



JAM + YARROW

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**DESIGN REPORT**  
SUMMER 2015



## DESIGN REPORT

# EXECUTIVE SUMMARY

### ABOUT THE PROJECT

Jam & Yarrow is a team of five Carnegie Mellon University graduate students who worked together on a capstone project for Ventana Medical Systems in Spring and Summer of 2015.

In this report, we summarize our design process for RAPID Patient Portal, a digital product that would help cancer patients make better informed decisions regarding diagnosis and treatment.

The RAPID Patient Portal shares its brand name with Ventana's RAPID Oncology, a physician facing application that is designed to aggregate information about patients across treatment divisions. While the two applications currently stand as independent products, Ventana's plan is to integrate them eventually so that one can seamlessly pull information from the other.

### OUTCOME

As a culmination of our work this summer, we provided Ventana with the following primary set of deliverables:

1. A functional and responsive prototype of the complete RAPID Patient Portal application.
2. A mockup prototype of the RAPID companion mobile app, optimized for patients on-the-go.
3. A concept video for the purpose of internal distribution within Roche.
4. A design report summarizing our design process from concept validation to high-fidelity designs (this book).

### VALUE

The RAPID patient portal provides significant value to people living with cancer, care givers and oncologists:

1. Offers a one-stop-shop holistic system aggregating disparate information in one place.
2. Captures and provides access to richer, broader and more accurate patient information.
3. Provides patient guidance, coaching and decision support.

As a secondary outcome, user-reported information and behavioral data captured through our application will provide unique business value to Ventana and Roche diagnostics by informing research for more personalized tests and treatments.

**OUR CLIENT**

# VENTANA MEDICAL SYSTEMS

*Improving the lives of all patients afflicted with cancer.*

Ventana Medical Systems, Inc., a member of the Roche Group, is a world leader and innovator of tissue-based diagnostic solutions for patients worldwide.

Passionately pursuing their mission to improve the lives of all patients afflicted with cancer, the people of Ventana discover, develop, and deliver medical diagnostic systems and biopsy based cancer tests that are shaping the future of healthcare.

Ventana values personalized information and develops cancer tests that can empower pathologists to determine the best and most relevant treatment for each individual cancer patient at the right cost.

Ventana believes that in the future, cancer patients' personal preferences and self-tracked information will play a major role in making an accurate cancer diagnosis, and creating an individualized treatment plan for them.

**ITERATIVE DESIGN REPORT**

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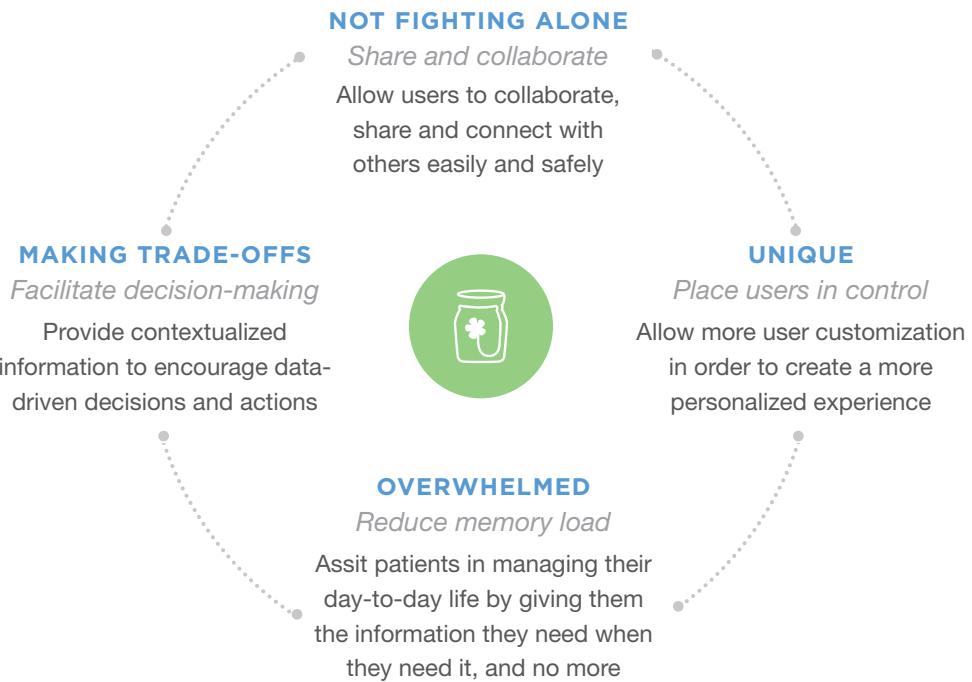
#### **OUR MISSION STATEMENT**

DESIGN A PERSONALIZED HEALTH-PORTAL  
THAT EMPOWERS PEOPLE LIVING WITH  
CANCER TO TAKE CHARGE OF THEIR  
TREATMENT AND CARE.

