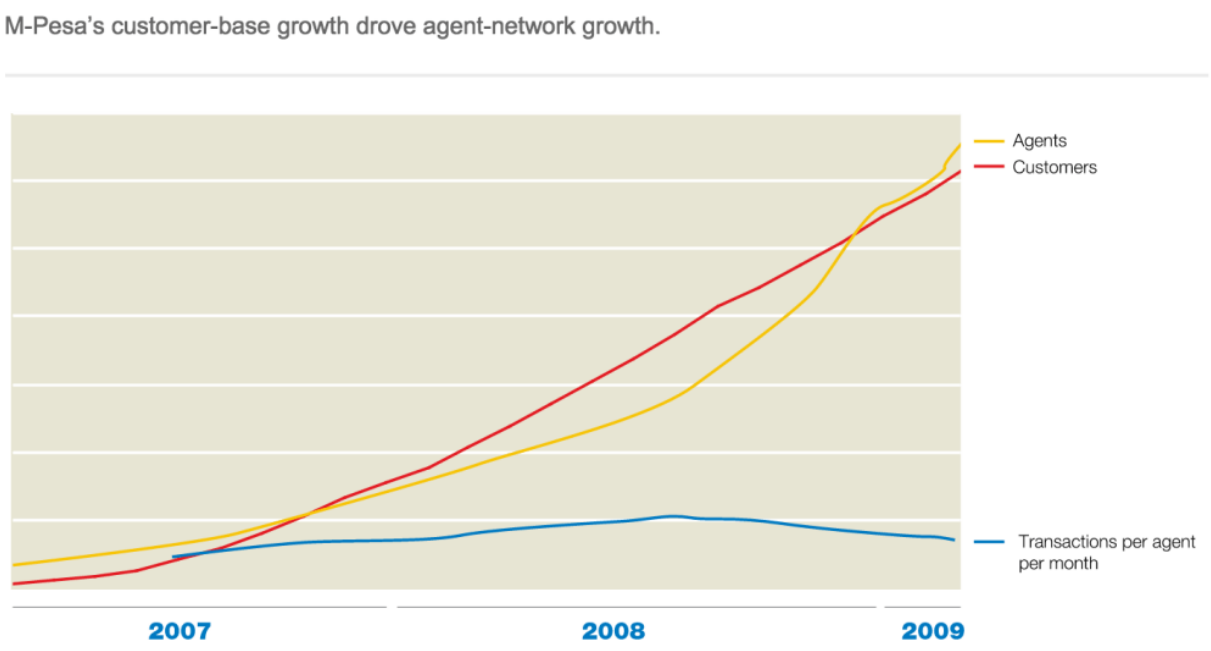
# The M-Pesa case

*M-Pesa market strategy, how they got started and how they got customers*

## Agent vs customer

M-Pesa needs to keep their customer-to-agents ratio close. Too few agents means less accessibility, thereby making the Mobile Payment Service (MPS) difficult to access.
Conversely - the up-front capital required, on average $1600, (see sidenode 1) to be an agent needs to be covered fast as it is a big deposit equivalent to 2.04 times the GDP per capita income in Kenya and 3.2 times greater than the annual income of a manual laborer worker in Nairobi, Kenya.




## Making a network

M-Pesa set up their own agent network by talking to local mom-and-pop stores and retailers to determine their needs by determining factors such as

- Level of education

- Conversation ability
- Business acumen

Additionally they offered training on customer service and how to manage liquidity. Lastly Safari-Com would monitor agents on-site every two weeks.

Safari-com already had a monopoly in Kenya, and had local airtime distributors who could act as agents, essentially piggybacking on the existing market. M-Pesa started in 2007 with 400 agents and an aggressive marketing and customer acquisition campaign. 9 months later they had 1200 agents. The success was so rapid that merchants who could not meet the agent criterias were subcontracted to operate under the agent's M-Pesa agreement. This was positive for growth but poised a brand risk. Safari-com acknowledged the sub-agents and placed a 20 percent cap on the portion of sub-agent commission an agent could take, and required that the agent take an active role in training and monitoring their subagents. Later, in 2012, Safari-Com had gathered over 40.000 agents and created "superagents", which is an agent with a large liquidity who sells to the agents in their geographical area making a hub-and-spoke strategy, similar to the already existent agent to sub-agent strategy.

