2019 UBS
Group Chief Operating Officer (GCOO)
Case Challenge

REQUEST FOR PROPOSAL

RemIT

Executive Summary

The current remittance process in Perk Bank is slow, manual, error prone and fragile. It is vulnerable to single point of failure as it relies solely on MS Outlook for work data and correspondence. It also relies on a CashOut whose slow performance and application crashes hamper productivity.

To make the process faster, more robust and efficient, an automation application has been created to automate various steps of the process. It works with a web form which will replace the front office, giving customers the flexibility of uploading payment instructions instead of scanned documents. The data within the forms will be passed throughout the process from form to DataWare, minimizing potential areas for human errors to occur. The signature system will be changed to 2FA technology, requiring very little effort for strong levels of verification and security.

To improve the existing technology architecture, a load balancer and an API gateway will be introduced into the system. The architecture would be protected using Symantec's all-round protection suite, securing data transfer and communication with clients.

The project will be delivered by the excellence contracting agency solution to maximise profitability and minimize risk. This external solution leverages on the domain knowledge that the provider has as well as the 100% work dedication on the system to ensure zero disruption to the process' development. The project will breakeven after 1.84 years and achieve 190.42% Return On Investment over the course of 5 years.

The project will be delivered in 2 phases over 8 months. 5 months will be spent on solution selection and preparation before the official project delivery begins. The remaining 3 months will be split into solution build, system testing and data migration.

With a faster process workflow that is more robust and cheaper, Perk Bank's remittance process will deliver higher satisfaction to its customers while empowering employees with greater productivity.

Introduction

The current global fintech landscape is anything but predictable. Startups are flooding the scene with the newest toys, snatching a portion of the financial market along with them. Major bank J.P. Morgan creates its very own JPMCoin and global tech giants like Facebook bans cryptocurrency advertisements only to create their very own later.

With industry-wide disruptions occurring with every passing second, banks need to keep pace or risk losing their international standing around the world. To stay competitive by incorporating major changes while limiting risk exposure to a manageable level, lone processes can be remodeled and assessed for their risk to benefit ratio.

The remittance process at Perk Bank is manual, error-prone and uses outdated IT applications. It is a prime candidate for digital transformation for better process efficiency and agent satisfaction (employees and customers). This proposal highlights the issues that plague Perk Bank's remittance process, followed by the envisioned process; remodeled with profitability, regulation compliance and efficiency in mind. The process' technical architecture will also be overhauled, all of which will be proposed with a projected timeline and financial analysis of the project. These are created using industry best practices and latest technology in mind, to create a remittance process that rivals agile startups and financial giants.

Assumptions

To create a comprehensive proposal without all the available facts, a few assumptions were made to lay the groundwork for the proposal.

Category	**Assumptions**
General	1) All the values are calculated in USD
Financial Analysis	1) For the Discount Rate used in NPV, we assume that Perk Bank do not invest the project funds elsewhere and hence, the opportunity cost is equivalent to the Global Inflation Rate which is pegged at 3.58% 2) Income Tax in Profit & Loss Statement is ignored 3) The Change Maker Team is paid the same way as the IT Programmers as per manpower cost per employee
To-Be Scenario Cost and Resource Planning	1) 500 transactions per month is taken for the prediction 2) 2 CAs to approve remittance of > $50,000 3) 8 Middle Office staff 4) 8 Back office staff 5) Total manpower: 18 6) Everyone is paid $4,000 per month ($20 per hour, 8 hours a day, 25 days a month)

Current Process Analysis

The current remittance process is outdated, vulnerable and needs to be overhauled if Perk Bank wants to stay competitive in the industry. To determine its desired state, the goals of the process improvement will be determined, along with an analysis of the current process, followed by its desired end state.

The remittance process will be overhauled with 6 key goals in mind. These will serve as the guiding principles when determining approaches and technologies to the end state.

1) **Remove paper waste** - Measured by percentage of activities that still require paper inputs.
2) **Reduce process time by at least 30%** (increases productivity and reduces cost as by product) - Average time taken from payment instructions to money release.
3) **Reduce manual steps** - Number of activities that are not automated.
4) **Service quality and customer experience control** - Number of potential activities where an error would directly impact client's perception of Perk Bank's service
5) **Scalability** - Number of processes that scales without needing more manpower
6) **Technical robustness** - Number of activities that deal with data security, application availability and their accompanying defensive strategies.

An analysis of the current process has shown that:

1) **The current process is inefficient and highly manual**. It does not use automation and performs the bulk of its activities via email correspondence - a slow and cumbersome approach. Staff may miss key information that is hidden in paragraphs of text or face difficulty when retrieving information from past emails. Email correspondence does not happen instantaneously on a usual basis and increase the lead time for processing. Staffs are not updated of the latest regulations and may send incomplete payment instructions to the client's destination.
2) **The process is vulnerable to single point of failure** as it relies on MS outlook as its sole channel for work and internal communication. This has proven to be a major problem because the entire process fails when MS Outlook is not available. CashOut poses a similar bottleneck issue where its constant crashes and slow performance hampers progress.
3) **The process gets hampered by inaccurate and incomplete information** because it only accepts scanned documents from clients, which may be blurred or incomplete when submitted. This result in inaccurate inputs or time wasted in extra correspondence with clients to verify their inputs.
4) **The process generates unnecessary carbon footprint** through its acceptance of scanned documents as input elements. Clients would print out physical copies of the form only to scan it. Likewise, the middle office would print copies of the documents for the document team to upload onto DataWare.

