PANDEMIC PROCESS BOOK

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Meet the Team

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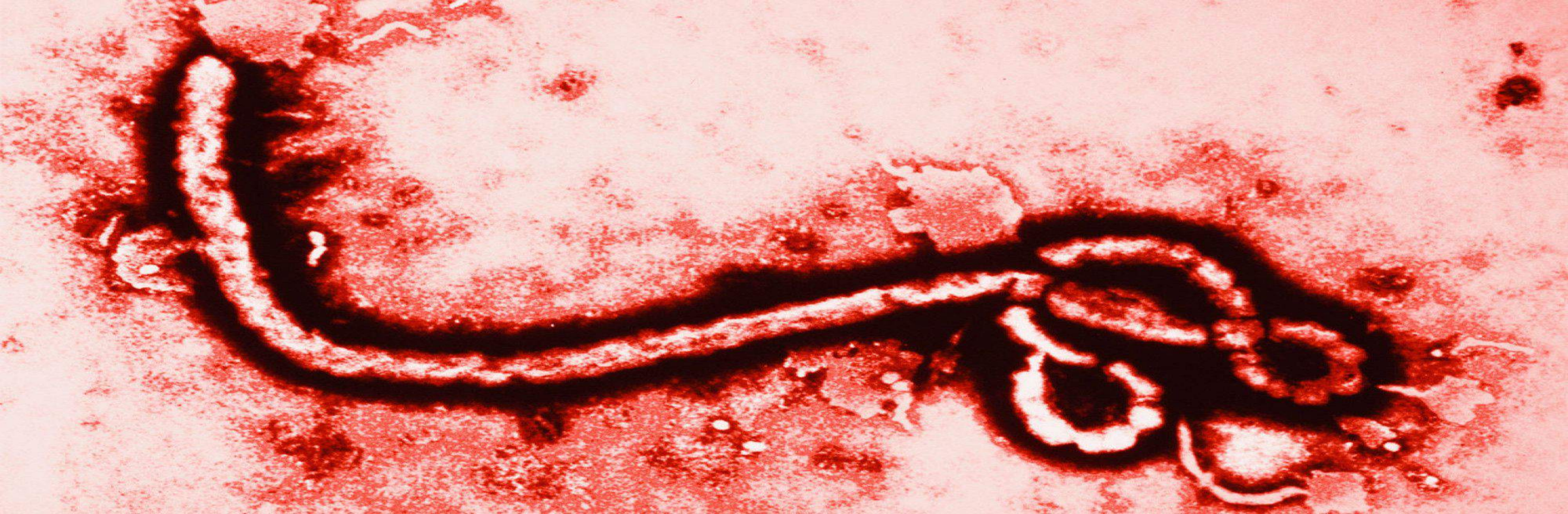
Subject Matter Expert (SME)

Dr. Phillip Allen Green

Dr. Phil Green is a medical doctor who specializes in Emergency Medicine and works in Walla Walla, Washington. In addition, he is also the pandemic response coordinator for parts of Oregon and Washington. Finally, he has written a book called Trauma Room Two which can be found on Amazon.

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Problem Statement

Slow Response to Ebola Pandemic in West Africa

Pandemics are a growing concern in an increasingly connected world. One of the largest pandemics, was Ebola in 2014, which affected several countries in Africa. Unfortunately at the time, many organizations and countries like the World Health Organization (WHO) and the United States (US). did not take the issue seriously, and as a result, their response was very slow.

Lack of proper training and standardized procedures

It's important the WHO and US are better prepared the next time a pandemic breaks out, as their was a mass hysteria in western countries, after several passengers flying out of West Africa displayed symptoms of Ebola. Although the casualties in western countries ended up being really low compared to Africa, the lack of proper training and standardized procedures for pandemics led to poor treatment of the initial victims who showed symptoms as well as their families.

We will be exploring solutions for an Ebola Pandemic in Walla Walla, WA, which is located in a rural area and may not have the same level of resources as a hospital in a major city.
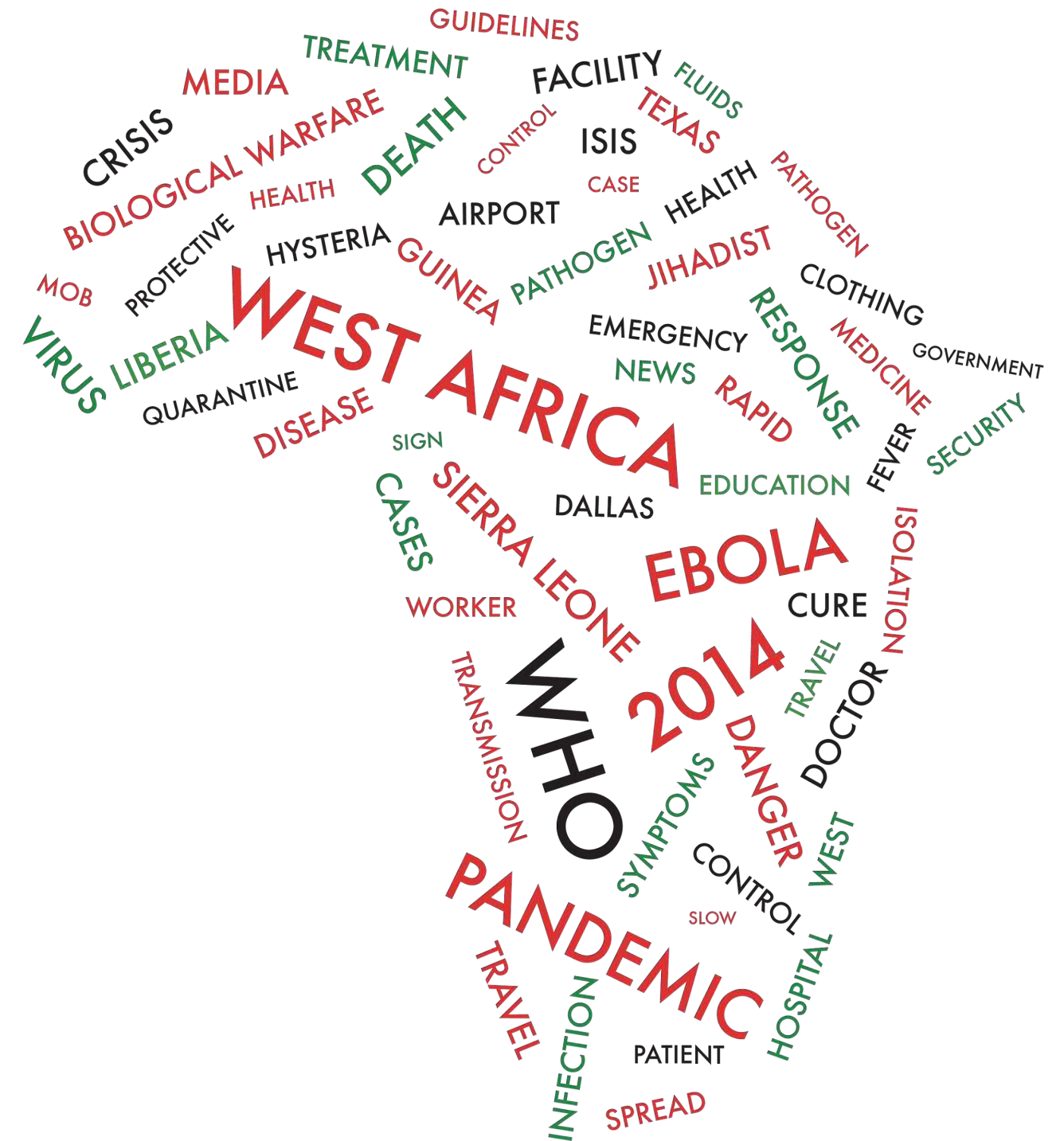
Challenges Faced