**Additional notes / Takeaways:**

1. M-Pesa and similar Mobile Payment Services have an up-front payment for agents and is one of the reasons MPS fail early on.
   https://digital.hbs.edu/platform-rctom/submission/m-pesa-a-mobile-money-success-story-from-kenya/
   Upfront payments include having e-money and cash liquidity, improving store standards, and improving security by installing locks and/or bars.
   https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/agentmanagement_tg22.pdf

2. http://www.mckinsey.com/insights/telecommunications/capturing_the_promise_of_mobile_banking_in_emerging_markets
   a. "Mobile-Money becomes profitable only when it goes viral. To make mobile money for the unbanked commercially viable, operators and telco's like

Safaricom “must sign up 15 to 20 percent of the addressable market.”

b. Proximity of the nearest agent makes a significant impact on transaction volumes. “When a cash agent is more than 15 minutes away, mobile money has relatively little appeal, and customers use it once or twice a month. But when the agent is less than 10 minutes away, usage rises to 10 times a month—and for those within 2 minutes of an agent, to 30 times a month.”

## The needs for mobile banking in SSA countries

Looking at the spreadsheet *https://docs.google.com/spreadsheets/d/1dpcEDlH6g_KuUUhuDEnyo0NsG8Bs1czOC5lMpIUQC5A/edit?usp=sharing* there are some SSA countries that stand out and from an overview could use a mobile banking service

| **Country** | **Pop / km²** | **GDP per capita (USD)** | **Financial Institution** | **Mobile Money account** | **Financial inclusion** |
|---|---|---|---|---|---|
| **Burundi** | 414,3 | 261,2 | 7.0% | 0.7% | 7% |
| **Central African Republic** | 7,62 | 467,9 | 13.7% | 0% | 13.7% |
| **Chad** | 12,42 | 709,5 | 8.8% | 15.2% | 21.8% |
| **DRC** | 32,75 | 580,7 | 15% | 16,1% | 25,8% |
| **Ethiopia** | 101,42 | 855,8 | 34,8% | 0,3% | 34,8% |
| **Guinea** | 51,94 | 962,8 | 14,6% | 13,8% | 23,5% |
| **Madagascar** | 45,92 | 523,4 | 9,6% | 12,1% | 17,9% |
| **Mauritania** | 4,39 | 1679,4 | 19,0% | 4,0% | 20,9% |

| | | | | | |
|---|---|---|---|---|---|
| **Niger** | 18,4 | 553,9 | 9,5% | 8,7% | 15,5% |
| **Sierra Leone** | 108,06 | 527,5 | 12,4% | 11,0% | 19,8% |
| **South Sudan** | 17,85 | 1119,7 | 8,6% | 0% | 8,6% |

Some particularly interesting countries are Mauritania who are rather rich compared to the others, at a GDP per capita of $1679, similarly South Sudan is at $1119,7.
On the population side of things, Mauritania is the third least densely populated country in SSA with only 4.39 pop. / km² which could prove an interesting technological challenge. Same case for the Central African Republic at 7.62 pop / km². The average population density in SSA is 106, which only Sierra Leone and Ethiopia comes close to which might be one of the reasons why these countries don't have a successful mobile banking service yet. Of course this depends on the scattering of the population in the country which I will continue investigating if we choose to go with this subsection of potential countries for a new product.
On the flipside is the country Burundi. Burundi is one of the most densely populated, and smallest countries in SSA. With 414 pop / km2, a GDP per capita of $261,2, and a financial inclusion of 7%, with only 0.7% of it being mobile money.

