Acolyte Order Dispatch System

Real-time multi-channel order updates for an on-demand delivery service



Project Overview



The Product

Acolyte is a Central Pennsylvania-based on-demand consumer goods and food delivery service with a client facing app. Customers can browse products, purchase items, and have them delivered. The fulfillment of orders is performed by independent drivers, using a separate driver app.



Project Duration

September 2021 to December 2021.



Project Overview



The Problem

Customers and drivers are experiencing miscommunication and a latency in updates during the ordering process.



The Goal

Designing and implementing an order dispatch system to keep both the customer and driver updated on the status of each order in real-time.

Understanding The Users

- User Research
- Personas
- Problem Statements
- Journey Maps

Research Summary



We conducted interviews and created empathy maps of both drivers and customers. While both user groups had certain differences, their issues primarily centered around the lack of clarity and communication in the current system.

A common request that was consistently brought up was the need to real-time order updates on both the customer and driver side.

Customer Pain Points



Confirmation



Receipt



Updates

The user needs confirmation that the order is being processed after placing it. The user needs a proof of purchase and order details.

The user needs to get updates on the status of their order.

Driver Pain Points



New Order



Complete Order

Drivers need to know when a new order has been placed so that they can fulfill it. Drivers need to have a way to signal to both the user and other stakeholders that the order has been fulfilled.

Customer Persona: Katarina Aetos

Problem Statement

Katarina is a Gen Z college student who prefers the convenience of ordering groceries online but finds Acolyte's delivery experience frustrating due to a lack of timely order updates.



Katarina Aetos

Age: 21 years Education: High School Graduate Hometown: Orlando, FL, USA Occupation: College Student "I'm always super anxious when ordering through Acolyte. I have no idea where my order is or when I'll get it. It's like way smoother to just head down to the store.

Goals

- Less cluttered navigation and layout for easier browsing and checkout.
- Streamlined ordering process and timely delivery updates.

Frustrations

- "Somewhere during the process, I start to feel lost about where I am."
- "Why do I feel the need to keep twiddling my thumbs till my order arrives?!"

Katarina is an undergraduate student attending classes in the local college at Tradroe, PA. She has a heavy course load as a junior and can't find the time to pick up groceries and other essential items between classes or during her study hours.

Acolyte claims to provide a "fast and hassle-free" delivery service but their app doesn't provide a optimized user experience. Katarina would like to be routinely notified of any order updates or milestones so that she can focus on other pertinent tasks.

Driver Persona: Abel Robinson

Problem Statement

Abel is a delivery driver who is committed to providing a seamless and timely delivery experience to his customers. However, due to Acolyte's confusing order dispatch system, he is unable to fulfil his customer's orders optimally.



Abel Robinson

Age: 29 years Education: College Graduate Hometown: Baltimore, MD, USA Occupation: Freelancer "I want to get my customer's items to them as efficiently and as fast as possible. If the app can't facilitate that, I'm not sure if it even makes sense using the platform."

Goals

- Quick order acceptance combined with optimal controls during deliver.
- Straightforward order acceptance, updates, and delivery confirmation.

Frustrations

- "The controls are so muddled that I'm not certain about what to tap on after each step."
- "I need to have some sort of a time limit available so that I can adhere to it while delivering."

Abel Robinson is a freelance journalist who delivers food items during his off-hours. He lives in the small town of Tradroe, PA and as a result, is able to deliver packages quickly, no matter which part of town he is in. Furthermore, Abel is aware of several landmarks and apartments around the town which allows him to complete deliveries on time, if not ahead of time.

His frustration arises from the current usability of the Acolyte app which greatly diminishes his need and the utility of the app.

Customer User Journey: Katarina Aetos

Mapping Katarina's user journey revealed how helpful it would be to have timely order updates via the app.

Persona: Katarina Aetos

Goal: Purchase item(s) using the Acolyte app and have it delivered

ACTION	Get App	Select Item(s)	Purchase Item(s)	Track Order	Receive Items
TASK LIST	A. Download app B. Set up account C. Confirm location	A Browse Items B. Find desired items C. Add items to cart D. Adjusted item quantities based	A. Review items B. Initiate checkout	A. Check app for pertinent order updates B. Review order details C. Contact driver for delivery instructions	A. Anticipate wait time between 30-45 minutes. B. Pick up items when driver arrives; rings or knocks on apartment front door.
FEELING ADJECTIVE	Curious to find food and consumer items	Happy that it didn't take long to find desired items	Anxious as there are multiple steps to go through before finalizing purchase	Happy that the order went through successfully and that it can be tracked.	Stressed until order arrives. Relieved to finally receive items.
IMPROVEMENT OPPORTUNITIES	Offer discounted promotions for recruiting new users	Advertise newly introduced items up front	Add a way to reduce number of steps by saving customer-related information	Periodically send push notifications on dispatch updates. Add textbox for delivery instructions.	Offer in-app real-time driver tracking.