# REVISITING OUR RESEARCH FINDINGS

*The findings summarized here are based on the extensive generative research we conducted in Spring semester.*

## WHAT CANCER PATIENTS HAVE IN COMMON...



## ...AND HOW THEY DIFFER

We found that people living with cancer vary in whether they take a more data-driven or more social-driven approach to decision making.

Data-driven decision-makers value objective, factual statistics and feel empowered by access to detailed information about their medical state.

Social-driven decision-makers value personal and anecdotal information from peers and are more likely to participate in support groups and forums.

Most patients do not fall squarely on one side or the other.



# INTRODUCING...

## RAPID HEALTH PORTAL



## RESPONSIVE WEB APP AND MOBILE COMPANION THE PRODUCT SET



### RAPID PATIENT PORTAL (WEB)

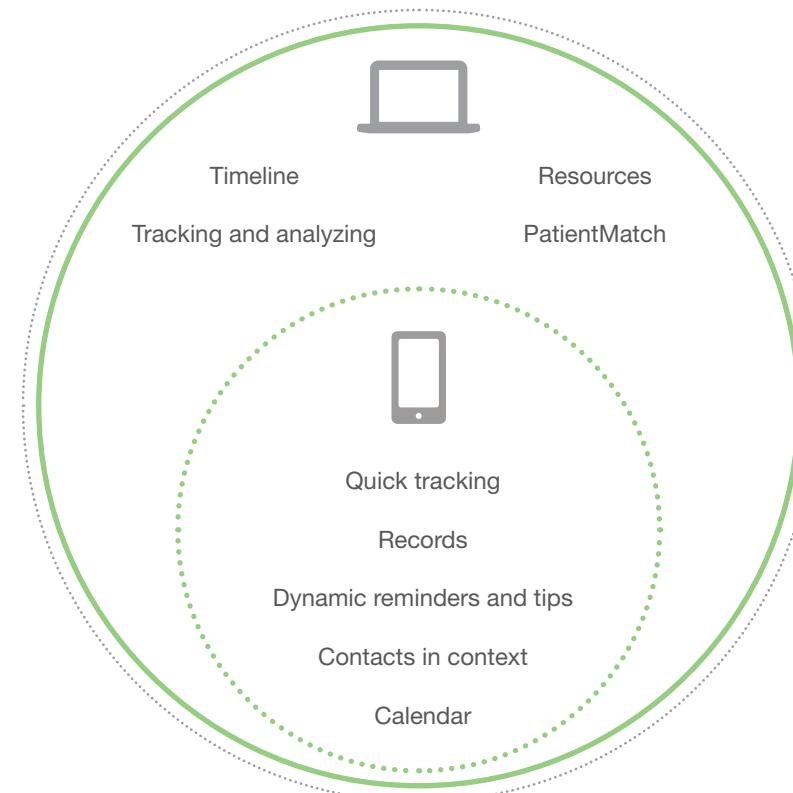
The RAPID web portal is a holistic health-portal that empowers people living with cancer to take control of their treatment and care. It integrates typically disparate information sources in one place, including medical records (appointment history, test results, doctor's notes, etc.) and user-reported tracking information.



