Impfdate

Mobile app

DESIGNING A RELIABLE AND CONVENIENT WAY TO MANAGE CHILDREN'S IMMUNIZATION RECORDS

My Role
UX Designer

Responsibilities
Conduct user research, information architecture, visual design of low-fi and high-fi wireframes, prototyping, usability testing and iteration.

*Click here to check the prototype file
**This is a shorter version of the full case study. It does not include detailed steps of the design thinking methodology and is intended for portfolio preview purposes only.

Context: The relevance of having organized records

Immunization plays a crucial role in preventing the resurgence of diseases, avoiding outbreaks, reducing spending and demand on public health systems. Incomplete dose records, difficulties in tracking vaccination status and inconvenience, complicate the process for families, leaving both parents and healthcare providers struggling to ensure children remain fully protected.

*Sources

"Why vaccination is important and the safest way to protect yourself" — National Health Service (UK) : https://www.nhs.uk/vaccinations/why-vaccination-is-important-and-the-safest-way-to-protect-yourself/ nhs.uk

Instituto Butantan – Peres KC: Historical analysis of the Sanitary registration and vaccine registration in Brazil (2021)
https://www.scielosp.org/article/csc/2021.v26n11/5509-5522/en/

"Parent-level barriers to uptake of childhood vaccination" — Kaufman J et al., BMJ Global Health (2021) : https://gh.bmj.com/content/6/9/e006860

RKI – Governance of COVID-19 Vaccine Data in Federations (Germany section: data challenges, missing vaccination status in ~20% of records)
https://naohealthobservatory.ca/wp-content/uploads/2022/03/NAO-Rapid-Review-33_EN.pdf naohealthobservatory.ca

Robert Koch Institute (RKI) – Seeber L: Educating parents about the vaccination status of their children (2017)
https://edoc.rki.de/handle/176904/2534 edoc Server

RKI – Epidemiologisches Bulletin 4/2023: Vaccination records should be checked… during routine healthy child visits
https://www.rki.de/EN/Topics/Infectious-diseases/Immunisation/STIKO/STIKO-recommendations/Downloads/04_23_english.pdf?__blob=publicationFile&v=3 Robert Koch Institute

Understanding the problem

Qualitative research was conducted through 5 interviews with parents of different demographics focusing on understanding the methods they use and challenges they face while managing their children's immunization records. The questions gave enough room for parents to share their experiences that led to missing doses. The gathered data served as input to understand the problem, build the empathy maps and trace the user journeys.

Participant A

Says
- "I take his immunization record booklet once a year to his pediatrician."
- "The health center also checks his booklet at school."
- "I wish I'd get a call or e-mail before the next vaccine."

Thinks
- Pediatrician and health center are the right opportunity to check her son's immunization status.
- Knowing about diseases is relevant.
- More proactive communication from pediatrician and health center would be beneficial

Does
- Brings the immunization booklet to health related appointments.
- Relies heavily on pediatrician/health center to update records.
- Occasionally misses doses but catches up later.

Feels
- Reassured when doctors confirm everything is up-to-date.
- Confident that the pediatrician and the health center check her son's records periodically.
- Would appreciate getting timely reminders.

Participant B

Says
- "We check their immunization record booklet."
- "We forgot he had to take it with 18 months."
- "I research before which ones are due and what they are for."
- "I'd like to get automatic notifications."

Thinks
- Vaccination is crucial.
- Knowing what diseases vaccines prevent is important.
- Getting notifications improves vaccination attendance.

Does
- Shares responsibility with her husband.
- Checks her sons' booklet.
- When realizes a dose is late, schedules an appointment.
- Researches upcoming vaccines before doctor visits.

Feels
- Responsible and proactive about her sons' health concerns.
- Slightly guilty about missing a dose, but relieved it was corrected.
- Would feel safer with automated reminders.

Participant C

Says
- "My wife is more organized, she usually keeps track."
- "I find it hard to understand the booklet—handwriting and labels."
- "I'd prefer a digital version."

Thinks
- His wife is more reliable to manage their son's health records.
- Vaccination is important but hard to manage when the child is also sick.
- Believes digital solutions would be much easier to follow.

Does
- Passively depends on wife and healthcare providers to keep track of his son's health.
- Took long to bring the vaccine records to the pediatrician.
- Adapts to vaccination standards when moving abroad.

Feels
- Overwhelmed by having to manage both his son's current sickness and his vaccination status.
- Frustrated by not understanding medical jargon.
- Confused when dealing with analog records.

Participant D

Says
- "I set reminders on my online calendar."
- "Once I missed because of work and forgot to reschedule."
- "I wish the records were digitalized."

Thinks
- Staying organized helps avoid mistakes.
- Digital tools are easier to manage than analog ones.
- Side-effects and disease info are equally important to know.

Does
- Proactively manages her son's health obligations.
- Sets online calendar reminders after every appointment.
- Schedules an appointment as soon as she realizes a dose is late.

Feels
- Responsible and proactive.
- Guilty when she forgot to reschedule an appointment due to stress at work.
- Confident with online calendar reminders but still wishes for digital records.

Participant E

Says
- "The family doctor calls us when it's time to get vaccinated."
- "For some vaccines that prevent more than one disease, I have to look up what their name stand for."
- "For some people, reminders could be very useful."

Thinks
- Trusts the family doctor to keep track.
- Doesn't remember details of past delays.
- Believes a reminder system is helpful but not essential for him.

Does
- Shares responsibility with his wife.
- Depends entirely on family doctor for tracking.
- Occasionally researches vaccine names.

Feels
- Confident his daughter's vaccines are up-to-date.
- Detached from the process, since responsibility lies with doctor.
- Curious about vaccine details but doesn't dig too deep.

