,
- Health records sharing
- Transportation
- New financial services and securities

As a utility, providing open access to interact with and create services which interact with this system is critical to its longevity and value. Such access may still be permissioned, however we would recommend the minimum requirements for permission to participate be kept very low. Wide participation need not impact security.

As a SaaS platform, ongoing development like integrations would be a part of CariPay's responsibility in this relationship. This work would also be prioritized as part of our ongoing product development roadmap to increase value for customers. There may be one time implementation fees for a given system (core banking), incentivizing banks to share and reuse technology where possible. As our platform grows internationally there will be opportunity for users of the system to reuse information and participate more broadly.