People diagnosed with Ebola may not be able to see or move due to blood in their eyes, vomiting, diarrhea, etc. Designs should be multimodal to account for loss of certain senses.

Anything an Ebola patient touches must be incinerated, so any design that comes into contact with a patient must be low-cost, disposable, or contamination proof.

Patients sent to quarantine need a meaningful way to keep in contact with family or loved ones, as they will be extremely stressed, and need someone who can reassure them.

Process Overview

STAGE 1

-15 Concepts (P. 10)

-1 Persona

-Journey Map (P. 11)

-Experience Map (P. 12)

STAGE 2

-6 Concepts (P. 18-19)

-1 Persona

-Journey Map

-Experience Map

-Popular Media Search (P. 16-17)

-Mood Board (P. 15)

-Critical Path (P. 20)

-Concept Evaluation Matrix/Plot (P. 22-23)

STAGE 3

-3 Concepts (P. 30-35)

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-Experience Map (P. 38)

STAGE 4

-1 Main Concept (P. 43-44)

-Storyboard (P. 47)

-Concept Evaluation (P. 42)

-Experience Map

-High Fidelity Prototype (P. 46)

Stage 1

Exploring the Problem Space

To begin tackling this problem, our team individually sketched 15 concepts, created a Journey Map of the hospital visit, and an Experience Map. We chose to map a hospital visit first, and refine this in later stages, centering it around the emergency room.

Sketch of Concepts
15 concepts were sketched, with the top 3 concepts being highlighted with a star in the upper left corner. The top 10 concepts were mapped to a key problem identified by expert Dr. Phil Green.

Journey Map of Hospital Visit
The Journey Map was used to map the step by step activities of a patient visiting a hospital. This helps take into account the character's internal thoughts and external influencers, which can then be used to identify opportunities.
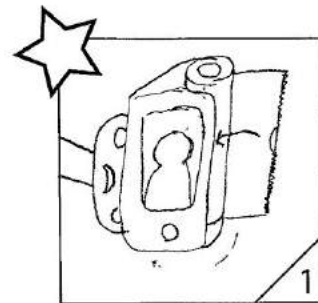
Experience Map Visualization
The Experience Map represents a visual representation of the Journey Map, using a combination of visuals and text to illustrate the users' flow within a hospital, as well as their needs and touchpoints.
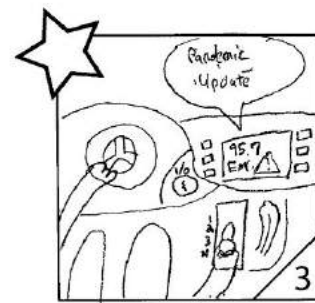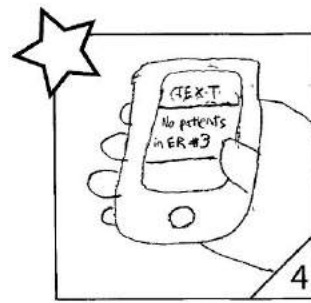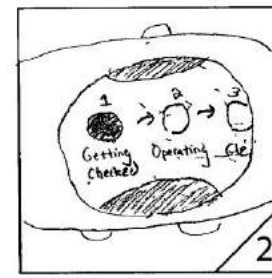
Sketch of Concepts (15)

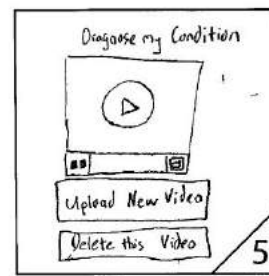

[Pandemic] Stage 1

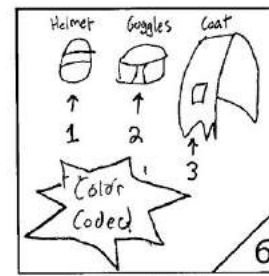Prevent Germs on Tablets with Wrap — 1
Pandemic Radio Station — 3
Hospital Chat System — 4
Patient Progress Beeper — 2