*Those were the empathy maps generated from the participant's answers

Figuring out opportunities

After the data analysis, it was possible to understand the perspective of the target users, identify pain points and opportunities to make managing the process more convenient, reliable and accessible.

Paper documents are unreliable	Doses are often forgotten due to a lack of reminders	Clear information about vaccines and diseases they prevent is relevant	The possibility to share the data and the responsibilities is important

*Those were the key insights learned during the research process

Proactive parent
Goal: Utilize a digital tool to help him keep track of his children's heath and not miss any dose.

Action	Look for an existing app which offers digital track of vaccines' records	Transferring the records from paper booklet to the app	Checking the current status	Set reminders for doses which are due or for future ones
Task list	Open app store, select and download an app that suits his needs the most Create an account	Manually entering each child's data (name, birthdate, etc) Manually entering each vaccine taken by each child	Comparing the vaccines taken to those which are necessary according to the child's age	Open the private calendar app, manually set up a reminder
Feelings	Frustrated by having to click into multiple apps to find one which can do everything he wishes Stressed by having to fill up all the data by himself	Focused on not skipping any information Frustrated by having to interpret handwritten information and worn out stamps	Responsible and attentive for making sure nothing is missing	Organized, proactive and prepared
Pain points	Having to fill up all data himself	Handwritting, stamps, abbreviations are unclear	Manual effort to check	Having to manually set the reminders
Opportunities	Patience information can be accessed, filled and updated by trusted health professionals	Patience information can be accessed, filled and updated by trusted health professionals Digital vaccination records can be stored and shared	Automatic current state feedback on app's dashboard Automatic reminder if status is not up-to-date	Auto-Sync app reminders with default calendar app Mobile alerts before next dose is due

Dependent parent
Goal: Feel reassured my child vaccines as up-to-date without having to track everything myself.

Action	Waits for pediatrician's office to call or for the next check up date to arrive	Brings booklet to the appointment	Pediatrician checks the vaccines on the booklet	Schedule next visit for checkup or next dose
Task list	When the checkup date arrives, it is written on the family's calendar so she visits the doctor with her child	Search for the booklet with the immunization records Take it with her to the office	Comparing the vaccines taken to those which are necessary according to the child's age	Making an appointment and writing on her private calendar
Feelings	Passive trust Reassured nothing can go wrong	Anxious by having to search the booklet, which is not used very often.	Relieved the doctor is checking if anything is missing	Confident, reassured nothing is missing and that the next appointment is already set
Pain points	Risk of physician being out of office due to unknown circumstances, risk of missing doses if the doctor forgets	Risk of not finding or loosing the booklet, which is the single source of record of the vaccines taken by her daughter	Manual effort to check Risk of human error	Having to manually set the reminders Risk of missing the appointment set too much in advance
Opportunities	Automatic notifications before next dose is due (e-mail, mobile alert)	Synchronized, shared across physicians and parents cloud-based digital records in an App on her phone	Automatic current status feedback on app's dashboard Automatic reminder if status is not up-to-date	Automatic app reminders synchronized with her default calendar app Mobile alerts before next dose is due
	Current status feedback on app's dashboard			

Overwhelmed parent
Goal: Compare my child's past vaccinations with the requirements in my new country, so that I know if catch-up doses are needed

Action	Schedule an appointment with the new pediatrician	Brings booklet to the appointment	Pediatrician checks the vaccines on the booklet	Schedule catch up doses
Task list	Calls or set up an appointment over internet	Search for the booklet with the immunization records Try to translate the information Take it with him to the office	Comparing the vaccines taken on other country to those which are necessary in Germany Reading and understanding the data	Setting an appointment and writing on her private calendar
Feelings	Anxious if the pediatrician is good and will have good chemistry with his child Worried there will be missing doses or exams	Anxious by having to search the booklet, which is not used very often. Frustrated by not being able to understand handwriting and worn out stamps	Insecure, worried there will be missing doses Frustrated by data difficult or impossible to decipher Confused by not knowing much about diseases and effects	Guilty some doses were missed and others are too late Worried the child's future heath will be affected
Pain points	Confusing different country standards/procedures	Risk of not finding or loosing the booklet Unable to read relevant data	Manual effort to check Risk of taking the same dose twice by not being able to read Missed doses discovered too late	Lack of ongoing clarity about consequences to the child's health
Opportunities	Clear vaccination timeline Multilingual support	Clear, easy to understand, plain language, digital vaccination records Digital cloud-saved, parent-shared data over an app on the phone	Multilingual support Plain language, easy to understand vaccine records and disease information.	Plain language vaccine and disease information Mobile alerts for future doses timeframe

*The user journey maps helped identify pain points from each user group and opportunities

What was learned

The findings revealed common behavior patterns between parents, with some being proactive, while others relying or sharing the responsibility with their trusted healthcare professionals and there were also those feeling overwhelmed. Each group's behavior pattern gave valuable insights about which design features might address their challenges.

PROACTIVE PARENT

Actively monitor vaccination status with partner or by themselves

Get informed before doctor's appointment

Set reminders themselves

DEPENDENT PARENT

Leave the responsibility for follow-up and reminders solely to the doctor or health professionals

OVERWHELMED PARENT

Rely on their partner and pediatrician

Can't keep track of things accurately themselves

Have difficulty understanding the technical terms

*Common behavior patterns could be sorted into 3 different groups of users

Setting the right direction

After reviewing the collected information about the users, setting goals and creating hypothesis for how a solution might help solving the user problem, it was time to analyze the competitors, their strengths, weaknesses and figure out opportunities.

