



MOBILE APP DEVELOPMENT CASE STUDY

#1: BUILT A MOBILE APP ON IOS AND ANDROID TO BOOST THE CASHLESS ECONOMY OF AN AFRICAN NATION

Expertise: Business App | mCommerce Application

Verticals: Retail & eCommerce

Technologies: XCode | Android Studio | IOS | Swift | Android

CLIENT OVERVIEW

The client manages a leading mobile application that streamlines transactions happening across Nigeria. This mobile app empowers users to buy recharge cards, pay utility bills online, and even transfer funds to Nigerian bank accounts at an incredible speed. Moreover, the client has made sure the app even enables its users to register as one of its agents and offers multiple subscription services: PHCN, DSTV, GOTV, STARTIMES, etc. On top of that, the client has ensured that the app is used for transferring money to a Nigerian bank account and even for earning commissions on every transaction. Because of this app, the Nigerian population is stepping into the world of cashless transactions that are defined by convenience and speed.

BUSINESS NEEDS

The client had the vision of offering a mobile application that could strengthen the foundation of a cashless economy for an African nation. However, putting that vision from paper to the real world required more than grit; it required deep domain expertise. And that is what the client lacked. The client did not have the expertise in building a mobile application that would help people embrace an era of cashless transactions. To that end, the client was looking for an engagement partner that could help realize this vision. Some of the key business needs that the client had in mind were actually the features that the client wanted in its mobile app.

- Loading a recharge card on mobile at the push of a button
- Seamlessly sending recharge pins to friends and families
- Enabling payments from any Nigerian bank ATM card
- Paying bills and transferring funds in no time

STRATEGY AND SOLUTION

After multiple rounds of discussions, the client zeroed in on our mobile app development team. Our team has experienced mobile app developers with in-depth expertise in building applications from the ground up and modernizing them too. Our mobile app developers did a couple of brainstorming sessions with the client's business team to get an idea of what the free mobile recharge app would and would not do. Besides, our team even highlighted the importance of offering a secured environment to the app users who will transfer funds, do recharges, and make other financial decisions. Moreover, our app development team enabled an administrator function within the app to handle agents/user sales management modules. Last but not least, the app was engineered to have referral-code generation and sharing capabilities to let users earn credits.

User Experience

Our front-end team developed an intuitive and efficient user interface for the app. Before designing the app's UI, our team understood the client's expectations of the interface. Besides, we even asked the client about any specific guidelines that our UX team had to follow to create a design that would be in sync with the tonality that the brand followed. Here are some of the highlights of the UI that we prepared for the client's mobile application.

- ✓ Ensured that all app screens were responsive and opened blazingly fast
- ✓ Created dashboards for users and agents where they could track their wallet balance and purchase history
- ✓ Built the processes of buying recharge cards and transferring funds in a way that they did not face any slowdowns

Architecture

Thanks to our expertise in mobile app development, we delivered a robust architecture that ensured seamless, smooth, and safe transactions of funds. Our foolproof backend architecture brought down the chances of hacking to an all-time low. Here are some of the highlights of the architecture that we built for the client.

- ✓ Created a secure built-in app wallet
- ✓ Made sure that the pace of the transactions was consistently high
- ✓ Protected the app user's datasets - including name, email address, telephone number, and card details - from fraudsters and phishers

Development Process

We followed an agile development methodology to make sure that the app would go from paper to the leading app marketplaces at an unbelievably short turnaround. As the app was supposed to be designed for iOS and Android, the client brought our Android app developers and iOS app developers on board. Moreover, the team was consistently monitored by a dedicated project manager who ensured that the application went live as per the defined deadline and according to the client's expectations. Here are some of the highlights of the development process that we followed.

- ✓ Analyzed the scope of the project and gathered requirements as per the client's specifications
- ✓ Leveraged the information gathered from analyzing different project requirements
- ✓ Built a robust plan that would use different mobile app development frameworks for both iOS and Android
- ✓ Ensured that any on-the-fly requirements from the client's team were handled promptly
- ✓ Gave post-deployment support to the client after the app was successfully published on Android and Apple app marketplaces.

BUSINESS OUTCOMES

Once the app was published on App Store and Google Play, the client received an incredible number of downloads in a short space of time. Moreover, the client was so happy with our team's performance and dedication that it awarded a web development project to us as well. Here are a few top benefits that the client reaped once its mobile app went live.