### RAPID PATIENT COMPANION (MOBILE)

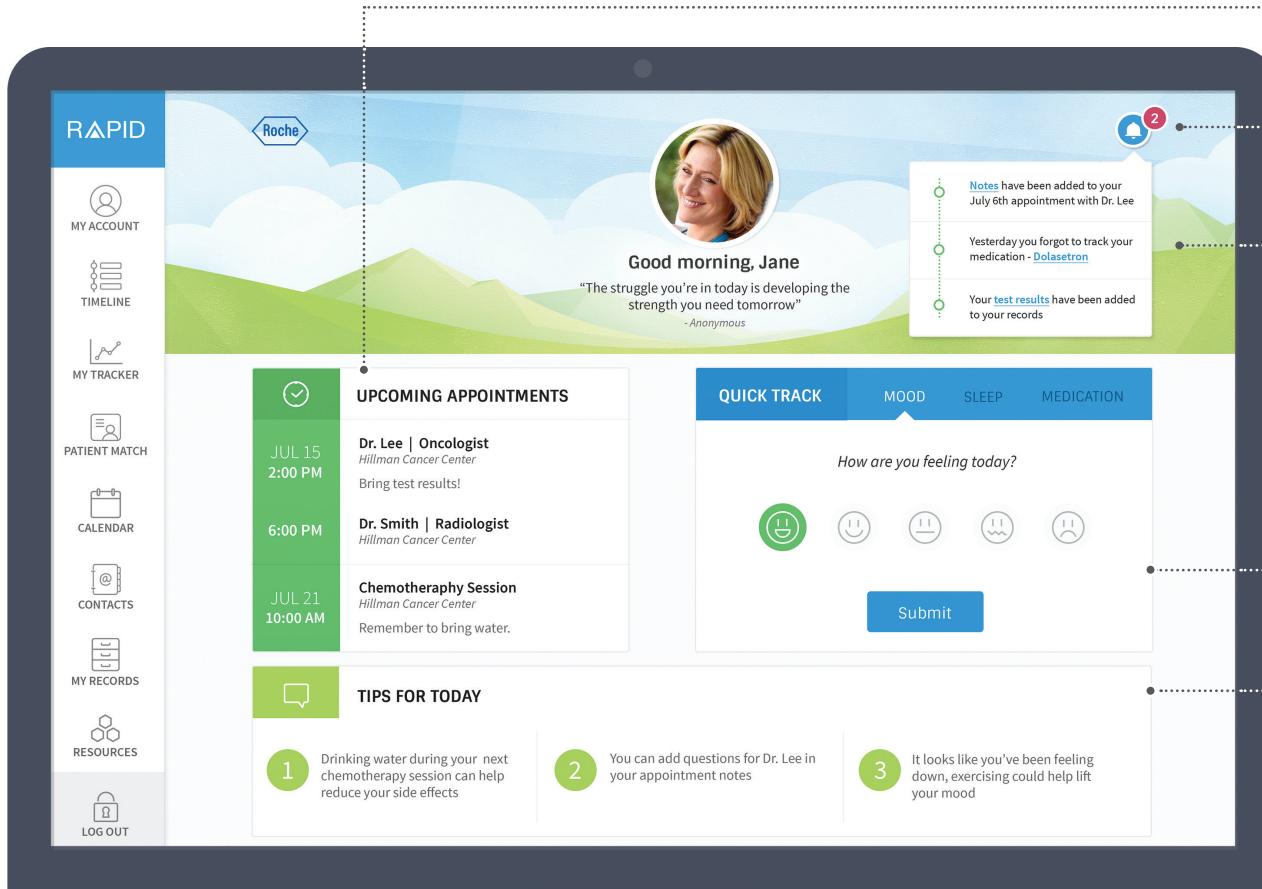
The RAPID mobile app is designed to function as a companion app to the RAPID Patient Portal to enable people living with cancer to take control of their treatment and care on the go.

### RAPID PATIENT PORTAL FEATURES



## RAPID PATIENT PORTAL

## WEB PORTAL HOME





## HEADER

A customizable cover image rotates according to time of day and welcomes the user along with a daily inspirational quote or goal statement. Users can indicate preference for quotes or input their own.



## TIPS FOR YOU

Personalized Tips are pulled from a database based on the user's records and tracking information. Common examples could include to-dos after treatment, strategies for alleviating symptoms, relevant support events in your area, suggestions for when to contact physician, etc.



## NOTIFICATIONS

Notifications alert users to new information in the system or any missed actions. Common examples could include new test results, patient matches, missed medication, lapse in tracking activity, etc.



## QUICK-TRACK

Categories users track the most appear in the quick-track feature, which also responds to time-of-day by displaying the items most tracked at that time.



## UPCOMING APPOINTMENTS

Users can click on individual appointments to view more detail about the doctor, location, type of appointment and how to prepare.

## HOW IT WORKS

The RAPID Patient Portal home offers a minimalist dashboard experience along with intuitive side-bar navigation for additional content. The homepage provides pertinent and comprehensible at-a-glance treatment and care information, including reminders, notifications and tips. The user can review and input updated information quickly without being overwhelmed with options. The cool pastel color scheme and evocations of nature inspire calm and a sense of possibility.

## RAPID PATIENT PORTAL

# PATIENT TIMELINE

The screenshot shows the RAPID Patient Timeline interface. At the top, there's a header with "Good morning, Jane" and a quote: "The struggle you're in today is developing the strength you need tomorrow" - Anonymous. A notification bell icon shows 2 notifications.

The left sidebar has navigation links: MY ACCOUNT, TIMELINE (selected), MY TRACKER, PATIENT MATCH, CALENDAR, CONTACTS, MY RECORDS, RESOURCES, and LOG OUT.

The main area displays a timeline for the year 2015. Key events include:

- June 18:** Started Tamoxifen (20mg in morning and evening daily). Notes: Expected side effects: may cause blockages to form in a vein, lung, or brain. Also may cause cataracts and other eye problems.
- June 16:** Chemotherapy (Adjuvant chemotherapy Cycle 3, followed by 19 days of rest period).
- June 8:** Started Dolasetron (100 mg orally given for prevention before chemotherapy). Notes: Common side effects: chest pain or discomfort, lightheadedness, dizziness, or fainting. Slow or irregular heartbeat.

On the right, there's a "View by:" section with buttons for Milestones (selected), View All, Test Results, Appointments, Prescriptions, and Other.

The timeline page displays key patient history and information in chronological order. Users can filter by topical categories as well as add their own notes to any timeline items. Milestones include items such as diagnosis, surgeries, chemo cycles, hospitalization, remission, etc.