Auditioning the competition

The audition compared 4 direct and 2 indirect competitors app's main features, how good or bad they work, how information is distributed across the app, how easy the navigation is and how the companies position themselves in the market. The results gave input to establish the value proposition and work in a solution.
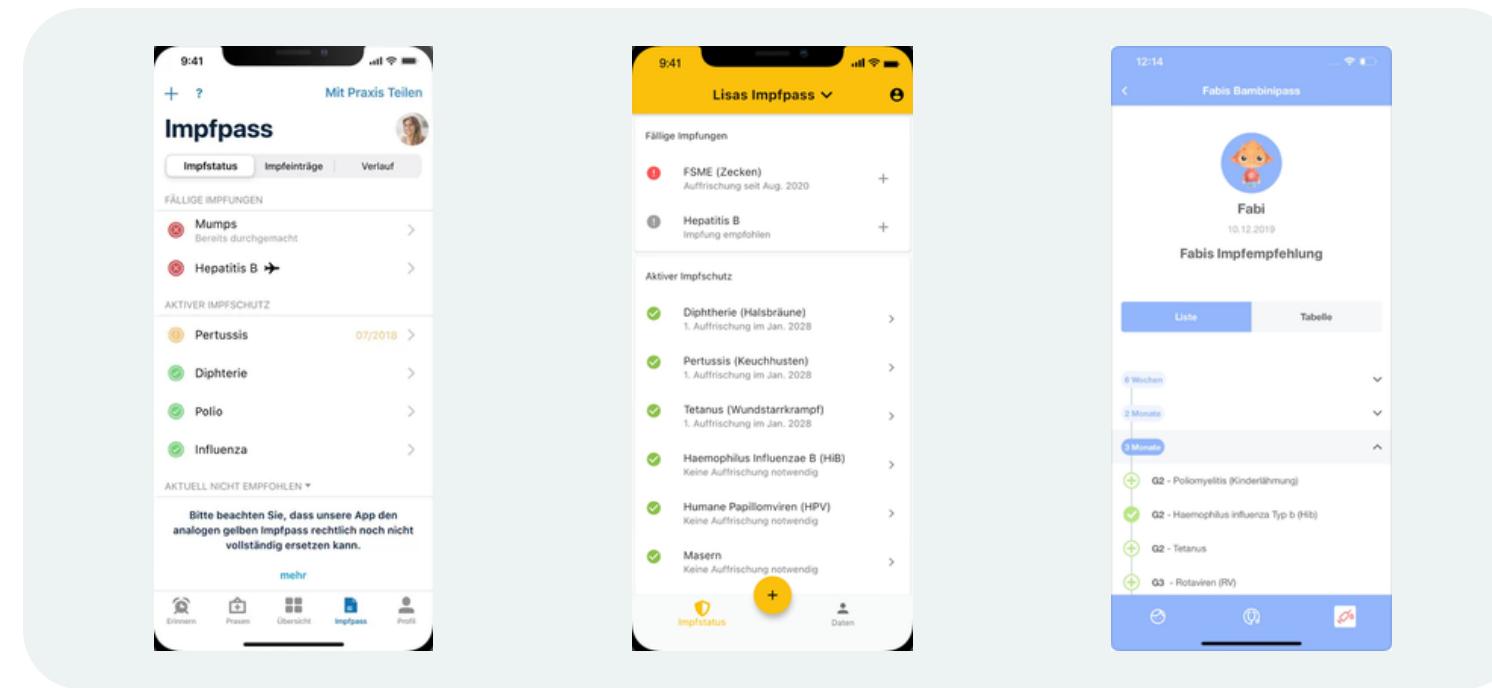
*Examples of the main competitors' first impressions

What are the gaps left by the competitors?

Most of the competitors hide such an important feature as a reminder under settings menu, and the sharing capabilities are very limited, with only one competitor allowing sharing with doctors.

*Main competitors' apps' menu

The main features, which would address the users' most critical pain points, were not as visible as they could be. Some menus showed features that could accessed though a different path while others were missing relevant ones. Not a single one offered all the solutions within the same product.

And how Impfdate distinguishes itself from the competition?

The value proposition of the app is to offer all immunization records in digital format, while allowing clear current immunization status overview, in advance-notifications about upcoming vaccines synchronized with the user's default calendar app, record's input editing and sharing between parents and trusted healthcare professionals, and simplified information about vaccines and the diseases they prevent.