- ✓ Streamlined the one-click payment process for most Nigerians with smart devices
- ✓ Built and strengthened the foundation of Nigeria's cashless economy
- ✓ Ensured that the funds were transferred between bank accounts securely and swiftly
- ✓ Made sure that the app functioned continuously and did not suffer downtime

CLIENT SPEAKS

“We are delighted with the app development team at Bytes. The team understood our challenges and helped us kick-start our journey of making Nigeria a cashless economy.”

#2: BUILT DIGITAL PAYMENT SOLUTION FOR A LEADING BANK IN TRINIDAD & TOBAGO TO EMBRACE THE CASHLESS ECONOMY

Expertise: e-wallet App | Instant Messaging App

Verticals: Finance & Banking

Technologies: ASP.NET | Java/J2ee | Swift | iOS | Android | Kotlin

CLIENT OVERVIEW

A leading bank in Trinidad & Tobago wanted people to go cashless and needed a digital payment ecosystem (mobile wallet) that would let anyone send, spend, receive, and manage their money with just their phones. The bank group is 184+ years old holding assets of US\$16.3 million and declared a net profit after tax and non-controlling interest of US\$195.8 million. The Group currently employs more than 6,058 staff in 23 subsidiaries operating in 14 countries. As a technology partner, we designed and developed a mobile wallet product that is hosted on MS Azure and offers the users social connectivity and nearby search features along with payment transactions.

BUSINESS NEEDS

Client was looking for custom digital wallet development services aiming to provide cashless payment solutions for both business and their customers. Client wanted wallet for both iOS and Android wallet apps for organizations to help them grow with an easy transaction process.

Client who is one of the reputed player in Fintech industry wanted core mobile wallet capabilities that would enable the users to securely and reliably send and receive electronic payments with appropriate participants in the mobile money ecosystem, constrained within national boundaries. Other than functional requirement client was very keen on supporting non-functional requirements, such as performance, availability, confidentiality, security, and usability characteristics necessary for the mobile wallet to meet the demands of its intended user profiles or roles (e.g., consumer, agent, merchant).

Client Was Looking For Below Main Functional Requirements:

- User registers and self-activates a mobile wallet
- Add amount to your wallet from bank account
- Get cash out Transfer value from mobile wallet to bank account
- Send wallet money to another consumer wallet
- Utilize the mobile wallet stored to pay business end cash wallet account
- Register one or more formal bank account(s) with the mobile wallet to enable funds transfer with financial institution
- List in process activities requiring action by the user to complete the specific business processes
- Get mini-statement Display balance and recent transaction
- Manage account Update information related to the consumer mobile wallet account

Client Was Looking For Below Main Non-Functional Requirements:

- People will only use digital wallet if the money held in a digital account is secure, and not subject to theft or unauthorized withdrawals. User will need complete guarantee that money will go only to the designated recipient, with a complete track of the transaction to enable user to prove that payment has been made or received.

- Robust. A digital payment system needs to be available for use as needed, like cash. Users should not have to be concerned about the system being down. As the number of users paying through this digital wallet grows, availability should always remain high and infrastructure wise and software wise it should be able to handle peak volumes.
- Cost to use the system must be very low, both from the standpoint of holding money as well as transacting.
- Convenient. The system needs to be easy to sign up for and use to support low literate consumers.
- Open. The system needs to be able to reach many (ideally all) counter parties for both making and receiving payments taking various financial and mobile service providers in the country.

Client Wanted Below Design Principles To Be Embedded In The Wallet Application:

- Irrevocability: The system should not specially manage transaction reversal by the originating party nor specify situations in which the liability for a transaction is passed from one participant to another. This does not mean that there should be no consumer protections: for example, the consumer should be able to make an inquiry into the status of a transaction, or lodge a complaint with their provider about an unauthorized transaction
- Tiered KYC: The system should be able to tiered "know your customer" (KYC) that allows for usage of digital wallet by end users to level of use. Users lacking proper identification and financial documents can only open basic accounts, and the risk related to these accounts may be handled by putting strict maximum account balance and transfer limits. This will not only help increase volume through usage by the low income group, at the same time keeping proper levels of fraud control.
- Payment standards: The system should adhere to internationally accepted payments standards (such as ISO 20022) rather than implementing system-specific, proprietary standards. Methods of development of different modules of the system by participants or other parties should also be enabled through open application program interfaces (APIs).
- Immediate funds transfer: Funds should be available to the payee in near-real time, providing immediate notification of payment from the payer to the payee- logically necessary to replace cash, which is another form of immediate payment.
- Open loop: Open-loop system will be able to have interoperability through the direct participation of all providers- Mobile, banking and Non-Banking financial service providers.
- Push payments: The system should effect push rather than pull payments.
- There should be no barriers to an individual's discontinuing use of the system