## RAPID PATIENT PORTAL

## TRACKER + ANALYZE

The screenshot shows the RAPID Patient Portal interface. On the left is a vertical sidebar with icons for MY ACCOUNT, TIMELINE, MY TRACKER (which is selected and highlighted in blue), PATIENT MATCH, CALENDAR, CONTACTS, MY RECORDS, and RESOURCES. At the bottom is a LOG OUT button. The main area has a blue header with the text "Good morning, Jane" and a quote: "The struggle you're in today is developing the strength you need tomorrow" - Anonymous. There are also notification icons for messages and reminders. The central content area is divided into two sections: "MY TRACKER" and "ANALYZE". Below these is a search bar asking "How does my symptom relate to my medication?". A text box displays a quote: "When you took your medication, 3 out of 5 times your nausea level was below mild". Below this is a graph comparing medication (DOLASETRON) and symptoms (NAUSEA) over time (July 5 to July 11). The graph shows that out of 5 instances of taking Dolasetron, the nausea level was Mild or None in 3 instances. The graph has three data series: DOLASETRRON (red circles), NAUSEA (green circles), and SEVERITY (grey circles). The Y-axis ranges from None to Severe. The X-axis shows dates from July 5 to July 11. The graph shows a peak in nausea level around July 9.

Date	DOLASETRRON	NAUSEA	SEVERITY
July 5	None	Mild	None
July 6	Severe	Mild	Severe
July 7	None	None	None
July 8	None	Mild	None
July 9	Severe	Severe	Severe
July 10	None	Mild	None
July 11	None	Mild	None

Below the graph are buttons for TIME, DAY, WEEK (which is selected and highlighted in blue), MONTH, YEAR, and ALL TIME.

The tracker section in the RAPID web application is composed of two key parts: tracking and analysis.

In tracking, users can track items such as medication, symptoms, mood, activity, sleep, and others. Users can also create their own custom categories to track, as well as set category metrics, goals and reminders.

In analysis, users can explore possible relationships between tracked items and identify trends over time. While causation should not be implied, users may find meaningful clues to tying a behavior to a health outcome, such as symptom to a medication, and come up with ideas or strategies to improve well-being.

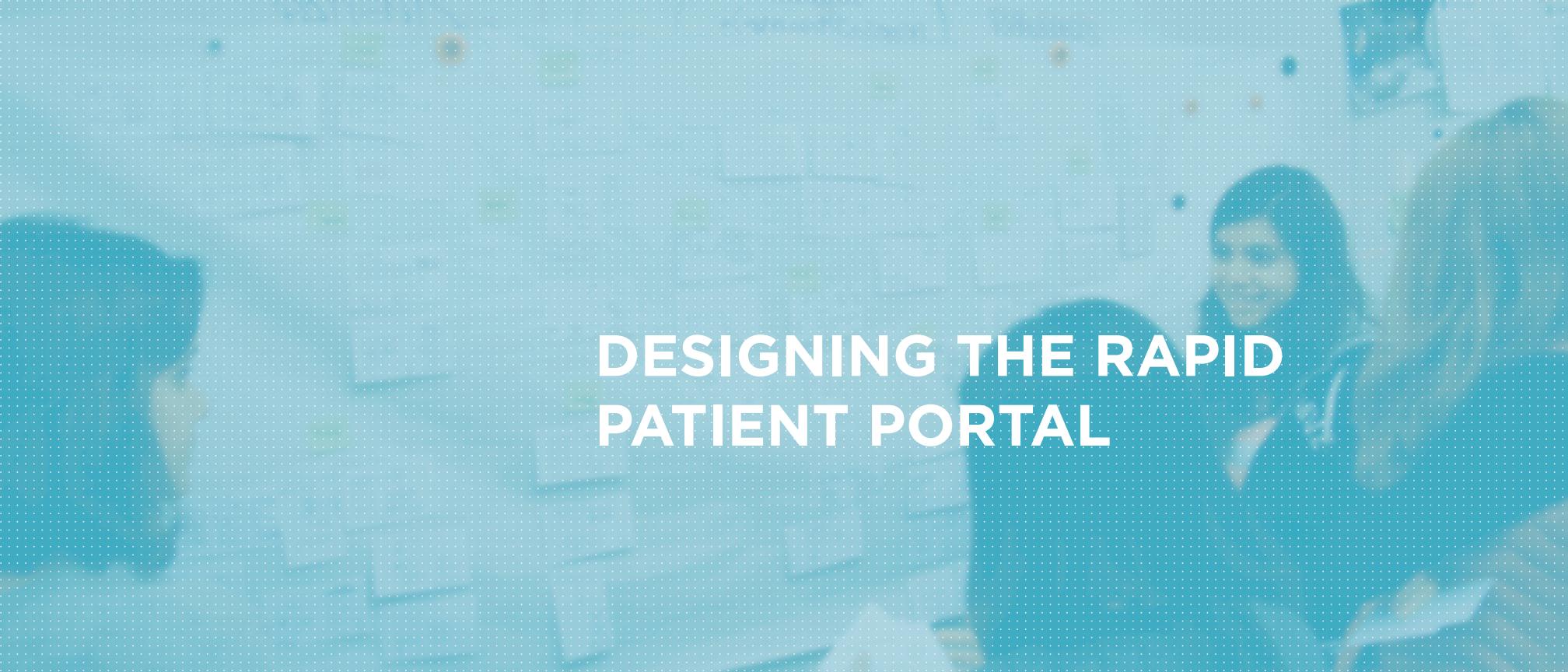
## RAPID PATIENT PORTAL

# PATIENT MATCH



The patientmatch section allows users to connect with other patients like them. Advanced search functionality enables patients to narrow down relevant matches according to diagnosis, age, sex, treatments, medications, geographic location and other filtering categories. Once matches are found, users can view their matches' timeline information and/ or email matches to connect outside of the portal application.