Time to brainstorm ideas

Starting with paper sketches to generate the first ideas as quickly as possible. The focus was on the 3 main features (record input, setting reminders and sharing) and the overview screen of the user's immunization status. The next step was to puzzle together the favorite pieces of each sketch.
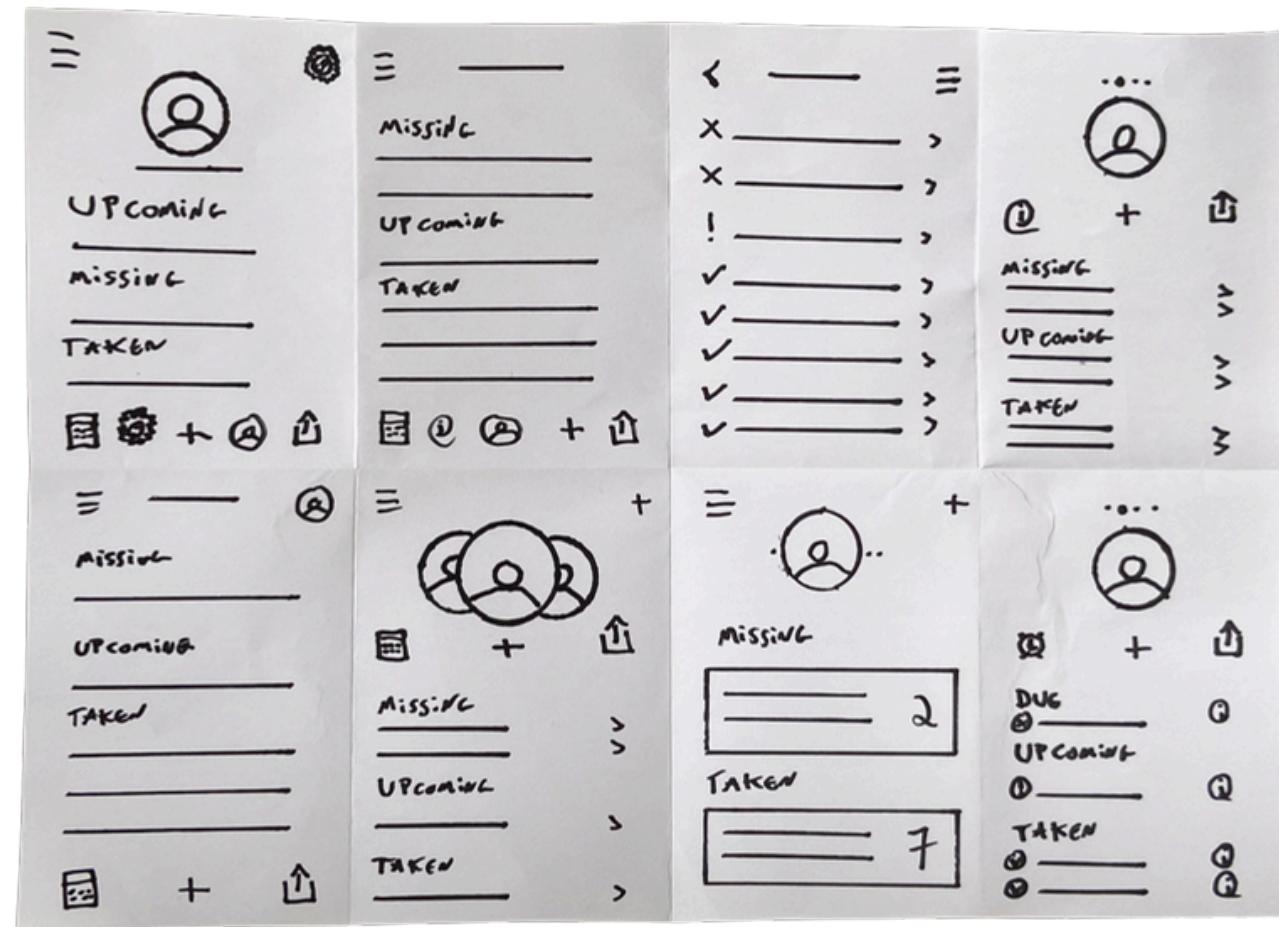
*Applying the crazy 8 technique to come up with ideas fast

Before moving from paper to the screen

The information distribution and screen flow are key when creating an intuitive app. The user journey maps served as a guide to trace the easiest path towards the users' goal.

Tracing the 'happy path'

The clearest path was designed so that every main feature should be accessible from the main screen and only necessary information should be displayed. From there, secondary actions were disposed in a thoughtful matter not to make the main screen too busy. The information architecture was shaped considering these principles.
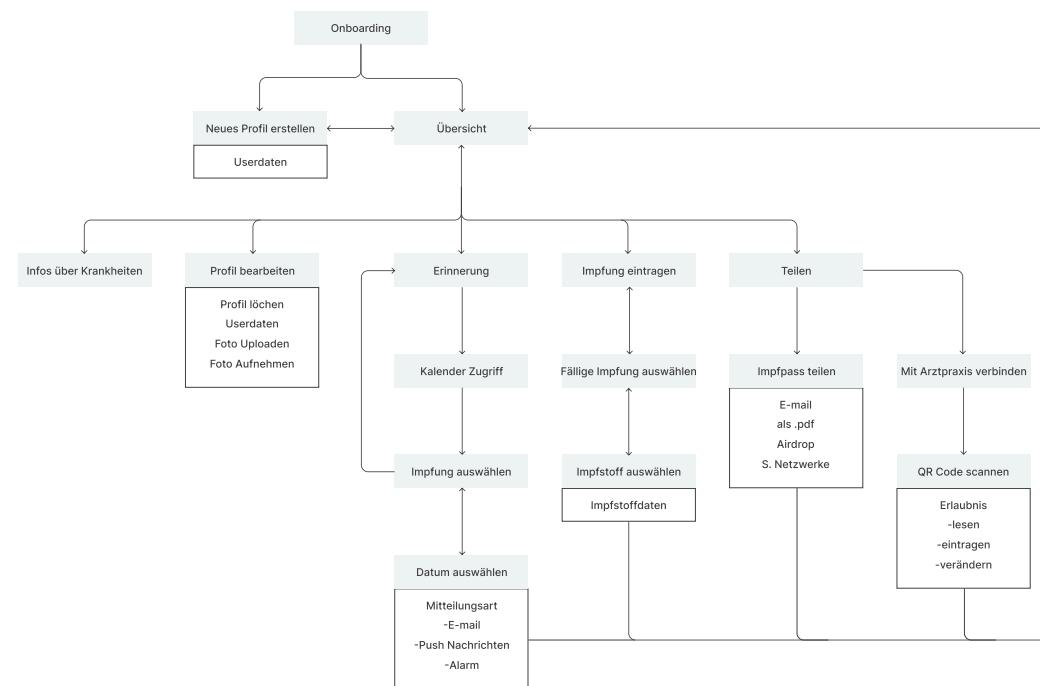
*The information architecture prioritized ease of navigation by using familiar design conventions.

