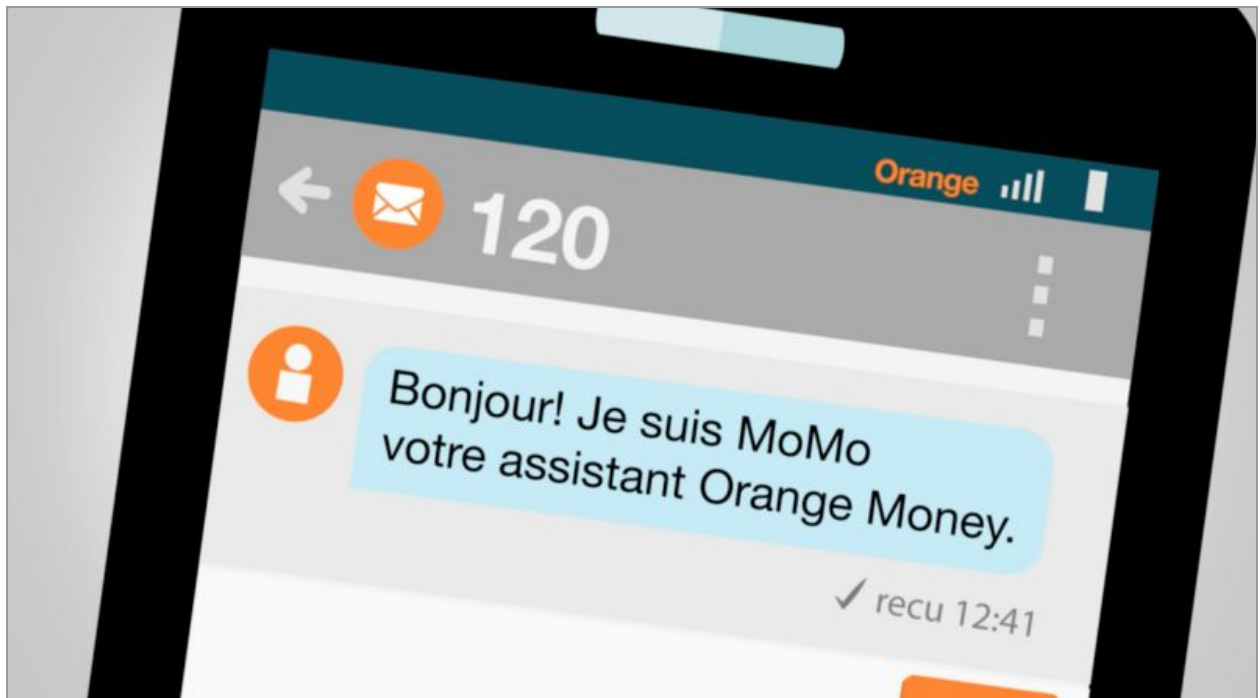


# MoMo: The Orange Money Digital Assistant



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## BACKGROUND

Two of every three adults worldwide are financially illiterate, meaning they lack the knowledge and skills to use their financial resources effectively for lifetime financial security. This staggering share of people is disproportionately concentrated in developing countries, where formal financial services and financial assistance programs are often lacking. Among the financially illiterate, women, the poor, and lower educated respondents are more likely to suffer from gaps in financial knowledge [1].

In Africa, there are very few resources available to access and learn about financial services. The resources that do exist, such as getting help from banks, present their own problems. Talking to a bank teller can be extremely intimidating for a number of reasons: the bank may be far from home, there is a lot of confusing paperwork and financial jargon, and you may feel judged for having a small balance. In addition to the many studies that support this, we have also seen this first hand while interviewing low-income people across Africa [2].

**Our company, Teller, aims to tackle financial literacy by bringing financial services into the hands of people in Africa, through integration with their favorite messaging apps.** We partner with financial institutions to launch an automated ‘chatbot’ that can simplify account opening, provide tips for first-time customers, and make getting help easier — all via messaging apps like SMS. Here’s how it works:

1. A user sends a message to an SMS shortcode or Facebook Page (e.g. “help”, “how do i open an account”, “nearest agent”, “fees”)
2. Our server receives that message and uses machine learning and natural language processing (NLP) to determine the user’s ‘intent’
3. We look up a response from our database to help answer the user’s question or walk them through an activity (e.g. “Let me walk you through how to apply for a loan. You will need...”)

