Case Study: Closure.med

Elizabeth Grigg

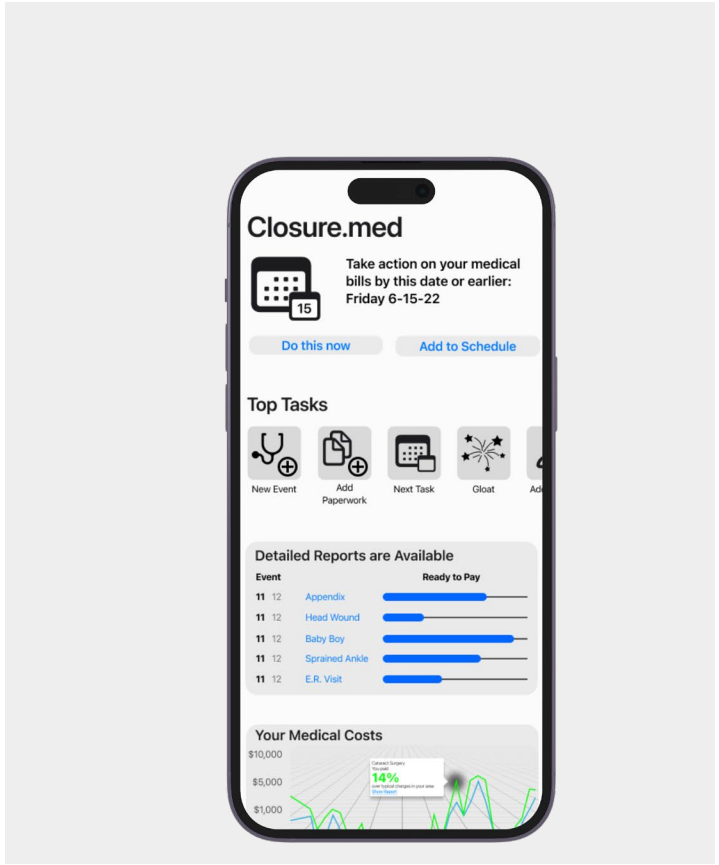
Project overview

The product:

Smartphone app to help any U.S. consumer of hospital services to better organize, understand, and pay their hospital bills.

Project duration:

Early 2022 - Present



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Project overview

The problem:

For hospital bills, consumers do not know the costs, and the bills arrive well after the date of service. Some of the bills arrive but should not be paid, yet, or ever – especially those that say “This is not a bill.”

The goal:

Closure.med will keep hospital bills organized and give consumers confidence their bill is “ready to pay” – meaning the app has performed a series of checks.

Project overview

My role -

All parts of UX:

Researcher

Designer

Usability Tester

Product Manager

Responsibilities:

Define the product

Research customer pain points

Storyboard major scenarios

Wireframing, including early, low fidelity digital, and mid fidelity digital

User Testing

Information Architecture

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Understanding the user

- User research
- Personas
- Problem statements
- User journey maps

User research: summary

Research was done for Closure.med during early definition of the product, as well as later with a fully "functioning" paper prototype.

During the early definition, the research goal was to discover customer pain points and gather enough information to develop one or two key personas. One early assumption was that a main feature of the app would be to actually pay the hospital bill, duplicating the features of the bank or Venmo. This turned out to be not as interesting as the organization and the recommendations engine side. My subjects were concerned about staying organized, not repeating work they had already done, and "not getting ripped off."

During the later research, the goal was to discover how well does the product work? The main result was a change to the information architecture. Instead of organizing the app by function, it was better to organize the app based on reports like a dashboard. All issue resolution is now done from the report, which acts like headquarters for all tasks available from that medical event.

User research: pain points

1

Pain point

Lack of transparency for what this service costs.

2

Pain point

Delays in billing, bills out of sync, and delays in between insurance and provider billing.

3

Pain point

Noticing mistakes such as payments not going through as promised from the insurance company.

4

Pain point

The healthcare system needs to do better coordination between sub-systems. The cross-checks are not happening, lowering confidence that the bill is accurate.

Persona: Dan

Problem statement:

Dan is not a naturally organized person. He needs help double checking the medical bills for his family.

Dan

Age: 45
Education: Bachelor's in Forrestry
Hometown: Billings, MT
Family: Married, 2 kids
Occupation: National Parks

"It would be really easy for them (hospitals) to say 'The last 20 times somebody came in here with a hole in their hand like yours, the bill was this.' "

Goals

- Staying a responsible consumer, even while he or a loved one is sick or injured
- Remembering what the heck any particular piece of mail is about, months later

Frustrations

- Lack of transparency for what he might be charged
- Delays in billing, made worse when different bills are out of sync

Dan is careful, if not a little suspicious, when any money is leaving his wallet and that includes healthcare. He is a bit of a maverick. He has been known to ask hospital administrators "How much will this all cost?" while being admitted with an injury.

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User journey map – Dan – Part 1

Dan likes being walked through a remedy for the issue that the app has found.

Persona: Dan

Goal: Handle a bill that comes in late for an event Dan doesn't remember happening

ACTION	Pay the bill as best he can	Dan gets a bill at 90 days	Dan looks at the app for guidance	Dan calls provider	Bill is fixed and paid
TASK LIST	Tasks A. As per the Will scenario above, paper bills and EOBs come in, B. Dan photos them, emails them to the app, C. When the app says ready he pays the bill.	Tasks A. Open mail B. Shake head in disbelief C. Take photo and send to bills@closure.med like all the others, wondering what will happen since that folder was reconciled	Tasks A. The app tells Dan to wait for the EOB for this new service (anesthesia) B. A couple weeks later, the EOB comes in, Dan photos and sends in to bills@closure.com C. The app switches status from "Wait" to "Ready"	Tasks A. Dan accesses the reconcile flow for the anesthesia bill. The overlay points out that the provider is charging more than the insurance company expects an in-network company to charge. The app provides the phone number to call. B. Dan calls the provider and has all info at his fingertips thanks to the app, the provider agrees to adjust the bill to the lower in-network price C. Dan uses the red pen tool and writes that info on the provider bill "called Wanda and expect new bill for $500 instead"	Tasks A. Dan gets the updated bill in the mail from Wanda at the Anasthesia's office for the dollar amount they discussed ($500) B. Dan photos the bill and sends to bills@closure.med C. Folder is still marked Ready, Dan opens the Reconcile flow, gets out green pen tool on the new bill and marks "Reviewed - OK" on the friendly overlay near the $500 as this is the expected amount for in-network according to the EOB in that same folder. Dan pays the bill through a paper check. (Dan.)