From paper to the screen

The first wireframes for a basic navigation and feature testing were drawn using Figma and enabled the first usability test. A moderated test conducted with volunteers tested the 3 main features: entering vaccines, setting reminders and sharing. *Time on task and drop-off rates vs. conversion rates* served as metrics to determine the success of the prototype
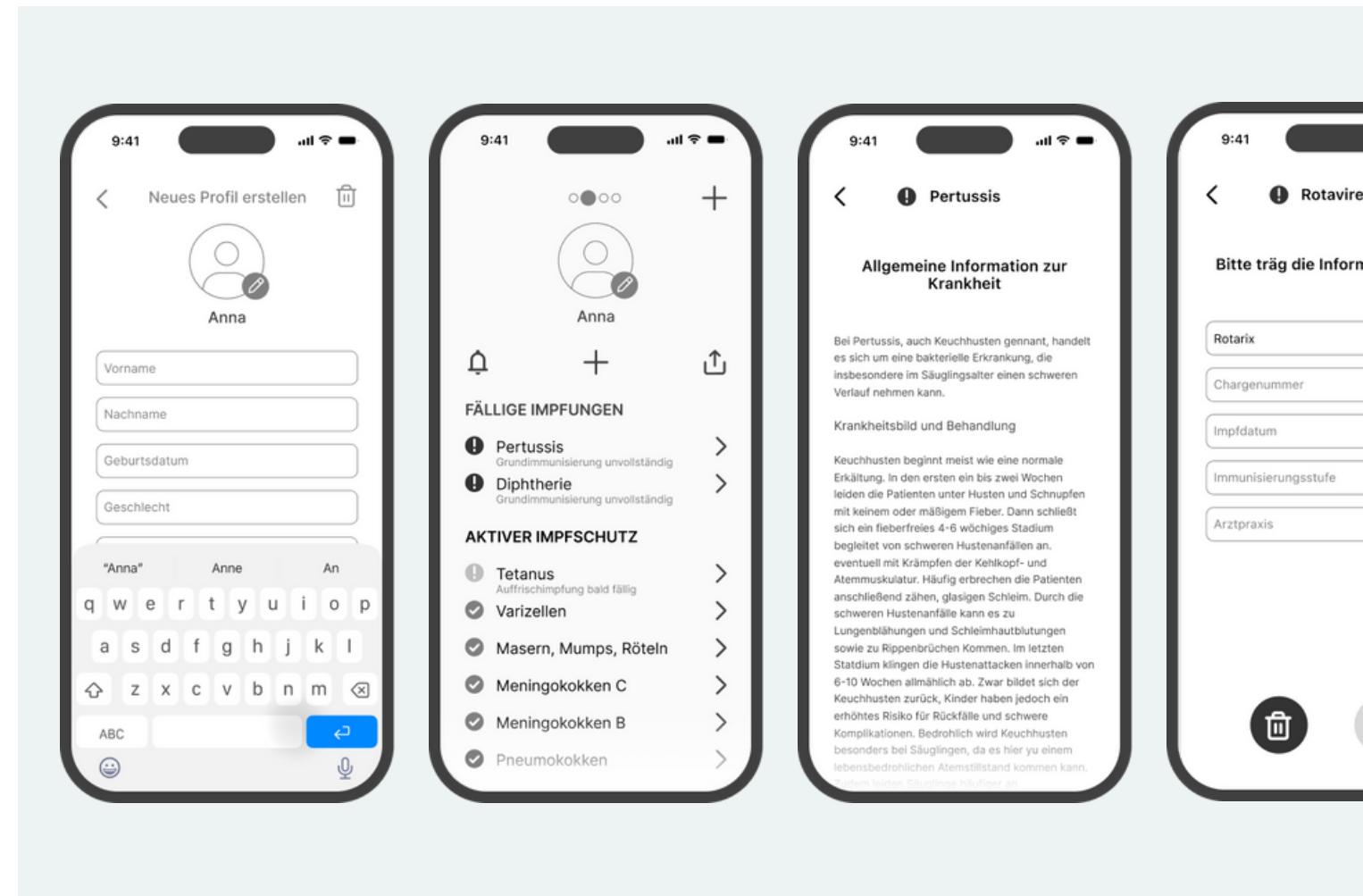
*Check here the test prototype

What did the results show?

After testing the 3 main features (entering vaccine record, setting reminder and sharing the records), the 3 users had time to give their feedback concerning their experience with the app, positives, negatives and suggest improvements.

ENTERING VACCINE	SETTING REMINDER	SHARING RECORDS
33%	**100%**	**100%**
completed the task	completed the task	completed the task
in 1:33min	in 0:21min	in 0:11min
average time	average time	average time

Learnings from the test results

Not all button functions were clear due to the lack of of labeling and buttons with different actions having the same shape (the 'plus' icon had the same shape as the one for creating a new profile, which caused confusion), resulting in increased time on task, specially for inserting new records.

Users reported that the child's age is crucial information for quick assessment by doctors, so it should be displayed visibly.