*Note: this entire interaction takes place in the local language*

This case study covers the details of our pilot with Orange Money in Madagascar, one of the leading mobile network operators and mobile-money providers. Orange Money currently provides feature-phone enabled financial services to over 40 million customers, mostly in francophone Africa. Teller helped Orange Money launch “MoMo”, an SMS-based financial assistant that helps customers learn how to open an account, look up fees, check their balance, and access customer service.

## PROBLEM AND OPPORTUNITY

A recent report published by the GSMA indicated that only 23% of the population in Madagascar had a mobile money account in 2017 [3]. This percentage lagged behind other countries in Africa and indicated that there was still a learning and usage curve that was hindering adoption. While Orange Money already had several educational resources (such as a help line, local agents, marketing videos, etc.), we decided to focus on the huge opportunity for helping people learn more about Orange Money and open an account.

We considered a few different options and channels to target this problem, such as a mobile app, digital kiosks, tablet-based educational content, or some agent-based initiative. However, due to the combination of limited smartphone penetration (essential for deploying a mobile app) and limited resources for a labor-intensive initiative, we settled on a simple messaging-based assistant. Our goal was to make using a mobile-money account as simple as texting a friend — an activity most mobile phone users already felt very comfortable with [4].

***“Orange Money Madagascar is a fintech company driven by its mission: empowering unbanked customers by bringing them digital financial services. This is a very demanding journey that requires at the same time finding ways to inform and educate our customers while also being very efficient as our average revenue per user is pretty low. A chatbot over SMS and social networks is the perfect way to deliver both.”***

Erwan Gelebart, Head of Digital Products, Orange Money Madagascar

## MOMO CHATBOT SOLUTION

The solution we chose to build was a messaging-based chatbot that would automatically communicate with customers. We decided to name our chatbot “MoMo”, a shortened version of “mobile money” and a name that fared well in focus groups. People could chat with MoMo to learn how to open a new account, check real-time fees for different transactions, check their account balance, and talk to customer service.

These use-cases were the result of chatting with various teams in the Orange Money organization: digital products, customer service, technical infrastructure, and marketing. The use cases we prioritized addressed real customer questions and issues and were green-lighted by the security and compliance teams.

We chose to support two messaging channels: SMS and Facebook Messenger. SMS was a natural choice due to its ubiquity in the market and the fact it does not require any additional applications to use. We also chose to launch on Facebook Messenger to test more advanced features like buttons, rich media, and direct customer support. Both channels provided data that we could use to train our NLP model, add new content, and track engagement.



## IMPLEMENTATION AND LAUNCH

Our implementation plan required us to solve several problems:

- **SMS Gateway:** In many countries, sending an SMS is as simple as running a code snippet from a provider like Twilio, Nexmo, etc. In Madagascar, there were no companies providing an SMS API (the code snippet), so we had to build an SMS Gateway from scratch and integrate it with Orange's servers. This was incredibly challenging for a few reasons: (1) setting up an SMS server is a relatively niche skill, and finding the right talent was difficult, (2) testing SMS delivery from another country required creative workarounds and rock-solid communication, and (3) accent characters required special treatment that we had not expected. This process took us several months to figure out but also provided several benefits: (1) we saved money on messaging by paying at cost, (2) we could connect our chatbot to a shortcode (making it much easier to memorize), and (3) we could also add our chatbot as an option to the Orange Money USSD menu, improving organic discovery by customers.
- **Natural Language Accuracy:** A major challenge of any chatbot using natural language processing is training it to understand incoming messages. For example, think about how many ways there are to say your account is blocked: "My login isn't working", "I can't access my account", "I forgot my password", "I need to reset my PIN", etc. To deal with this issue, we slowly expanded access to test groups, before launching to all users. This ensured that as we went along, we could manually review and train MoMo to understand new messages and get smarter.