Google

User journey map – Dan – Part 2

The app has helped Dan remember what hospital events have happened, by having him set up the Event and picking a Photo

FEELING ADJECTIVE	This is harder for Dan than Will, based on personality. Dan gets **cranky** and needs a lot of cajoling from his wife to take these photos and then finally ice cream as a reward.	**Upset**, he paid that bill. **Mystified**, as he does not even remember what he needed anesthesia for on Dec 12 2019 anymore (Appendix, but it's the app's job to remember that)	**Anxious** not about the bill but about forgetting about the bill, fortunately the app has a reminder system	**Afraid** to make this phone call but reassured he has all the info he needs.	**Victory**
IMPROVEMENT OPPORTUNITIES	Neither the app nor Dan know that another lone, rogue bill is coming up. The app might be able to set expectations better eg "Some bill might still come in and here is what to do" - Find a good way to remind people of their accomplishments of reconciling the billing for an event / paying a bill, while at the same time letting them know they are still within say 1 year of the event and bills can still happen. **Accessible app notifications** perhaps?	Make more prominent the user flow for late bills or bills that have already been reconciled. Perhaps an alternate email address late-bills@closure.med, so Dan feels like his situation is on the right track. Some kind of calendar view of medical incidents might be helpful too - ensure it is **viewable onscreen as well as printable** and exportable to standard calendar apps	Reminder system if time has gone by and nothing has happened. Has Dan done the tutorial about how to call the provider if there is an issue? This tutorial was developed in **high contrast colors** so can be seen even in the early hours while Dan is in his truck waiting for his shift to start.	You can't **use the phone and look at it at the same time**, so being able to print this handy information is key. What if a printer is not available? Would pencil and paper work? It would be cool if closure offered a service where they could leave an automated voicemail with this information to the provider after the call. Dan could just call Wanda and say he was going to initiate an automated call to her, so she would know what to expect.	The status of Ready is not completely correct during the correction phase, but this is a detail it might be more confusing to split this hair.

Persona: **Name**

Problem statement:

Will wants the file management he currently does to become automated, so he can save time.

Will

Age: 51
Education: Bachelor's, English
Hometown: Framingham,CT
Family: Bachelor but large family close by
Occupation: High school guidance counselor

"You have to be super organized and have reminder systems and tracking systems and filing systems - I don't think the average working person has the time."

Goals

- Know before he pays the bill, is the bill accurate?
- Closure, such as if there is an issue he is waiting for, is it resolved?

Frustrations

- Delays in the system and delays in between systems
- Holding each system accountable
- Disparate systems don't talk to each other

Sandwich generation Will has cared for his young niece, his sister, and his aging parents' hospital bills ranging from short to long term, minor to serious, and is a role he plays in his family due to the experience and expertise he has gained.

Google

User journey map – Will – Part 1

Will is the kind of person to print everything out and use different colored pens to make his notes.

Persona: Will

Goal: Know the accuracy of the hospital bill before he pays it

ACTION	Define the visit	A bill has come in	An insurance EOB "this is not a bill" has come in	Reconcile	Pay bill
TASK LIST	Tasks A. Using the app, give the hospital visit a name such as "Appendectomy" B. He gives the folder a start and end date. C. He sees that there is a folder in the app waiting for paperwork.	Tasks A. Open the bill, take a photo, and email the photo to bills@closure.med B. The app wakes up, places the bill in the folder C. The app flags the folder "Not ready to pay"	Tasks A. Open the EOB, take a photo, and email the photo to bills@closure.med B. The app wakes up, places the EOB in the folder, and flags the folder "You can have a look now" C. Other bills and EOBs have also come in from the various providers involved in the appendectomy.	Tasks A. The app has read the bills and EOBs and created a friendly overlay for each line item. "2 rolls Gauze," CPT code 12345, diagnosis code 6789, billed $20, insurance paid $0, This was expected as you are still meeting your deductible. B. Will can skim over all that and look at the totals. Billed $6000, insurance paid $5,400, he owes $600 across three providers. C. Will can use an in-app green pen tool to create a checkmark to remind himself he reviewed this and thinks it is ok. (Green check mark visible in front of folder).	Tasks A. The app has provided a cheat sheet for Will's reconciled accounts so he can set up just those payments from his bank. B. Those payments include provider name, account number, address, in a way he can copy and paste into the banking website he uses. C. Will completes this process of making this payment electronically in a system he is comfortable with, alongside his regular bills.

User journey map – Will – Part 2

The thought of using a mobile app to do something with this complexity, is unimaginable

FEELING ADJECTIVE	Even though that was just a few days ago he can hardly remember who he saw, what their names are, or how many people might have been involved. **Frustrated** and helpless.	Satisfied, organized, **proud**	A little **overwhelmed** and hoping for the right moment when he is calm and able to think.	Was a little **concerned** he had an outstanding balance but was thankful it was explained in a helpful way. Wielding that green pen. Glad he didn't have to use the red one.	**Relief** at getting this crossed off and also this folder can stick around in the app for his records.
IMPROVEMENT OPPORTUNITIES	Even with no bills yet, our app should be able to provide typical financial and staffing stats on the procedure and a place to store the pre-authorization. For people unfamiliar with the terminology there should be a youtube video explaining all these **terms that has CC localized** in languages common to H1B Visa holders in the US.	How long will this go on? How many bills will there be? The app can provide a little game showing how the game of paying insurance usually works (drag/drop/win!) to familiarize yourself with the process and help stave off the anxiety of knowing there is a bill you have not yet paid. Simple "what you can do in the meantime" checklist eg get provider phone numbers together (**various accessible formats**) in case there is an issue and you have to call them.	The timing of when to have Will look in the folder might be tricky. Too early he might miss a bill, too late and creditors might call. Maybe switch the flag to "have a look" at 45 days as a rule? Or switch the flag to "have a look" if all the rows line up with EOBs even if earlier than that? The "have a look" indicator should be delivered visually, audio, through app notification (**honoring phone accessibility settings**) and through text notification (having broad adoption across devices).	This friendly overlay has a lot of edge cases especially when providers might make a mistake, how to show that clearly to Will? How to coach people into getting brave to make a phone call that the provider may have made a mistake? Good material for another little game that Will can play while waiting for the rest of the bills to come in. The games should be super easy "among us" level difficulty in terms of task and always have **voice and finger gesture** winnable paths.	Ability to pay from an FSA or HSA account, or link to a tax app. Ability to set up another individual as an "on behalf of" administrator for your info (not legally binding). Ability to let a third party drive the app for you if you need to show them something and are remote, for example, if this was Will's Mom having a procedure and **she is technically illiterate**, she can have Will breeze through her phone to check things during their weekly call.