RAPID PATIENT PORTAL  
**TRACKER**



# DESIGNING THE RAPID PATIENT PORTAL

1. Our development timeline
2. How we identified foundational features
3. Going from lo-fi to hi-fi prototypes
4. Looking forward

# HOW WE IDENTIFIED FOUNDATIONAL FEATURES



## BRAINSTORMING

+60 features

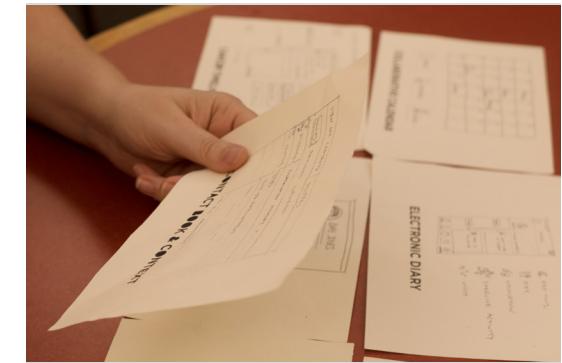
Based on the extensive research we conducted in the spring, and what we discovered about patient challenges, desired and needs, we generated over 60 discrete feature ideas. We combined several features into feature sets and organized them into topical categories such as dashboard, tracking or social features.



## CLIENT VISIONING

15 features

We met with our client to present them with our research findings and our list of ideas. Together, we mapped our features on an “Impact vs. Feasibility” matrix. Through this activity, we identified about 15 feature sets that were both impactful and feasible in the context of this project.



## SPEED DATING

5 main features

We took the list of feature sets we identified in the client visioning session and created quick concept sketches for each. We then presented our sketches to potential users for feedback and honed-in on a set of 5 foundational features to include in our portal: Timeline, Custom Tracking, Case Match, Contacts and Calendar. These five features became the starting point for our low-fidelity designs.

# OUR DEVELOPMENT TIMELINE

## ❖ IDEA VALIDATION METHOD

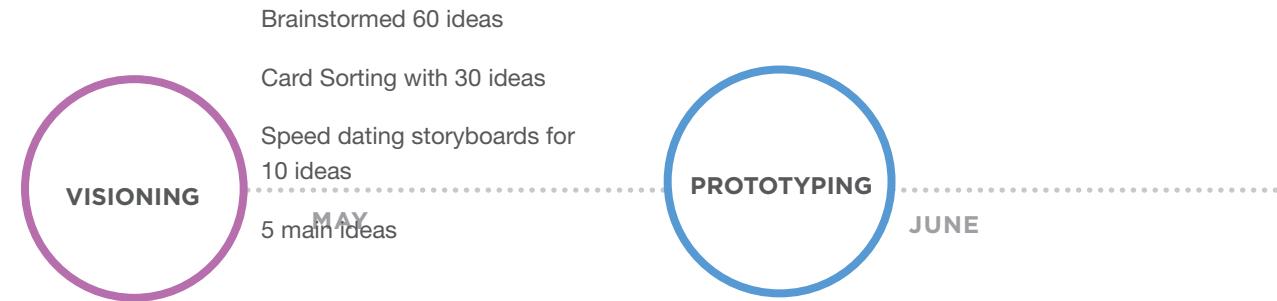
- Card Sorting
- Speed dating storyboards

