UX Report Summary

Group: ChestX

Members:

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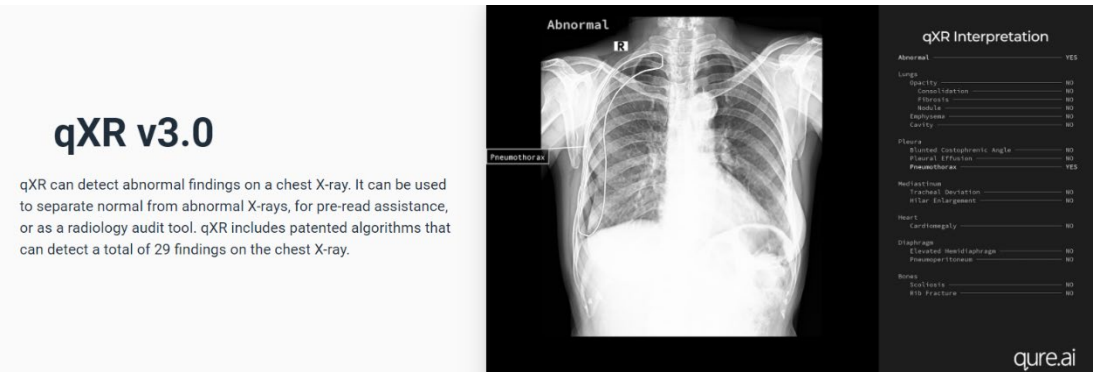
1. Preliminary research (during the transition phase)

During the research phase, it wasn´t sure on what topic the application would focus on – mainly because it wasn´t clear, which datasets were available online or not.

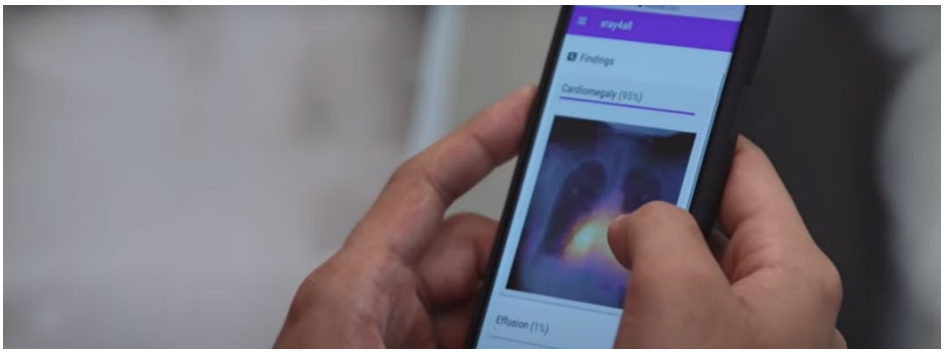
Thus, a general research was conducted about which problems could be solved with an application that analyses/identifies chest problems (pneumonia, cancer, etc.). It started off with looking at existing solutions in the medical industry and which issues they solve:

- qXR v3.0 (https://qure.ai/qxr.html), which can an detect abnormalities via chest X-ray:



- CAD4TB (https://www.delft.care/cad4tb/), detects Tuberculosis via chest X-rays:

- CheXNeXt (https://med.stanford.edu/news/all-news/2018/11/ai-outperformed-radiologists-in-screening-X-rays-for-certain-diseases.html), can read chest X-rays for 14 pathologies on the mobile phone:



2. Research after data set has been identified

The research then stopped, after the group´s majority decided on a dataset, which focused on identifying COVID-19 via chest X-rays. The previous intel gathered where then used as inspiration on how our application could function. Articles were then read about other existing applications that detect COVID-19 in a similar manner, such as here and here.

3. Problem definition, user identification and user scenario

After completing a benchmarking analysis on the current technology, the next step focused on identifying the actual problem our application could solve – along with who our users were and what kind of scenarios we could come up with.

3.1 Problem definition

As the dataset was focusing on identifying COVID-19 symptoms, the problem needed to be linked to that – which we phrased as the following:

Due to the pandemic, people are required to take corona-tests to go to restaurants, hairdressers, etc.. This produces vast amounts of plastic wastes and the procedure itself is uncomfortable (painful for some individuals). People want a quick, easy und more sustainable option to get tested.