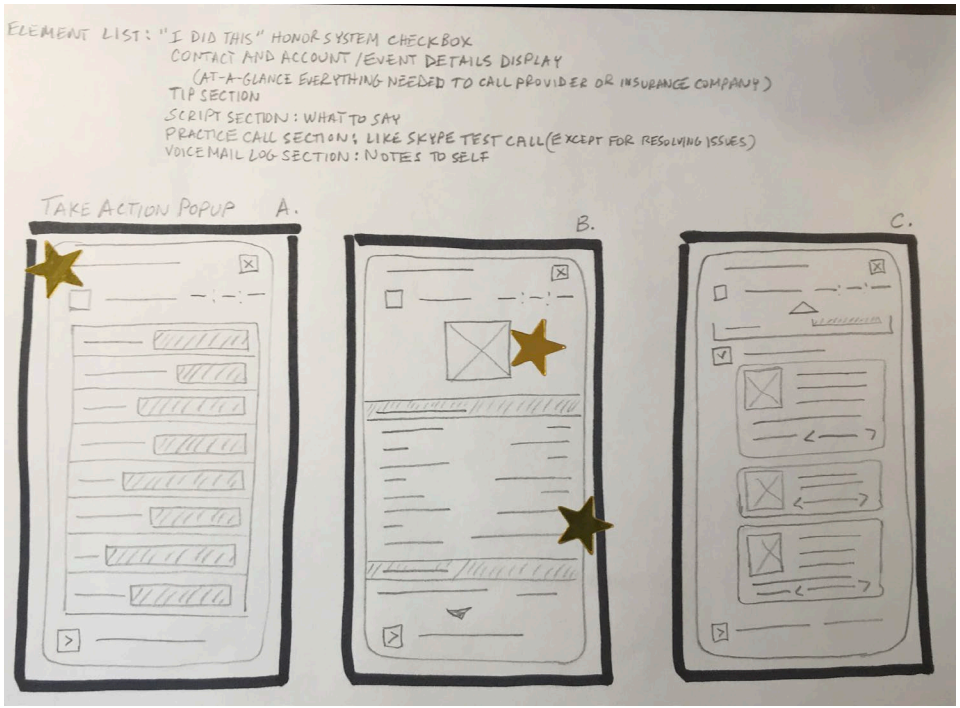
Starting the design

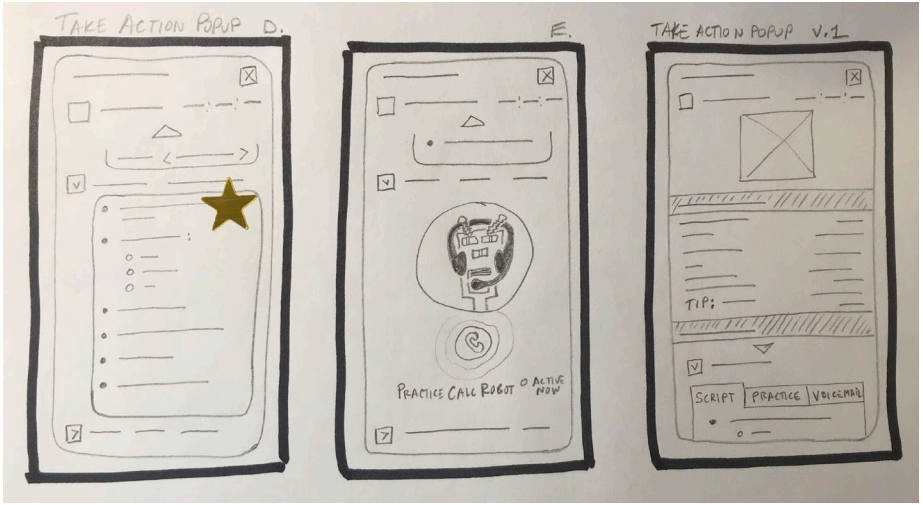
- Paper wireframes
- Digital wireframes
- Low-fidelity prototype
- Usability studies

Paper wireframes

The stars are next to elements that worked, and were kept for the final version.

This character is an AI robot you can talk to, to practice calling your provider. (Not kept)

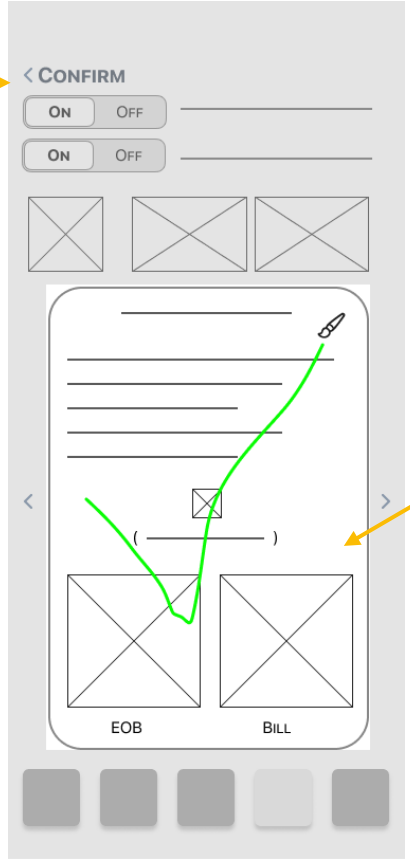




Digital wireframes

The original app design before the paper prototype review relied on a Confirm screen as an important step in the app flow. Confirm had a nav button at the bottom of the app.

Using ms-paint style markup, the user is declaring to the appp "I've reviewed this and don't want to fix the problem." The user has a good reason to approve this, such as the dollar amount being not worth their time.

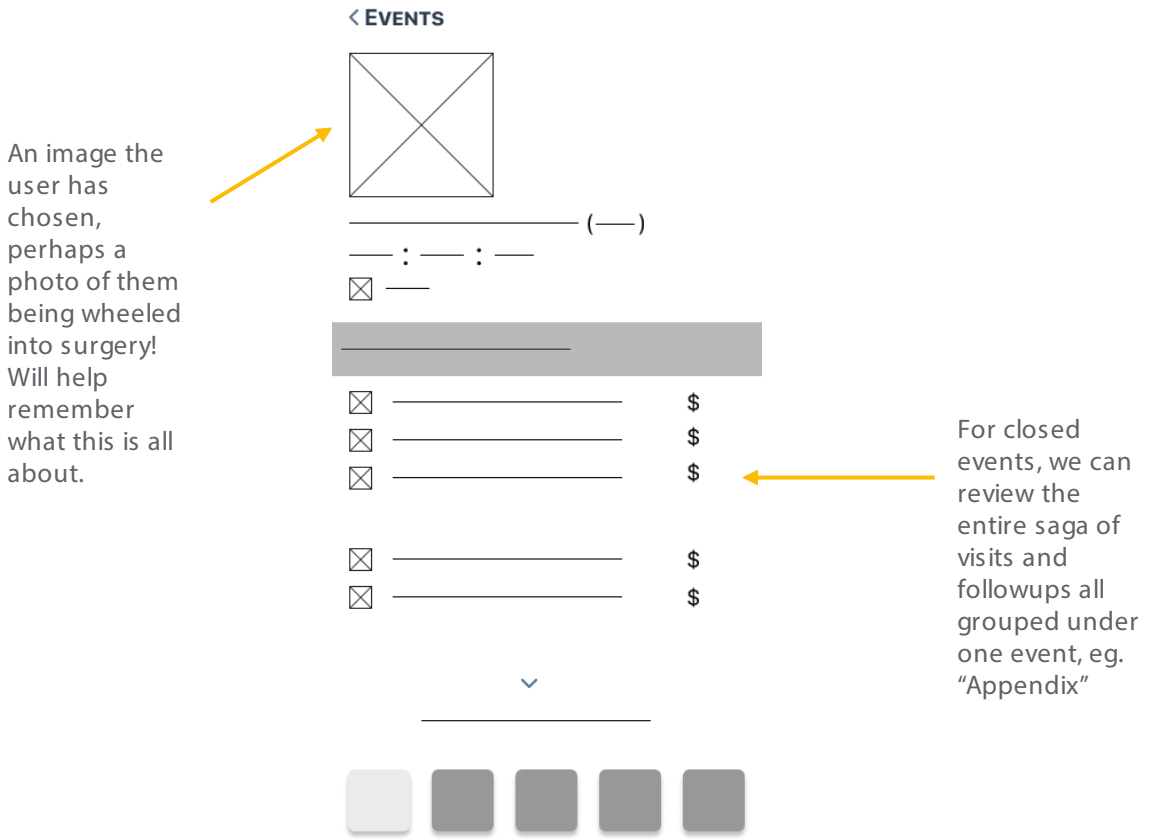


Using pinch.zoom interaction, the user can see where the line item for the EOB compares directly against the line item in the bill.