Using A.I. as a tool

In order to optimize the workflow, A.I. was used, at different stages of the project, **not to create** content, but as a tool to sort data and enhance solutions with prompts based on user testing feedback.
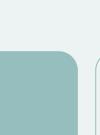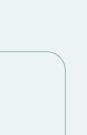
The prompt asked for visual hierarchy improvement, button labeling and age being displayed in the profile. A first sketch of the app's icon was also subject of A.I. enhancements. The output was obviously analyzed and altered so that it would fit the user needs.
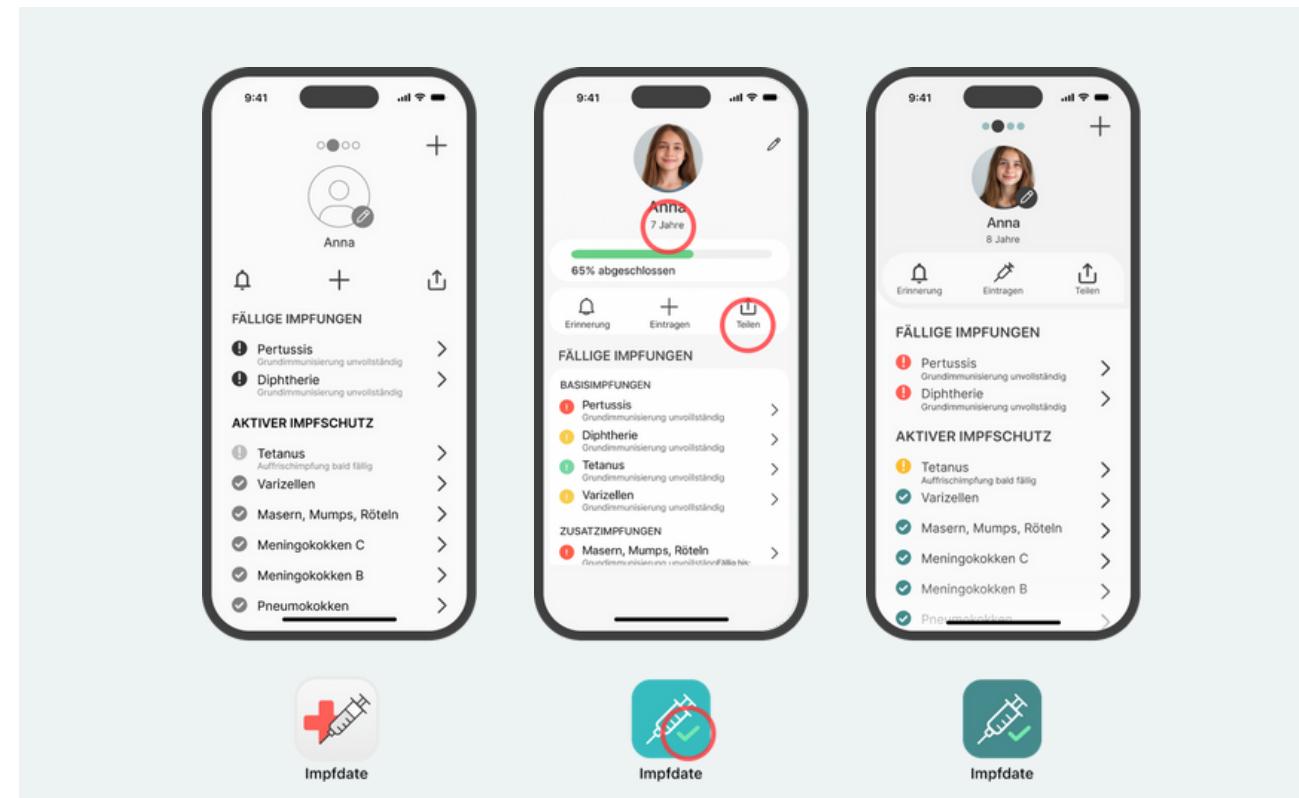
*UI design iterations with A.I. as a tool.

Working on a design system

The app design incorporates a softer green palette to transmit trust and protection. Additional colors serve as visual cues for alerts or to improve legibility by giving WCAG compliant contrast to text, buttons and icons. The font choice of sans serif gives a friendly and approachable feel, distancing itself from typical serif font for long and technical text.

Farben

#1A5759
Tasten,
Symbole, Text

#458A8C
Secondär Text

#EDF2F2
Feld
Hintergrund

#EDF2F2
Hintergrund

#4CAF50
Status

#FF5F57
Status

#FEBC2F
Status

#FAFAFA
Hintergrund
Paragraph-
Text

Typografie

h1	Headline 01	Inter, 24-28pt, bold
h2	Headline 02	Inter, 20pt, semi-bold
p1	Lorem ipsum dolor sit amet	Inter, 16pt, medium
p2	Lorem ipsum dolor sit amet	Inter, 16pt, regular
Caption/Helper	Lorem ipsum dolor sit amet	Inter, 14pt, regular

Tasten

Secondär Aktiv   Primär Aktiv   Inaktiv

Navigation

‹ ›

App

Impfdate

Symbole

Status

*The color pallets, types and icons create the visual identity of the app.

Working on the UI

The actions and information were distributed through the screen considering the thumb reach zone, placing the most important clickable actions were the reach feels natural.

