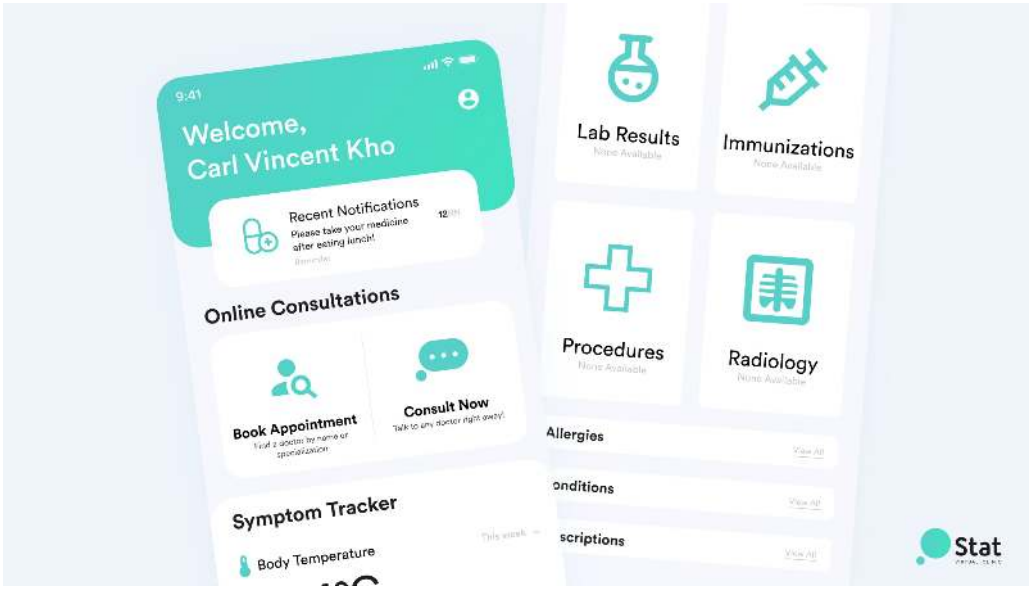
Stat: Your Virtual Clinic—A Design Case Study

A Telemedical App concept with the Filipino audience in mind in response to COVID-19



Stat—Your Virtual Clinic by Carl Kho

Return to Portfolio / Next Case Study

Healthcare access is one brutal process. This is emphasized by our limited access to hospitals because of the pandemic. In response to that, the researchers developed Stat—Your Virtual Clinic. Stat is a mobile application designed to help patients land a consultation with a doctor on their smartphones.

> **Note**: See all the awards this project bagged here. This is my first UI/UX project.

Discipline

MedTech (getting into HIPAA) and product design.

Timeline

July 2022—August 2022

My Role

Product designer, video editor, writer, and pitcher.

Intended Users

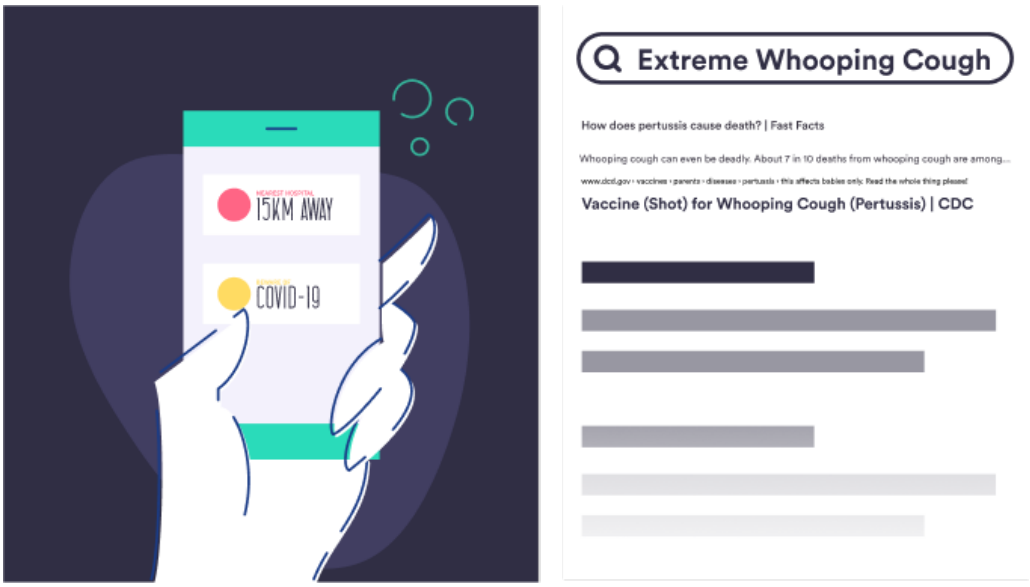
Filipinos seeking medical attention but want but are unable to physically visit a doctor because of Pandemic restrictions (lockdown).