STRATEGY AND SOLUTION

- To successfully redefine the digital payment paradigm, the client wanted to establish a strategic partnership with a trusted partner. That way, the client wanted to streamline how it was overcoming the challenges. To put the project from conception to completion, the client teamed up with our mobile app development team. Along with the client's business team, we brainstormed on the app's features that will cater to its audiences comprising customers and businesses. Below, we have mentioned the key highlights of the project's front-end and backend.

Frontend

Developing an easy-to-use user interface for merchants and customers

- Creating a chat window where customers and businesses can communicate
- Building an interface where sending and receiving payments is fast and secure
- Enabling customers to find businesses based on categories
- Helping customers to book a tab in a hotel or restaurant at a high speed

- Empowering businesses to deliver unified brand experiences with a few taps

Backend

We helped the client build digital payment innovation that would weed out any friction points while strengthening security, improving convenience, and accelerating speed. Our backend developers used Microsoft.NET as the framework to build a robust foundation for the digital payment ecosystem. Here are a few highlights of the backend that we deployed for the client.

Development Process

We took this work as unique and custom, keeping the process very personalized for the product. We followed the below process:

- Understanding and Analyzing requirements: We commenced the development process of mobile wallet by conducting a detailed research about the market. We analyzed the existing wallet apps globally and to understand the current trends and requirements of the users in the market. The research also helped us with the risk management process to understand challenges while proceeding with the development process. We also discussed on the right audience for wallet app and had discussion with the team of end users to get feedback on the requirements and needs from a mobile wallet app. We also reviewed the rules and regulations of the payments and banking industry in the T&T. Every country has its compliance and we it in detail.
- Freezing scope and development challenges: Developing a wallet app requires skill and experience. We had developers from fintech experience with a strong background on the payment gateways and financial transactions.
- Wire Framing, study of App Data and User Experience Design: Designing was one of the critical juncture of the development of a wallet app. We focused on creating an attractive and engaging user experience with the principle in mind that great design will help attracting the targeted audience as User Experience plays a significant role in the efficiency of a wallet app because it involves money and security. We started with creating the wireframes of the app, visualizing app data flow, screens and data fields. We used tools like Balsamiq or Sketch to create wireframes. Professional designer from Bytes worked on entire design of the app as UIUX (User Interface User Experience) is the key factor in retaining the user base.
- Code engineering: In this phase we worked with the concept of Minimum Viable Product. Here we added all the features to Minimum viable product (MVP), test it, and implement additional functionality of the product with improvements. Developers integrated all the third-parties and databases, and bring the digital wallet to life.
- Working on Third Party API: Third-party integration helped to create an e-wallet app with a lower investment of time and money. Therefore, developers widely use various frameworks, APIs (application programming interfaces), cloud solutions, and SDKs (software development kits). The ready-made tools and third-party codes simplified the project's work and allowed to get a high-quality application in a much lesser time.
- Manual, Automated and User testing: We applied testing services: covering the entire life cycle or joining at any stage. Our QA engineers used a wide range of test design techniques, from manual testing to automated tools and writing scripts:
 - Functional testing that evaluates the compliance of a component or system with functional requirements;
 - Interoperability testing to determine the compatibility of wallet;

- Loophole testing to ensure that there are no loopholes, deficiencies, or security flaws that could be exploited;
- Penetration testing to protect the app against outside attacks and find any weak points; and
- Non-functional, change-related, structural, and other types of testing.
- Integration of Application monitoring and Analytics
- Publishing Application on the stores: When wallet was successfully developed and tested, it was the time for delivery and launch. We place the mobile wallet in the app stores.
- Users Data Analysis for Improvisation: Once app was placed in app stores, we and collect early user reviews for product analysis.
- Maintenance and Support: After release, we provided client with professional maintenance to ensure the best possible interaction between wallet and user. Technical support covered various services, such as general system updates, program code correction, or security management. Android and iOS get updated regularly, wallet should answer this challenge, so we have to release new system versions on time. We made sure that wallet worked correctly across devices and platforms, support the latest OS versions, and continually improve the user experience.

