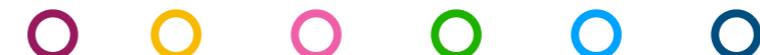


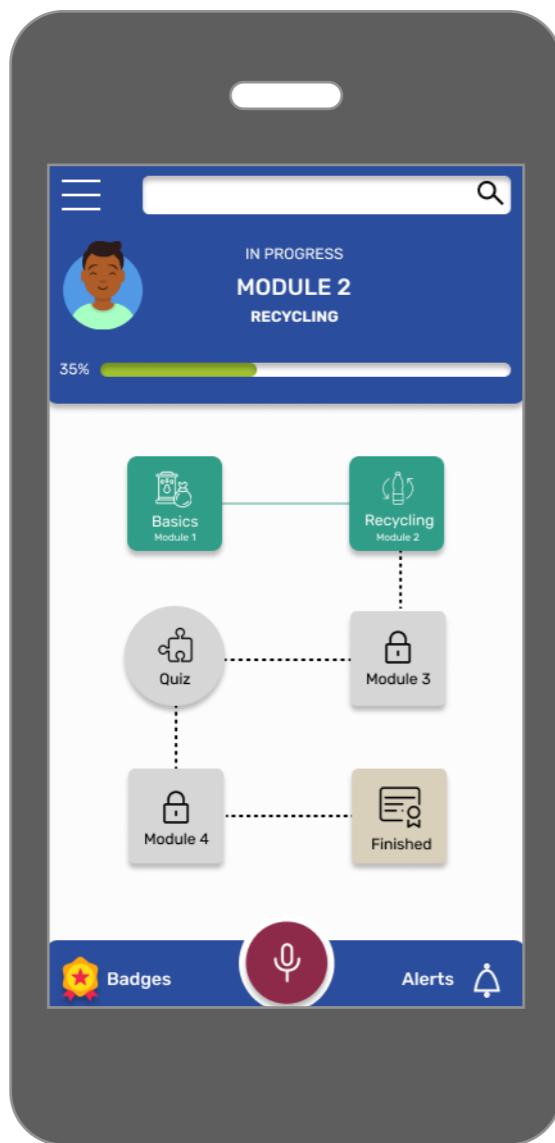
Interaction Design Studio I

WasteCare

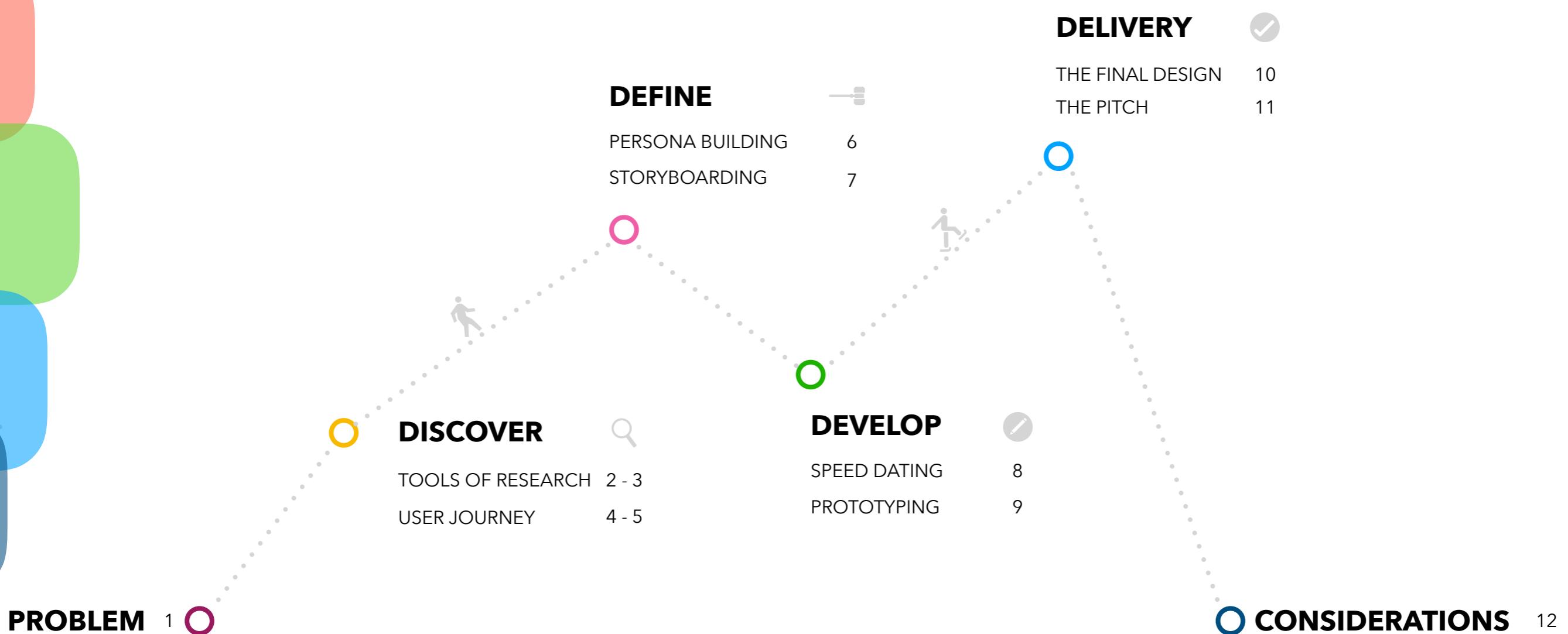
Responsive Web Design



Clara Olson, Lindsey Shi, Emily Gong



OUR PROCESS



IDENTIFYING THE ISSUE

I Medical waste is a problem, a *\$15,000 per violation* problem.

With estimated costs for hospitals failing to comply with Department of Transportation guidelines on waste management so high, having employees well-trained and committed to keep waste management compliant in hospitals is essential.

I A responsive waste training design would be a useful solution.

As a responsive web design study, we wanted to design a website tool that would be responsive and be a proactive solution to resolve a crucial waste issue. Through our research, we recognized a need for this type of usable and portable training website effective and encouraging for nurses at hospitals that wish to stay complaint.

TOOLS OF RESEARCH

How did we identify the problem?



A two year investigation...resulted in the Department of Environmental Protection fining 12 UPMC hospitals \$451,000 for violating Solid Waste Management Act...along with [a \$86,900 fine on the Allegheny Health Network]...



...the violations were not intentional, but resulted from inadequate training of employees.

— **PublicSource, June 22, 2016**

Christopher Reed. PublicSource. 9 December 2018. <https://www.publicsource.org/both-pittsburgh-area-hospital-networks-were-fined-for-medical-waste-violations/>

2

Secondary Research

Through our secondary research, we read through a series of news and explanatory articles such as Post-Gazette and PublicSource to find information on the exact types of medical waste there were and what were the necessary need for involved stakeholders in each one. We discovered that medical waste mishandling was a crucial pain point.



PROBLEM



DISCOVER



DEFINE



DEVELOP



DELIVERY



CONSIDERATIONS

TOOLS OF RESEARCH

How did we identify the problem?

Questions:

Tell me about a time when you experienced difficulty in getting waste disposed.

What do you do with medical waste during the day?

How sufficient do you think current training or education on safe medical waste is?

Answers:

Often throws liquids like IV bags or wasted liquid medicine into the sink as there is no time to adequately maneuver between patients. **Always throws SHARPS correctly into the right bin as those bins are required and available in every room.**

Disposes of it correctly into specific color-marked bins. **Does often see others throw away the wrong type of trash into the wrong bin. Assumes that her colleagues need some help with keeping waste-compliant.**

Nurse finds training is 70% helpful. People breeze through it. **New information is worked in but not highlighted. It's hard to emphasize on everything.**

3

Guerrilla Research

After specifying the issue, we narrowed our general topic further through three separate interviews with nurses that worked at various hospitals. Through them, we learned a few key points on how nurses approach waste and waste training.