5) **Payments may get duplicated or missed** when staff misplaced client instructions in the folders on MS Outlook. File movements are also not documented, making it hard to trace erroneous payments and perform reconciliation.
6) **The process has an inefficient method of verification**. Staffs have to cover many records of signatures before finding the right one or realizing that the signature is outdated, delaying the payment until the signature is updated. This increases lead time and puts Perk Bank at a disadvantage against faster competitors.
7) **The process is unable to process more urgent instructions** due to the above delays and inefficiencies. It is also not scalable given the bottlenecks by its outdated technology.
8) **The process is vulnerable to breach in regulation** as it does not use secure data transfer protocols when extracting and uploading information onto CashOut and DataWare.

By using the latest technology and incorporating automation, the to-be process is faster, greener and more robust. Referable at Appendix C, it:

1) **Contains an application which houses the business data and logic**. This allows automation to process business rules and activities without human intervention which hastens the process. The application helps with:

    a) Collating files from DataWare for middle office to verify documents
    b) Archiving documents into DataWare if payment is released
    c) Handling email correspondence with clients for additional verification
    d) Storing all business information from start to end of process

2) **Replaces the front office with a web form**. The form allows digital inputs from clients, replacing the need for physical and scanned documents. It also validates the information sent by clients and only allows complete instructions to be processed. This reduces the carbon footprint generated by the process and saves Perk bank the hassle of chasing for information.

    The form will also transfer data onto documents for the middle office, removing the need for the form to be manually populated by the front office. This removes a potential area for erroneous data transfer which can result in wrong payment instructions.

3) **Uses a revamped version of CashOut** which is robust and processes payments instantaneously. It also helps:

    a) Middle office transfer data from the documents into the application
    b) Extracts data based on the special requirements that certain currencies and banks require
    c) Processes and tracks the progress of verifying payment instructions to prevent erroneous payment and for faster reconciliation. This removes the bottleneck that was previously present due to the application's bad performance, allows

urgent payments to be made immediately, saves staff the trouble of keeping up with regulation and prevents duplicate or missed payments, helping with reconciliation.

4) **Uses 2FA** (2 Factor Authentication) **technology 6-digit verification** instead of signature-based verification which is faster, more accurate (safe from forgery and erroneous rejection of payment instructions) and less cumbersome because it does not require clients to constantly update their signatures. This replaces the activities which require comparing signatures from documents found in DataWare.
5) **Is environmentally friendly** because the digitally transformed process does not require paper and scanned documents anymore.
6) **Uses Symantec Protection Suite Enterprise Edition 3.0** as its main configuration against cyber threats. It covers web, messaging and endpoint protection, protecting the suite of IT systems and applications used by this process.

Proposed Solution

Description

From the High Level Architecture Diagram and Solution Blueprint in Appendix F and G, a detailed explanation of how these technologies would be used to drive our application.

We overhauled key services and applications to automate important activities which are manual or problematic. As mentioned above, these services include data collation service, regulation service, purchase order service and ticketing system which will be built using Flask. The data collation service automates the retrieval of verification documents from DataWare by matching the name of the issuer of the payment instruction to their file with the verification document. The regulation service pulls out regulation related information and is constantly updated to ensure that there is a compliance of regulations. This handles any currency exceptions and removes unnecessary clarification.

Next, the payment order service automates the process of inputting information in the payment order, by utilizing the digital form submitted by clients and verified by the Perkpay team. Moreover, an internal ticketing system will be created to replace the work folders in Outlook. This internal ticketing system would allow the checkers to add any comments and pass to the next checker using the ticketing system. This ensures that the verification process would be handled in an organized fashion. As a result, it prevents the possibility of payments to be overlooked or duplicated. These would then be containerized as a Docker image. The image will process the requests that are handled by the user interface from Nginx.

Solution Architecture

As shown from Appendix F, we have decided to utilize a Service-Oriented Architecture. Taking into consideration for scalability and maintenance, Service-Oriented Architecture allows the developers to scale micro-services and deploy any changes independently. We will be using Nginx as a reverse proxy to connect the user interface and the services. Moreover, Nginx will also act as a load balancer to manage request sent from the user interface to the services. As a result, this remediates the single point of failure issue. Thus, this ensures high availability and a resilient enterprise solution.

Security in Technology

As the process involves the transmission of sensitive data, security is of utmost importance. A few key security considerations would be the implementation of the 2FA technology which utilizes AES Encryption to prevent spoofing by potential hackers. This provides a first layer protection to ensure that user's information is secured. Next, for all transmission of sensitive information, a 256 bit encryption algorithm will be employed to encrypt the information. As the encryption key is virtually impossible to crack[1], this ensures that information can be safely transmitted from one endpoint to another.

Authorization tokens would be used whenever a request is made from the web to prevent external parties from accessing sensitive information within the internal servers. In addition, a data loss prevention software e.g. Symantec Data Loss Prevention can also be incorporated to ensure there would be no breach in data throughout the payment process and subsequently avoid the loss of data during transmission.

