

CASE STUDY

# USING JOURNEY MAPPING TO DEVELOP A MOBILE APP FOR CHRONIC PATIENTS



This case study shares how students at the University of Michigan developed user personas and journey maps to create an innovative mobile app to remind teenage chronic patients to take their medication.

## ABOUT THE UMSI DESIGN CLINIC

The Design Clinic at the University of Michigan School of Information (UMSI) pairs teams of graduate and undergraduate students with external clients, providing consultation services on user interface, interaction design, usability testing, customer discovery and user research. Student teams select, scope, negotiate and execute one-semester-long projects from their innovation community and support weekly design helpdesk hours.

Clients, which include businesses and other organizations, are then free to implement student recommendations. The independent study program was initiated in 2015 and is based on voluntary contribution.



## FACTS

Aim of the project

**developing a mobile app to support chronic patients taking their medication**

Project duration

**4 months (January to April 2017)**

Number of students contributing

**6**

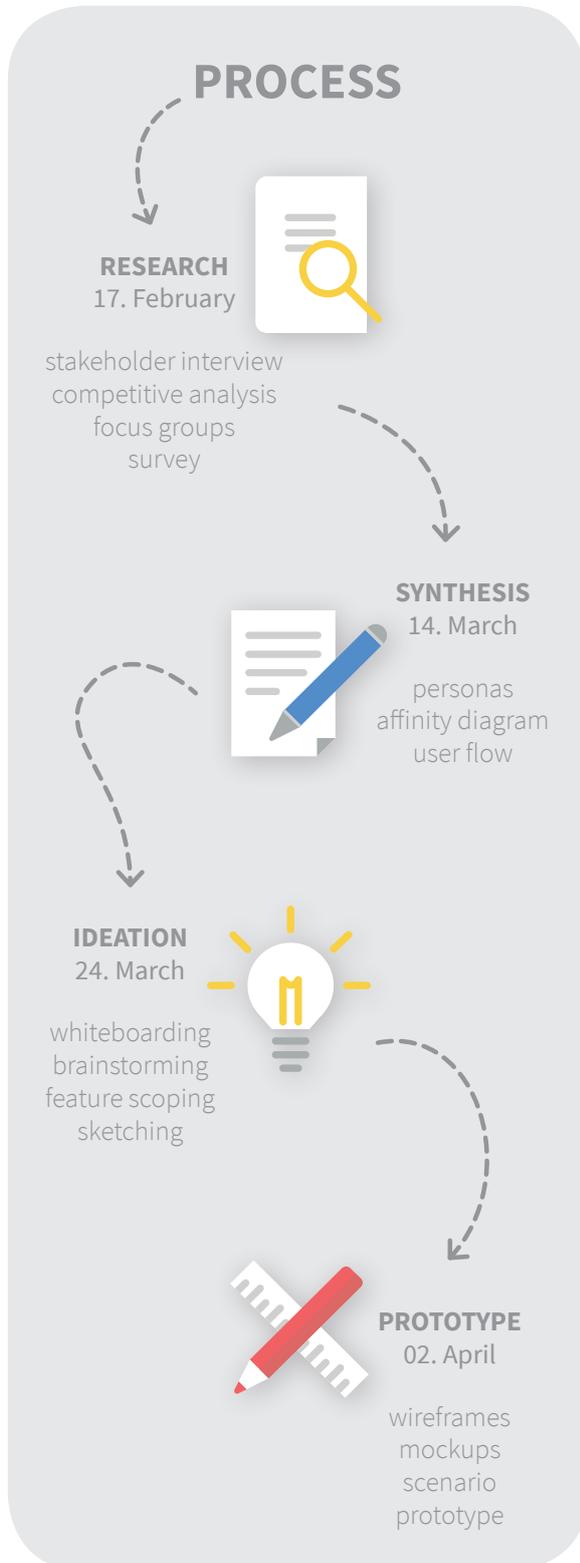
Number of journey maps created

**2**

Number of personas created

**2**

**#HEALTHCARE  
#CHRONICPATIENTS  
#UNIVERSITY**



## PROBLEM AND GOAL

In the US, 31% of all adolescents have at least one chronic condition and need to take their medication on time, which is a significant health issue<sup>1</sup>. Existing medication apps, however, do not deliver feasible solutions for people as they are too complicated, not customizable or user-friendly. Some of them are missing a reminder function, others do not have a feature for refilling the pillbox. With some apps, patients can't add colors of the pills in order to better identify them, nor can they share their medication schedule information with caregivers.