PROBLEM



DISCOVER



DEFINE



DEVELOP



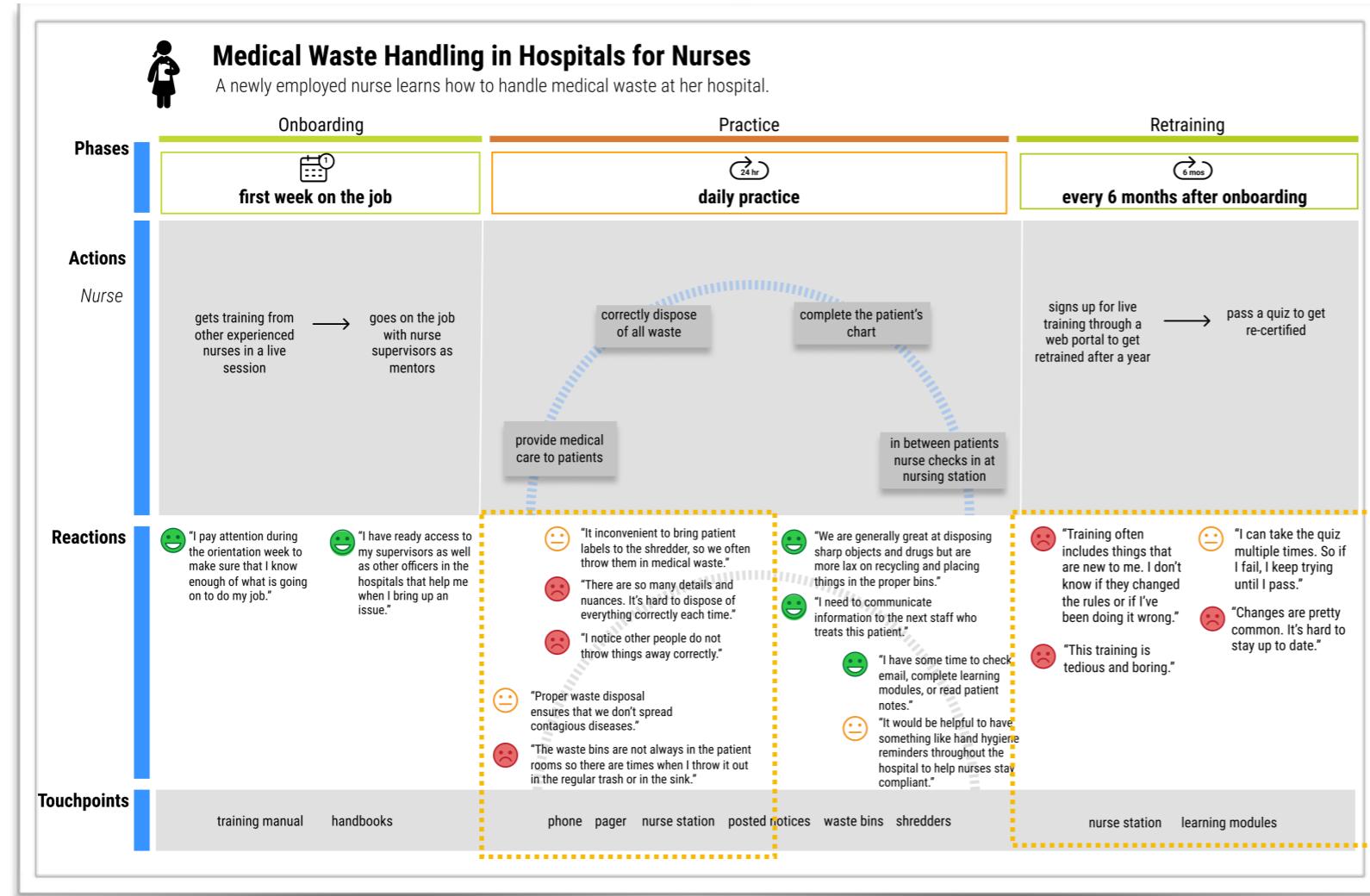
DELIVERY



CONSIDERATIONS

USER JOURNEY OF THE CUSTOMER

How does a nurse handle waste?

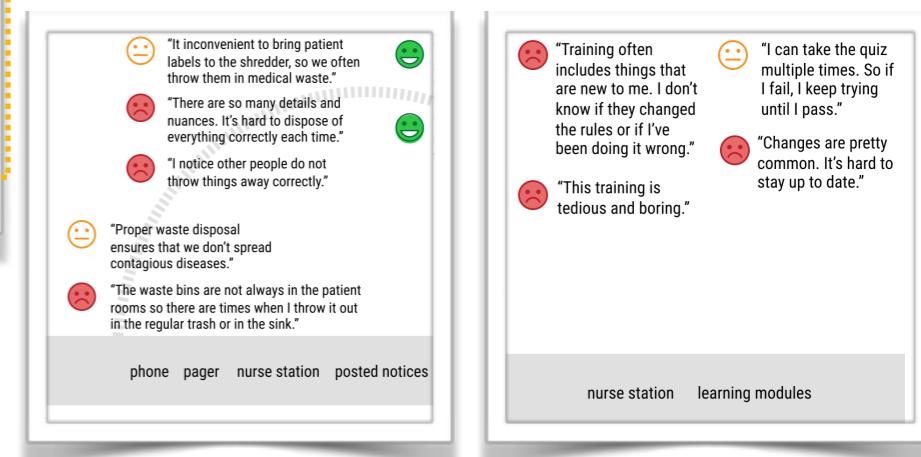


The Nurse's Journey

To better understand the end user's current interaction with waste management protocols, we outlined the specific initial, day-to-day, and recurring training occurrences endemic to nurses.

4

From this, we recognized that there were **opportunities for change in assisting with on-the-go waste assistance and retraining for nurses.**