## ❖ TESTING METHODS

- Task Analysis
- Think Aloud

## PROTOTYPING METHODS

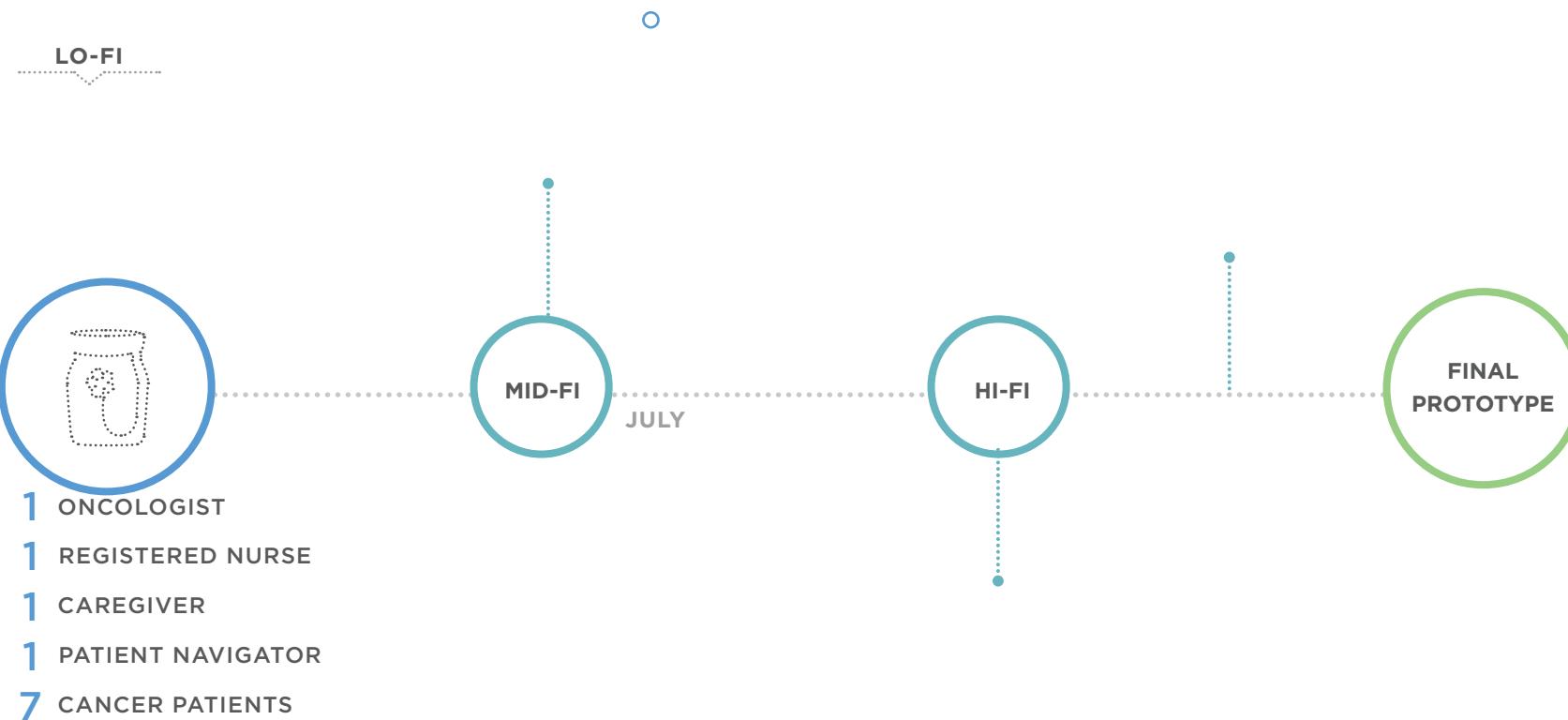
- Paper prototyping
- △ Sketch and Invision tool
- HTML/CSS, Javascript



**COMPETITIVE ANALYSIS** We reviewed and analyzed existing services and tools for finding information about cancer.

**LITERATURE REVIEW** We read literature, articles and blogs for a broader understanding of desires, challenges and needs.

**DIARY STUDIES** We created a diary study for patients to log their daily cancer related activities for a span of 2 weeks.



## WEB APP

# STARTING WITH LO-FI PROTOTYPING



## WHAT WE DID

We created sketches for the rapid patient web portal and a paper prototype of the mobile application. We tested our ideas with 10 users to observe user flow and if the features we designed were easy to understand.

## WHAT WORKED

1. Participants liked the personal, warm tone of the application.
2. Participants appreciated the ability to customize their tracking categories.
3. Participants liked the ability to see their appointment and other history with particular doctors.
4. Participants liked the idea of the product