Auto-layout, components, variables and tokens were used in Figma to allow the app to be responsive, scalable and consistent throughout the screens.
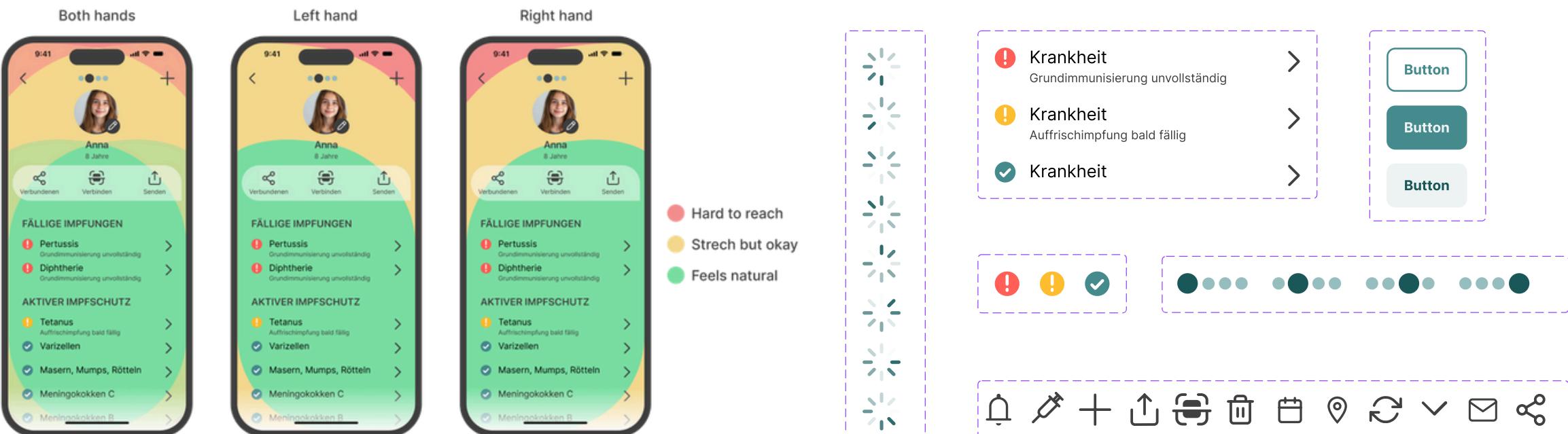
*The thumb zones for the mobile app

*These were the components created in Figma for the app

Testing the prototype

After finishing the mockups, a new prototype was created and tested. Focusing on four functions of the app (entering records, reminders setting, sharing with others and reading disease description), the moderated usability study asked 3 participants to evaluate the experience and perform 4 tasks, evaluated the results and iterated the design based on the same time on task and drop-off rates vs. conversion rates KPIs.

Scanning a QR Code is a simple method to connect to the doctor's office, saving time and avoiding typing errors

The three main functions of the app are visible from the main screen
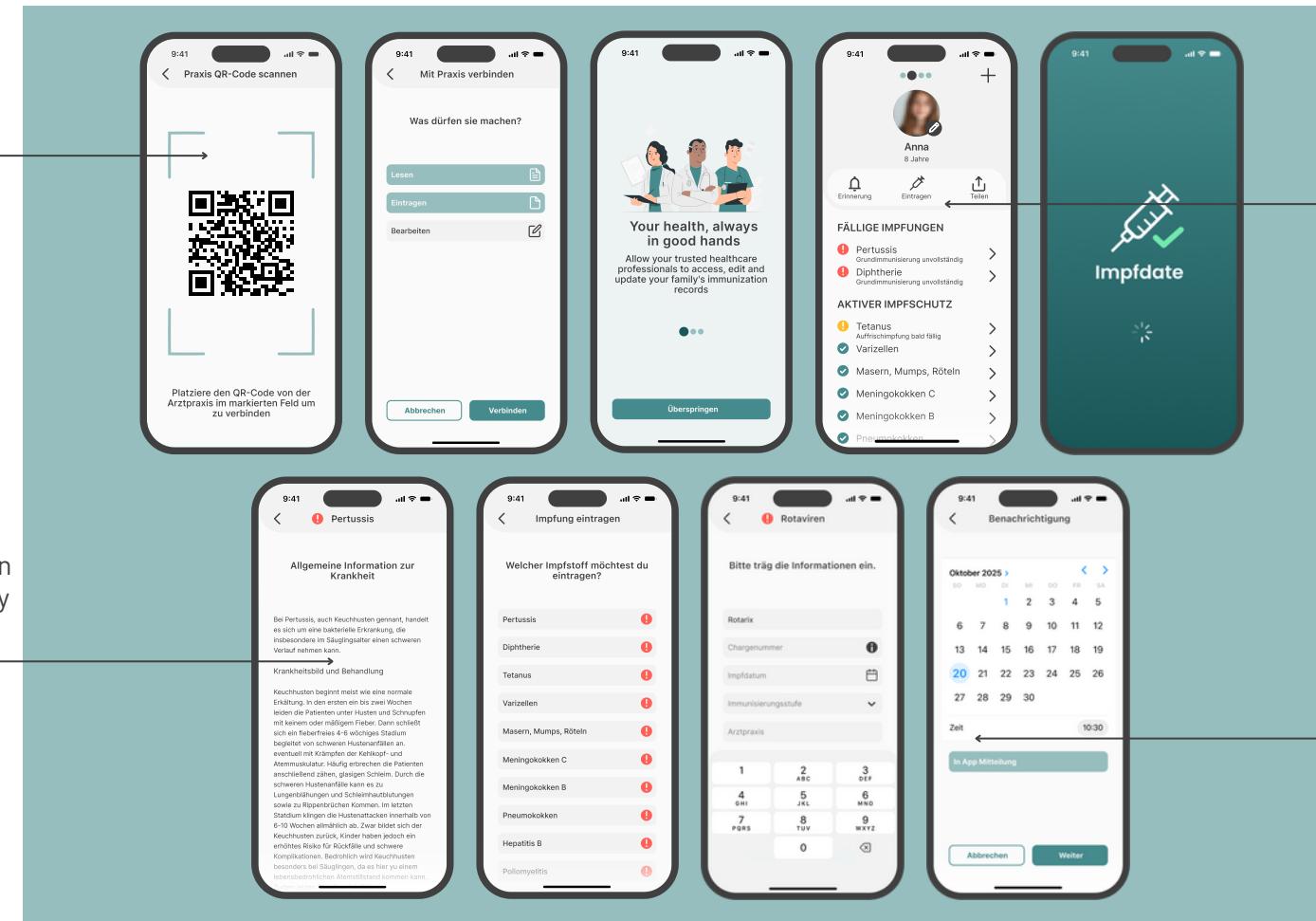
Desease information in plain language for easy understanding

Missing or upcoming dose reminder in app or integrated with user's default calendar app

*Click here to test the prototype

Combining results with observations

Adding labeling helped better identifying the individual functions with 100% conversion rates. The time on task couldn't be compared with the first test because additional steps were added to the features, but the observations of how users interacted with the product revealed, that 66% tried to enter a record through the disease card, which points that it would make sense to include this path to access the feature.