Upload video to get checked — 5
Color-coded PPE — 6
Flowers with Message Display — 1
Free Pandemic Water Bottles — 3
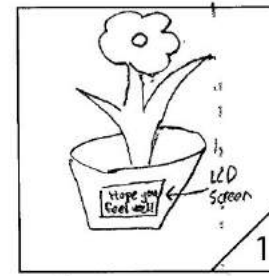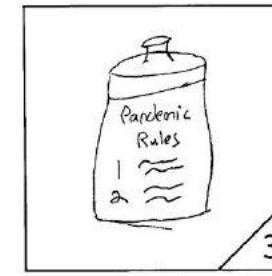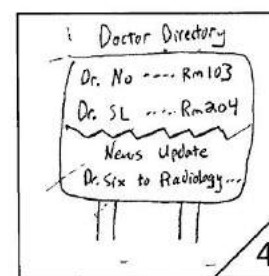
Doctor Directory & News Display — 4
Warning in the Sky — 5
The Pandemic Song
Pandemic TV Show
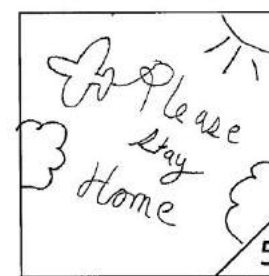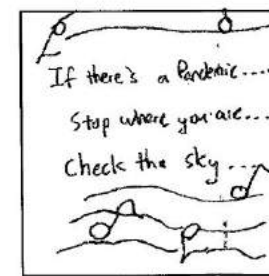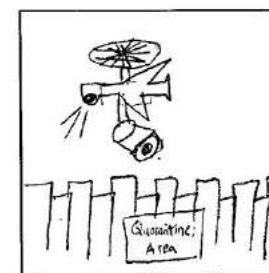
Drone Surveillance
Home Blood Test
Incident Reminder (Board)
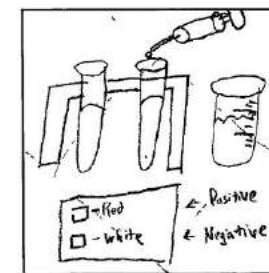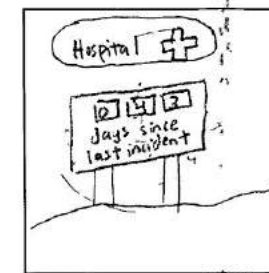
KEY PROBLEMS

#1: How to keep ill patients in hospital in contact with family at home in a way that's meaningful

#2: How to keep family sent home in contact with the team caring for their loved one

#3: Education of patients to prevent rumors and misinformation

#4: Need a way to push new messages to all the staff about updates and new info in a hospital

#5: Challenge to keep people away from the hospital who are not sick but worried

#6: Maintaining proper guidelines for donning and doffing protective equipment

Journey Map of Hospital Visit

TIMELINE OF JOURNEY STAGES	RESEACH YOUR DOCTORS ONLINE	SCHEDULE APPOINTMENT	REGISTRATION & PREPARATION	SEE THE DOCTOR & UNDERGO OPERATION	FOLLOW UP & PAY THE BILL
TOUCHPOINTS Who or what are they interacting with?	-Health Insurance Website -Phone -Friends and Family -Computer	-Secretary -Nurses -Phone	-Secretary -Nurses -Forms -Magazines	-Doctor -Medical Tools -Nurses -Posters in Room	-Secretary -Forms -Any Data/Results received
CUSTOMER'S NEED What is their top need? What needs are not being met?	-Find the right doctor -Close by -Reliable -Check what's covered by plan	-Make an appointment -Fits the personal schedule -Book as soon as possible	-Reaching the doctor -Recalling medical history -Checking In	-Doctor understands their issue -Accurate diagnosis -Receive treatment	-Pay the copay -Schedule followup if required -Get prescription if necessary
THOUGHTS & FEELINGS What are their innermost thoughts at this precise moment?	-Pain (Physical & Mental) -Needs help -Sad	-Pain (Physical & Mental) -Frustrated if no time slots available -Relief once scheduled	-Bored from waiting -Restless -Tired	-Nervous during the operation -Relief if pain is gone -Happpiness that it's over	-Sad if bill is expensive -Satisfied if treatment was good -Anxious to leave
CONTEXT What else in the environment might influence them?	-Advertisements (bus) -User feedback (yelp) -Friends & Family	-Call is busy -Call quality -Attitude of secretary who answers	-Sick patients nearby -Messy waiting area -Impatient	-Posters in Room -Background Noise from other rooms	-Advertisements (coupons) -Advertisements (brochures)
INSIGHTS & OPPORTUNITIES What can you do to help them meet their needs, make the experience easier, or more enjoyable?	-Make process simpler -Rating system for hospitals and doctors	-Allow patients to schedule appointments online -Provide more information on website regarding doctor availability	-Add more interaction with patient such as tablets -Let patient fill in medical history on tablet to prevent additional labor	-Make the room more inviting and warm -Add decorate but informative posters, along with some for humor	-Make the billing process more clear (i.e. give accurate deadlines for receiving back bill from insurance company)

Experience Map Visualization

MAPPING THE HOSPITAL VISIT

CHANNELS

Computer · Smartphone · Tablet · Friends & Family · Phone · Secretary · Magazines · Smartphone · Secretary · Forms · Nurse · Posters · Doctor · Prescription · Wallet · Medical Bill

STAGES

| RESEACH YOUR DOCTORS ONLINE | → | SCHEDULE APPOINTMENT | → | REGISTRATION & PREPARATION | → | SEE THE DOCTOR & OPERATION | → | FOLLOW UP & PAY THE BILL |

NEEDS

-Find the right doctor	-Make an appointment	-Reaching the doctor	-Doctor understands their issue	-Pay the copay
-Close by	-Fits the personal schedule	-Recalling medical history	-Accurate diagnosis	-Schedule followup if required
-Reliable	-Book as soon as possible	-Checking In	-Receive treatment	-Get prescription if necessary
-Check what's covered by plan				

Stage 2

Narrowing the Scope

After generating the concepts and mapping the user's journey through a hospital visit, the next step was to narrow the scope. Our team created a moodboard, a critical path, and reduced the number of concepts from 60 (15 each) to 6 concepts.

Moodboard
The moodboard was created to visually illustrate the emotions we wished to elicit from hospital patients. It centers around making patients and their families happy while visiting a hospital, through hospital staff you can trust,.