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Figure 1: A few variations of "Account Blocked"

We also encountered a few, smaller challenges:

- **Supporting Two Languages:** While we chose to make French our primary interface language, we also opted to support basic Malagasy (the local language). First, we trained our NLP model to understand simple Malagasy keywords for the most common prompts. Second, we wrote code to detect when a user was speaking in Malagasy, and if so, display a message in Malagasy offering them the ability to chat with a human customer service agent.
- **Enabling Conversation Handoff:** For our bot on Facebook Messenger, we offered the ability for customers to tap a button and instantly chat with a human customer service agent. This involved implementing a system to pause the bot and let a human takeover the chat.
- **Building a Custom Dashboard:** Before we migrated to a third-party analytics service, we built our own custom dashboard to record key metrics of our custom SMS Gateway.

The goal of our pilot was three-fold: (1) test to see if technologically, we could even build a functioning chatbot that worked over SMS and understood users, (2) observe how people interacted with it, and (3) train our NLP model. With these three broad goals in place, we came up with a strategic launch plan so we could ensure a smooth, stable, and secure product launch.

Launch Schedule	
<b>Phase 1: Focus Group</b>	Orange Money conducted focus groups to test assumptions, such as channel preference, use-cases, and messaging tone.
<b>Phase 2: Internal Staff Testing</b>	We refined our NLP model and got feedback from internal Orange employees.
<b>Phase 3: Pilot / Soft Launch</b>	We launched a pilot by quietly adding “MoMo” as an option on the existing USSD Menu. This allowed us to continue testing our scalability while refining messaging content and improving model accuracy.
<b>Phase 4: Broad Launch with Marketing Campaign</b>	After several months, we launched broadly with a TV, social, and online marketing campaign featuring a simple and effective explainer video.



Figure 2: Screenshot from Marketing Video

## RESULTS

After one full year, we can share a few high-level statistics about our chatbot.