An existing solution for the problem was **CAD4COVID**, which had the following advantages:

- Compared to using CT to detecting COVID-19 in its early stages, X-ray causes less radiation, is often cheaper, quicker, and easier to use
- X-ray is also more available in resource-constrained settings. Further benefits of X-ray are that they can be portable and thus used at the patient's bedside
- Can detect progression of COVID-19 cases
- Benefits: Reduce health workforce workload + quicker detection, higher throughput, quantify disease progress and recovery

3.2 Solution concept

By drawing inspiration from CAD4COVID (and the previous research), we came up with the following solution:

A mobile van with an X-ray, where a person's chest can get X-rayed, and the image gets uploaded to our application. It then analyses whether the current patient has COVID-19 not. It would help countries avoid buying multiple tests and reduce plastic wastes as they aren´t

reusable. The whole process can be organized in a minivan, which would look similarly to the image below:

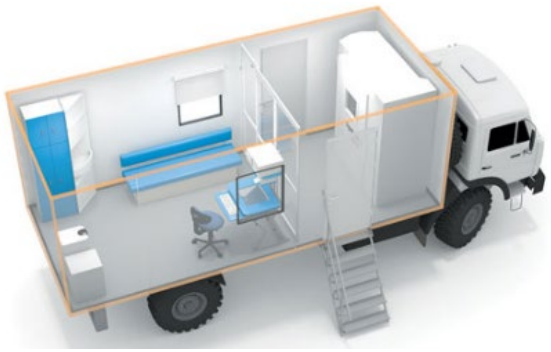


Figure 1 Mobile X-ray in minivan

3.3 User identification

After settling on a problem and a solution, the next step centred on figuring out who our users would be (using the current COVID-19 test centres as reference):

- Doctors
- Patients
- Test-centre workers

After a group discussion, the majority votes for test centre-workers – mainly because they´d primarily use the application to upload the patient´s chest X-ray and then scan whether they have COVID-19 or not.

3.4 User scenario

To envision how exactly it would all run down, we created the following user scenario:

A patient enters the mobile van and gets a chest X-ray. The patient leaves the van, while the test-centre worker uploads the X-ray image to our application. Our application then analyses the image (after being trained) and within a few minutes, deduces by itself whether the patient has COVID-19 or not. The test-centre worker then transfers the patient results via e.g., e-mail (similar to the current rapid tests in berlin: after they test you, they´ll send you your results via e-mail within the next 10 -15 minutes as a PDF. You can then use the document to prove your negative for e.g., a restaurant or a hairdresser appointment).

3.5 Online surveys + responses

The next step focuses on whether the assumptions we made about test-centre workers were true (whether they´d find such an application useful or not).

To test it, we created an online survey. The German version can be found here and the English one here.

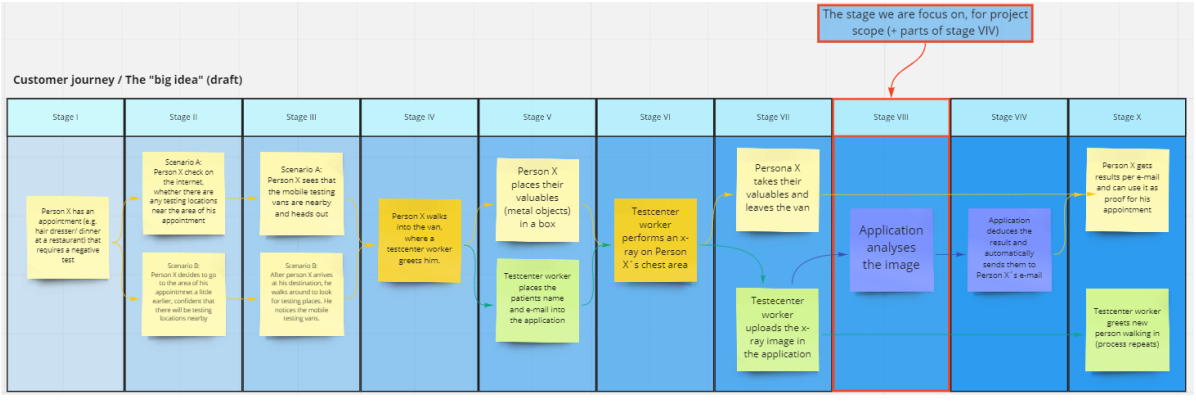
The links were the distributed using the team member´s social networkers, as well as online forums that focused on medical topics – end goal being to reach test-centre workers. In the end however, only one person could be reached with the following insights:

- She doesn´t find the current procedures neither good or bad – she rather deems them necessary and thus follows them.
- She also thinks that the X-ray procedures will make things more complicated and rather scare clients away – especially because X-rays aren´t necessary good for the patient´s health. Pregnant women wouldn´t be able to participate and others who are already overwhelmed by having to use their phones to sign in, will be overwhelmed by an X-ray.
- The idea would however help with the plastic wastes problem. But she´d then prefer recyclable tests instead.

It would have been preferable to gather other opinions and see if there are common patterns between them - a testing situation would have also been useful, but outside of the TechLabs project scope (where you bring test-centre workers in, create a simulation where there´s a patient, they use the application, etc. just to see whether they´d still find it complicated or not).