Popular Media Search
A popular media search was conducted to learn more about the public's perception of Ebola, and how governments and organizations responded. Several sources were used, like news sites, youtube, and blogs. Afterwards, a word cloud was generated from the results. (See P. 5 for word cloud)

Sketch of Concepts
The original 60 concepts produced in Stage 1 were reduced in Stage 2 to 6 concepts. This was so we could have more depth as opposed to breadth in our concepts.

Critical Path
We chose to create a Critical Path for one of our concepts, which illustrates a positive and negative path a user can face when using our concept. Then, we used the Experience Map to determine which stage of the hospital visit the branching paths may occur. In our case, for the Home Blood Test Kit, the branching path occurs during the first stage, while the user's still at home.
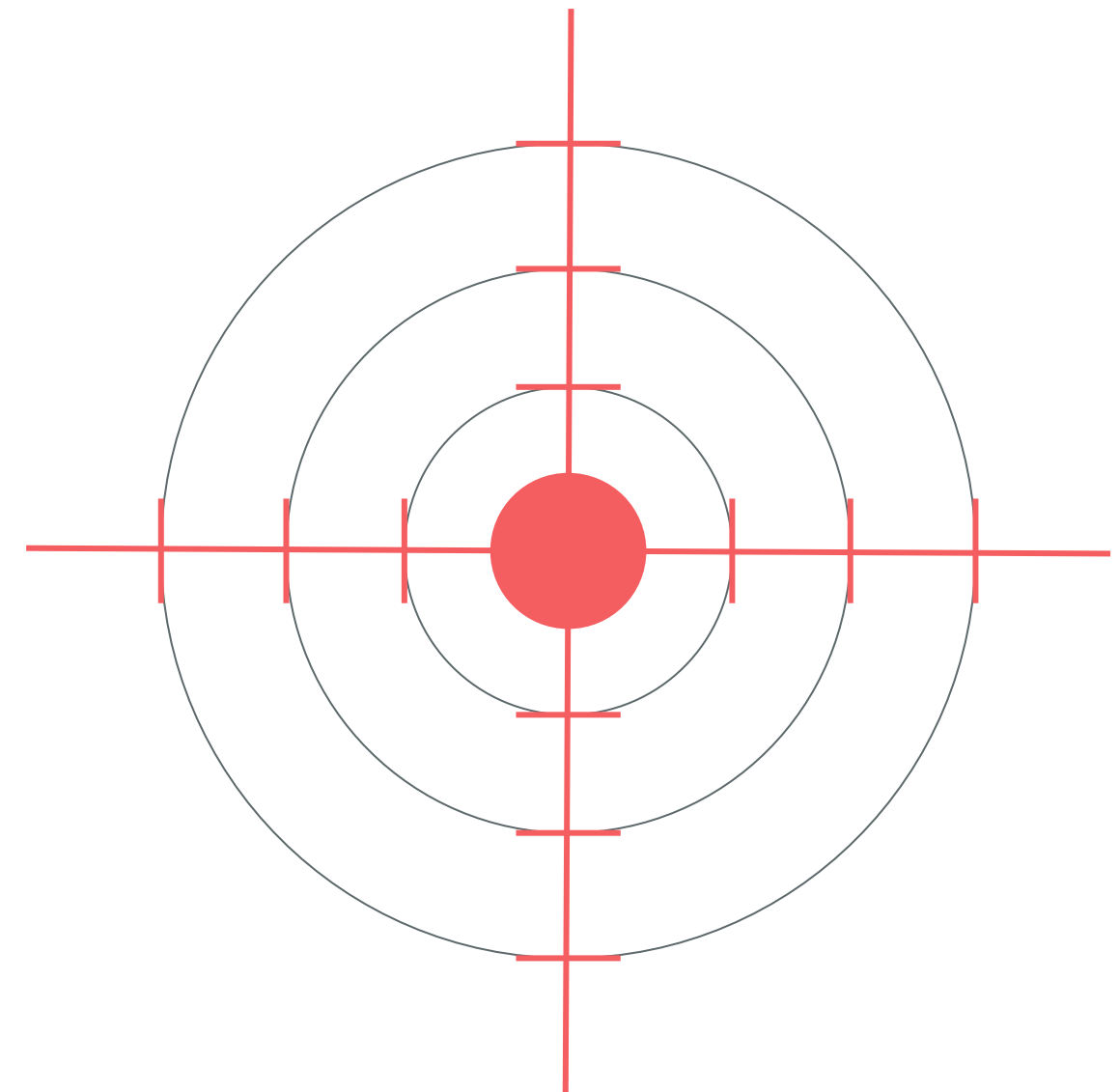
Moodboard

Popular Media Search

The largest Ebola Pandemic was in 2014, which affected several countries in Africa. After conducting a popular media search for pandemics/ebola, it's clear that the 2014 event in Africa is the most well known and discussed about topic online. After looking at a variety of sources, specifically news articles, blog posts, and journal articles, several trends can be seen. The most important one is that the general public had a very negative opinion about how the different governments and World Health Organization (WHO) responded to the 2014 outbreak.

Several articles from multiple news sources such as BBC, Telegraph UK, NY Times, and CNN all point at the hysteria that erupted after the virus began spreading in Africa. Many of the countries didn't take it seriously at the beginning, and as a result their response was very slow. This is an example of normalcy bias, which is the mental state people enter when facing the possibility of a crisis or disaster. Many citizens of Western countries such as America made the assumption that since an ebola pandemic has never happened in the States, then it will never occur.

However, the public opinion of people outside Africa not affected by the pandemic, greatly differed from those in Africa. Many people in Africa had the impression that the virus was implanted by the Western countries, and this mistrust eventually led to several African mobs attacking Ebola treatment centers set up by Western countries. This coupled with low education participation rates in many African countries and a lack of basic facilities, caused it to further spread, as Africans treating infected patients did not follow proper guidelines.