The share and send buttons could also open a path to connect with the doctor's office, so users didn't need to go back one step to do so. Not every user navigates equally, so offering alternative paths make sense.

| ENTERING VACCINE	SETTING REMINDER	SHARING RECORDS	DISEASE DESCRIPTION
100%	**100%**	**100%**	**100%**
completed the task	completed the task	completed the task	completed the task
in 0:32min	in 0:34min	in 0:28min	in 0:12min
average time	average time	average time	average time

*These were the results from the second usability test

Presenting the solution

After the iteration from the second test, the final prototype has the basic structure of an App with onboarding screens, overview and functions integrated with built-in and third-party apps from the phone, such as calendar, printer and social media. The prototype doesn't require user registration or has any commercial purpose yet due to it simply being a private portfolio project focused exclusively on the user's pain points.
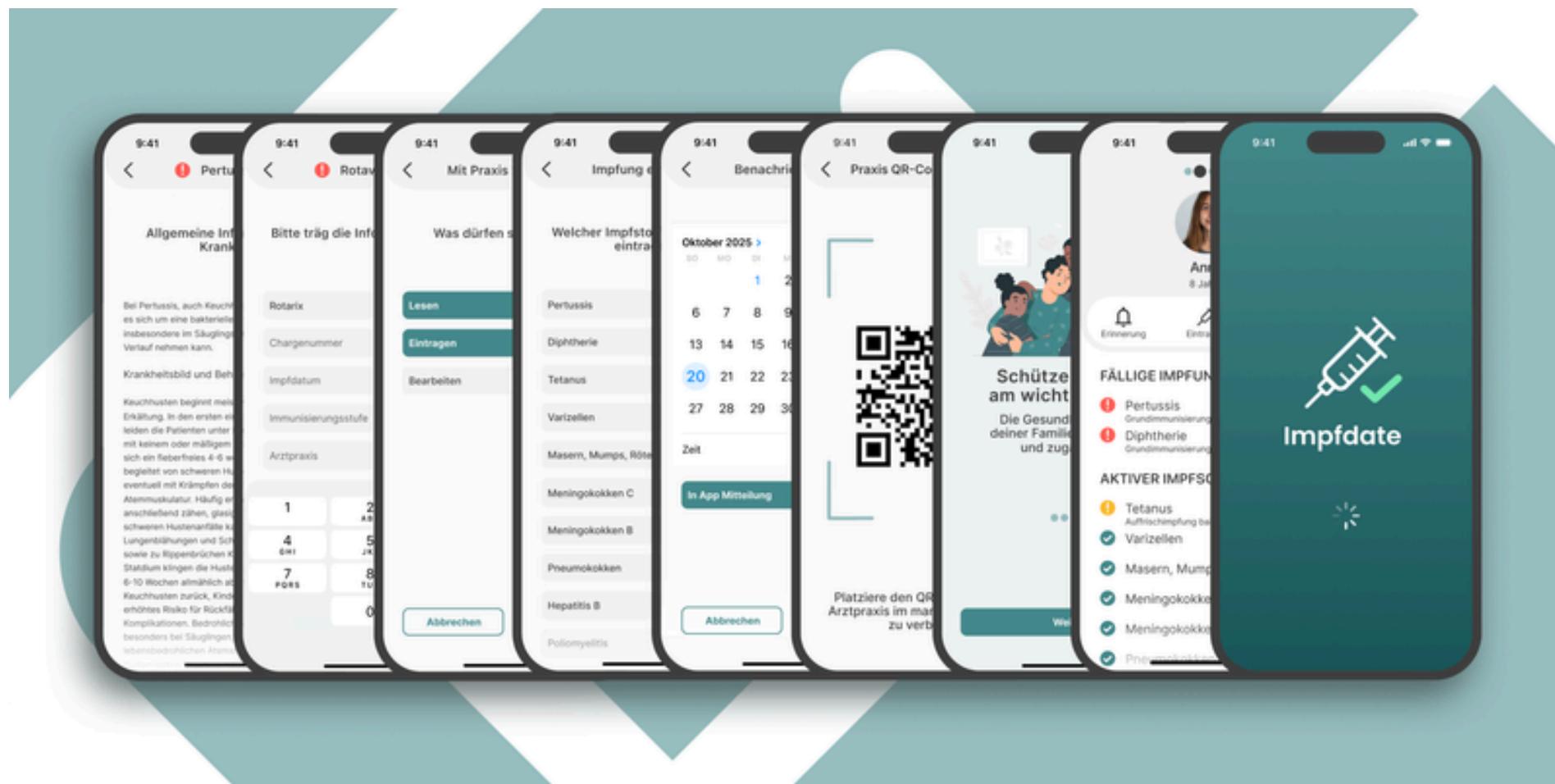
*Click here to check the prototype file

Considerations and next steps going forward

Users' feedback and observing how they interact with the product during tests brought new insights that couldn't be achieved only through the interviews, and allowed the app experience to become more fluid. It was interesting to observe how users navigate differently while trying to complete the same tasks.

There are still many opportunities to explore within the app, such as adding images to the disease description to illustrate symptoms, multiple language support, UI hierarchy improvement, and adding micro-interactions and animations to make the experience more pleasant.

There could also be created the practitioner's version of the app, with expanded capabilities to manage multiple patiences' profiles, remote synchronization and appointment suggestions. But that doesn't make sense yet as the project is just conceptual.