4. Customer journey

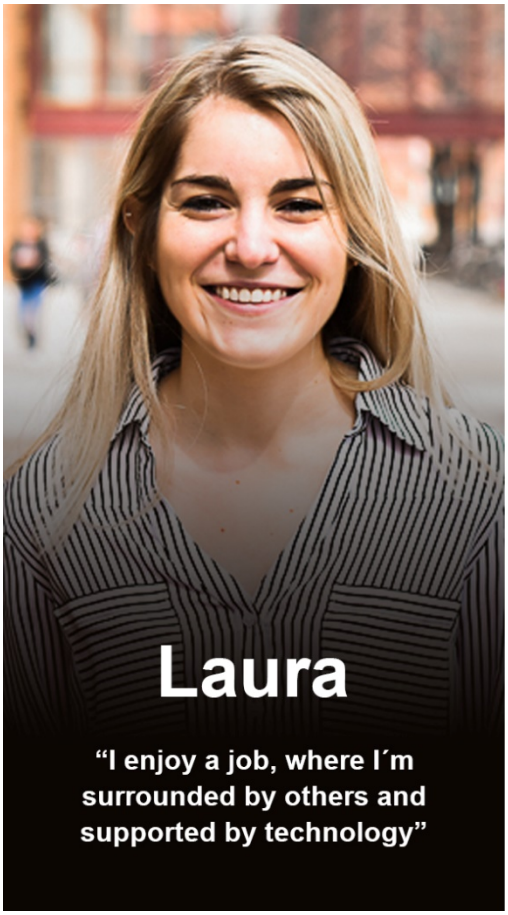
All of the steps were then summarized by creating a customer journey:



It shows off the “big idea” with the mobile van and the actual aspect we´ll focus on during the TechLabs project. It can be viewed on the team´s miro board in more detail here.

5. Persona

After the customer journey, a persona was created too – with the awareness that most of the details are assumptions, as not enough data was gathered during the online survey phase:



Demographics

Age: 23
Location: Berlin, Germany
Job: Volunteer at a corona test-center

Goals

Work on the side to earn money, while completing her bachelor´s degree in social studies

Learning habits

1. Reads a lot of books about human psychology
2. Likes to use technologies that priovides constant feedback

Frustrations

1. Finds it annoying when monotonous and repetitive processes don´t get replaced by machines to save time
2. Plastic wastes