Google

Digital wireframes

One of the best parts of the design was saved for the finish line in the original design. After the paper prototype review, this report view is given center stage.



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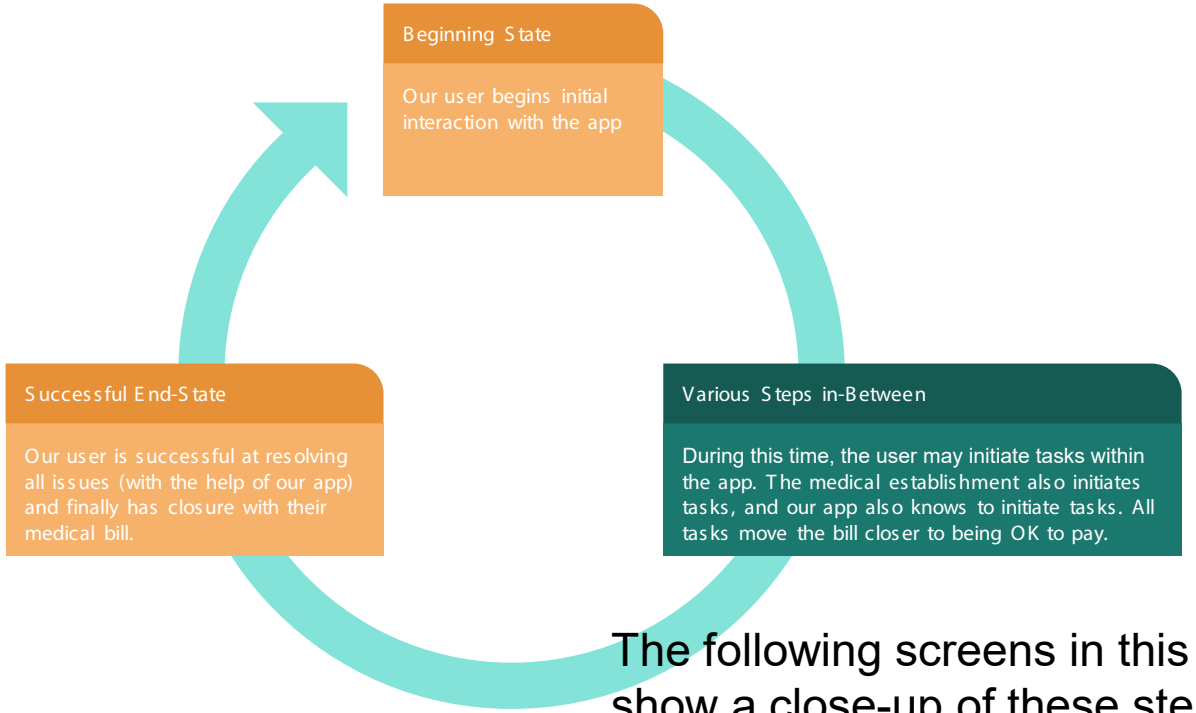
User Flow Diagram for Closure.med

How to understand this presentation



The following screens in this presentation show a close-up of these steps.

Beginning State

There are 3 ways to initiate an Event in Closure.med

1. The Home page has a large New Event button
2. With location services turned on, our user will get a txt reminder after a few days if they have visited a medical facility in our database.
3. If our user gets a bill or an EOB in the mail and accesses our Paperwork feature, the service date will be detected as not matching other events and will wait in the user's cloud storage system for a New Event to be created

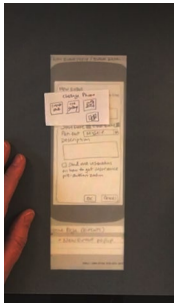
A medical event is not necessarily what a medical billing professional might call it. It is anything a patient might call it. For example, the user might remember he sprained his ankle. This event might span several visits and an emergency room trip and physical therapy afterward. For closure.med, that can all be one event: "Sprained ankle."

Beginning State

"You visited Valley Memorial Hospital on 3/2/2022. Would you like to create a new event to manage billing and insurance for you or a loved one? http://closure.med/txtyes/idnum36014A620J3"

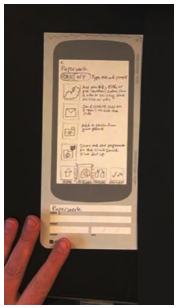
Get txt msg

2.



New Event Popup

Home Page



Scan EOB or Bill

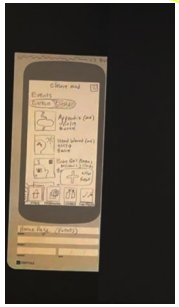
Paperwork Page **3.**

repeat

Physical Mailbox

EOB arrives in mail
Or
Bill arrives in mail

Home Page



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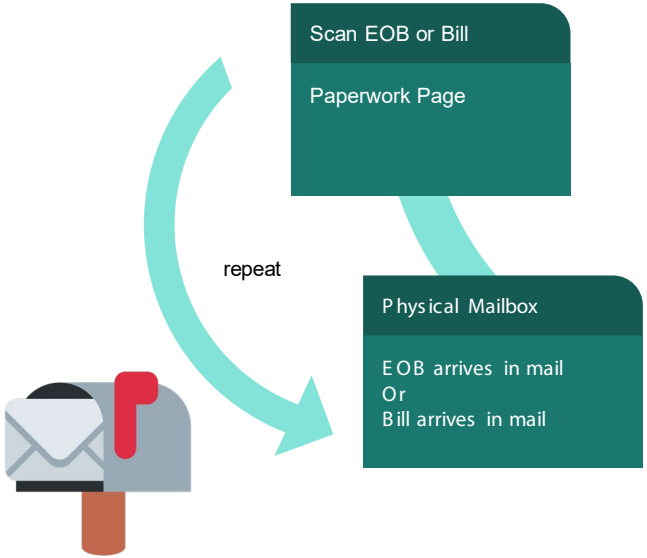
Intermediate State



Default waiting time for all the paperwork to arrive is 45 days. This can be customized in preferences.

Until that time has elapsed, the user's job is to keep an eye on the mailbox and scan any bills and EOBs that come in. The paperwork page of the app has many ways to capture and organize this information safely.

Our end goal is the user sits down to pay the bills for this event once, rather than let it drag out over time.

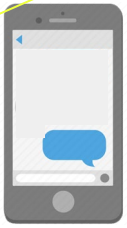
Almost There

The user goes puts bills through a guided review process before paying them.