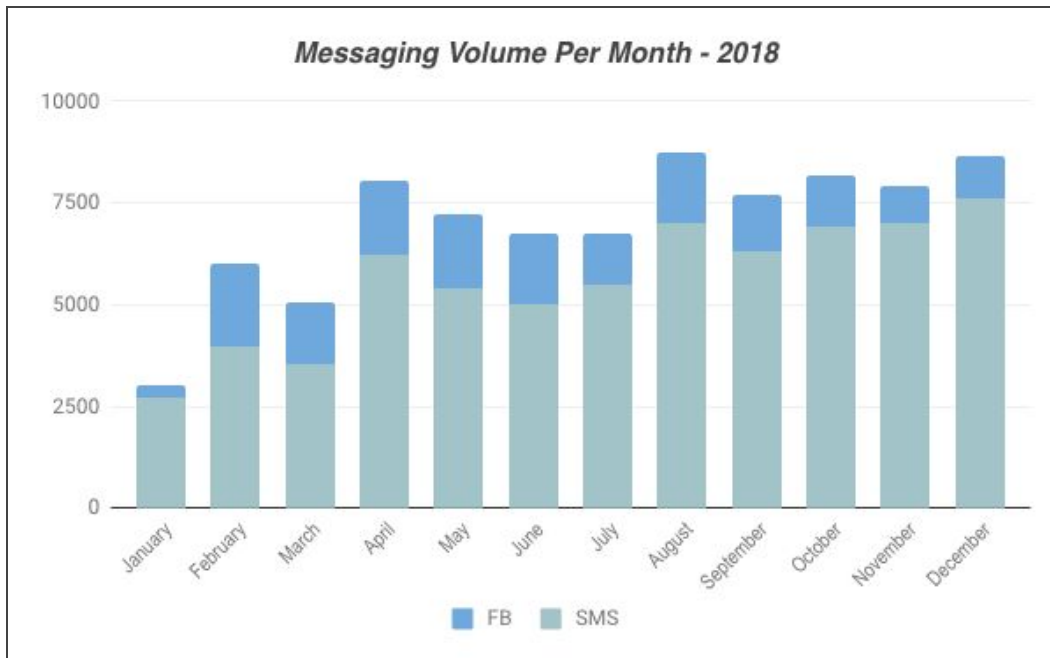


Figure 3: Messaging Volume

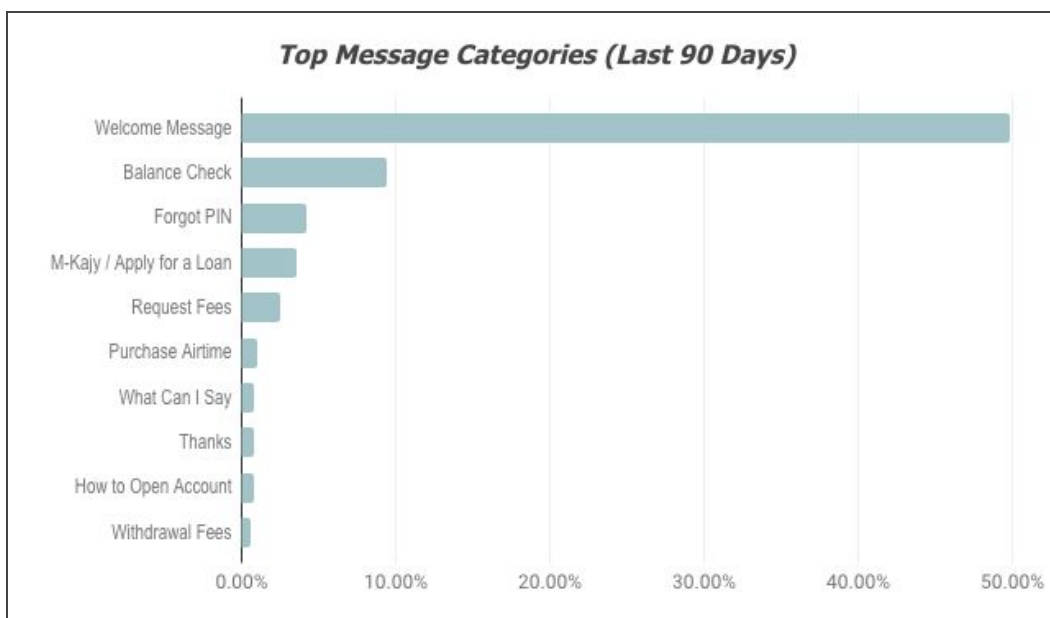


Figure 4: Top Messages

Metrics	
<b>Total Messages Exchanged</b>	<b>85,000</b>
<b>Total Unique Users</b>	<b>18,500</b>

<b>NLP Model Accuracy (Last 90 Days)</b>	<b>92.3%</b>
<b>[Just For Fun] "Thank You" Messages</b>	<b>550</b>
<b>[Just For Fun] "I Love You MoMo" Messages</b>	<b>12</b>

***"Our chatbot, MoMo, processes thousands of requests every month, representing a decent share of our overall interactions with our customers. I think we created the first fintech chatbot tailored for Africa. This has been achieved only because we worked with a startup and especially with Teller who proved to be an exceptional business partner. There is still a lot to do but I have to say the results exceeded by far my expectations. The journey only begins."***

Erwan Gelebart, Head of Digital Products, Orange Money Madagascar

Based on the goals we set for our pilot, it was a success. We proved our chatbot could work, gathered data on customer behavior, and trained our NLP model. These results allowed us to move our project from a pilot to a full commercial partnership. The overall usage metrics from this project have also been very encouraging for our first year in operation. Our next step is to connect usage to business metrics — in other words, track how interacting with MoMo affects account-level metrics such as transactions completed and retention.

## NEXT STEPS

As customers get comfortable interacting with MoMo, we plan on steadily adding new features and more integrations. One major update that we hope to make in 2019 is supporting WhatsApp, the preferred messaging channel for most people in Africa. Another goal is to expand to other Orange Money markets and leverage our pre-trained NLP model. As more and more people across Africa get access to mobile phones, we hope that Teller is able to help them conveniently access and understand financial services.

## SOURCES

[1] [http://gflec.org/wp-content/uploads/2015/11/Finlit\\_paper\\_16\\_F2\\_singles.pdf](http://gflec.org/wp-content/uploads/2015/11/Finlit_paper_16_F2_singles.pdf)

[2] <https://www.elixirr.com/2017/06/africa-the-unbanked-continent/>

[3] <https://www.gsma.com/mobileeconomy/sub-saharan-africa/>

[4] <http://www.pewglobal.org/2015/04/15/cell-phones-in-africa-communication-lifeline/>