Financial Analysis

With reference to the Profit & Loss Statements in Appendix H, outsourcing to Prestigious Systems and Services Leasing offers the best Return On Investment (ROI) of 231.08%. This is followed by the contract with Excellence contracting agency solution where the ROI is 190.42%. Though the former has a higher return, we propose Perk Bank to adopt the latter as the solution for implementation based on various reasons.

Firstly, where security is a concern, outsourcing a crucial business unit will mean Perk Bank risks losing control over it. Confidential client information will be exposed to Prestigious systems and services leasing causing Perk Bank to run a risk of information being compromised. As such, this option is highly not recommended since high level of trust is needed.

Similarly, with an ROI of 190.42% for adopting Option 2 compared to 121.89% by Option 1, Option 2 provides a significantly higher return for Perk Bank. ROI calculate the efficiency of

[1] Complexity of 256-bit encryption: https://www.techopedia.com/definition/29703/256-bit-encryption

the investment by measuring the amount of return relative to a particular investment. The total expenses for the 5 years are calculated to be $2,934,053 which is well within the $3.5 million budget. With this, it is evident that Option 2 is the most viable solution that Perk Bank can adopt.

Lastly, contracting this project out is highly viable as external agency has the expertise in developing IT software efficiently. Perk Bank can leverage on their expertise and maintain business operations without expending additional resources to develop internally. Another benefit will be that the contracting agency can provide continuous support for the application for when assistance is required so this serve as insurance for Perk Bank. This is on top of the internal IT support that is catered for the system, providing extra layers of system support.

To give a clearer outlook on Option 2 as a solution, Appendix J shows the actual return Perk Bank can expect while taking the time value of money into account. With a Net Present Value (NPV) of $1,911,941.51 and a discount rate of 3.58%, Perk Bank can expect this return based on today's value. Lastly, taking global inflation rate into account, the payback period is projected to be Year 1.84 as in Appendix K. Given the breakeven period that this proposal achieves, Perk Bank can expect early returns and cement its competitive standing in a digitalised world.

Execution Plan

The Execution Plan will be carried out in two phases - Project Preparation and Project Development.

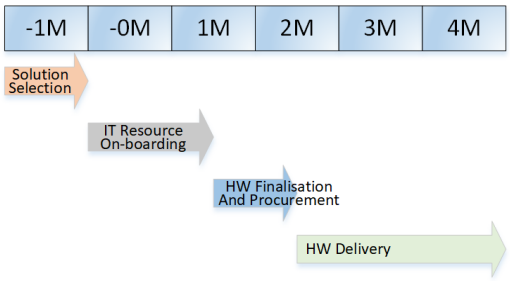


Figure 1: Execution Plan Phase 1

In the first phase, The Change Maker Team will spend a full month on Solution Selection, followed by the next five months with resources on-boarding, Hardware Finalisation, Procurement and Delivery.

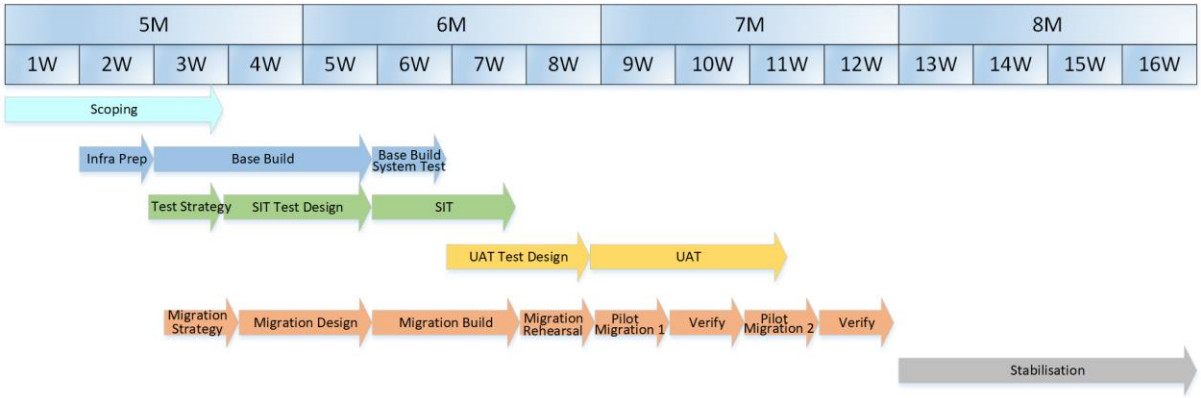


Figure 2: *Execution Plan Phase 2*

In the second phase, the system will be built and tested within three months, followed by a full month of project stabilisation to provide continuous support from the development team. The base build will be developed before System Integration Test (SIT) and finally User Acceptance Test (UAT) where live users will be doing the beta test on the new system. The migration team will work separately from the development and testing team. Careful designing and preparation is needed as this system is an uplift from the current CashOut system and data migrated needs to be consistent. As such, more time is allocated to the migration process.

Conclusion

To sum up, the remodeled process is more secure, carbon-free and faster. This gives internal stakeholders the ability to do more with less, delivering more value to Perk Bank's customers. The technical architecture is enhanced with load balancers and tighter security to minimize downtime and ensure system robustness. The project will be delivered by engaging an experienced external party and will have a breakeven of 1.84 years. With cost savings, compliance and higher efficiency, Perk Bank's remittance process will deliver higher customer satisfaction, potentially placing the bank ahead of its competitors in the competitive yet disruptive digital fintech industry.