PROBLEM

DISCOVER

DEFINE

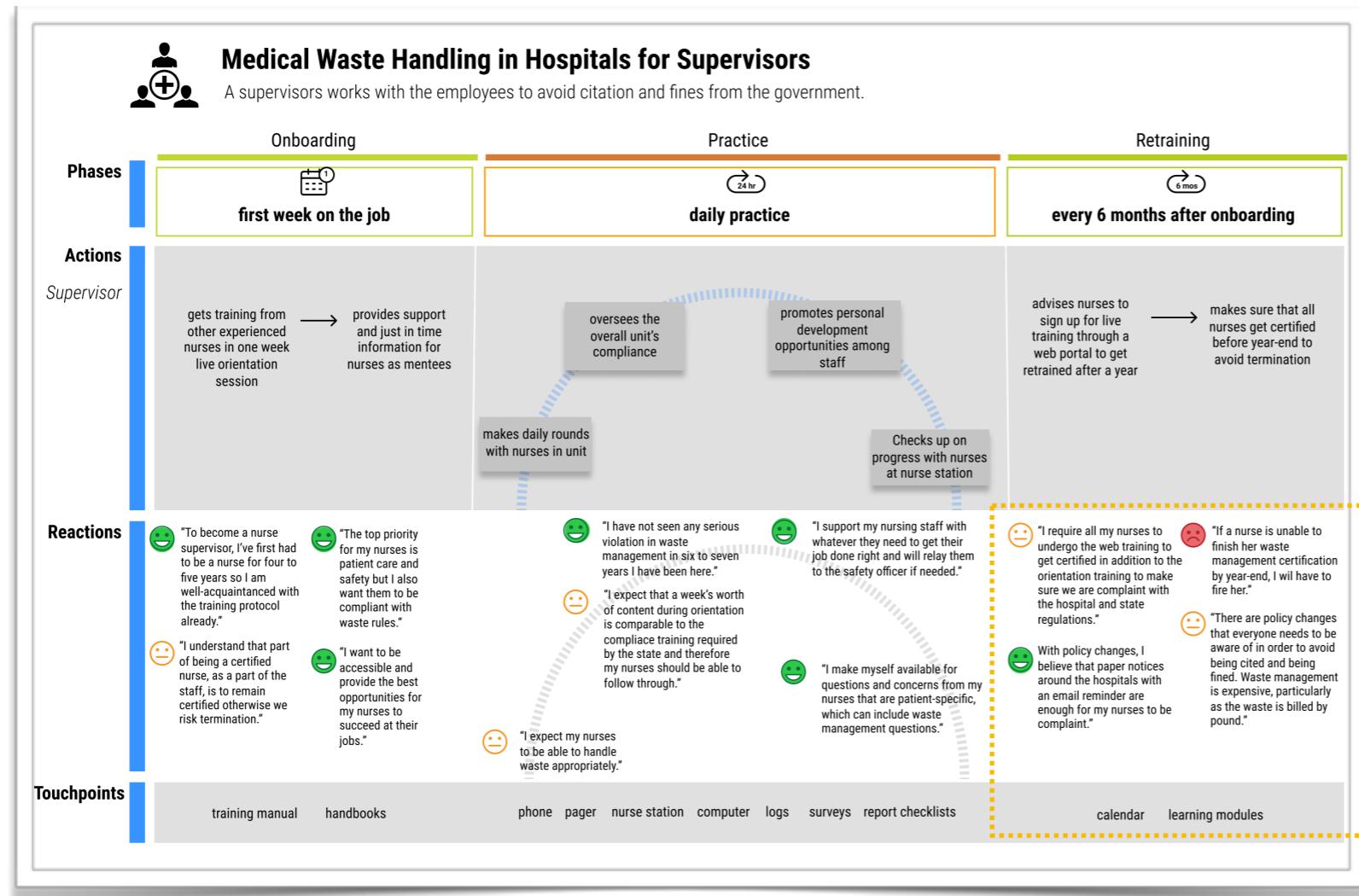
DEVELOP

DELIVERY

CONSIDERATIONS

USER JOURNEY OF THE SERVICE PROVIDER

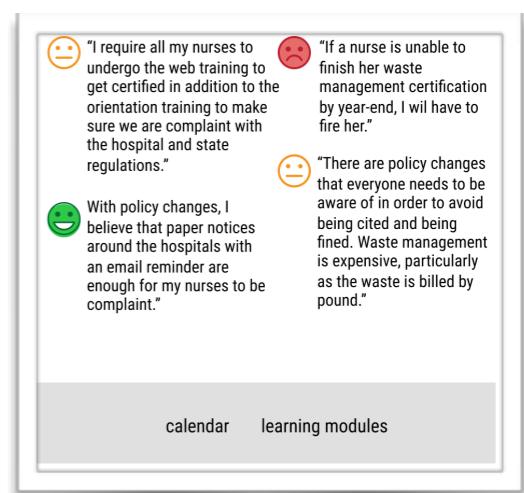
How does a supervisor handle waste?



The Supervisor's Journey

To better understand the service provider's current interaction with waste management protocols, we outlined the specific initial, day-to-day, and recurring training occurrences endemic to supervisors.

From this, we recognized that there were **opportunities for change in assisting with progress check-ins and recertification tracking between supervisors and nurses.**



GAINING PERSPECTIVE

Who are the people who are part of the medical waste management process?

Persona Building

Drawing on the data gathered from guerrilla research and the information we used to build our customer journey maps, we proceed by defining the different roles directly related to our problem area by building personas. These personas helped us think of the different stakeholders on a personable level and identify any areas we needed more information before moving forward in our research and design.