BUSINESS OUTCOMES

As the engagement drew to a close, the client had the app ready to take T&T's consumer world and commercial landscape by storm. Once the app got released for businesses and consumers, the community became all set to introduce a new level of digital in the way it buys and sells commodities and services. Here is the list of benefits that the client reaped once the project was successfully deployed.

- Making cashless transactions a possibility by banking upon payments made via QR codes. QR code-enabled digital payment systems, combined with strong growth in mobile phone penetration in T&T, enabled government strategic initiative, accelerating the replacement of cash with digital liquidity, including receiving and sending payments electronically.
- This project played a key role in expanding T&T government mission to give access to financial services by enhancing the reach of digital payment services in poor and rural areas
- This digital wallet solution helped major financial institutions in country for strategic planning and execution of financial solutions for poor people, while stimulating the adoption of efficient and low-cost digital payment solutions.
- Allowing the user to self-issue a mobile wallet and account reduces the barriers to financial inclusion without compliance becoming a major challenge. Credit risk is reduced for all financial institutions, as all accounts are prefunded.

CLIENT SPEAKS

“The team at Bytes has the right set of digital capabilities to build a digital wallet that has streamlined how cashless transactions happened in T&T. I am so happy with the final digital product and would recommend this team of experts to anyone who is looking for professionalism with deep digital expertise.”

#3: CREATED A WEB-ENABLED SECURE TRANSACTION ECOSYSTEM TO HELP A SERVICE PROVIDER PROCESS ONE-CLICK PAYMENTS

Expertise: Web and Enterprise Portal

Verticals: Finance and Banking

Technologies: WordPress | Apache/Linux

CLIENT OVERVIEW

DIXIPAY is an innovative electronic payment service provider offering financial services globally through the internet, depending on the latest IT technology in this field. Their services include credit cards, prepaid cards, e-wallet payments, online money remittance, and e-commerce service.

BUSINESS NEEDS

Our client came up with an idea of launching a payment system that should allow individuals to open accounts free of charge, in order to send and receive money from their friends and families via the internet, pay bills or purchase online from any merchant or internet shop worldwide at any time. The platform enables users:

- All in one stop shop payment system
- The most comprehensive reporting system
- Unique fraud prevention solution
- Secure payments worldwide with multiple payment methods
- The most effective risk management system for the business

STRATEGY AND SOLUTION

Bytes developed a one-stop shop innovative payment platform with the highest security; As for the corporate customers and online business, we offer turnkey solutions to accept payment and credit card online through flexible merchant accounts, which in turn provide the maximum comfort and safety for the buyers, and of course, the highest rate of sales for merchants.

Front-End

Our team's continued research and development allowed us to develop efficient, user-friendly and features rich, interactive payment service compatible web portal, as per the desired frameworks and technologies. Our design team put their best efforts to build a unique UI-design as per the client expectation. The front-end of the web portal offers the features as per the set objectives of the client, such as:

- ✓ User-friendly irrespective of the age or background
- ✓ Multilingual and responsive web portal
- ✓ Readable network - write up in a way that enhances ease of reading

Backend

Using more than a decade-long expertise our dedicated team of developers made use of industry best practices to deliver robust, scalable and flexible service web portal, we came up with the solution after

passing through various stages of business analysis, solution implementation, and customization. DIXIPAY offer features such as:

- ✓ Safe and secure bank wire transfer
- ✓ An easy and safe way to add funds to users' account using DIXIPAY prepaid cards.
- ✓ Businesses can accept payment online
- ✓ Facilitate multicurrency processing and settlement

Development Process

Bytes' team of high-profile e-commerce developer was involved throughout the project development, including business analysis, development, integration, testing, maintenance, and support. To keep the customer abreast of project progress, our team had calls with the customer and his team, as well as presented reports and demo-versions on a regular basis.

- Analyze the objective and gather requirements according to the client specifications.
- Using the information gathered from the requirement analysis phase, we put together a plan for the development of web portals like technology, CMS integration, and API for instant fund transfer.
- Web designer created one or more prototype designs for the portal. We closely worked with the designer, exchange ideas, until we arrived at the final design for the web portal
- The challenging points of the development process were discussed collectively and resulted in a variety of approaches to problem resolution.