## WHAT DID NOT WORK

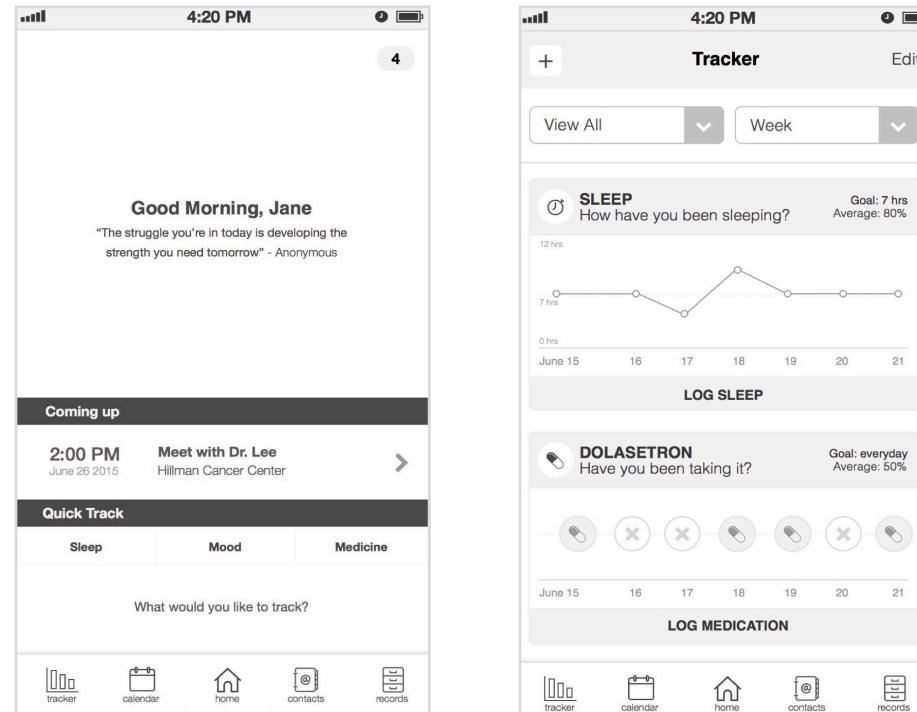
1. Some users felt they needed an explanatory welcome experience to the application
2. Some users were not sure how to interpret the tracking data.
3. Some of the wording in our prototype confused participants or led them in a different direction
4. Users were concerned about sharing and privacy options within Patient match. Users wanted more shortcuts and quick value

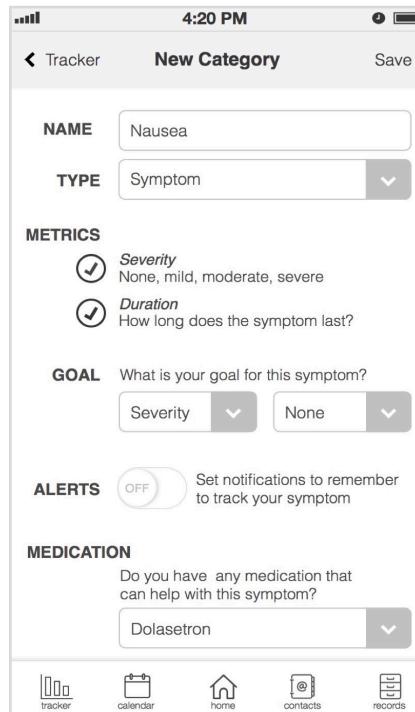
## MOBILE APP

# MID-FI PROTOTYPING

## WHAT WE DID

Based on the feedback obtained from lo-fidelity prototype testing, we made some design and layout changes. We created mid-fi prototypes for both the web patient portal and the companion mobile application. We tested these prototypes with 8 users to find layout and user flow issues.





## WHAT WORKED

1. Users like the idea of Quick track adapting to the time of day and most tracked categories
2. Users liked the predefined tracking categories and found them useful to track
3. Users appreciated the ability to view their histories of interactions with specific doctors
4. Users liked the idea of timely reminders and being able to click on reminders to perform relevant actions

## WHAT DID NOT WORK

1. Logging data seemed to involve more effort and users were not sure how feasible detailed tracking would be for them
2. Users wanted to have more control over quick track and the categories selected
3. Some users did not get the concept of customizing tracking categories, and instead consider them to be tracking new instances
4. Some users wanted a way to take dynamic notes on the application

## WEB APP

## MID-FI PROTOTYPING

The screenshot shows the app's main dashboard. On the left is a sidebar with icons for Timeline, Track, Casematch, Calendar, Contacts, My Records, Resources, and Log Out. The main area has a header "Morning, Jane" and a quote: "The struggle you're in today is developing the strength you need tomorrow" - Anonymous. Below this is a "Coming Up" section with a reminder for a meeting at 2:00 PM. A "Reminder" section shows a message about未 tracked medication. The "Track" section includes a "Quick Track" for Sleep, Mood, and Medicine, with a "How was your sleep last night?" question and a scale from Very poor to Great. The "Timeline" section shows a list of events for June 15, 16, 17, and 18, such as appointments with doctors and exercise sessions. A "Load More" button is at the bottom.

This screenshot shows a detailed timeline view. It features a sidebar with the same icons as the first prototype. The main area has a header "Morning, Jane" and a quote. It displays a timeline for June 16, 17, and 18, with specific events like appointments and exercise sessions. A "Started Tamoxifen" milestone is shown on June 18, with a note about the treatment and its effects. A "Radiation Therapy" milestone is also present. On the right, there are sections for "View By:" (Milestones, Test Results, Appointments, Prescriptions, Tracker, Other) and "Your doctors" (represented by icons). A "janelr0712" profile picture is visible.