Appendices

Appendix A: Root Cause Analysis of the Remittance Process

S/N	Issue	Cause	Root Cause	Issue Category	Business Process Performance Metrics	Impact Level (1 being the least and 5 being the worst)
1	Team unaware of payment instruction	emails are not received when encrypted email server failed,	Sole reliance on 1 email server	System	Number of unhappy client due to instructions missed	**5 - Very impactful** Critical point which causes loss of trust from clients
2	Payment instructions are duplicated or missed	Process flow of transferring work from folder to folder is error-prone	Reliance on 3rd party software limits customization of software to meet needs	System	Number of missed or duplicated payment instructions	**5 - Very impactful** Delayed and duplicated payments will shake clients' trust.
3	Having to constantly switch between payment instructions	Need to constantly switch between cases due to incomplete instructions, prone to errors	Cases do not meet all the requirements upon initial processing	Process	Percentage of cases that could be processed upon initial inspection.	**3 - Impactful** Constant switches between payment instructions will increase errors made.
4	No tracking system when jobs are completed	Process flow does not have function to track movement of funds	Reliance on 3rd party software limits customization of software to meet needs	Process	Time taken to complete reconciliation process	**3 - Impactful** Inability to track payments effectively will hamper reconciliation efforts.

5	Time taken to compile and verify documents is very long	A lot of documents to compile and check against. Documents may be incomplete or invalid (mismatch / unclear) Checking with client is time consuming and may harm client relations / perception of the bank	Not using digital methods of verification which requires fewer inputs than physical verification	System	Time taken to verify every request Average number of correspondence needed to clarify and obtain all required information for remittance. Erroneous execution due to erroneous data extraction at this stage	**3 - Impactful** Time taken to verify each request is very long, may not meet tight deadlines for remittance. Unnecessary time and effort spent compiling, understanding and verifying client inputs.
			Not providing digital means for client to request remittance	Process		
6	Inability to process urgent payments	Process is taking too long to complete	Process activities are inefficient, interaction with CashOut creates bottleneck	Process	Average and fastest time taken to handle a payment instruction	**3 - Impactful** Bank has the right to reject payments if it exceeds the deadline. However, relations can be strained significantly if bank constantly rejects clients' urgent requests.
			Lack of proper documentation of country/ bank regulations cause delay in releasing payment			