Driver User Journey: Abel Robinson

Mapping Abel's user journey helped us determine the intricacies of what he would need to successfully complete a customer's order request.

Persona: Abel Robinson

Goal: Deliver item(s) to customers in a timely manner using the Acolyte Driver app

ACTION	Get App	Receive Order Notification	Accept Order	Pick up Items from Warehouse	Deliver Items to Customer
TASK LIST	A. Download app B. Set up account	A.Check app for available delivery requests. B. Review delivery locations and additional order details	A. Accept order based on order details and delivery convenience B. Contact customer for additional delivery details (if needed)	A. Review items in order B. Pick up ordered items from warehouse C. Verify picked up items	A. Drive items to customers locations following appropriate traffic laws and regulations. B. Deliver items to customer.
FEELING ADJECTIVE	Happy that the set up process didn't take long	Focused when analyzing locations for fast and optimal delivery	Anxious as there is a timer that starts upon acceptance of order.	Anxious when verifying items from warehouse to ordered items displayed in app	Stressed about the customer being home to pick up order. Relieved when they do pick up order
IMPROVEMENT OPPORTUNITIES	Have an onboarding video to walk through general usage scenarios	Provide estimated delivery time up front based on driver's current location	Add a way to add a limited number of 5 minute increments to the timer	Make it easy for the driver to quickly access ordered items once delivery request is accepted	Offer minor perks/points to driver in the form of potential free items for completing each delivery

Designing The Customer App

- Paper Wireframes
- Digital Wireframes
- Usability Studies

Paper Wireframes

Taking the time to draft iterations of various screens in the app on paper ensured that the elements that made it to digital wireframes would be optimized when addressing user pain points.



Stars were used to mark the elements of each sketch that would be used in the initial digital wireframes.

Digital Wireframes

As the initial design phase continued, we made sure to base screen designs on feedback and findings from the user research.

> Users can view pertinent order details and their address and payment details on file before they purchase the items. Furthermore, if required, they can choose to quickly edit their personal/sensitive details.

Acolyte ORDER DETAILS ORDER DETAILS Doritos Cool Ranch Doritos Cool Ranch Quantity: 2 Cleaning Supplies Clorox Disinfecting Wipes Clorox Disinfecting Wipes Quantity: 1 TOTAL 14.0 Subtotal Delivery 327 McElwain Hall State College, PA 16802 PAYMENT ON FILE Expiration: 08/25 Complete Your Purchase Imme Acolyte	9:41		.ıll 🗟 🔲
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CLEANING SUPPLIES Clorox Disinfecting Wipes \$4.5 Quantity: 1 TOTAL 14.0 Subtotal 10.3 Delivery 3.0 Tax 0.66 DELIVERY ADDRESS 327 McElwain Hall State College, PA 16802 PAYMENT ON FILE Expiration: 08/25 Complete Your Purchase Froducts Cat		CHIPS Doritos Cool Ranch Quantity: 2	\$5.79
TOTAL 14.0 Subtotal 10.3 Delivery 3.0 Tax 0.6 DELIVERY ADDRESS 327 McElwain Hall State College, PA 16802 PAYMENT ON FILE Expiration: 08/25 Complete Your Purchase Home Products Cart		CLEANING SUPPLIES Clorox Disinfecting Wipes Quantity: 1	s \$4.59
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Users are able to view the number of items in their cart no matter which tab they are currently browsing.

Digital Wireframes

It was crucial to provide visual context to the user about updates to their order and also a way for them to verify delivery details.

> Once a user successfully places an order, they can view all details including delivery and item information. Furthermore, if they want to specify additional delivery instructions, they can contact the driver assigned to their order



This helps display progress through a sequence of logical and numbered steps and also provide transient feedback.

Usability Study: Findings

We conducted two rounds of usability studies. Findings from the first study helped guide the designs from wireframes to mockups. The second study used a high-fidelity prototype and revealed what aspects of the mockups needed refining.

Round 1 Findings

Users want to filter items so that they can find products easily.



Users should be able to cancel an order after they have placed it.

Round 2 Findings



Users want multiple payment options for quick and easy order placement.

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Users want push notifications for order updates.

Designing The Driver App

- Paper Wireframes
- Digital Wireframes
- Usability Studies

Paper Wireframes

It was crucial to create a simple user flow for drivers to accept and deliver orders in a timely manner. The initial paper wireframes helped us to evaluate various avenues before performing usability studies with potential drivers.



Stars were used to mark the elements of each sketch that would be used in the initial digital wireframes.

Digital Wireframes

As the initial design phase continued, we made sure to base screen designs on the evaluations generated from the paper wireframes.