Tools

Figma, Adobe After Effects, Photoshop, and Premiere Pro, Google Forms, and Maze (User Testing)

To further illustrate, let us paint a picture:

> John wakes up at 3 AM from a coughing fit while simultaneously experiencing a splitting headache. This has been going on for a week now, and John wants to talk to a doctor about it. However, the nearest health center is 15 kilometers away. Not to mention the risk of COVID. John googles his symptoms & attempt self-medication. He is not only delaying proper diagnosis but also compromising your peace of mind. John didn't get to sleep properly that night and consequently performed poorly during the day.



John's situation. (Modified) Illustrations by Grape (left) and Carl (right).

We can immediately see the critical situation John is in, and that Google Search certainly did not help. The problems, as shown above, are:

Nighttime Coughing

John is a victim of nighttime coughing. A real happening. A tickling sensation is leading to the cough. There are two common causes of nighttime coughing: acid reflux and post-nasal drip *(Parsons, 2018)*.

Limited Access to Hospitals

What is alarming in this situation is that John has been experiencing these kinds of cough for a while now. He needed something immediately before this complicates into a possibly life-threatening disease.

Night Visits—the worst time to get checked

During the time of disturbance, it was 3 AM. A time where heart attack patients get a 13 percent increased risk of death and emergency treatment get 33% less attention *(Dasari et al., 2014)*.

Potential Exposure to Covid-19

As a person of many responsibilities, going to the hospital with the desire to get treated is obvious. However, with COVID-19, you may return with a new disease.

Cyberchondria

Googling symptoms is not rare. The majority who want to immediately get the gist of what they are feeling turn to this act. This act is called Cyber-chondria *(TNN, 2018)*.

Going back to our situation, Nighttime Coughing is linked to **Chronic obstructive pulmonary disease (COPD).** Chronic inflammatory

lung disease causes obstructed airflow from the lungs *(Fischer et al., 2018)*. What could've been an easily treatable disease might stir the person googling's mind into thinking that he or she is affected by a significant illness.

Self-medication

Self-medication is defined as taking medications without the physician's prescription. It is a worldwide public health problem, especially in countries with limited resources. Although self-medication can reduce waiting time and save money, it may carry some potential risks, e.g., antibiotic resistance or improper management with subsequent complications *(Zeid et al., 2020)*. This may provide the victim with a false peace of mind and may lead to further problems.

Hypochondriasis

Hypochondriasis or health anxiety is defined as worrying excessively that you are or may become seriously ill. You may believe that normal body sensations or minor symptoms are signs of severe illness *(Mayo Clinic, 2018)*. This can cause poor sleep and later on affect your daily life.

The many factors affecting John and his peace of mind. Illustration from HRCloud.