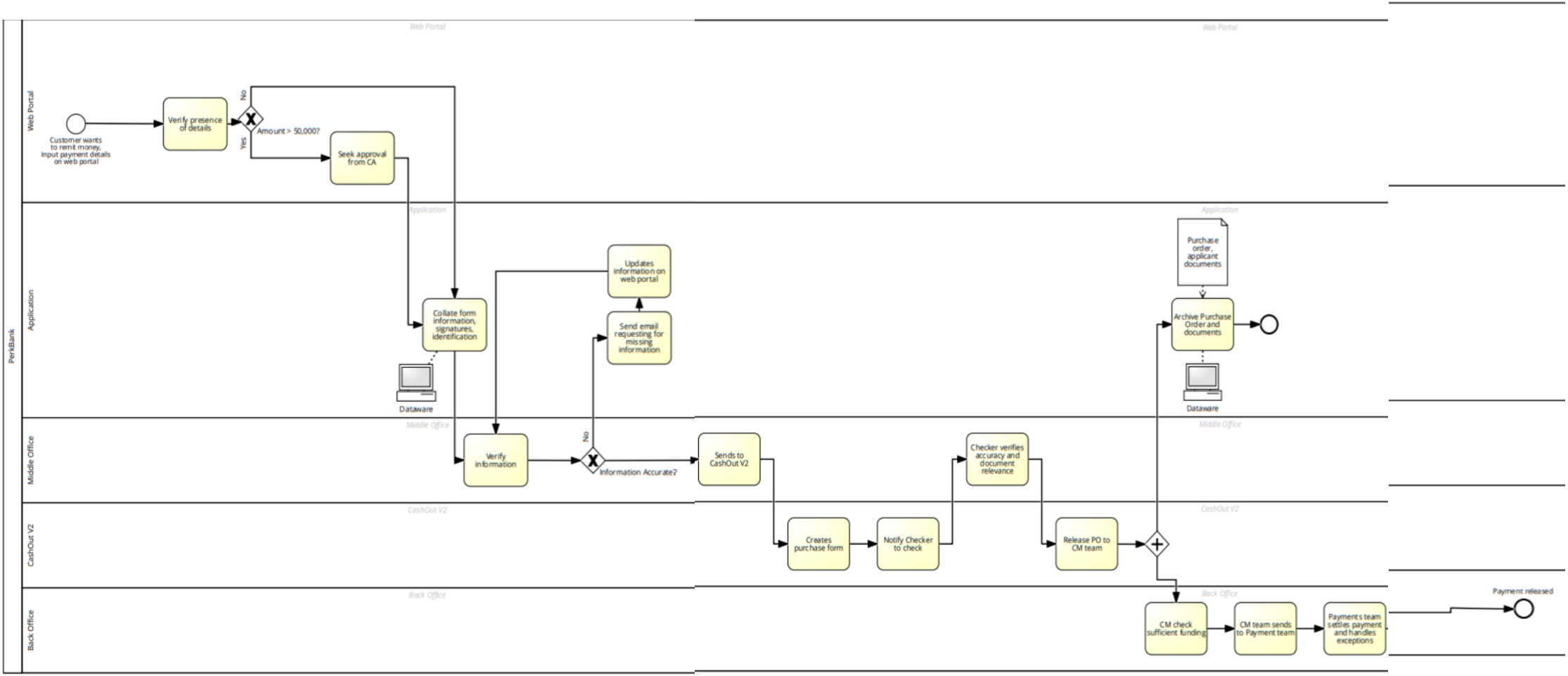
Appendix B: Root Cause Recommendation

S/N	Root Cause And Business Goal	Recommendation	Recommendation impact score, analysis	Complexity
1	Root Cause: 1) Susceptible to single point of failure resulting in missed payment instructions 3) Having to constantly switch between payment instructions 5) Contacting clients due to insufficient information provided 6) Inability to process urgent payments Business Goals: 3) Reduce the number of manual steps	Have an online form for customers to submit payment instructions digitally	**4 - Very impactful** Payment instructions will be clear because it does not rely on handwriting or scanned format Instructions will be comprehensive as form validates if client has input all necessary details before submitting. It will also be load-balanced across multiple servers to prevent single point of failure. Form also standardizes input format which hastens the process of extracting information, as compared to that of an email. This saves cost as it replaces the front office's jobs. It also reduces process time as Perk Bank does not need to waste time having multiple correspondences to get the required information for payment processing.	**1 - Low level of complexity.** A web form can be designed quickly, cheaply and is easy to integrate into infrastructure.
2	Root Cause: 5) Contacting clients to verify the authenticity of payment instruction Business Goals: 1) Remove paper wastage	Implement 2FA technology as a method for verifying payment instruction	**5 - Highly impactful** No need to verify hand-written signatures, saving lots of time as staff need not go through many documents just to find the right signature. It also saves paper on client's end as they need not print it before scanning it over.	**3 - Complex.** Existing architecture needs modification to incorporate 2FA as a form of verification for payment instructions. It performs a crucial check in the process and has no

	3) Reduce the number of manual steps		It also removes cumbersome reliance on using and chasing for up-to-date signatures for verification. Lastly it removes fraudulent remittance due to forgery.	margin for error. It has to be extensively tested for potential errors before going live.
3	<u>Root Cause:</u> 5) Time taken to compile and verify documents is very long 6) Inability to process urgent payments <u>Business Goals:</u> 1) Remove paper wastage 2) Reduce process time by 30% 3) Reduce the number of manual steps	Have a main application to collate and update documents on DataWare, and handle email communication with clients.	**4 - Very Impactful** Collation and updating of client information on DataWare is a low-value activity that takes a lot of time. These activities are now automated, freeing staff to focus on more value-added activities like processing more instructions / engaging more clients per day. Furthermore, the digital-only trails from web form to digital collation on DataWare significantly the carbon footprint of the process as paper is no longer needed in it.	**4 - Very complex.** With standardized naming conventions for various client documents, bot can collate and update documents easily. Although the logic to collate and update documents can be simple, the change process carries a fairly big risk because it influences all records in Perk Bank. Staff conducting the name change for the documents has to fully understand business requirements. They have no margin for error as a typo or erroneous classification of files may lead to serious business implications.
4	<u>Root Cause:</u> 2) Payment instructions are duplicated or missed 4) No tracking system when jobs are completed 6) Inability to process urgent	Create a new version of CashOut which is robust and lightweight. It auto-populates	**5 - Highly impactful** The new payments processing system removes 3 potential points of error in the process. 1) When staff transfer data onto the form 2) When staff updates the 4-Eyed status	**2 - Somewhat complex** The new application requires the same inputs as the previous form, which is few and straightforward.

	payments <u>Business Goals:</u> 2) Reduce process time by 30% 3) Reduce the number of manual steps	payment instructions based on the documents it receives and has a status checker for payments that have been or yet to go through the 4-Eyed check process. It also handles additional requirements by extracting the required information from the provided documents	check of the payment instruction. 3) When processing payments that deal with currencies and beneficiary banks with additional requirements. This lowers the number of erroneous cases that will be processed twice or not at all. It lowers the number of exception cases for back office to handle and makes the reconciliation process easier. The new application will also process payments instantaneously and can handle heavy loads. This removes the potential bottleneck that the existing CashOut creates, where app crashes and slow performance hampers productivity. It does away with batch clearances, allowing urgent and early payment instructions to be processed earlier, giving better customer service.	The application's functionality is also rather simple so development will be fast and low in cost. Reconfiguring the database connection or transferring data from the original application may be complex depending on the current architecture and database configuration. Fortunately, this is an unlikely scenario as databases are usually separate from the monolithic architecture that is commonly used in the past.