# Neobanking in SSA

Neobanks are fairly new in SSA with some of the bigger ones, Eversend and SOL Wallet appearing in 2017 and 2018 respectively. Neobanks have different goals in mind, Eversend focuses on cross-border transactions where SOL focuses on becoming M-Pesa with debit cards and multiple currencies such as USD/EURO/Bitcoin in South Africa.

The problems with neobanks are that cash rules in SSA, without any bank branches, deposit and withdrawals are no longer options meaning that the only way to use the e-money is through supporting merchants or by transferring the e-money to someone else.

Until wide adoption has been reached, cash should still be an option in these countries.

# Pain Points highlighted by Fritz

## Atomic (= all-or-nothing) transactions:

- Atomic spot (simultaneous) exchange of physical resources for digital resources (physical cash for mobile cash) -- how to ensure
    - (a) exchange is always atomic and perceived as such (commit or abort)

      Several things can be done, but without a middleman there is no perfect solution.
        1. Some level of trust is needed, depending on the size of transaction
        2. Refunding and proof of trade (receipt) in case of fraud

    - (b) has a high success rate (of commits)?

      A good reputation system can ensure that trust is provided from either party. Similarly, having an M-Pesa license (or similar document) will enforce that sellers act in good faith.
      The rest is up to the banking system, ensuring that either the transaction happens correctly or returns with a useful error message describing why a transaction might have failed, i.e. insufficient funds.

- Atom distance exchange of physical resources for digital resources (goods for mobile cash) -- how to provide trustworthy escrow (of payments) plus trustworthy delivery (trustworthy delivery service with fine-grained tracking; plus low-cost trustworthy arbitration service -- for conflict resolution). How else?

  Proof of mailing, proof of delivery, proof of payment. Concepts of normal e-commerce. Additionally usage of a reputation system.

- Atomic financial transactions (loans) -- how to provide cheap credit? Reputation, plus collateral. How to secure collateral to loan giver (requires trustred digital resource manager)?

Banks can provide credit at a cheap rate by allowing the user to put other items up as collateral. Additionally banks can look into the users transaction history and determine if they're worth allowing credit for. Lastly, since banks have KYC knowledge, they can ensure legal actions if the loan is not repaid. Since most loans in SSA are micro-loans, such drastic actions should rarely be necessary.

## Trust:

- How to establish fundamental trust in
    - (a) stability of value (being equivalent to cash)

      Trust in value can be obtained by backing in other commodities like gold, and/or a 1:1 trade when withdrawing / depositing cash for e-money. Additionally trust in value can come from who is in charge of issuing the money. For instance, cash is trusted because we trust the issuer.
      We trust M-Pesa because the conversion rate is equivalent to the local currency, thereby pegging it to that currency.

    - (b) liquidity (being easily able to use it for something)? Trust is a social concept, requires cultural (e.g. perceived neutrality of Safaricom boss), technical mechanisms -- how can they reinforce/supplement each other?

      Having previous trust in the company, utilization of third party governance and/or display transparency showing that the company is worth trusting.

## Availability:

- How to make digital cash effectively available (physical access, devices/UIs, low price/transaction fees, privacy [?])

  SSA consists of developing countries with their main payment method being cash, as such there is a need to support cash as well as modern payment solutions (NRC/VISA/…). To support this, there needs to be a way to withdraw and deposit cash,

either through bank branches, ATMs, merchants or agents, for this to become successful, McKinsey points out that these withdrawal spots have to be within close proximity to become successful.

Majority of the population in SSA have mobile access, with a lesser percentage of them being smartphone access, which is why it's common for neobanks and M-Pesa-like solutions to utilize USSD, a network almost similar to that of SMS. The ideal solution would be to support smartphones with/without internet, as well as cell phones with USSD. The smartphone allows for better security since SMS can be read by mobile operators, who can also swap sim cards. Additionally smartphones allow users to circumvent the literacy issues of USSD by displaying pictures.

