

Annex A: Interoperability Cost-Analysis Tool - User Guide

Purpose

The purpose of the Excel “Interoperability Cost Analysis Tool” found in Annex B is to help financial institutions determine the feasibility and profitability of implementing a mobile money service within their institution. There are four different business models representing different methods under which mobile money could be implemented, as well as a baseline: establishing a new brick and mortar branch location. This tool is setup so that each financial institution can change the assumptions based on their individual needs and assessments in order to compare and contrast the different models.

Model Assumptions

1. All numbers are in USD
2. The highlighted blue cells are the only cells that can be modified. The non-highlighted cells contain formulas **DO NOT EDIT THEM.**

Model Definitions

1. **New Branch** – Model to project a brick and mortar branch in a new location.
2. **One to One** – A single financial institution connects directly with a mobile money provider
3. **Shared One to One** – Many financial institutions that share the same core banking software form a network to connect with a mobile money provider. Many costs, such as integration, regulatory compliance, and training can be shared amongst the network of financial institutions.
4. **Many to One to One (or Many)** – Many financial institutions with varying core banking systems form a network by each creating an interface with a central switch provider, who then connects to the mobile money provider and other payment networks. Though individual core banking interfaces need to be developed for each individual financial institution, the costs are lower than each financial institution creating an interface directly with the mobile money provider.
5. **One (or Many) to Cloud One to One (or Many)** – One or more financial institutions that all have the same cloud core banking platform connect to a mobile money provider and other payment networks. Integration costs are indirectly paid by the financial institution via monthly fees to the vendor under a Software as a Service business model.

Step 1 – Determine the Dashboard Assumptions

hypothèses	nouvelle succursale		Un à Un		Partagée Un à Un		Un (ou plusieurs) à un à un (ou plusieurs)		Un (ou plusieurs) à Cloud à Un (ou plusieurs)	
	Nombre de mois prévus pour les taux de retour sur investissement	60	60	60	60	60	60	60	60	60
Montant cumulé des prêts mensuels	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Temps de montée (mois)	12	18	18	18	18	18	18	18	18	18
Valeur moyenne du prêt par prêt	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500
Taux d'intérêt sur les prêts (par mois)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Taux d'épargne (coût des fonds) par mois	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Nombre de "retrait" par mois (par exemple, transfert et services offerts par les agents)	300	-	-	-	-	-	-	-	-	-
Commission moyenne des institutions financière sur les retraits	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50
Autres sources de revenus / sur les prêt par mois	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Nombre d'officiers de crédit à distance	-	4	4	4	4	4	4	4	4	4
Pourcentage de rabais - Coût d'opportunité	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Provisions pour mauvaises créances en pourcentage	10%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Nombre des IF (Institutions Financière)	1	1	1	30	30	30	30	30	30	30
Coût total de démarrage	\$ 450,500	\$ 434,000	\$ 434,000	\$ 479,000	\$ 479,000	\$ 275,000	\$ 275,000	\$ 108,000	\$ 108,000	\$ 108,000
Coût total de démarrage par FI	\$ 450,500	\$ 434,000	\$ 434,000	\$ 70,100	\$ 70,100	\$ 242,133	\$ 242,133	\$ 108,000	\$ 108,000	\$ 108,000
Temps avant le début des opérations (semaine)	92	134	134	130	130	130	130	130	130	130
Retour sur investissement initial (mois)	20	#N/A	#N/A	20	20	23	23	13	13	13
Total de revenu	\$ 1,085,400	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000
Total des dépenses	\$ 650,520	\$ 975,780	\$ 975,780	\$ 928,020	\$ 928,020	\$ 781,650	\$ 781,650	\$ 708,720	\$ 708,720	\$ 708,720
Revenu Net	\$ 434,880	\$ 104,220	\$ 104,220	\$ 151,980	\$ 151,980	\$ 298,350	\$ 298,350	\$ 371,280	\$ 371,280	\$ 371,280
Revenu net cumulé	\$ 1,470,578	\$ (255,022)	\$ (255,022)	\$ 364,735	\$ 364,735	\$ 941,854	\$ 941,854	\$ 1,444,320	\$ 1,444,320	\$ 1,444,320
Taux de rendement interne	158%	-17%	-17%	54%	54%	122%	122%	309%	309%	309%
VAN Valeur actualisée nette	\$ 1,125,317	\$ (296,087)	\$ (296,087)	\$ 255,654	\$ 255,654	\$ 711,192	\$ 711,192	\$ 1,139,019	\$ 1,139,019	\$ 1,139,019

In the first tab of the tool, review the assumptions. The values in the highlighted blue cells were averages and can be modified for your financial institution. Any changes to the blue cells will automatically adjust the formulas.