Appendix C: To-be model of the remittance process



Appendix D: As-Is Scenario Cost Planning Calculation

Report:	Cost Calculation (Process)			
Date:	29.06.2019			
Time:	10:21:14			
Name:	As-is PerkBank Remittance Process			
Frequency (per year):	1800			
			Without Cost Center	**Total**
Task	Input factor	Costs per execution	Costs	Costs
Receive payment instructions from client	1.00	$ 0.33	$ 600.00	$ 600.00
Send email to client relationship manager for approval	0.50	$ 1.67	$ 1,500.00	$ 1,500.00
Receive approval email for movement of funds	1.00	$ 0.33	$ 600.00	$ 600.00
Complete digital form and email middle office	1.00	$ 1.67	$ 3,000.00	$ 3,000.00
Receive payment instructions from front office	1.00	$ 0.67	$ 1,200.00	$ 1,200.00
Collect relevant signature data and other client identification to verify signature on client payment instruction	2.00	$ 3.33	$ 11,999.98	$ 11,999.98
Request for accurate data via email correspondence	1.00	$ 0.00	$ 0.00	$ 0.00
Control check - currency exceptions	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Create payment order	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Click on Cashout link and navigate through menu	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Input details from form into Cashout	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Print Order confirmation	1.00	$ 0.33	$ 600.00	$ 600.00
Drag email to checker to complete data entry	1.00	$ 0.33	$ 600.00	$ 600.00
Checker receives email from maker	1.00	$ 0.33	$ 600.00	$ 600.00
Click on Cashout link and navigate through menu	1.00	$ 1.00	$ 1,799.99	$ 1,799.99
Eyeball check details to verify accuracy	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Eyeball check that all relevant documents are attached in the email	1.00	$ 0.67	$ 1,200.00	$ 1,200.00
Release payment order	1.00	$ 0.67	$ 1,200.00	$ 1,200.00

Print out order and submitting documents and send to Documents team	1.00	$ 1.00	$ 1,799.99	$ 1,799.99
Documents team to scan and archive into DataWare.	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Payments team to receive order	1.00	$ 0.33	$ 600.00	$ 600.00
Cash Management team to ensure there is sufficient funding	1.00	$ 1.00	$ 1,799.99	$ 1,799.99
payments team to release payment and handle exceptions	1.00	$ 3.33	$ 5,999.98	$ 5,999.98
Request for accurate data via email correspondence	1.00	$ 0.67	$ 1,200.00	$ 1,200.00
Sums		**$ 30.17**	**$ 54,299.84**	**$ 54,299.84**

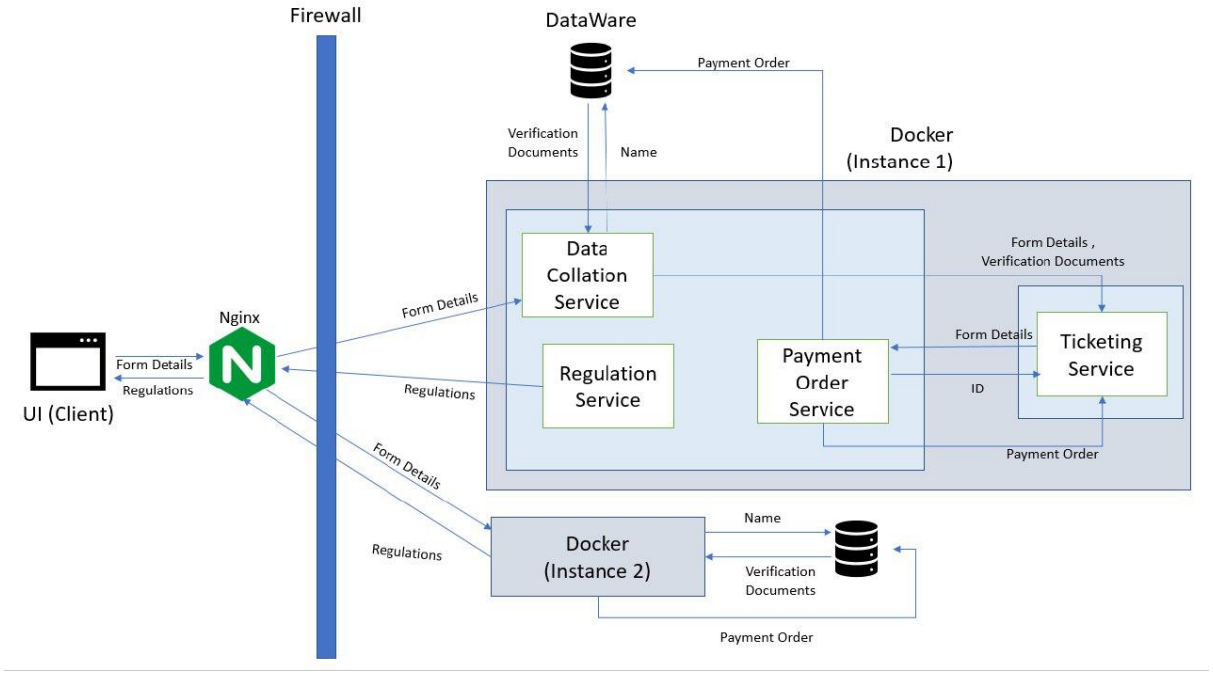
Appendix E: To-Be Scenario Cost Planning Calculation

Report:	Cost Calculation (Process)
Date:	29.06.2019
Time:	10:21:14
Name:	PerkBank Remittance Process
Frequency (per year):	1800

			Without Cost Center	Total
Task	Input factor	Costs per execution	Costs	Costs
Verify presence of details	1.00	$ 0.00	$ 0.00	$ 0.00
Seek approval from CA	0.50	$ 0.00	$ 0.00	$ 0.00
Collate form information, signatures, identification	1.00	$ 0.00	$ 0.00	$ 0.00
Verify information	2.00	$ 1.67	$ 5,999.99	$ 5,999.99
Send email requesting for missing information	1.00	$ 0.00	$ 0.00	$ 0.00
Updates information on web portal	1.00	$ 0.00	$ 0.00	$ 0.00
Sends to remIT	1.00	$ 0.33	$ 600.00	$ 600.00
Creates purchase form	1.00	$ 0.00	$ 0.00	$ 0.00
Notify Checker to check	1.00	$ 0.00	$ 0.00	$ 0.00