Popular Media Search

From the many blog posts surrounding this issue, it appears the turning point for many Western countries was when passengers traveling out of Africa began showing symptoms of being infected by Ebola. In fact, once this happened, the media went crazy, and began hyping the imminent threat, which caused some people reading/watching the news to overreact and believe that a biological war was possible. It would be very easy for several carriers of the virus to travel through airports, and infect several thousands of people during their travel. Several comments discussed the potential for a few Jihadists with a virus like Smallpox, boarding the plane to the U.S. and causing an instant pandemic. With the recent activities of ISIS, I wondered if there was any news articles about the potential of them using biological warfare. To my surprise, there were several articles published in 2015, discussing how ISIS fighters were cracking down on militants suspected of contracting Ebola, going as far as incinerating them.

Finally, looking at the comments on a Youtube video titled "Ebola - What You're Not Being Told" with 2 million+ views, there is a glaring contrast from the original comments when the fear was widespread, and the aftermath. Now that the pandemic is over in Africa, many people complained in the comments section that the fear was overhyped by news outlets, and how easily people were influenced by mainstream media. While this may be true, if you look at how few deaths there were in America and Europe, you can see that the main reason Africa suffered so poorly compared to the Western countries was because of a lack of resources and education. As a result, even though many American citizens may have felt that the media exaggerated the danger of Ebola, the fact is, if the United States didn't respond properly, the casualties could have been much worse than 2 deaths.

Sketch of Concepts (6)

Doctor Training Status DB with Chat	Amber Alert-style Notifications	Virtual Reality Training
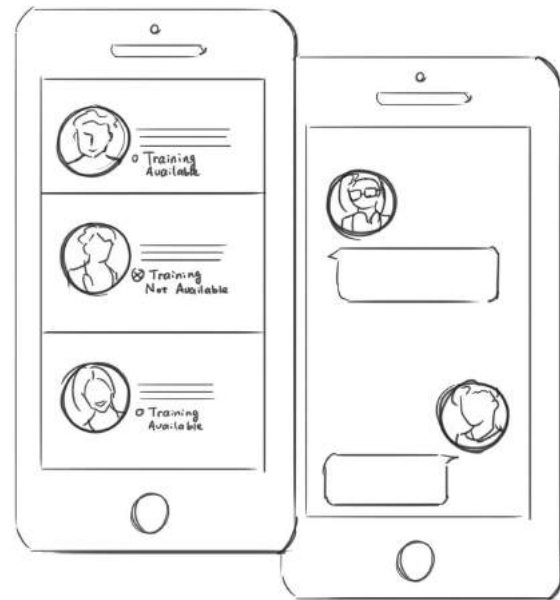
-Assists doctors in keeping track of training required

-Includes real-time chat functionality for doctor to doctor communication

-Would be either BYOD or hospital issued

-Would be broadcasted using Wireless Emergency Alerts (WEA)

-Can be used for alerts involving imminent threats to safety of life

-Transmitted to all phones using a cell tower instead of individual recipients

-Allows for the simulation of dangerous or risky situations

-Highly visual approach which aids with learning

-Can train a large amount of people within a virtual setting

Sketch of Concepts (6)

Collaborative Pandemic Response Wiki	Home Diagnosis Blood Test	Flower for Patient Communication

-Provides a collaborative editing and approval tool for contributors

-Adds accountability, as everyone can see any changes made

-More uniform response guidelines across states through the wiki
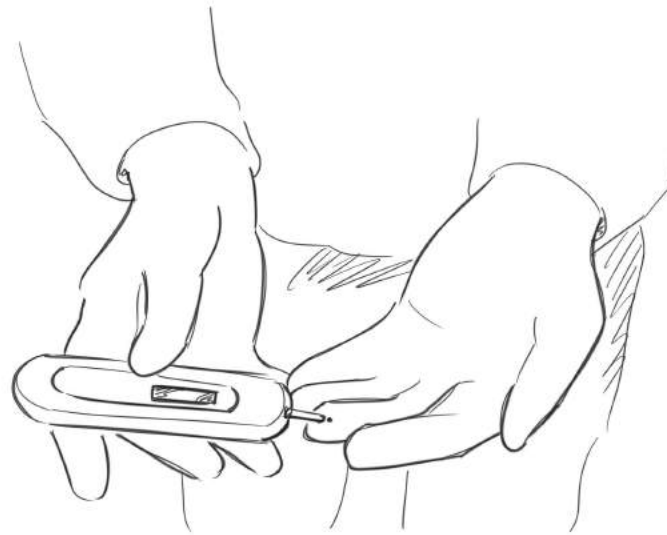
-Helps keep people away from the hospital who are not sick but worried

-Can be easily distributed to the public or sold in stores

-Allows you to test yourself in the privacy of your home
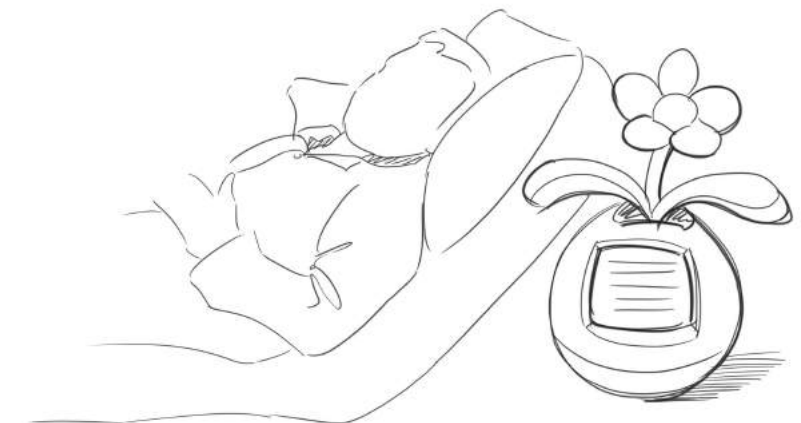
-LCD would display messages sent from family & friends