Dashboard Line Item # Definitions:

1. Titles
2. The time frame of the project. This time frame can be changed to analyze the different models at a 3, 4, and 5 year projection.
3. Cumulative amount of loans disbursed for any given month. As an example, if a financial institution 1,000 loans disbursed at the beginning of a month, 80 of those loans are paid back within the month, and 90 additional loans are disbursed all during the same month, then there was a cumulative loan disbursement of 1,010 loans for that month. This model uses a cumulative amount of loans disbursed, and then multiplies that cumulative by the monthly loan rate in order to calculate monthly loan revenue.
4. Amount of time it will take to reach the cumulative amount of loans disbursed each month.
5. The average loan value for each of the loan disbursements.
6. The monthly interest rate charged to the cumulative amount of loans to calculate the monthly loan revenue. As an example, if there were 1,000 cumulative loans disbursed, at an average loan value of \$1,500, at a monthly rate of 3%, then the monthly loan revenue would be \$45,000 (Number of Cumulative Loans Disbursed*Average Loan Value*Monthly Rate = Monthly Loan Revenue).
7. The monthly cost of funds used for funding the loans. Used to calculate the monthly cost of funds (Cost of Funds*Number of Cumulative Loans Disbursed*Average Loan Value = Monthly Cost of Funds).

8. Branch locations that deal with cash transactions can provide other revenue streams by offering cash-in/out services for remittances and agent networks. This amount specifies the average number of transactions a branch office can transact on a monthly basis. Only the “New Branch” model allows for this additional revenue source because it is the only model that deals with cash at the service location.
9. The average commission for the cash-in/out services detailed in line item 8. Agent cash in/out revenue is calculated by: Average Cash In/Out Transactions*Average Commission for Cash In/Out Transaction.
10. Other payment income streams are the other sources of revenue that the mobile models can generate. Examples include air time top-ups, service payments (welfare payments, utility payments, etc.), mobile money transfers, etc. This is a monthly total of commissions that is calculated by multiplying the cumulative number of loan disbursements by the other payment income streams.
11. Within the mobile models, it is assumed that there will be a number of remote loan officers who will be providing the service of loan origination to the new clients/members, instead of the members traveling to the existing branch locations of the financial institution. The number of loan officers is set forth in this line item.
12. The discount rate is used to calculate the Net Present Value calculation for line item 24. The discount rate is the opportunity cost of funds for investing in some other activity rather than the proposed models.
13. Loan loss provisions is the percentage of the monthly loan revenue that will need to be set aside for loan loss provisioning. The monthly loan loss provision calculation is as follows: (Monthly Loan Revenue*Loan Loss Provision Percentage = Monthly Loan Loss Provision Expense).
14. The number of financial institutions that are part of the technology network to share the related startup and operational costs.
15. Total startup costs for the entire model
16. Total startup costs for every financial institution within the business model
17. Time to complete all of the startup items. This is a linear calculation and the critical path was not calculated.
18. The time it would take (in months) to earn back the initial investment from the cumulative net income.
19. Total projected annual revenues at the end of the projected period that was set forth in line item 2.
20. Total projected annual expenses at the end of the projected period that was set forth in line item 2.
21. Total projected annual net income at the end of the projected period that was set forth in line item 2.

22. Total projected cumulative net income at the end of the projected period that was set forth in line item 2.
23. The total return of the entire project for the projected period that was set forth in line item 2. Not to be confused with the time for return on investment. An example would be an investment for a new branch:
 - a. Initial Cost: \$500,000
 - b. Time for return on Investment (Break-even): 20 months
 - c. Internal Rate of Return: 36%
24. Taking into account the opportunity cost of funds, the Net Present Value calculates the revenues received over the time period and calculates how much the investment would be worth in the present day.