Checker verifies accuracy and document relevance	1.00	$ 1.67	$ 2,999.99	$ 2,999.99
Release PO to CM team	1.00	$ 0.00	$ 0.00	$ 0.00
Archive Purchase Order and documents	1.00	$ 0.00	$ 0.00	$ 0.00
CM check sufficient funding	1.00	$ 1.00	$ 1,799.99	$ 1,799.99
CM team sends to Payment team	1.00	$ 0.33	$ 600.00	$ 600.00
Payments team settles payment and handles exceptions	1.00	$ 3.33	$ 5,999.98	$ 5,999.98
Sums		**$ 10.00**	**$ 17,999.94**	**$ 17,999.94**

Appendix F: High Level Architecture Diagram



Appendix G: Solution Blueprint

Appendix H: Profit & Loss Statement

Option 1 : Perk Bank Internal solution						
Profit and Loss Statement						
(USD)						
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Revenue						
Cost Savings (Solution)	-	$660,000	$660,000	$660,000	$660,000	$660,000
Cost Savings (Business Process)*	-	$18,000	$18,000	$18,000	$18,000	$18,000
Total Revenue	**-**	$678,000	$678,000	$678,000	$678,000	$678,000
Expenses						
Manpower Cost	$670,300	-	-	-	-	-
Capital Expenditure (with Depreciation)	$10,000	$52,500	$52,500	$52,500	$52,500	-
Operational Cost	**$59,109**	**$307,864**	**$307,864**	**$307,864**	**$307,864**	**$307,864**
Manpower Cost		$288,000	$288,000	$288,000	$288,000	$288,000
Software Subscription Cost	**$59,109**	**$19,864**	**$19,864**	**$19,864**	**$19,864**	**$19,864**
Symantec Protection Suite Enterprise Edition	-	$19,850	$19,850	$19,850	$19,850	$19,850
Twilio Programmable SMS Service	-	$14	$14	$14	$14	$14
Oracle Database Enterprise Edition	$59,109					
Total Expenses	$739,409	$360,364	$360,364	$360,364	$360,364	$307,864
Net Income	**-$739,409**	**$317,636**	**$317,636**	**$317,636**	**$317,636**	**$370,136**
Return On Investment (ROI)	**121.89%**					
*Amount is Calculated from difference between Appendix D and E						

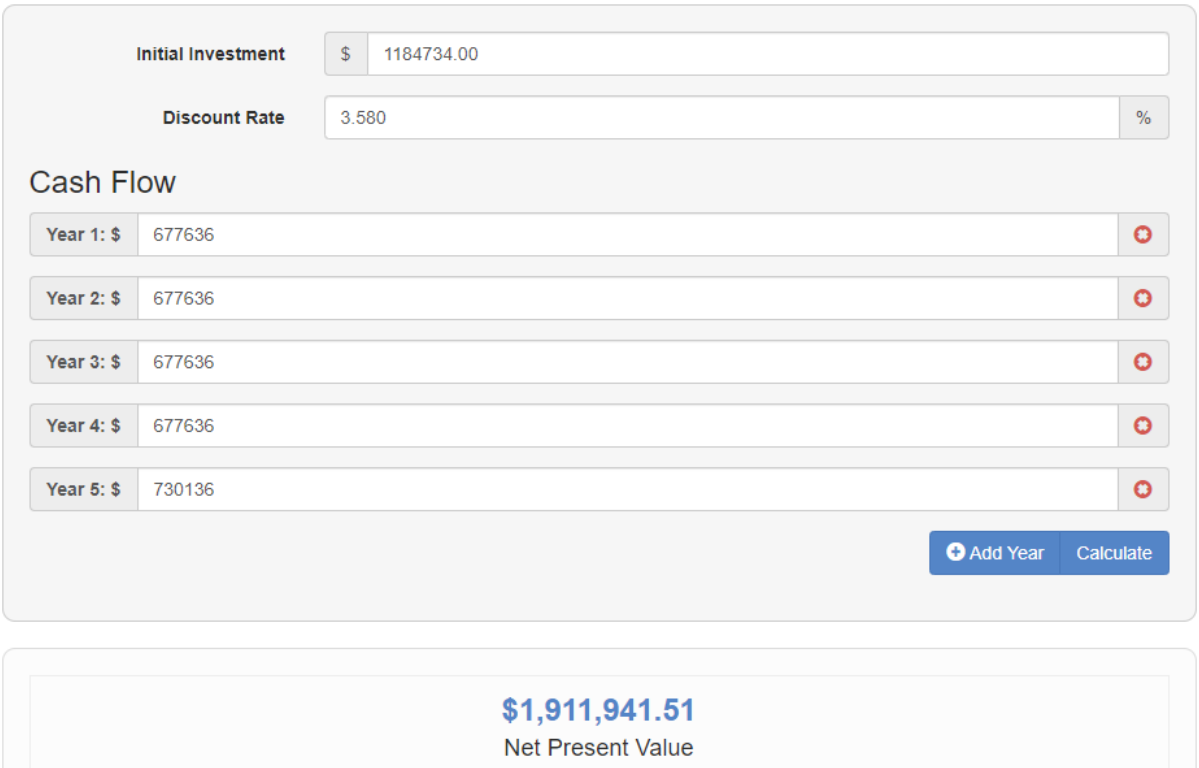
Option 2 : Excellence contracting agency solution						
Profit and Loss Statement						
(USD)						
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Revenue						
Cost Savings (Solution)	-	$1,020,000	$1,020,000	$1,020,000	$1,020,000	$1,020,000
Cost Savings (Business Process)*	-	$18,000	$18,000	$18,000	$18,000	$18,000
Total Revenue	**-**	$1,038,000	$1,038,000	$1,038,000	$1,038,000	$1,038,000
Expenses						
Manpower Cost	$1,115,625	-	-	-	-	-
Capital Expenditure (with Depreciation)	$10,000	$52,500	$52,500	$52,500	$52,500	-
Operational Cost	**$59,109**	**$307,864**	**$307,864**	**$307,864**	**$307,864**	**$307,864**
Manpower Cost	-	$288,000	$288,000	$288,000	$288,000	$288,000
Software Subscription Cost	**$59,109**	**$19,864**	**$19,864**	**$19,864**	**$19,864**	**$19,864**
Symantec Protection Suite Enterprise Edition	-	$19,850	$19,850	$19,850	$19,850	$19,850
Twilio Programmable SMS Service	-	$14	$14	$14	$14	$14
Oracle Database Enterprise Edition	$59,109					
Total Expenses	$1,184,734	$360,364	$360,364	$360,364	$360,364	$307,864
Net Income	**-$1,184,734**	**$677,636**	**$677,636**	**$677,636**	**$677,636**	**$730,136**
Return On Investment (ROI)	**190.42%**					
*Amount is Calculated from difference between Appendix D and E						