End User

Nurse Josh works in the ICU and his priority is treating his patients. **He must complete medical waste trainings in order to do his job, but he finds the modules to be incredibly tedious.**

Since his role in the ICU requires him to miss staff huddles on occasion to care for patients, **he finds he often misses vital information regarding policy changes and there are limited resources he can turn to when he needs help.**

Nurse Joshua Moore



GOALS Provide the best and safest medical care to patients.

ROLES A nurse has multiple duties throughout the day. In terms of patient care, nurses must pay attention to several different factors in terms of proper waste disposal. Roles: caretaker, first contact, point person for patient care

CONTEXT Hospital, patient rooms, surgical unit, etc.

TASKS

- Dispose of medical waste properly by throwing waste in the appropriate bins
- Stay compliant with regulations by completing learning modules
- Fill in patient charts and communicating patient needs with other staff
- Lack of enough proper waste bins (with exceptions to sharp objects) - unable to throw wastes appropriately due to wanting/need to be near patients
- Regulations are very nuanced and changing all the time - it is hard to keep up to date with current protocol
- Retraining is tedious - just click through it to complete the module, but I don't actually read any of it

PROBLEMS

Nurse Supervisor Amy Butler



GOALS Provide a friendly, accessible, and professional environment for nurses to work in and meet standards and regulations pertaining to proper waste management

ROLES Supervisor, leader, disciplinarian, enforcer

CONTEXT Office in hospital, conference rooms, training rooms

TASKS

- Distribute postings/notices of changes in regulation around hospital to keep nurses and other staff informed of changes
- Oversee onboarding training for new nurses to make sure they are properly educated in waste management
- Oversee retraining and recertification of nurses
- Intervene if any nurses are improperly disposing of waste and take any necessary re-education measures

PROBLEMS

- Regulations are always changing and nurses do not always pay attention to the notices board
- Nurses do not seem the most engaged during retraining and do not have tangible takeaways from the sessions

Hospital Administrator Richard McCoy



GOALS Manage, supervise and administer the hospital staff and make sure everything runs in order.

ROLES Management, strategist, decision maker for budgets and resource

CONTEXT Top level management in hospital

TASKS

- Act as liaisons among governing boards, medical staff and departments heads
- Coordinate medical and health services and policies
- Recruit and evaluate administrators, nurses and doctors
- Plan budgets and set rates for health services
- Assist in the education of new doctors in teaching hospitals
- Develop procedures for quality assurance

PROBLEMS

- Keep costs reasonable and delegate costs responsibly
- Maintaining facility standards that adhere to federal requirements
- Raising awareness of hospital services to neighboring communities and first-time patients

PROBLEM

DISCOVER

DEFINE

DEVELOP

DELIVERY

CONSIDERATIONS

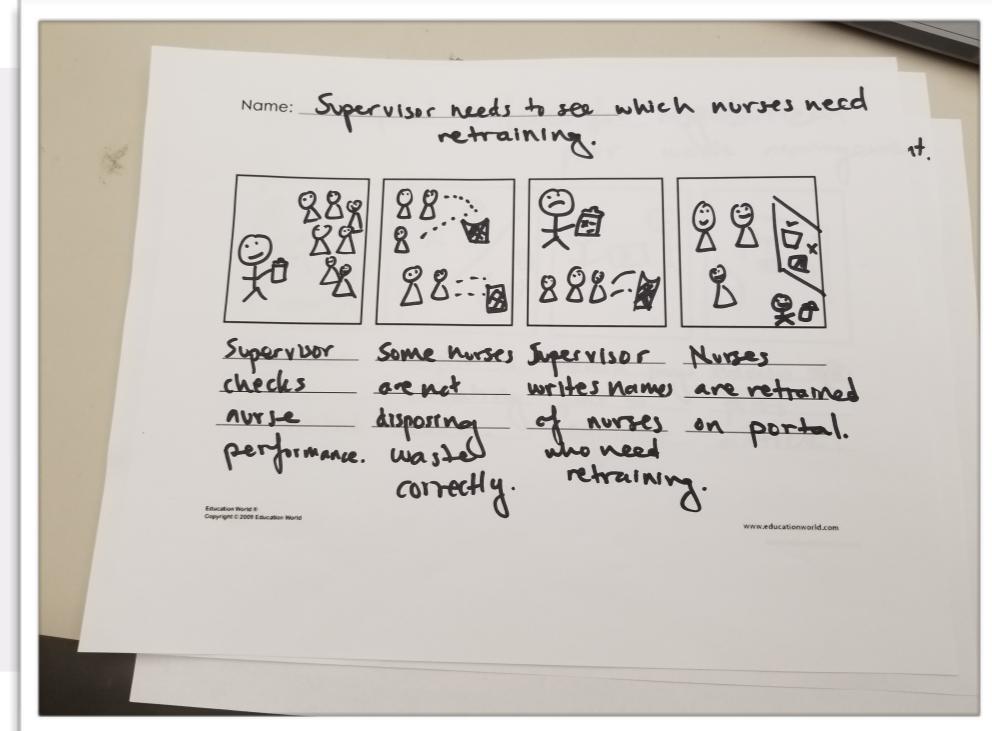
SETTING THE STAGE

How are those involved interacting with the medical waste?