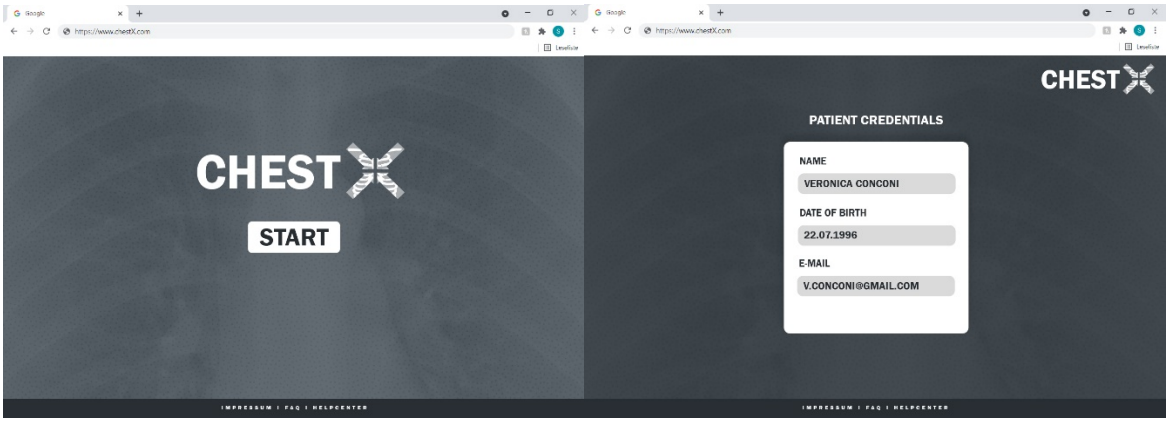
Hobbies

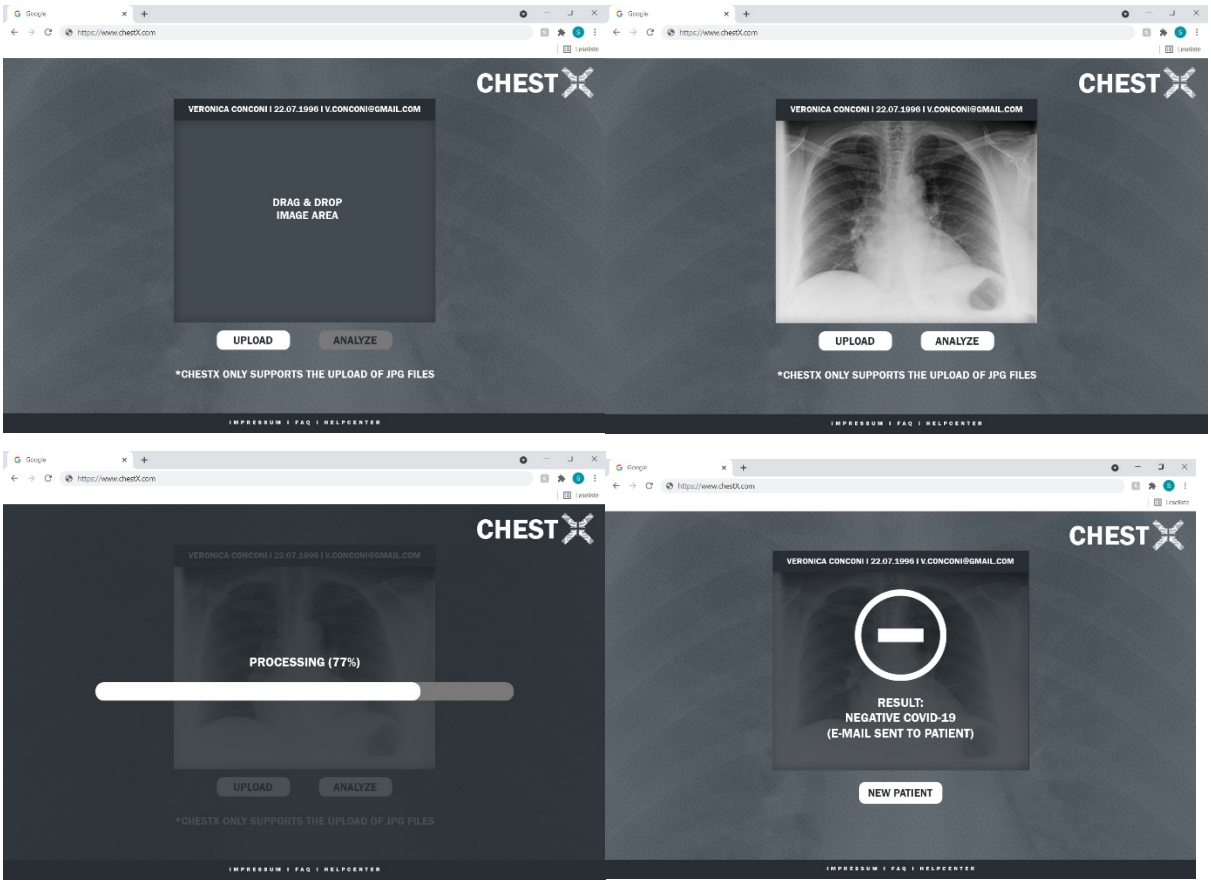
1. Socializing
2. Social media
3. Digital art

This concluded the research aspect and now transitions to creating the front-end blueprint.

6. Photoshop blueprint

Before creating a prototype on Figma, a visual blueprint was first created on photoshop, to illustrate the application´s main features:





7. User flow through application

Based on the blueprint, the following user flow could be deduced:

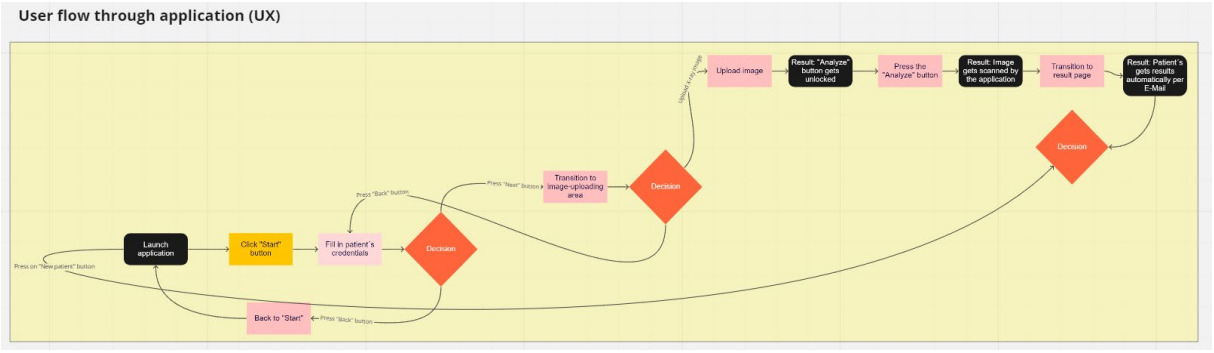


Figure 2 User flow through application

It can be viewed on the team´s miro board in more detail here.

8. Figma prototype

The template was then re-created on Figma with prototyping-attributes. It can be found here.