-Leaves of flower will wave when a new message is received

-Patient can use voice commands to play through the messages

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Critical Path

A Negative Critical Incident
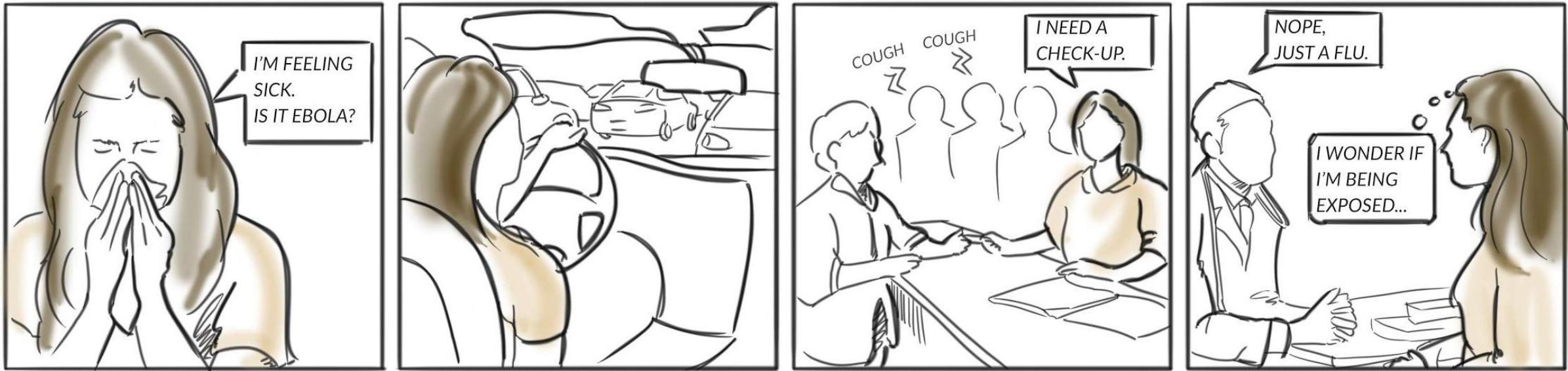
A Positive Critical Incident
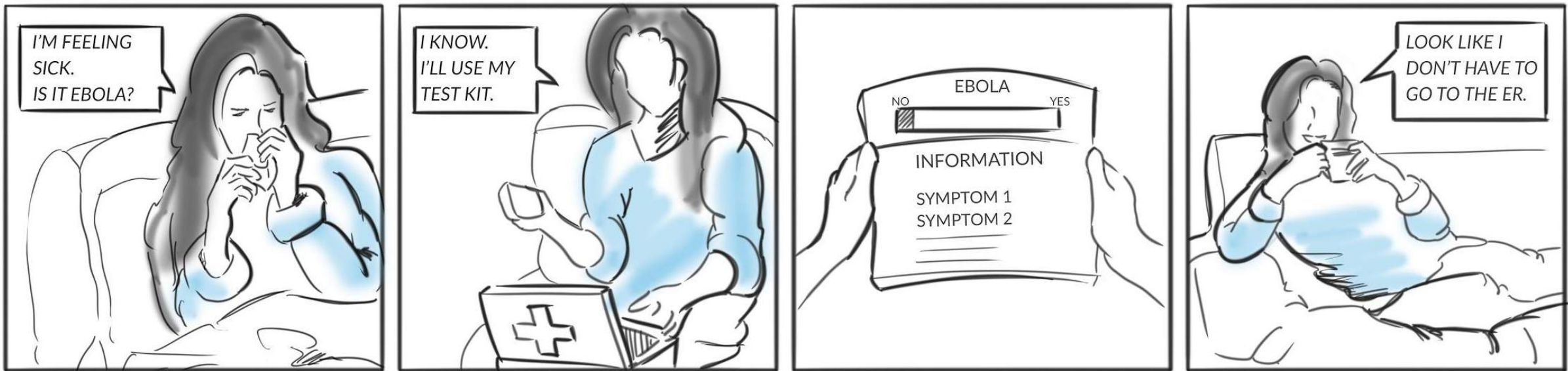
Evaluating the Concepts

After selecting 6 concepts through team discussion, we brainstormed six different values to evaluate each concept. This was to determine which concepts were best, as we would need to further reduce the concepts down to 3 during Stage 3. The evaluation metrics were divided into two groups, one for users, and the other for providers. In our case, this represents the patients as the users, and the doctors as the providers

Here are the values we generated:

Scalability
How easy it is to quickly scale up production of a concept to a large amount of users

Feasibility
How easy is it to implement the concept

Affordability
 How much is the concept within a hospital's financial means

Ease of Use
How easy is it for a new user to use the concept

Effectiveness
How much impact does the concept have on alleviating or preventing a pandemic

User Satisfaction
How satisfied would a user feel after using the concept

Concept Evaluation Matrix

	Doctor Training Status Database and Chat	Amber Alert-style Notification	Virtual Reality Training	Collaborative Pandemic Wiki	Home Diagnosis Blood Test	Flower for Patient Communication
Total	**14**	**15**	**10**	**11**	**8**	**12**
Scalability	5	5	3	3	3	4
Feasibility	5	5	4	4	3	4
Affordability	4	5	3	4	2	4
Provider Value Criteria						
User Value Criteria						
Ease of Use	4	5	3	4	3	5
Effectiveness	5	4	4	3	4	3
User Satisfaction	4	3	5	3	4	5
Total	**13**	**12**	**12**	**10**	**11**	**13**

Concept Evaluation Plot

- The Concept Evaluation Plot is used to visualize the Matrix generated in the previous slide.

- The triangle is created by drawing a line from the highest Provider and User scores.

- Any concepts that lie above the line are ideas that are strong with both users and providers, which is ideal.