The new normal—online medical consultations

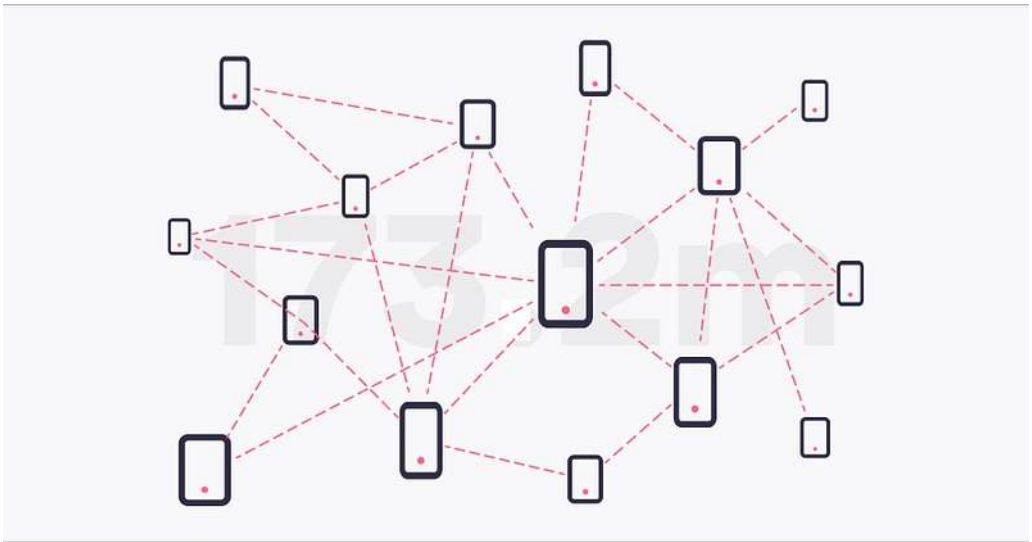
> "The quality of your healthcare depends on the size of your pocket." - Parsa, 2020

The researcher has created Stat to grant Filipino of all social status access to quality healthcare. The new normal has led to the rise of food deliveries and online shopping *(BMPlus, 2020)*. With Stat, the digitalization of healthcare is now next in line.

Readiness

The Philippines is a developing country, but our technology has kept up

with most of the world *(Sagcal, 2018)*. Not only that, but Filipinos are still going strong even after being named the Social Networking Capital in the world *(Universal McCann, 2008)*. There are 173.2 million phones connected to the Philippines right now *(Kemp, 2020)*, and while these numbers look good, the country's health system is staggeringly low. The recorded nurse-to-patient ratio is **12.6 nurses per 10 000 people.** In rural areas, it gets even worse. Going down to **4.2 nurses per 10 000 people** *(Santos, 2020)*. That in itself is a wail for a better health system for the Philippines.



There are 173.2 million phones connected in the Philippines right now.
Data from Digital 2020. Illustration by Carl Kho.

How it works

For the patients

The app is straightforward.

1. Upon entering the screen, users are presented with the option to schedule a consultation or have one right away.
2. The application wastes no time as it redirects itself to the symptoms area, where users can tick & specify the relevant sensations they're feeling.
3. When a doctor is found, the users may start the consultation.
4. After then, the doctor will summarize the consultation, along with the diagnosis and e-prescription.
5. The users will then choose between having their medications delivered or picked up at a pharmacy for their choice.

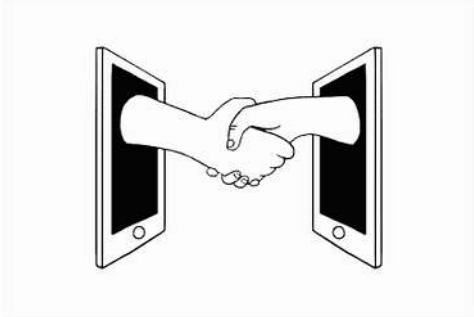
Apart from the consultation proper, the researcher wishes to implement a **COVID monitoring area** where:

1. Users can input data like temperature, frequency of coughing, the overall feeling of fatigue, and the frequency of dizziness to help doctors in accurately diagnosing.
2. This also includes a privacy-first contact tracing system imported from Google and Apple's Exposure Notification System *(Alphabet Inc. & Apple Inc., 2020)*.

How the contact tracing system works

1. Users have the choice to turn their contact tracing on or off.
2. The system will then produce a random id for identification and not your location.