Users can view key order details such as the address and number of items before accepting the delivery request

9:41	.ul 🗢 🔲	
♦ Acolyte Driver	8	
New Pending	Complete	
ORDER #16544 327 McElwain Hall 3 items	Accept	
order #16543 468 Coolidge Ln 7 items	Accept	
ORDER #16542 21 Bush Ave 2 items	Accept	
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Drivers are able to quickly toggle between different order states. In addition, a notification badge helps them ascertain the number of new and pending orders

Digital Wireframes

The driver is able to view pertinent details when they accept a delivery request. The layout in the screen is similar to what a customer is shown when they place an order.

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		ORDER		
			CHIPS Doritos Cool Ranch Quantity: 2	\$5.79
			CLEANING SUPPLIES Clorox Disinfecting Wipes Quantity: 1	\$4.59

A driver can tap this button when they finally deliver an order. The placement of this button is intentional so as to deter any false

Usability Study: Findings

We conducted two rounds of usability studies. Findings from the first study helped guide the designs from wireframes to mockups. The second study used a high-fidelity prototype and revealed what aspects of the mockups needed refining.

Round 1 Findings



Drivers wanted a way to preview additional non-sensitive order details before accepting an order.



Drivers wanted a more intuitive way to accept orders in order to avoid any unintentional clicks.

Round 2 Findings

- 1 Drivers wanted a flagging/reporting feature for undeliverable orders that were not residential addresses or outside the delivery range.
- 2 Drivers wanted a timer feature after accepting an order so as to gauge appropriate delivery time limits.

Developing an Interconnected Solution

- The Goal
- Process Flow
- Technologies

The Goal



Status Updates



Real-Time



Multi-Channel

Users need a confirmation that the order is being processed after placing it.

Updates need to be reflected in real-time to keep the user up-to-date.

Multi-channel communication: This means Email, SMS, and updates on the app UI.

Process Flow

Diagram visualizing sequence of activities.



Technologies

We chose technologies that would allow us to implement our solution fast and smooth by leveraging specific benefits of each decision.

Firebase Services API Services Image: API Se



Cloud Functions to handle the dispatch of each event

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Firestore to provide real-time updates in application UI



SendGrid for sending order confirmation receipt

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/onage to communicate order updates via SMS

Implementation

- Cloud Functions
- Firestore DB
- Email
- SMS

Cloud Functions



We used **Firebase Cloud Function Callables** to make authenticated contextualized requests directly from the client. Doing this instead of allowing the client to directly mutate objects ensures integrity in the ordering process.

We defined 3 functions that would act as the core of the order processing system. To start the process, a customer places an order, calling the **createOrder** callable. This creates an order and notifies the driver of a new order.

"The Cloud Functions for Firebase client SDKs let you call functions directly from a Firebase app." Firebase Documentation

Cloud Functions



submitOrder()

Creates a new Order object in Firestore DB, giving us more control over orders.

Sends email confirmation & notification.

acceptOrder() Updates order status in Firestore for real-time update in UI and sends notification to customer, notifying their drivers name and

ETA.

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completeOrder()

Updates order status in Firestore for real-time update in UI. Hands over event to post-sale.

Firestore DB



By using Firebase Firestore database we gained a few advantages right out of the box. Firestore is updated in real-time and synchronized across all connected devices allowing us to provide live updates in the app.

Firestore and Firebase Functions are integrated and works seamlessly together. This made it easy for us to buth present relevant data in UI, but also control the order processing flow from our cloud functions.

"Cloud Firestore uses data synchronization to update data on any connected device."

Firebase Documentation

Email



Receiving a receipt or proof of purchase was important to the customer. We solved this by using **SendGrid** to send the user an order confirmation email directly after placing the order. This was triggered directly by the submitOrder cloud function.

SendGrid API is simple to use and allows for pre-defined templates to be populated by referencing a template ID and passing it data. This makes it easy to change the email designs in the future.





A large part of the notification system was achieved by using the **Vonage SMS API** to send text messages to the customers and drivers. They offer many flexible services and a simple API that we called in our cloud functions.

When the submitOrder cloud function was called the system dispatched an SMS to the driver to notify of a new order. When the driver accepted the order with **acceptOrder** the customer gets sent an SMS with the drivers name and ETA.

Results

- Demos
- Summary

Demo: Submit Order

When a customer completes a new order they're taken to the order page. Here they will see real-time updates in the order stepper.



Demo: Submit Order

When the customer submits an order, the driver app receives a real-time notification showing that order. The driver can then accept it and finally complete it. This is updated in real-time for the driver and customer.



Summary



We intentionally kept the scope of this case study limited to the order dispatch system. There are many other parts we did not mention, such as auth and e-commerce solution, that were foundational for the order dispatch system to work.

We reached our goals of building a solution that keeps the customer and driver updated in real-time. Users now have a clear communication strategy from start to finish when ordering products.

Thank You!