Step 2 – Define the Startup Costs

In the second tab are the costs associated with opening a new branch. On the top are the one time startup costs. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

Startup Costs/Timeline			
		Cost (USD)	Timeline (weeks)
Real Estate Costs			
	Buying Land	\$ 100,000	20
	Construction Costs	\$ 250,000	30
	Rent Land and Building + Renovation Costs	\$ -	-
	Total Real Estate Costs	\$ 350,000	50
Administrative			
	New Branch Location Analysis	\$ 3,000	3
	Contractual agreements for building	\$ 4,000	4
	Design definition	\$ 2,000	2
	Other fixed assets	\$ 50,000	5
	Human Capital Acquisition (HR)	\$ 7,000	7
	Training	\$ 5,000	2
	Marketing	\$ 5,000	1
	Modify/implement policies and procedures	\$ 2,000	5
	Total Administrative	\$ 78,000	29
IT Infrastructure			
	Servers	\$ 2,000	3
	Internet	\$ 3,000	2
	Data Communications Hardware	\$ 1,000	3
	Security	\$ 1,500	1
	Power (Generators, batteries, inverters, etc)	\$ 10,000	2
	One time software license fees	\$ 5,000	2
	Total Technical	\$ 22,500	13
	Total Startup Costs/Timeline	\$ 450,500	\$ 92

New Branch Startup Costs Definitions:

1. Real Estate Costs

- a. **Buying Land** – the purchase of new land for the new branch office location.
- b. **Construction Costs** – Costs to construct the new branch office building.
- c. **Rent Land and Building + Renovation Costs** – These are only the startup costs associated for entering into a rental or lease agreement for a new branch office

location. The monthly rent/lease amounts should be placed below within the operational costs.

2. Administrative

- a. **New Branch Location Analysis** – the market analysis undertaken to determine the location of the new branch office location.
- b. **Contractual agreements for building** – costs associated.
- c. **Design definition** – costs associated for the design of the new branch office location.
- d. **Other fixed assets** – computers, desks, chairs, vault, etc.
- e. **Human Capital Acquisition (HR)** – employees who will be working within the new branch.
- f. **Training** – costs involved for training the new personnel. These include salary paid, travel expense reimbursements, food, and hotel.
- g. **Marketing** – costs associated for printing of new marketing materials to be used for the new branch location.
- h. **Modify/implement policies and procedures** – definition of and implementation and/or modification of new policies and procedures that would need to be implemented for the new branch office location.

3. IT Infrastructure

- a. **Servers** – additional servers that are required to connect the branch location to the central core.
- b. **Internet** – communications required per the above.
- c. **Data Communications Hardware** – communications per the above.
- d. **Security** – IT security costs.
- e. **Power (Generators, batteries, inverters, etc.)** – self explanatory
- f. **One time software license fees** – software license fees relating to applications and operating systems installed on branch workstations, servers, other hardware, as well as software products relating to general business operation.

Similar to the second tab, the remaining tabs list the one time startup costs for each of the integration models. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

Coûts de démarrage /chronologie	coûts (USD)	Temps (semaines)
Administratif		
Frais juridique, frais de révision de conformité et approbation (réglementation et marchés)	\$ 25,000	26
Recrutement du personnel (Agent de crédit et équipe informatique)	\$ 8,000	12
Formation	\$ 8,000	12
Marketing	\$ 10,000	4
Transport pour les agents de crédits	\$ 20,000	3
modifier/Mise en œuvre des politiques et procédures	\$ 30,000	12
Total Administratif	\$ 101,000	69
Infrastructure		
nouveau matériel pour les bases de données	\$ 25,000	12
Installation Internet(si nouveau)	\$ 2,000	1
Interface principale - Une License (si nouveau)	\$ 35,000	4
Data Communications Hardware	\$ 1,000	24
Intégration avec le fournisseur de Banque mobile	\$ 250,000	12
Mise à jour et vérification des politiques et procédures de sécurité informatique/Audit	\$ 20,000	12
Total Infrastructure	\$ 333,000	65
Total coûts de démarrage / chronologie	\$ 434,000	\$ 134

Remaining Model Startup Cost Definitions:

1. Administrative

- a. **Legal and Compliance Review and Approval (Regulatory and Contracting)** – Costs associated for receiving regulatory permission to provide the service within your financial institution.
- b. **Staffing Recruitment (Remote Loan Officers + IT Staff)** – costs associated for hiring the new remote loan officers and IT Staff.
- c. **Training** – training costs for the new employees.
- d. **Marketing** – costs for the design and printing of new marketing materials for the launch and service of the model.
- e. **Transportation for remote loan officers** – purchase costs for the remote loan officer’s transportation.
- f. **Modify/implement policies and procedures** – the costs associated for the modification and implementation of new policies and procedures (loan underwriting, security, etc.) associated for launching the associated business model.