1. The Compare page allows users to “let slide” any differences in naming between line items that are called something different on the EOB versus the Bill, but are really the same thing and are not an issue.
2. The Confirm page shows all issues for the user’s review. This includes unreimbursed items, unbilled items, and items that have different amounts than expected from either party. Any issue that the user decides needs to be fixed will put the bill back into the Not ready to be paid state.
3. Finally, if all issues are resolved, the user is presented with the info they need to pay the bill.

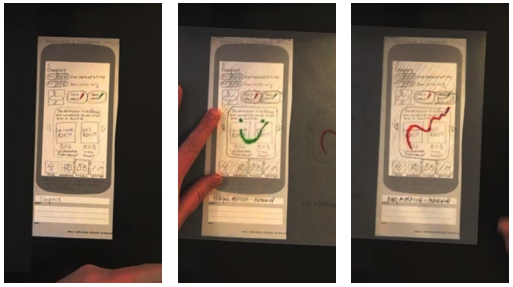
Another end goal is to help users advocate for billing corrections or incorrect insurance reimbursements. We use OCR scanning and great organization to help them be effective over the phone to resolve issues in their favor.

Almost There



"Your bills for your Appendix are ready for you to compare with EOBs and double check for any issues. http://closure.med/txtready/idnum36014A620J4"

Get txt msg



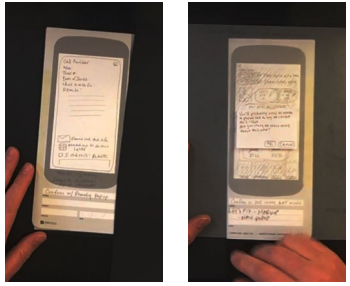
Match up Line Items

Compare Page

Pay bill

Cheat sheet
Provider info

3.



Fix Issue (if selected)

Call assistance
Cheat sheet
Provider info

Review Issues

Confirm Page

2.

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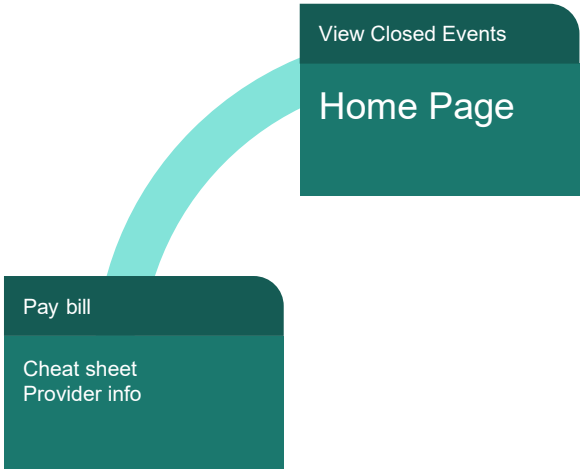
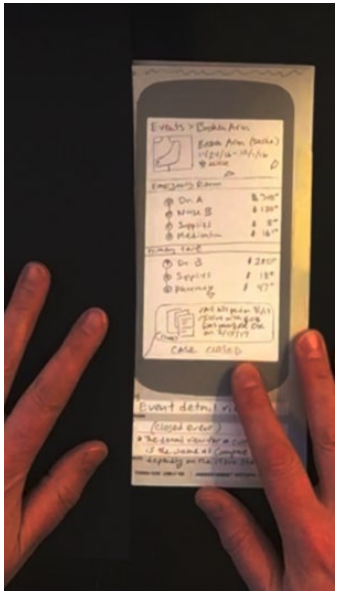
End State



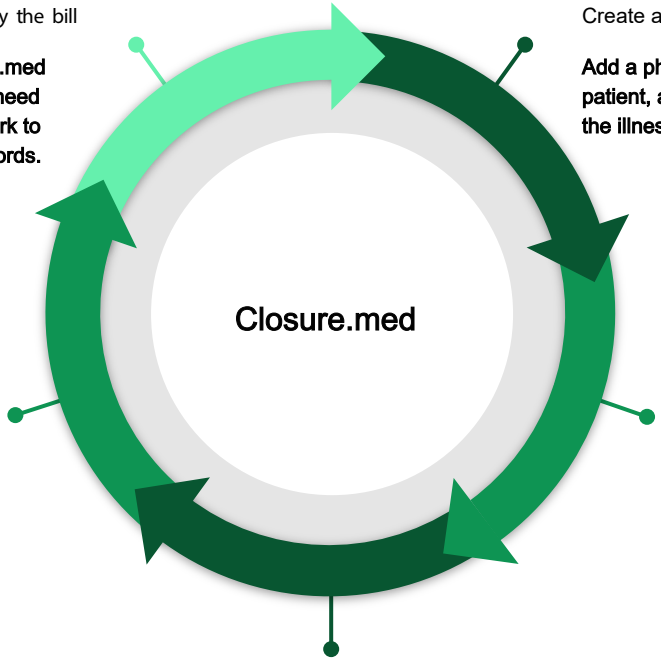


After the bill is paid, from the home page, the user can see an overview of medical events for which billing is closed (yay!) and also medical events for which billing is still in progress.

The closed events is helpful as a reminder and record of payment.

Closed events is the victory lap for the app and the user both!

Challenge: Design a client billing app for a Hospital



Create a new medical Event

Add a photo, name of patient, and start date for the illness or injury.

Add Paperwork

Scan, save, email, or photograph your bills and EOBs right to your existing cloud service. File the paperwork in the right folder for your Event.

Begin guided review

If enough time has passed, or if we have enough paperwork, it's time to make sure all the line items match up. Closure.med will pull each line up for you side by side and help you decide if there is an issue.

Double check and fix any issues

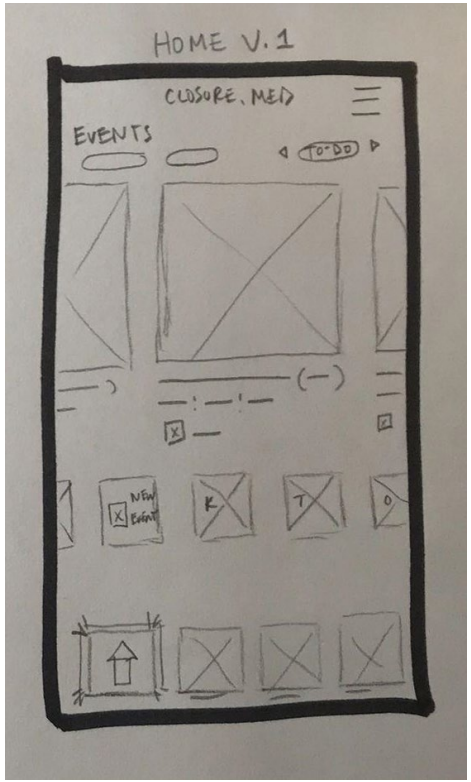
Sometimes insurance companiess or providers make mistakes. Closure.med will help you find them. Better, we will help you fix them with cheat -sheets on who to call, what to say, and how they might fix it.