They change every 10–20 minutes for security.
3. The phone and the phones around the user will work in the background to exchange these privacy-preserving random IDs via Bluetooth.
4. It is not needed for the app to be open for this process to take place.
5. The phone periodically checks all the random IDs associated with positive COVID-19 cases against its list.
6. If there's a match, the user will receive a COVID-19 exposure notification, with further instructions from your public health authority on how to keep you and the people around you safe.



A digital handshake (contact tracing).

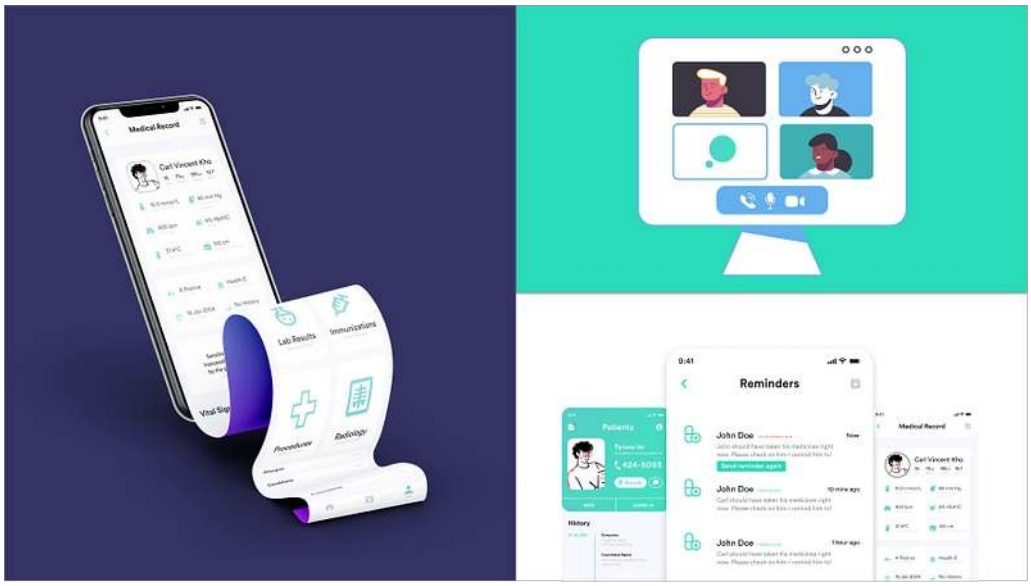
For the doctors

Apart from getting to meet the patients, the app assists the doctors in practice.

1. First, before getting to use the app, doctors must present their Professional Regulation commission ID (PRC ID).
2. Once inside Stat, doctors can check their appointment schedule after finishing a successful setup and get familiar with the built-in electronic health records system.

Sample teleconsultation

1. Doctors check the patient's forwarded list of symptoms as well as their specifications. At this moment, doctors can only see the basic info of the patients.
2. Moving into the digital space, doctors prefer getting to check a patient up before diagnosing them physically. For that, doctors came up with The Telehealth Ten: A Guide for a Patient-Assisted Virtual Physical Examination *(Benziger et al., 2020)*
3. After finishing the consultation, doctors, if agreed upon by the patient, can now become a "regular" and give doctors access to their electronic health records, which can consist of laboratory results, vital signs, and allergies—with the extra private information like whereabouts and contacts still hidden unless consented upon.
4. Doctors can also look at how they are performing financially and the overall statistics of their app usage.



Stat—Your Virtual Clinic (Doctors POV). Concept by Carl Kho.

	Step 1: Vital Signs -Weight, blood pressure, pulse, oxygen saturation, temperature
	Step 2: Skin assessment -New bruises, rash, swelling
	Step 3: Head, Eyes, Ears, Nose, and Throat -Assess vision, hearing, sense of smell; observe throat, swallowing
	Step 4: Neck -Assess pain with rotation, jugular venous distension, Corrigan's pulse
	Step 5: Lungs -Deeply inhale and hold; observe wheezing and tachypnea
	Step 6: Heart -Assess pulse; incorporate data from wearables
	Step 7: Abdomen -Assess if abdomen is firm, tender, or distended
	Step 8: Extremities -Press thumb into pre-tibial area and assess edema; perceived temperature
	Step 9: Neurological -Speech, gait, Romberg, stand from seated position
	Step 10: Social Determinants of Health -Diet, physical activity, sleep, stress, housing, transportation, safety, mood

The Telehealth Ten. A patient-assisted physical examination guide for doctors, by doctors.