In this project, students collaborated with a client to provide chronic patients with an easy system to stay on medication schedule.

## PROJECT SETUP

In January 2017, the student group started their project with collecting data that helped identify needs and opportunities for product development. In order to do so, students used various user research methods:

- ▶ six stakeholder interviews
- ▶ two patient interviews
- ▶ two focus groups with more than 40 participants
- ▶ an online survey with 41 entries

Furthermore, they did a comparative analysis of eight existing apps which showed that existing products do not meet the needs of teenage chronic patients.

*Data showed that 41% of all chronic patients are reminded of their medication when they see the pillbox. 37% forget to take their medication mainly on weekends or during holidays. 31% set an alarm on their phone as a self-reminder. 15% already use customized medication feature tops.*

<sup>1</sup> Child and Adolescent Health Measurement Initiative; The Data Resource Center for Child and Adolescent Health. (2012). National Survey of Children's Health. Portland, OR: Child and Adolescent Health Measurement Initiative; The Data Resource Center for Child and Adolescent Health. Retrieved May 4, 2016, from <http://childhealthdata.org/browse/survey/results?q=2473&r=1&g=448>.



## Remember Joy?

"I know that chronic illness is going to be my lifestyle and medical adherence is a huge part of it, but I still want to experience high school at its fullest. I don't want to be constantly mindful of my medication schedule or have people around me to be overly aware that I'm chronic."

### Joy's Current School Life

"I don't want to explain my situation everyday. People sometimes ask rudely and cannot understand my difference."