Mobile phones are quite affordable, varying by country and existing services like M-Pesa operate at affordable fees. Price for data as well as airtime can however be quite steep.

## Settlement:

- How to securely manage claims (IOUs, digital checks) and minimize their settlement risk (bounced checks)? (-> Asynchronous/off-line payments)

  Clearing houses

- How to provide netting of IOUs? (Requiring no settlement, but replacement of one set of claims by another set of claims.)

  Netting is not a *hard* requirement for a bank to meet, but it reduces the amount of transactions. A service would have to calculate the differences and compare the settlement dates, nullify both IOU's and create a new one with the difference.

## Security:

- How is control of funds/resources ensured such that
  - (a) only the right owner can control (transfer) it

Encrypted passwords/PINs or non-custodial wallets

- (b) the right owner has effective control over her funds (that is, it is not too complicated, too many rules to be abided by, other people required to get control, etc.)

  Non-custodial wallets. Obtaining effective control is difficult since it's such a regulated area which requires that many rules are abided by. New users and people with low financial literacy will find banking difficult, good UI and guidance can however be a key factor in converting these users from non-banked to banked.

# Product

## The problem at its core

The population in African countries are not financially included, most can see the benefit and have a desire to become part of the banking world but can't due to reasons such as

- Banking costs
- Banking locations (Not enough branches, too far away)

Majority of payments in SSA are cash based, mobile wallets are online. As such there is a discrepancy. How can a product support offline cash, while allowing for modernisation with mobile wallets?

## The problems M-Pesa face

- The agents need to deposit a large amount of money to provide liquidity. Zain's ZAP, an M-Pesa competitor, grew rapidly because their deposit requirement was at $60, but proved inadequate as it wasn't enough for a long term solution.
- Because m-pesa is backed 1:1 it's difficult for a merchant to become an agent.
- Agents take on a larger role by registering users, handling KYC, and educating users.
- Gathering an initial amount of agents is difficult without piggybacking off of an existing market

- Agents face a risk of being robbed - 25% of agents in Brazil were robbed within the last 3 years of a report, losing an average of $500 of their money
- Fees - a minor issue
- SMS / USSD is not secure, it's encrypted but phone operators can view all messages, as well as swap phone numbers.

## Solutions

As such I see that there is a potential market that does not revolve around utilizing agents, or at least not agents in this traditional sense where a brick-and-mortar store serves as the agent, which essentially makes it B2C.

I see two potential products (potentially more, depending on the country and their needs):

**1 - A product similar to M-Pesa but with free-roaming agents**

The largest drawback of the M-Pesa lies on the agents as listed at the start of this section. By allowing anyone to become an agent, 2 of the 5 problems could be removed, namely the need for a large initial deposit and the handling of new users. This also provides some other benefits such as:

- 24/7 transactions
- Less liquidity issues as the liquidity is spread between multiple people (Peer-to-Peer)
- Potentially less robberies as the two users can settle on where they meet

Drawbacks would then be:

- Secure communication through SMS/Internet/Bluetooth/Firechat and the costs revolving it
- Finding local agents
- Trust issues

**2 - The technical solution**

What this entails will have to be discussed once determined on a country, currently the agents are a drawback for the existing MPSs. This product could live on top of the current economy, but to serve as a bank the user should be able to withdraw cash which is where an agent or something similar is required. Examples of technical solutions could be:

- **Visa-solution**: Currently the amount of agents required to create a network is immense, their main purpose is to allow users to withdraw / deposit cash. By stepping away from a cash-based economy the amount of agents required would be significantly reduced.
- **Firechat solution:** If we settle on a dense country or city, an interesting approach could be to use firechat, a protocol that transfers messages between all the other users within reach of each other.This could be used to do transactions via bluetooth, or find local agents and do transactions over SMS/USSD
- **More** i,e.
    - Crypto-based
    - Asynchronous / eventually settled instead of connecting to a central server
    - (Wireless Access Point) WAP