Development

This isn't just a concept. Stat is in its early development stage with a design along with a working prototype. As of the moment, the researcher is working with Firebase and Twilio to bring the app to you. Firebase for taking things such as Stat's real-time database to the cloud and Twilio supporting HIPAA-eligible, which is a data privacy act but for health, workflows via SMS, voice, and video communication channels *(Eddy, 2020)*.

Data, data, data!

Validation from Prototype Testers

The researcher conducted user testing with Useberry and further asked users with the help of Google Forms.

User Testing

Going deeper into data, User Testing shows that 100% of Doctors and 97% of patients approve of Stat because it eliminates long queues and unnecessary exposure while providing real-time, easy access to medical data.

Accuracy

Doctors from Mactan Doctors' Hospital in Lapu-Lapu city also deems the self-examination and the data from Stat sufficient for an accurate diagnosis.

Diagnostic Effectiveness

To get diagnostic effectiveness, the researcher had doctors identify diseases based on symptoms. The test collectively recorded a low 8% error rate with the pre-consultation/basic patient data alone.

Usability Testing

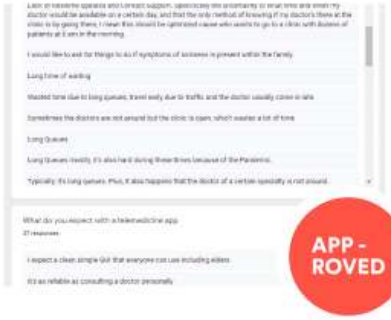
Finally, in the usability testing, 93% of the testers completed the task. It is intuitive and user-friendly in terms of User Experience (UX), as shown by heat maps and user journeys.

Analysis of Data

Technical | Research

What real people think of Stat - Your Virtual Clinic

User Testing



APP - ROVED

100% of Doctors

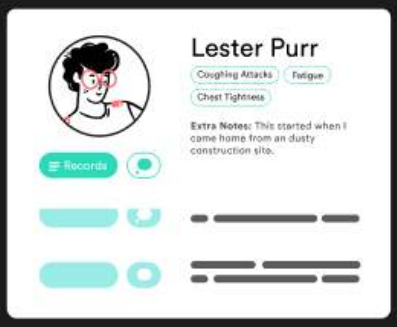
97% of Patients

- Long queues
- Unnecessary exposure
- Real-time Medical Data
- Quick & easy access to medical results

Accuracy

- Information provided by Stat is deemed sufficient and helps give accurate diagnois by Doctors from ***Mactan Doctors' Hospital***

Diagnostic Effectiveness

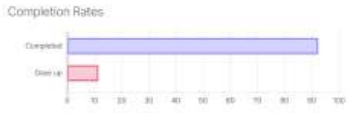


Pre-consultation Disease Identification Test

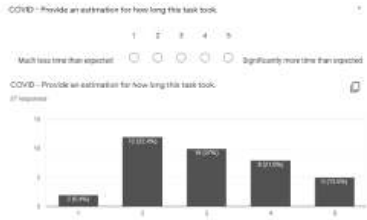
- 92% success rate
- 8% error rate
- Pre-consultation info and the patients' (basic) records helps Doctors save time

Usability Testing

Heatmaps, User Journey, and Completion Rates



93% of the prototype testers successfully finished the task



- In terms of User Experience (UX), the app was designed to be familiar and user-friendly
- 84.68% of the users found it easy to navigate and completely finish their task

Conclusion

Soon enough, different individuals with different needs won't need to worry about their healthcare because Stat has digital consultations, safe & convenient collection of medication, COVID-19 monitoring & tracking, Electronic Health Records, and peace of mind. All of that, just a tap away. This is Stat, your virtual clinic.

By Carl Kho on April 6, 2021.

Canonical link

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