1. Doctor Training Status Database & Chat
2. Amber Alert Style Notification
3. Virtual Reality Training
4. Collaborative Pandemic Wiki
5. Home Diagnosis Blood Test
6. Flower for Patient Communication

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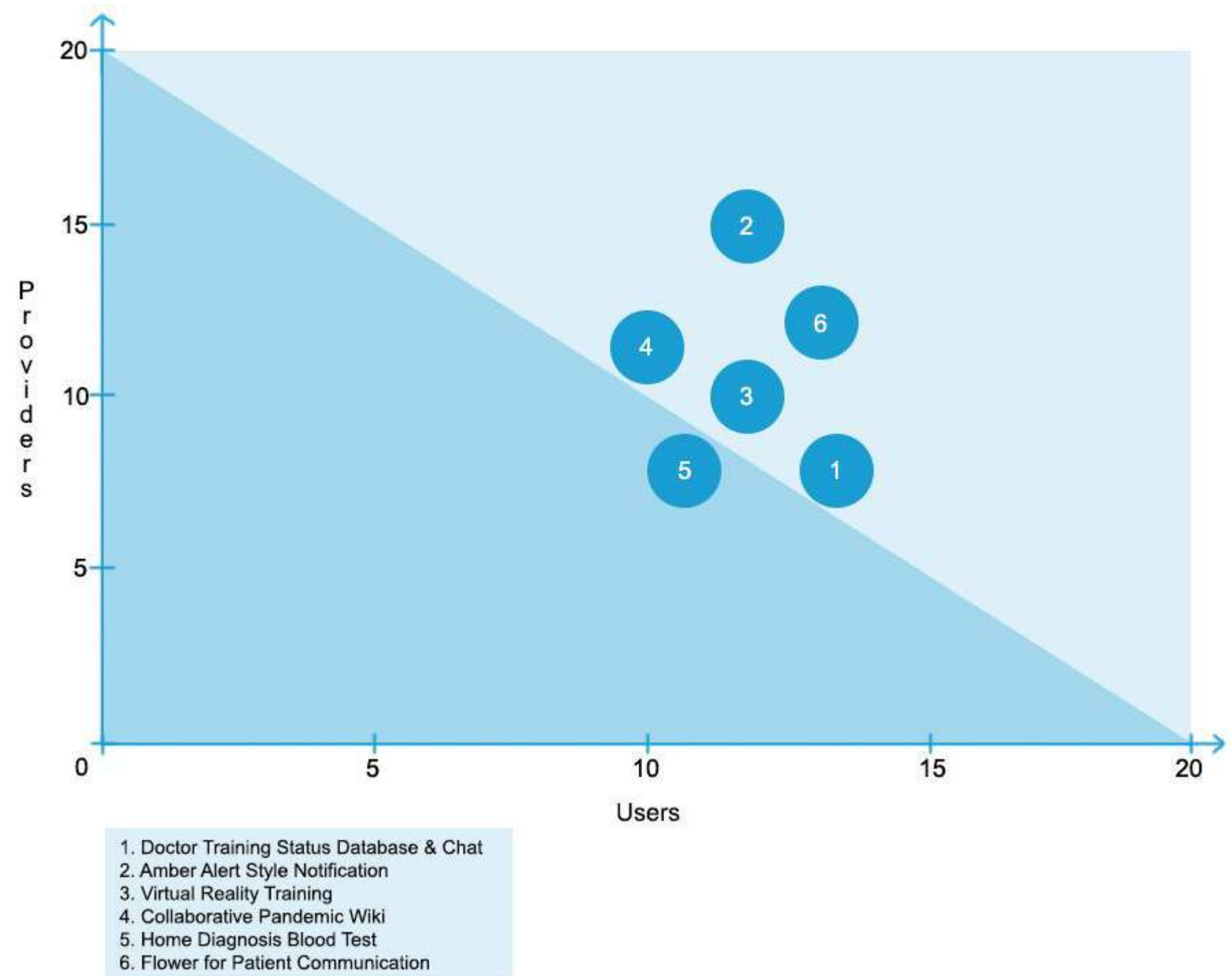
Stage 3

Understanding the Target Users

As mentioned in the Problem Statement, our team's focus was on Walla Walla, WA which is located in a rural area. To better understand its population, we developed 3 different personas, representing different population segments found in Walla Walla. These include the standard citizen, the student, and the elderly. These were provided by Dr. Phil Green.

The Standard Citizen
- Mostly middle upper class
- Very small homeless population
- Majority of people are in farming, wine, or the service industry related to wine tourism
- Overall, has one of the largest Seventh Day Adventist (religion) population anywhere

The Student
There are 3 main colleges here:
- Whitman-wealthy, liberal arts, mostly stick to their own campus and social groups
- Walla Walla University-liberal arts, all Seventh Day Adventists
- Walla Walla Community College-highest ranked community college in the country with students that are older, offers degrees in wine and the wind turbine industry

The Elderly
- Large population of retirees due to 300 days of sun and mild desert winters
- Many nursing homes
- Frequent utilizers of the hospitals and medical system

Persona 1: The Standard Citizen

BEN WILKINSON

"When you live in a small town, you really don't have many options in healthcare."

BIO

Ben has lived in Walla Walla his entire life. He works in the agriculture industry in a vineyard. On the weekends, he helps sell wines and sweet onions at the farmers market downtown. He has a wife who works as a bank teller and one daughter, who is in elementary school. His family has lived in Walla Walla for years, and he visits and cares for his aging parents weekly. He is very involved in his community and enjoys spending time with his family and pet dog. He is Catholic and attends church on Sundays with his family. In addition to his work in the vineyard, he stays active by jogging in the mornings and going on hikes with his family. His job at the vineyard gives him basic health insurance, which he has extended to cover his family. He visits the doctor for minor health problems, but the hospital is small with limited resources. When his dad had thyroid cancer, he had to drive to a larger hospital to get appropriate treatment.

Age:	35-37
Gender:	Male
Education:	Walla Walla HS
Marital Status:	Married
Household Income:	$40,000
Industry:	Agriculture
Location:	Walla Walla, WA

TECHNOLOGY USED

Smart Phone
Infrequent — Frequent

Laptop Computer
Infrequent — Frequent

Desktop Computer
Infrequent — Frequent

TECH PROFICIENCY

Low — High

GOALS/NEEDS

- Be a stable provider for family
- Care for his aging parents
- Be an involved parent and community member
- High quality medical care for himself and family
- Maintain an active lifestyle

FRUSTRATIONS

- Balancing work and family life
- His aging parents' health issues
- Paying co-pays for his family's doctor visits
- How isolated Walla Walla is
- Driving out-of-town for better healthcare

Persona 2: The Student

JASON RODRIGUEZ

"It's tough staying healthy in college, I should get more sleep and eat better."