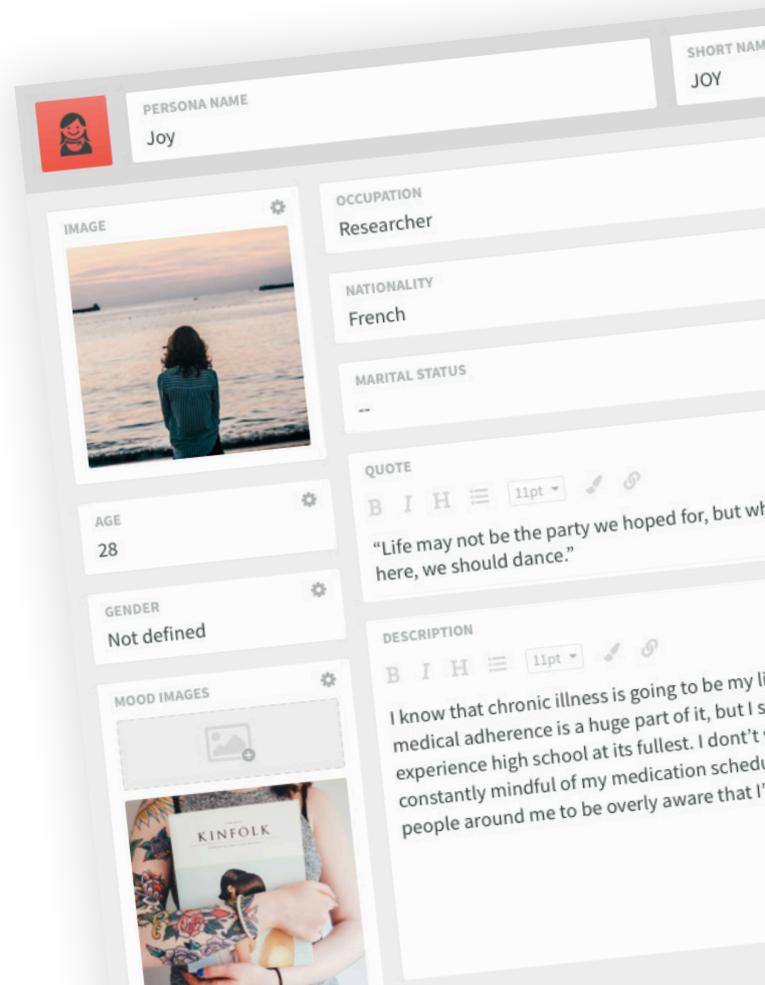


### Joy's Current Notification App



Based on these learnings, students developed a persona named Joy. They put all the data collected together, analyzing her goals, motivations, and also her frustration with existing apps. The team described Joy as a high school teenager who suffers from a chronic illness as she constantly has to take medication and feels embarrassed of doing so in public because of unwanted inquiries. Various apps already exist for patients like Joy and she has tried out some of them already. However, she is fed up with current options which take too many steps to accomplish her daily tasks. For example, she needs different schedules for just one medicine, but the current app only allows her to fix one schedule for one medicine. She has to repeat the process over and over again until every intake is set up in the app. That is why she is not a big fan of using apps as medication reminders.

*In the next step, students created a journey map to visualize Joy's problems with current apps. The journey map helped students to empathize with the persona and analyze the experience step by step.*





## IDEATION AND IMPLEMENTATION

Ideas for a better app were collected and synthesized through an affinity wall, where ideas for improvement and research findings were documented on cards.

For the ideation phase, the project group also worked with whiteboarding, brainstorming, feature scoping and sketching. For creating the first prototype, they used wireframes, mockups and scenarios.

Finally, students developed a new mobile app and implemented various features that were supposed to improve the user experience:

- ▶ The new medication management system is flexible. Users can add several medicines which need to be taken at the same time, or they can set different schedules for one medication.
- ▶ The app could be connected with a wearable device or patch as patients requested a good reminder system which at the same time is not intrusive to other people around them. Reminder systems on wearables can easily be customized. Teenagers can now choose the vibration strength or disable the blink mode.
- ▶ The notification setting allows both text and phone calls. Research has shown that texting is the most common way of communication among teenagers. Phone calls are made mainly for close relationships.
- ▶ Emojis were incorporated as they are widely used by younger generations. Special emojis, which were developed by the client of the project for diabetes patients, were adopted. Teenagers could express their feelings and the record can be shared with caregivers, parents or doctors.



- ▶ Based on the emojis, users get a diary and report in order to evaluate effects overtime.
- ▶ Parents, friends and doctors play a vital role in the patients' life. Therefore the app allows users to include them as their "allies" and share their information with them. Once a user misses a dose, allies will be notified and can remind the patient.

*As the next step, the student team worked on integrating feedback collected from user testings and iterating on the interaction details. Furthermore, the "allies" version of the app had to be developed to find a reasonable mechanism for parents to help their children. While the student team finished their task, the client started working on implementing the app on the market.*

### Improved Scheduling Process

- Add to existing schedule feature allows you to easily add new medicine to already scheduled events
- Give it a nickname to help you memorize

### Diary and Report

- Use customized Emoji to record how you feel after taking a medicine
- View your adherence and recorded effects overtime
- Invite your allies to see it so that they can also understand your condition



### Allies

- Invite others to help you stay on track with your medication
- When you missed a medicine, allies will be notified to remind you
- Send a weekly adherence report to your allies so that they can better understand you

### Wearable Integration

- Connect this app with a wearable of your choice and set a customizable vibration pattern to remind you when you need to take medicine
- Remember your schedule but never worry about having people noticing your schedule



## CONCLUSION

This case shows how journey mapping was used to develop a user-friendly mobile app within a voluntary university design project. Creating personas and journey maps was a crucial step in the development, as it helped students to empathize with their users, analyze and structure their research into tangible insights, and create an app that fits their needs at each single step of their usage.

*“The research led to a clear understanding of the struggles of these teens, converging to spot-on design insights. The design has created innovation in addressing the user needs and the product concept dramatically improves the current solutions.”*

— **client representative**

The patients loved the new solution developed by the students because it finally made it easy for them to take their medication.

*“It is by far the best thing I’ve seen for a medication or symptom app. I love everything, and how it all seems to be so easily adjusted and make to fit your own needs. I love the clean layout, the calendar, the “allies” section, and especially love that you choose the word “allies.”*

— **Patient, anonymous**

Students themselves benefit from this hands-on project too.

*“Our graduates are in high demand, and often land highly sought jobs at Facebook, Google, Apple and other prominent high-tech companies.”*

— **Nancy A. Benovich Gilby,**  
former Ehrenberg Director of Entrepreneurship & Design  
Clinical Associate Professor at the University of Michigan