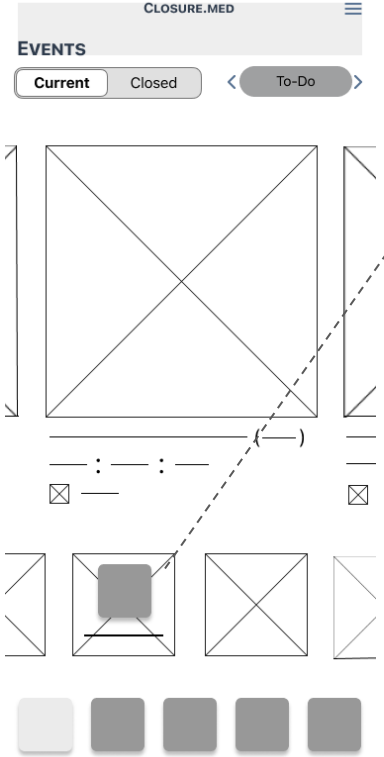
Pay the bill

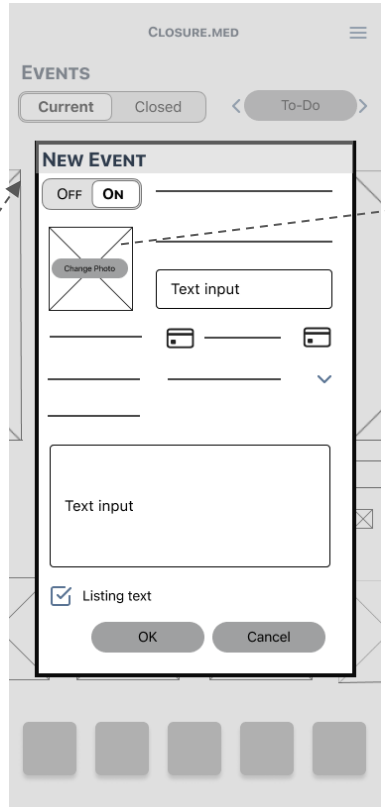
Once all issues are resolved, Closure.med shows you a quick guide on info you need to pay your provider, and a checkmark to keep a log of the payment for your records.

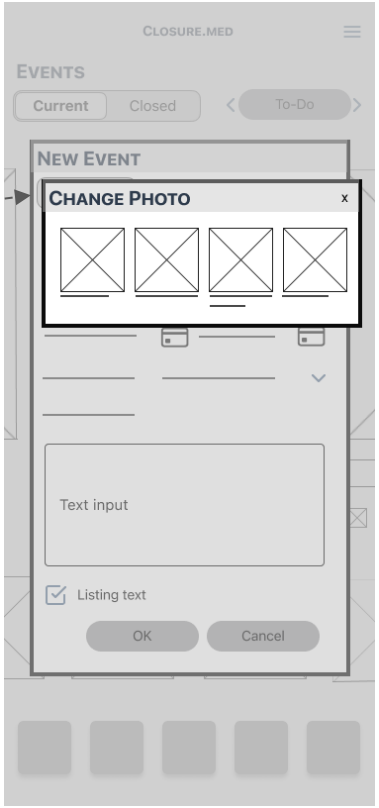
Here is some background on the product

Home Page

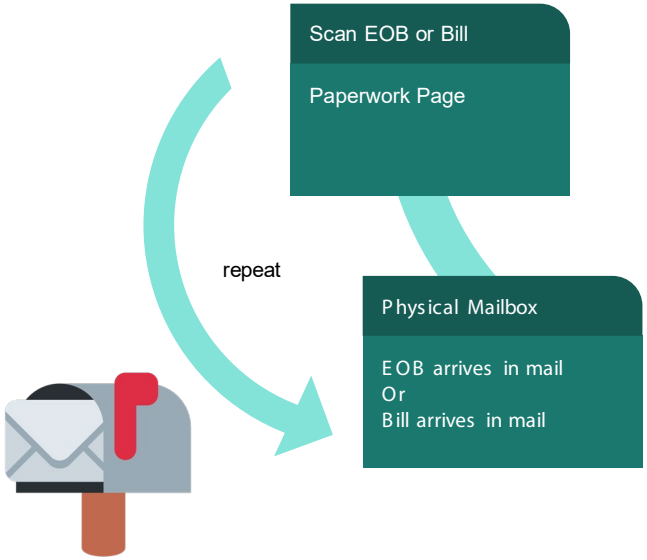

HOME V.1
CLOSURE.MED
EVENTS
TO-DO

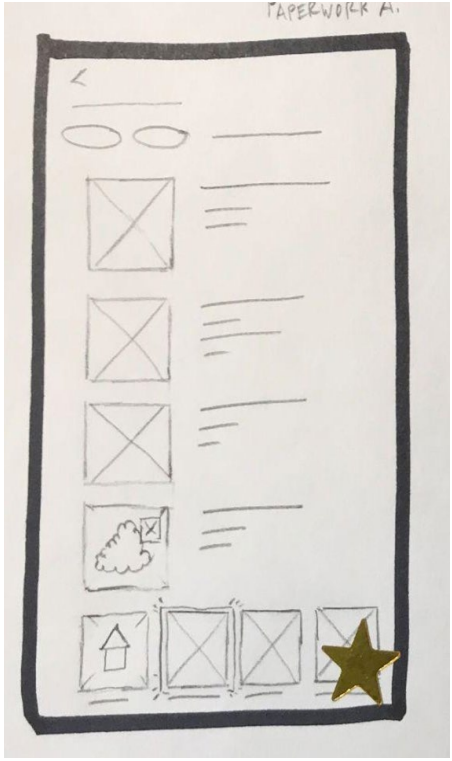

CLOSURE.MED
EVENTS
Current
Closed
To-Do

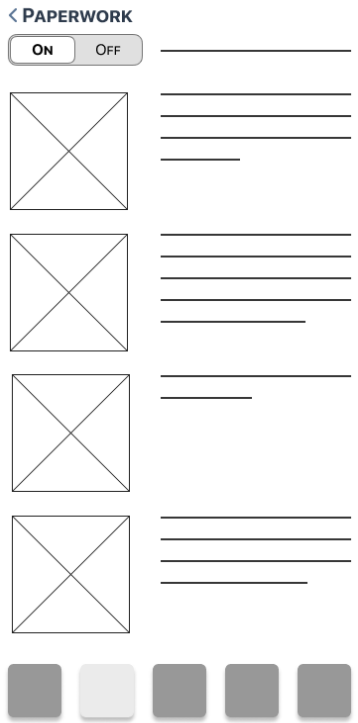

CLOSURE.MED
EVENTS
Current
Closed
To-Do
NEW EVENT
OFF
ON
Change Photo
Text input
Text input
Listing text
OK
Cancel


CLOSURE.MED
EVENTS
Current
Closed
To-Do
NEW EVENT
CHANGE PHOTO
x
Text input
Listing text
OK
Cancel