2. Infrastructure

- a. **New Hardware for Data Center** – Hardware costs associated for the business model.
- b. **Internet installation (if new)** – new internet connections where applicable.
- c. **Core Interface - One License (if new)** – interface costs for the respective business models.
- d. **Data Communications Hardware** – hardware required for the data connections amongst the network or related parties.
- e. **Integration with Mobile Money Provider** – this line item varies between the different business models depending upon which entity is required to create the line

of integration. However, it is referencing the cost associated for that data integration.

- f. **Update/audit IT security policies and procedures** – similar to the administrative policy and procedure modification line item above, except now applying to the IT policies and procedures.

Step 3 – Define the Operational Costs

Farther down on the second tab are the costs technical and operational costs associated with managing a new branch. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

52		Operating Expenses		
53		Internet Service	\$	1,000
54		Rent or lease of land/building monthly expense	\$	-
55		Data infrastructure cost	\$	500
56		Core software license support and maintenance	\$	83
57		Number of Employees		10
58		Monthly Salary (with benefits)	\$	330
59		Total Employee Cost	\$	3,300
60		IT Staff	\$	300
61		Cost of Cash Management (armored cars, etc)	\$	6,000
62		Total Operating Expenses	\$	11,183
63				
64		Earnings before Interest and Tax		
65		Interest Expense		0%
66		Taxes		10%
67				

New Branch Operational Costs Definitions:

1. Operating Expenses

- a. **Internet Service** – monthly cost for internet
- b. **Rent or lease of land/building monthly expense** – monthly cost for the rent or lease of land and/or building.
- c. **Data infrastructure cost** – monthly cost for the data warehousing.
- d. **Core software license support and maintenance** – additional core banking software monthly costs associated for opening a new branch location.
- e. **Number of Employees** – number of employees that will be contracted.
- f. **Monthly Salary (with benefits)** – average monthly salary of the employees, benefits included.
- g. **Total Employee Cost** – total monthly cost for all employees within the new branch.
- h. **IT Staff – IT staffing costs.** This line item was separated due to the cost differences between the IT and Administration salaries.
- i. **Cost of Cash Management (armored cars, etc.)** – Total monthly costs associated for contracting armored cars for the administration of cash with the new branch office.

Similar to the second tab, the remaining tabs list the operational costs for each of the integration models. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

46				
47		Operating Expenses/month		
48		Internet Service	\$	100
49		Data infrastructure cost	\$	500
50		Software support and maintenance	\$	200
51		IT Staff	\$	4,000
52		Salary (with Benefits)/employee	\$	800
53		Transportation/employee	\$	200
54		Other Costs	\$	500
55		Total Operating Expenses		
56				
57		Software Licensing/Provider Costs		
58		Core interface - monthly support	\$	583
59		Switch integration - monthly support	\$	1,667
60		Other costs/month	\$	500
61		Total Software Licensing/Provider Costs		
62				
63		Total Operating/Software Expenses		
64				
65		Earnings before Interest and Tax		
66		Interest Expense		0%
67		Taxes		15%
68				

Remaining Model Operational Cost Definitions:

1. Operating Expenses

- a. **Internet Service** – monthly cost for internet.
- b. **Data infrastructure cost** – monthly cost for the data warehousing.
- c. **Software support and maintenance** – monthly cost for the operational support and maintenance software.
- d. **IT Staff** – monthly expenses for the IT staff
- e. **Salary (with Benefits)/employee** – monthly expenses for the remote loan officers.
- f. **Transportation/employee** – monthly transportation expenses for the remote loan officers.
- g. **Other Costs** – other costs associated for the operational business model.

2. Software licensing/Provider Costs

- a. **Core interface - payment module - monthly support** – the monthly core interface cost for the respective business models.
- b. **Mobile money provider integration - monthly support** – the monthly integration cost with the mobile money provider.
- c. **Other costs/month** – self-explanatory.