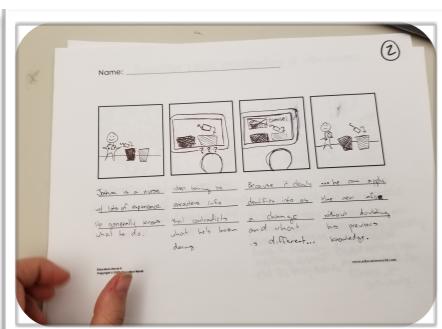
Scenarios & Storyboarding

After defining the individual users and stakeholders in our problem space, we spent time brainstorming different scenarios that captured opportunities for a variety of design interventions.

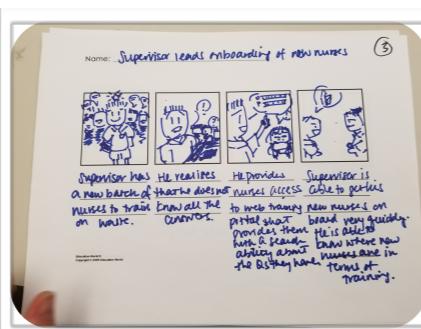
Brainstorming covered a wide variety of situations with a final total of 18 ideas. From that list we narrowed down to a handful of storyboards that we would use to generate feedback.



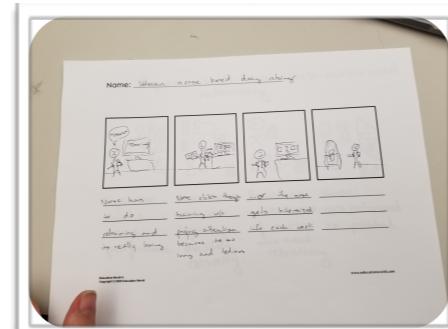
Supervisor needs to see which nurses need retraining by checking the web portal.



Some information in the web-portal is different from last year, but it is labeled clearly as a new protocol.



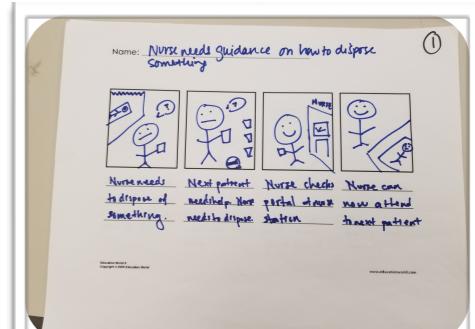
Supervisor uses web portal to train many new nurses.



Nurse with lots of experience uses shorter web-training sessions to keep informed about proper waste management.



Hospital is fined due to poor waste management and admin posts a notice using a web portal.



Nurse needs uses web portal to look up information on how dispose of something.

COMMITTING TO THE ACT

Is what we thought in terms of how people interact with waste accurate?

Speed Dating

We used the storyboards we created to explore our solution opportunities with individuals outside of our team. Given the time restraints we were unable to discuss the solution with hospital staff, but many of our volunteers were able to draw on their own experiences in hospital or similar work environments to offer valuable feedback for us to consider.

Common Themes:

Portability and On-the-Go Access to Information

Users like scenarios where nurse had ability to search for info on waste disposal. However they doubted the nurse's station as the best place to access the information. Wouldn't they need this info while in the patient's room? What if they can't make it to the station to use it?

Policy Changes Accompanied by Context

When faced with a policy change in how to dispose waste, all users agreed that context of the change would be helpful. They agreed that highlighting what the policy was before, what the exact difference was in the new policy, and why it changed would help them work new policy into their routine.

Monitoring Employee Progress

Supervisors can find value in a solution that helps them monitor employee progress and see common search patterns. This can help identify holes in training and opportunities to improve.