Option 3: Prestigious systems and services leasing						
Profit and Loss Statement						
(USD)						
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Revenue						
Cost Savings (Solution)	-	$984,000	$984,000	$984,000	$984,000	$984,000
Cost Savings (Business Process)*	-	$18,000	$18,000	$18,000	$18,000	$18,000
Total Revenue	-	$1,002,000	$1,002,000	$1,002,000	$1,002,000	$1,002,000
Expenses						
Manpower Cost	$168,000					
Capital Expenditure	$250,000					
Deployment Cost	$100,000					
Operational Cost	**$59,109**	**$619,864**	**$619,864**	**$619,864**	**$619,864**	**$619,864**
Service and Support Fee	-	$600,000	$600,000	$600,000	$600,000	$600,000
Software Subscription Cost	**$59,109**	**$19,864**	**$19,864**	**$19,864**	**$19,864**	**$19,864**
Symantec Protection Suite Enterprise Edition	-	$19,850	$19,850	$19,850	$19,850	$19,850
Twilio Programmable SMS Service	-	$14	$14	$14	$14	$14
Oracle Database Enterprise Edition	$59,109					
Total Expenses	$577,109	$619,864	$619,864	$619,864	$619,864	$619,864
Net Income	**-$577,109**	**$382,136**	**$382,136**	**$382,136**	**$382,136**	**$382,136**
Return On Investment (ROI)	**231.08%**					
*Amount is Calculated from difference between Appendix D and E						

Appendix I: Manpower Cost Calculation

	Option 1	Option 2	Option 3
Change Maker Team			
Working days	25	25	-
Employees Needed	4	4	-
Programmers			
Min Days to Complete Per Employee	87	75.3	87
Actual Days Taken (Working Days)	87	75	80
Employees Needed	23	17	5
Actual Days Taken Collectively (Non-Working Days)	-	5*	-
One Time Additional Cost	$10,000	$10,000	-
Manpower Cost	**$ 670,300.00**	**$ 1,115,625.00**	**$ 168,000.00**
*Additional 5 days of effort is required by the programmer team of 17 on a non-working day rate			

Appendix J: Net Present Value Calculation for Option 2



Appendix K: Payback Period for Option 2

Discounted Payback Period: **1.840 years**

Cash Flow Return Rate: **49.94% per year**

	Cash Flow	Net Cash Flow	Discounted Cash Flow	Net Discounted Cash Flow
Year 0	$-1,184,734.00	$-1,184,734.00	$-1,184,734.00	$-1,184,734.00
Year 1	$677,636.00	$-507,098.00	$654,215.10	$-530,518.90
Year 2	$677,636.00	$170,538.00	$631,603.69	$101,084.79
Year 3	$677,636.00	$848,174.00	$609,773.79	$710,858.57
Year 4	$677,636.00	$1,525,810.00	$588,698.38	$1,299,556.96
Year 5	$730,136.00	$2,255,946.00	$612,384.56	$1,911,941.51

References

Global Inflation Rate: 3.58%: https://www.statista.com/statistics/256598/global-inflation-rate-compared-to-previous-year/

Pricing for Oracle Database Support: https://www.oracle.com/assets/technology-price-list-070617.pdf

Pricing for Symantec Protection: https://www.netsecuritystore.com/Symantec-Protection-Suite-Enterprise.asp

Pricing for Twilio Messaging Service: https://www.twilio.com/sms/pricing/us