Operational Revenue/Expense Calculations

Below is an explanation of the mathematical formulas used to calculate the revenue and return on interest for all the models. These line items are found in the tabs for each model under the label “implementation.”

1. Month	Number of months for the project
2. Number of Loan Disbursements	First the loan disbursements increase according to the ramp up time, at which point the loan disbursements will stay constant at the cumulative amount of monthly loans value.
3. Revenues	
a. Loan Revenue	Number of loans for the period*Average Loan value per Loan*Loan Interest Rate
b. Agent Cash In/Out Revenue	Number of Cash In/Out transactions*Average commission to FI for cash out services
c. Payments Revenue	Other payment income streams*Number of loans for the period
i. Total Revenues	Sum of the last three line items
4. Product Expenses	
a. Cost of Funds	Number of loans for the period*Savings Interest Rate (Cost of Funds)
b. Loan Loss Provisions	Loan Revenue for the period*Loan Loss Provision rate
i. Total Product Expenses	Sum of last two line items
5. Profit Margin	Total Revenues – Total Product Expenses
6. Operating Expenses	
a. Internet Service	Fixed value across all months
b. Data Infrastructure Cost	Fixed value across all months
c. Software Support and Maintenance	Fixed value across all months
d. IT Staff	Fixed value across all months
e. Salary (with Benefits)/Employee	Fixed value across all months

f. Transportation/Employee	Fixed value across all months
g. Other Costs	Fixed value across all months
i. Total Operating Expenses	Sum of last seven line items
7. Software Licensing/Provider Costs	
a. Core Interface	Fixed value across all months
b. Mobile Money Provider Integration	Fixed value across all months
c. Other costs	Fixed value across all months
i. Total Software Licensing/Provider Costs	Sum of last three line items
ii. Total Operating/Software Expenses	Total Operating Expenses + Total Software Licensing/Provider Costs
8. Earnings Before Interest and Tax	Profit Margin – Total Operating/Software Expenses
a. Interest Expense	Fixed value across all months
b. Taxes	Once Earnings before Interest and Tax is above zero then the tax rate begins to apply.
i. Net Income	Earnings before Interest and Tax – Interest Expense - Taxes
1. Cumulative Net Income	Sum of all previous Net Income periods

The Case for Bank-Led Mobile Adoption Strategies in Haiti

Assumptions		Business Models				
Line Item Assumptions		New Branch	One to One	Share Core to One	Many to One	Cloud; Many to One
Expected months for Rate of Return On Investment		60	60	60	60	60
Cumulative amount of monthly loans		2,000	2,000	2,000		
Ramp up time (months)		12	18	18		
Avg. Loan Value per Loan		\$ 1,500	\$ 1,500	\$ 1,500		
Loan Interest Rate (per month)		3%	3%	3%		
Savings Interest Rate (Cost of Funds) per month		1%	1%	1%		
Number of "Cash-out" transactions per month (e.g. remittances + mobile agent services)		300	-	-	-	-
Avg. commission to FI for cash-out services		\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50
Other Payment income streams/loan disbursement/month		\$ -	\$ -	\$ -	\$ -	\$ -
Number of remote loan officers		-	4	4	4	4
Discount Rate - Opportunity Cost		7%	7%	7%	7%	7%
Loan Loss Provisions Percentage		10%	20%	20%	20%	20%
Number of FI's		1	1	30	30	30
Total Startup Cost		\$ 450,500	\$ 434,000	\$ 479,000	\$ 275,000	\$ 400,000
Total Startup Cost by FI		\$ 450,500	\$ 434,000	\$ 70,100	\$ 242,000	\$ 00
Time before operations start (weeks)		92	134	130		130
Initial return on investment (months)		20	#N/A	20		13
Total Revenue		\$ 1,085,400	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000
Total Expenses		\$ 650,520	\$ 975,780	\$ 928,020	\$ 781,650	\$ 708,720
Net Income		\$ 434,880	\$ 104,220	\$ 151,980	\$ 298,350	\$ 371,280
Cumulative Net Income		\$ 1,470,578	\$ (255,022)	\$ 364,735	\$ 941,854	\$ 1,444,320
Internal Rate of Return		158%	-17%	54%	122%	3099%
Net Present Value		\$1,125,317	\$ (296,087)	\$255,654	\$711,192	\$1,139,019