BUILDING THE GOODS

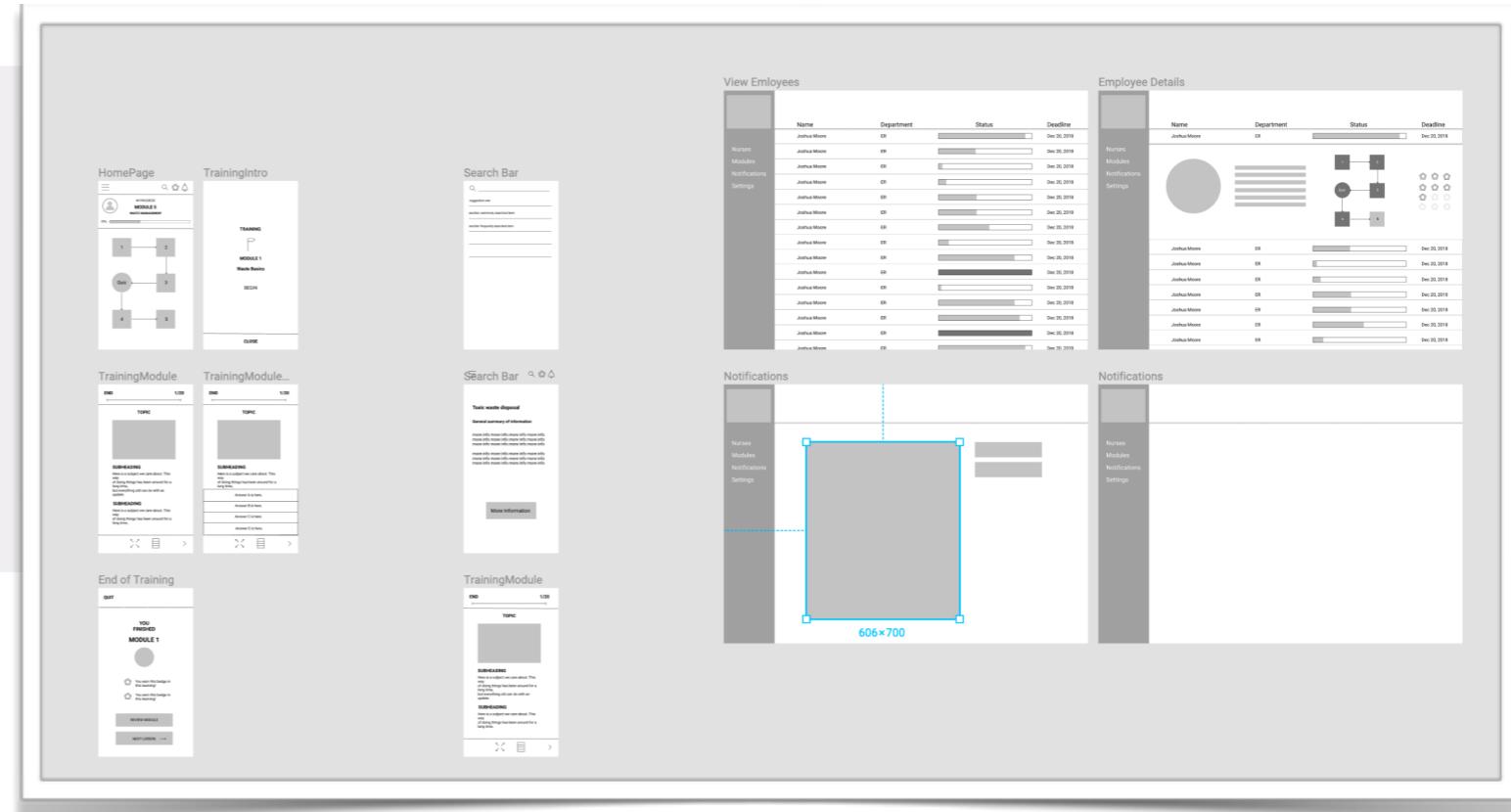
What design will people be using?

Prototyping

Based on our early exploratory research, we were able to define a problem space. From the feedback we received in speed dating, we were able to develop the foundation of our website.

The features we were most interested in emphasizing included:

- Bite-sized and more engaging training modules.
- Built-in achievements and reinforcement for completing material by employing common game design patterns.
- Easy-to-search interface for nurses needing to access information while they were on-the-job.
- Clearcut notification solutions for communicating policy changes



In building our wireframes, we envisioned the needs of our nurse best met by an interface optimized for mobile phone (so that he or she could access information easily between patients and not rely on available desktops at nurse stations).

For the desktop side, we demonstrated use from the nurse supervisor's perspective. Given the variety of responsibilities, it is likely she would make use of this interface at a desktop computer while completing other managerial duties.

THE FINAL DESIGN

How can we incorporate feedback into a streamlined final design?

Finalizing

After receiving feedback on our wireframes and mid-fi prototypes, we felt that the user flow of our screens was strong. For our final iteration, we worked on updating the appearance of the training interface to ensure the entire user journey would be approachable and enjoyable.

Color Scheme

We selected a brighter navy blue as our main banner color in the training portal. We chose a white background paired vibrant hues of green and turquoise for our progress bars and module buttons. For notifications and deadlines, we selected a friendlier shade of bright red.

Iconography

We created avatars to use for our personas Josh and Amy. We wanted the avatars to reflect the same energy level as the rest of the training site. we chose simple black and white line icons for the module buttons, but used brighter colors for our in-module pages and training badges.