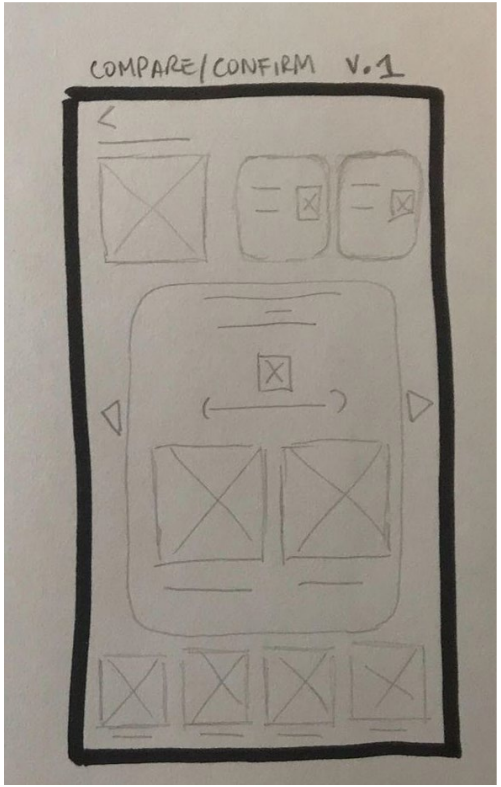
Paperwork

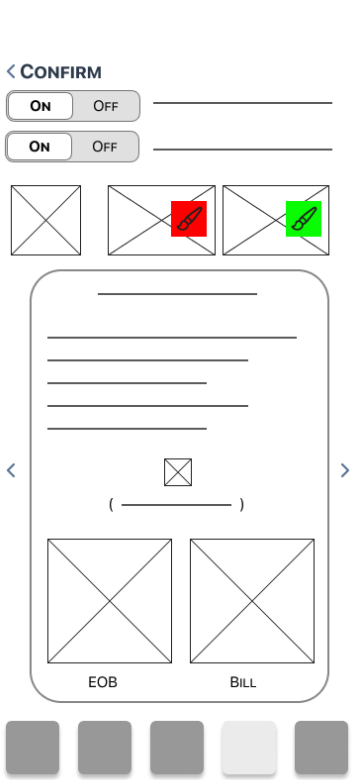

Scan EOB or Bill
Paperwork Page
repeat
Physical Mailbox
EOB arrives in mail
Or
Bill arrives in mail




PAPERWORK
ON
OFF

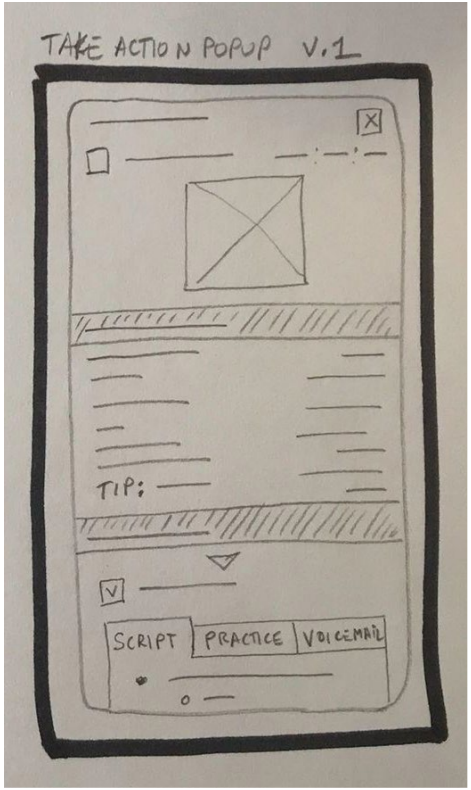
Begin Guided Review with Compare and Confirm

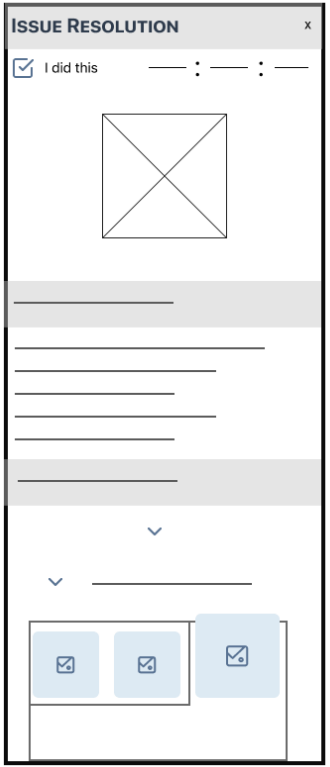




Double check and fix any issues

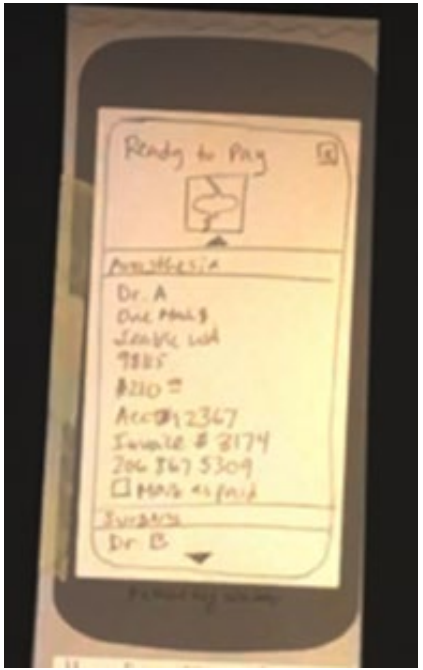
then

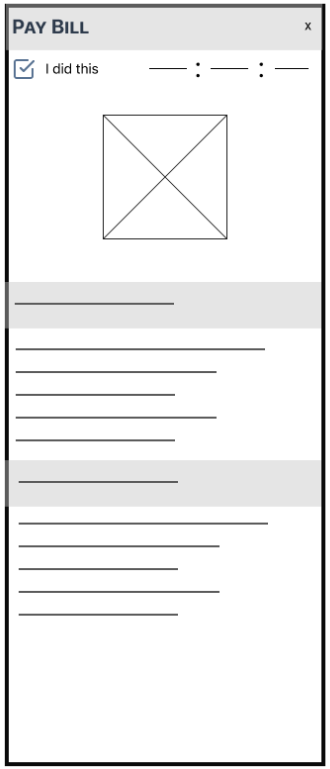




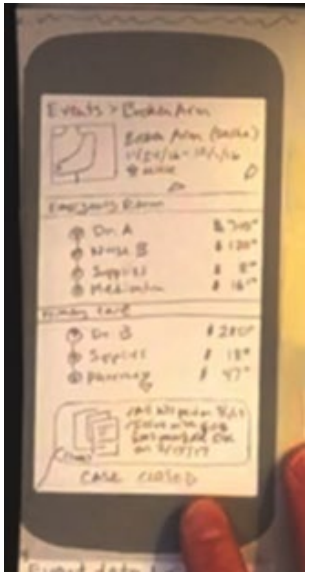
Completing the user's end goal

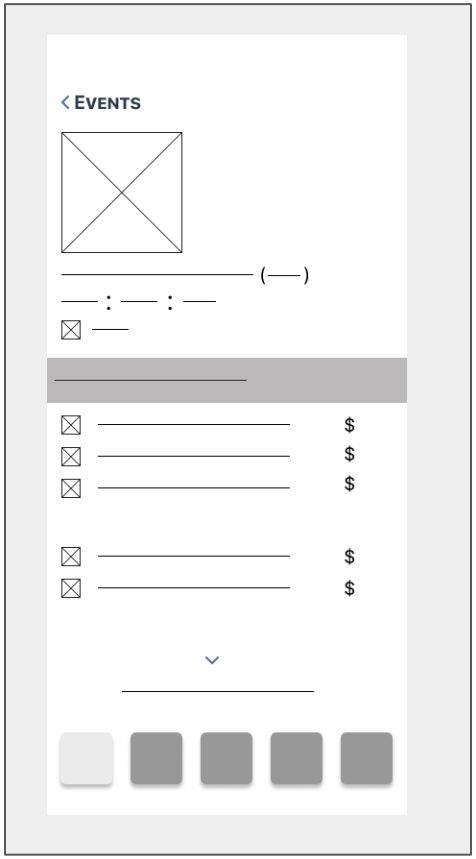
Pay Bill





Victory Lap!
Review closed event





Usability study: findings

Here are the results from the usability study with the paper prototype.