BUSINESS OUTCOMES

The developers worked on the project with proper planning, frame applicable online strategies. By making use of the appropriate front-end and backend development tools and technologies, we developed a multilingual electronic payment system, where collaboration and value realization is assured for all the stakeholders. We were able to offer:

- One-click payment process
- Recurring payments system
- All services are provided in privacy and confidentiality
- Web fingerprints and device identifier-fraud prevention solution
- Virtual terminal - Real-time processing for mail order/telephone order
- Multiple users can access the virtual terminal at the same time and much more

CLIENT SPEAKS

“AWESOME!!! Well done.”

#4: BUILT A P2P ONLINE MONEY LENDING PLATFORM THAT RAKED IN A POST-LAUNCH INVESTMENT OF OVER \$100M

Expertise: Application Development | Finance Application

Verticals: Finance and Banking

Technologies: ASP.NET | IIS/Windows | C# | Web Services | MS SQL Server

CLIENT OVERVIEW

Klickstart is an online marketplace for loans, connecting willing borrowers and investors with each other. They offer an efficient, transparent and simple platform that allows borrowers and investors to transact on mutually acceptable terms.

BUSINESS NEEDS

The Client was looking for software development professionals for the design and development of a highly responsive web portal for borrowers and investors, which radically transform the way lending and borrowing, is carried out in India, with following features:

- User- friendly, Interactive UI
- Assurance of the quality of services
- The seamless connection where the borrowers and investors providers can easily communicate
- An efficient, transparent and customer-friendly medium that offers borrowers low-interest rates and investors better returns

STRATEGY AND SOLUTION

The web portal has been crafted to offer a seamless user experience and allows managing all the things on the single platform. The designing team put their best efforts to build a highly feature-rich, interactive platform with unique design as per the client expectations.

Front-End

Our dedicated front-end developers and designers build a responsive web design with unique highly and feature-rich platform as per the client expectations. The front- end of the web portal has different sections for Investors/Borrowers, EMI calculator, reporting with stats, type of loans and eligibility. It offers functionalities as per the set objectives of the client, such as:

- The easy and fast registration process
- Seamlessly connection between the borrowers and investors
- Registered users can be the part of the peer-to-peer money lending system.
- The borrower, as well as Investor, can post their application and make offers.

Backend

Our experienced .NET development team worked on the project with proper planning, frame applicable online strategies developed a robust, fast and easily accessible platform with the following features:

- EMI Calculator to ensure producing right output for the borrower

- Mechanism of background check and verification of borrower's and investor's profiles

Development Process

As the customer approached Bytes with a clear vision of the solution, the development process was organized in the cost and time-efficient way. The team was involved throughout the software development stage with on-going integration, testing, maintenance, and support

- During the system analysis phase we design the system architecture and database in such a way that it could perform fast execution, on the other hand, it could also perform data integrity and security
- Using the information gathered from the requirement analysis phase, we put together a plan for the development of web portal like technology, CMS integration, third-party API integration, modification and migration of the data among others
- Web designer created one or more prototype designs for the portal. We closely work with the designer, exchange ideas, until we arrived at the final design for the web portal
- Our development team uses the Model-View-Controller (MVC) architectural pattern to implement a user interface that separates an application into three main logical components: the model, the view, and the controller.
- The challenging points of the development process were discussed collectively and resulted in a variety of approaches to problem resolution
- Our dedicated front-end and backend developers complete the functionality of forms or scripts as well as testing for last minute compatibility issues

BUSINESS OUTCOMES

As a result of our best efforts, the platform continued to become more user-friendly and come closer to delivering the perfect user experience. We were able to deal with each of these challenges and delivered the project with all the perfection within the desired time period. The platform is controlled by a highly organized administrator panel and offer:

- Easy accessibility and good value for money
- The quality and delivery of care, a great deal better
- Within few months of the web portal launch, huge traffic was recorded as; 43 Investors, 247 Borrowers, 19.09% Average Interest Rate Per Annum, 10,12,50,000 Investment Amount Offered, 34,48,95,000 Loan Amount Requested.

CLIENT SPEAKS

“Bytes Team is highly sportive and technical. When it comes to communication from the start to end it was fantastic and we are very happy with the final delivery. They have professional approach and we look forward to working with them in the near future. We have built a strong relationship with the team at Bytes and we recommend them. Thanks Bytes!” ***- Gaurav Mittal Owner, Klickstart.com***