10

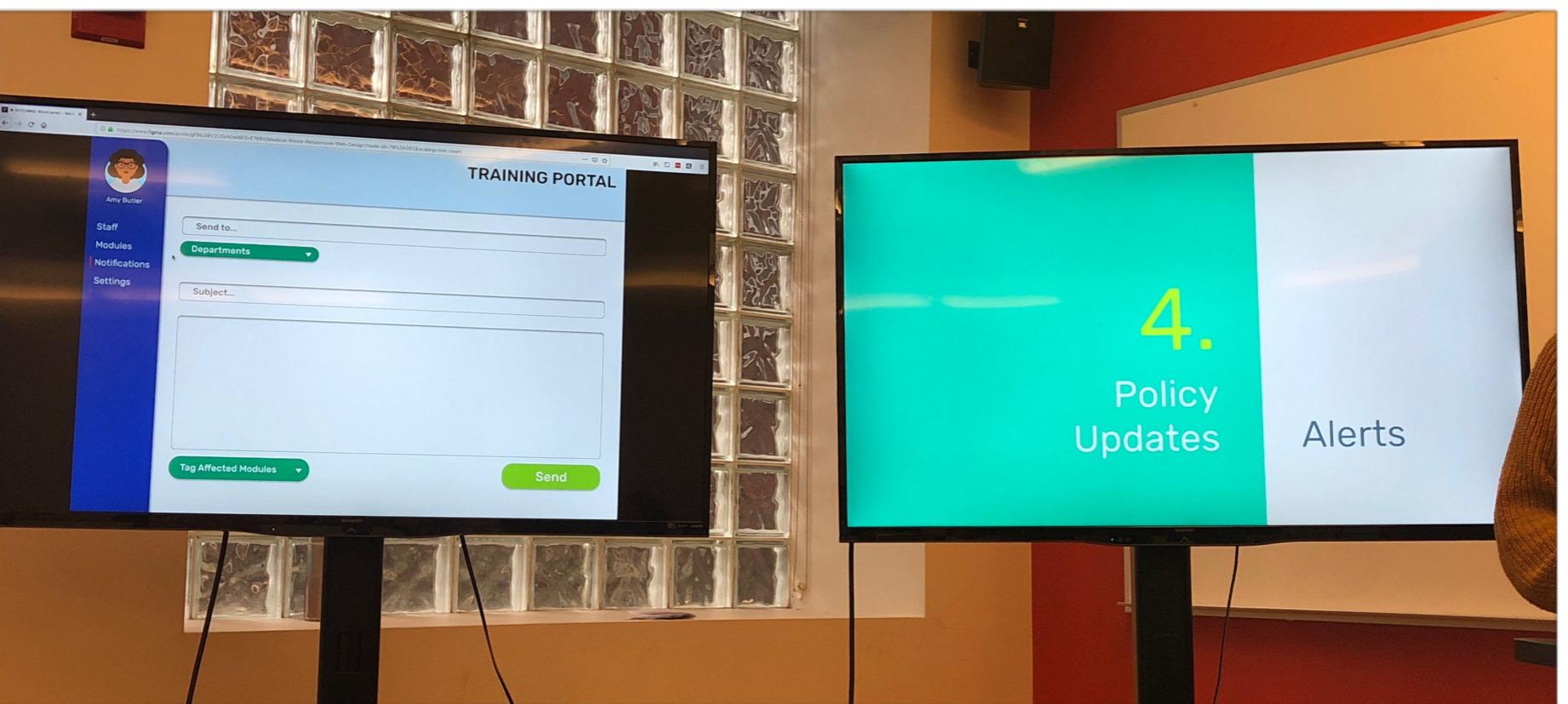
THE "SHORT" STORY

Pitching

For our client presentation, we needed to show the most important elements of our design that would meet our clients' needs and add value to their roles.

We presented our mobile and desktop screens alongside a slideshow with five key takeaways:

1. Self-Guided Learning
2. Quizzes & Achievements
3. Tracking Employee Progress
4. Policy Updates
5. On-the-Go Search



Presenting to:
Richard
Hospital Manager
Natalie
Nurse Supervisor
Amy
Nurse Supervisor

To begin our pitch, we introduced our user personas and described their current struggles with waste management training at their hospital. We wanted our clients to understand what problems our redesigned training portal would be solving.

We explained the research we conducted that motivated our design decisions. Our five value propositions were presented along a demonstration of the screens from both a nurse's view and a supervisor's view.

CONSIDERATIONS

We learned a lot over the course of our redesign.

User research gives much-needed insight into the problems we are trying to solve. We started out with the broad field of waste management, then narrowed it down to medical waste management before deciding to create a training website.

Thinking about our end product from our personas' point of view is extremely useful. We thought about what Nurse Josh and Supervisor Amy do in the course of a day and how our redesign could best fit their needs. Without thinking about our users, we were missing a lot of valuable insights.

A lot of inspiration can be drawn from existing products. We looked at how existing products like DuoLingo and GRE test prep applications tackled the issue education reinforcement. We adapted these strategies into our site to make recertification more fun for nurses.

Pitches must match the knowledge level of the clients and not overwhelm them with the details. It was important for us to step back and think about what information was really essential for our clients to know. Instead of explaining every step of our process, we focused on highlighting our value propositions.