## WHAT DID NOT WORK

1. The name “case match” seemed clinical to most
2. Some oncologists were concerned about privacy and hospital liability with case match
3. Some patients felt the visualization tool has a learning curve due to the different types of graphs included
4. Users were confused by the “tracker” filter on the timeline and felt it was not needed
5. The homepage seemed a bit information-heavy and busy to some

## WHAT WORKED

1. Patient match was a very popular feature among patients
2. Patients and oncologist alike were very interested in the tracking data and appreciated the visualization tool
3. Users liked being able to pick tracking categories to compare and analyze
4. The timeline filters felt intuitive and helpful to all users
5. Users appreciated the explicit privacy settings leading up to the “case match” page

## KEY TAKEAWAY

At this point, we learned that we needed to further reduce the amount of information presented to the user. Some users loved the patient match feature, but some were hesitant to use it. Similarly, some users were very excited about the option to analyze their tracking data at a higher level of granularity, but some users did not want to be involved in that much detail.

**WEB APP**

# HI-FI PROTOTYPING

**WHAT WE DID**

We created hi-fi prototypes of mobile and RAPID patient prototype using tools like illustrator and inVision. We chose a warm and color palette and incorporated things we learned from the testing phases of low and medium fidelity prototypes

**WHAT DID NOT WORK**

## WHAT WORKED

# LOOKING FORWARD

## *What should RAPID Patient Portal 2.0 include?*

Over time, we recommend that Ventana implement a few additional features that fell outside of the scope of our prototyping efforts this summer. We also recommend that Ventana continue testing additional design iterations with potential users.

The following feature suggestions are based on extensive conversations we conducted with users through the course of multiple design and testing iterations this summer:

### TRACKING

- Collect user-generated tracking categories in a database searchable by other users.
- Facilitate integration of popular tracking apps such as fitbit and my fitness pal.

### DATA ANALYSIS

- Enable comparisons of several tracking categories on one graph in Analyzer
- Enable test-result comparisons in Records
- Enable comparisons between test-results and tracking categories in Analyzer

### SOCIAL FEATURES

- Make tracking categories social by introducing shared goals and user tips
- Explore pathways for enabling PatientMatch functionality within the limitations of HIPPA
- Expand on PatientMatch functionality to facilitate patient support groups and events

# CREDITS

# THANK YOU

*We would like to recognize a few people who have greatly contributed to our work process and outcomes.*

We would like to thank Mark Morita and Tosin Oyeniran for their time, giving us direction and sharing a vast amount of resources relevant to our project.

We are grateful to Leanne Libert and Laura Ballay, our project advisors, who gave us guidance, insights and feedback throughout the course of the project in the Spring semester.

All the cancer patients, survivors, experts, and care givers have been very kind to share their stories and support our project.

## OUR FACULTY ADVISORS

### *Leanne Libert*

Leanne is an adjunct instructor in the Master's of Human Computer Interaction institute in CMU. She is also leading a team of designers and writers at Thoughtform, a design consultancy. She has been in the role of a design researcher, information architect in various companies over the past 10 years.

### *Laura Ballay*

Laura is the director of Master of Human Computer Interaction institute in CMU. Prior to leading the program, she has more than 10 years of industry experience. She has worked as a design strategist and manager in various technology firms.

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# THE TEAM



**ROSINA RODRIGUEZ**

**PROJECT LEAD  
UX DESIGNER**

Rosina has a bachelor's degree in New Media Design from Rochester Institute of Technology. She has previously worked as a Web and UX Designer at Ingenia Digital Agency in Mexico City. Rosina is inspired by technology and design to create unique and meaningful design solutions. She loves drawing, painting and can always be found creating doodles.



**ANNA BELAK**

**UX/UI DESIGNER  
SUPPORTING PROJECT LEAD**

Anna has a bachelor's degree in Rhetoric and Business Administration from the University of California, Berkeley. Prior to starting the MHCI program, she worked as a design strategist for AECOM. Anna is passionate about designing applications that change user's behaviors for the better. In her spare time, Anna likes to hang out with her miniature schnauzer Maybe, and obsessively watch singing show auditions on YouTube.



**MIN KIM**

**UI DESIGNER  
UX RESEARCHER**

Min has a bachelor's degree in Industrial Design and Human-Computer Interaction, and is currently pursuing an accelerated master's degree in HCI also in Carnegie Mellon. For last summer, she interned at R/GA as an experience designer. She also has experience working as a user experience designer at a start-up in Korea. Min is intrigued by designing and prototyping ideas for both digital and physical realm. When not designing, she is a coffee addict. She also loves food.

**SWATI JARIAL****UX RESEARCHER  
INFORMATION ARCHITECT**

Swati has a Bachelor's degree in Electronics Engineering and a Master's degree in Telecommunications. Previously, she has worked as a Bioinformatics Database Associate in Qiagen Sciences and Systems Analyst (QA tester) at UPMC. Now she is pursuing a career in design due to her desire to create impactful and aesthetic user-centered solutions to meaningful problems. She also loves gardening, her Boston Terrier dog Skip, and Gollum.

**SHAWN XU****TECHNOLOGY LEAD  
UX DESIGNER**

Shawn received bachelor degree in Information Systems, and has previous experience working as a technology analyst in J.P Morgan Chase, developer / product designer for two Boston-based tech start-ups, and researcher at MIT Media Lab. Shawn is obsessed with 3D printing technology, video games, and cool gadgets.