List of findings

1. The compare + confirm pages did not work
2. The closed event page worked well and needed more visibility
3. Some setup steps should be less accessible as they are used rarely
4. Data sources for abberant prices will be vital
5. Users want a dashboard model for their stats and progress
6. The app itself needs to build trust

Refining the design

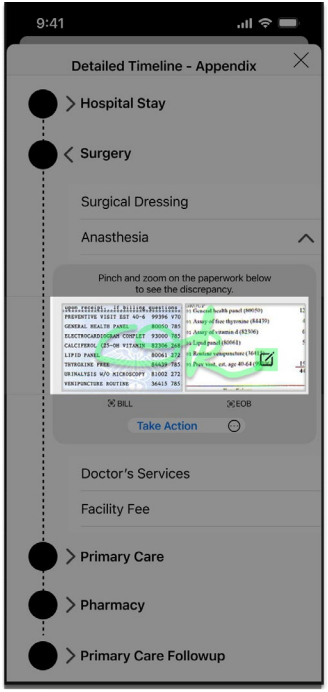
- Mockups
- High-fidelity prototype
- Accessibility

Mockups

I removed the compare and confirm pages, and placed this functionality in Reports.

Before usability study

After usability study

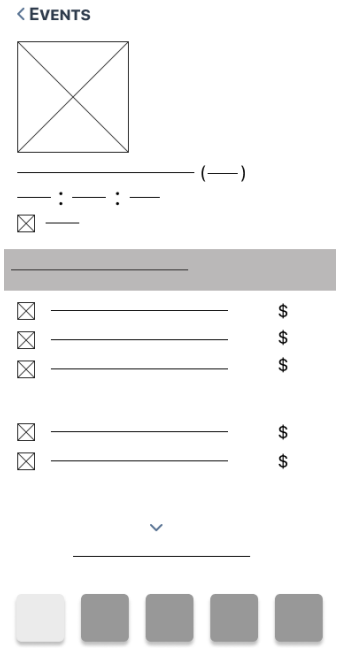


Google

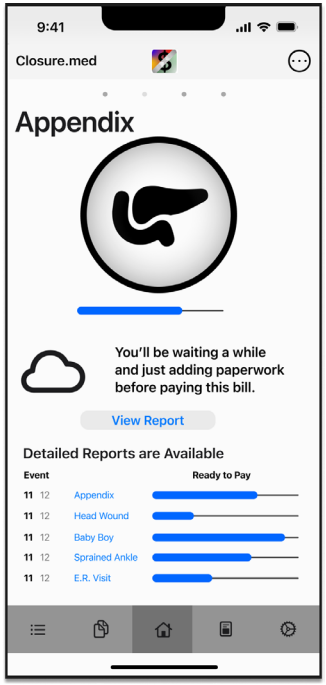
Mockups

The Report page brings the timeline view of the billing, which is successful, and makes it available earlier. Everything you want to do with the app can be launched from the Report view of your event.

Before usability study

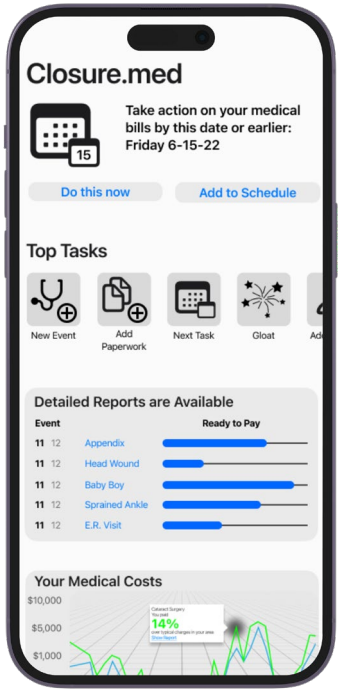


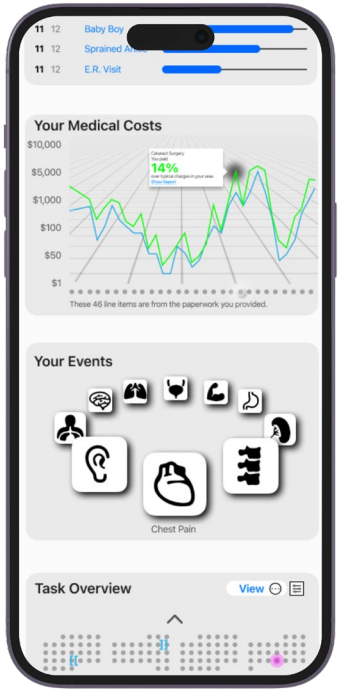
After usability study

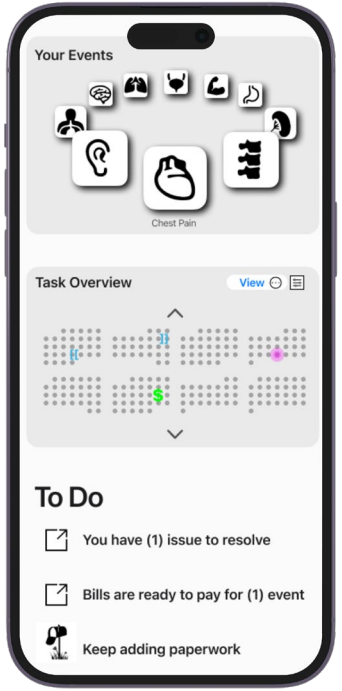


Google

Mockups







Google

Accessibility considerations

1

Markup mode should have a button and not be reliant on the user wanting go to into a paint type interface

2

Alerts and notification are dependent on the phone's operating system. Are these fully customizable? For example, can the notification shout itself from across the room if you can't read it with your eyes or are not nearby?

3

Not all photos of the paperwork will withstand magnification via pinch-zoom.

Going forward

- Takeaways
- Next steps

Takeaways

Impact:

There has to be a way to be a better consumer for hospital services. To quote a user: “Every time you get a bill you’re like, ‘This is bulls**t’ but do I have time to deal with it? Is this different from the last one, or how much are they overlapping? I could quit my job and this could be my full-time job now, or give up and pay what they are asking.”

What I learned:

People have a lot of patience but solving for trust may be the largest challenge for this app. This will be dependent on the quality of data we bring in as a source for analysis.

Google

Next steps

1

High fidelity screens

2

High fidelity prototype

3

Individual user testing of the prototype

Google

Let’s connect!

Here is how to reach me

egrigg9000@gmail.com
206.334.1570

My portfolio

https:// bit.ly/eg loom overview
(link)

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