BIO

Jason has grown up in Walla Walla for most of his life. His parents moved to Walla Walla when he was 6, to work as migrant farm workers at a local vineyard, and have stayed there since. He is currently a junior undergraduate student, studying Enology & Viticulture, in hopes of one day managing his own wine vineyard. He has a strong desire to make a lot of money after graduating from Walla Walla Community Colege, since he grew up in a lower class family, which had a tough time affording proper medical healthcare. This was because they were seasonal workers who did not qualify for the vineyard's employee health plan. He is also worried about his future health, since his family has a history of heart problems. As a result, he tries his best to get at least 8 hours of sleep and eat healthy, but it has been tough, as he has a 1 hr commute everyday to class, and is also working part-time to help pay for his degree.

Age:	18-35
Gender:	Male
Education:	Walla Walla HS
Marital Status:	Single
Household Income:	$10,000
Industry:	None (Student)
Location:	Walla Walla, WA

TECHNOLOGY USED

Smart Phone
Infrequent — Frequent

Laptop Computer
Infrequent — Frequent

Desktop Computer
Infrequent — Frequent

TECH PROFICIENCY
Low — High

GOALS/NEEDS

- Get a high-paying job after graduation
- Manage time between classes, work, and social life
- Stay physically fit by jogging and cycling often
- Find healthy places to eat nearby
- Get at least 8 hours of sleep a day

FRUSTRATIONS

- Commuting to campus everyday
- Lack of things to do in Walla Walla
- No hospital on campus
- Living with parents
- Poor family medical history

Persona 3: The Elderly

IDA HAWKINS

"I chose a retirement community close to the hospital, for some peace of mind."

BIO

Idea grew up in Seattle worked in the city as an artist up until the age of 65. She chose to retire in Walla Walla after hearing about its great weather and low cost of living. She currently lives in the Wheatland Village Retirement Community, which is located near the Walla Walla General Hospital. She is on Medicare and Social Security benefits, and frequently visits the hospital for checkups for various health issues associated with aging. Her eyesight has deteriorated in recent years, so she relies on public transportation and hired drivers to get around the city. She is an active member of her community as well as the church, and frequently attends weekly art and gardening activities. Her husband passed away a few years ago, but she still has a son living in Seattle, who visits her in Walla Walla monthly. She owns a smart phone, but because she is daunted by learning new technologies, she mainly uses it just to call her son on the weekend and during emergencies.

Age:	65-85
Gender:	Female
Education:	U of Washington
Marital Status:	Widowed
Household Income:	Social Security
Industry:	None (Retiree)
Location:	Walla Walla, WA

TECHNOLOGY USED

Smart Phone
Infrequent — Frequent

Laptop Computer
Infrequent — Frequent

Desktop Computer
Infrequent — Frequent

TECH PROFICIENCY

Low — High

GOALS/NEEDS

- Trusted health care related resources
- Transportation services to get around
- Regular communication with her family
- Retiring without being a burden to her son
- Be an involved church and community member

FRUSTRATIONS

- Deteriorating health due to aging
- Unable to drive self due to poor eyesight
- Isolated from her son who lives in Seattle
- Difficulty learning to use new technologies
- Boredom living in nursing home community

Mapping the Concepts

The Concept Evaluation Matrix/Plot from Stage 2 was used to reduce the 6 concepts, to 3 concepts. One of the criteria we used to select the final 3, was to look at the stages of the experience map, and map where each concept falls under.

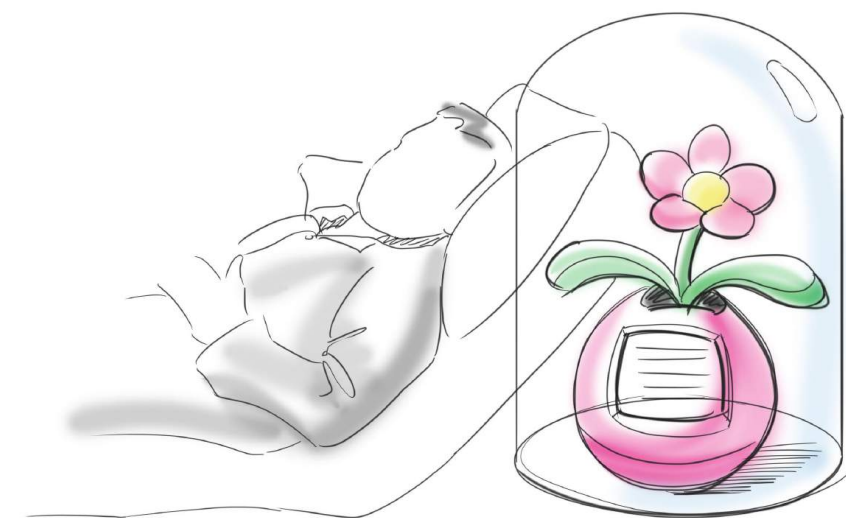| PRE-DIAGNOSIS	DIAGNOSIS AND TREATMENT	RECOVERY
Collaborative Pandemic Wiki	Training Status DB with Chat	Communication Flower for Patients

Pandemic Response Wiki

Problem

Pandemic response guidelines can differ from state to state. This leads to a slower response in the event of a pandemic, and improper treatment, such as incorrectly donning & doffing PPE gear like hazmat suits.

Solution

Provide a collaborative editing and approval tool for contributors (one from each state), so that everyone is one the same page. By having a single wiki that everyone contributes to, the guidelines can be streamlined and standardized.

Pandemic Response Wiki

Benefits
Provides a single centralized location to collaboratively organize information. Also adds accountability, as every contributor must justify changes because everyone can see them. Finally, updates are not bottlenecked by negligent government workers.

Drawbacks
This would require all staff to uphold and maintain quality submissions as well as fact-check their work. In addition, if there's too many contributors, it will be difficult to approve any new changes.
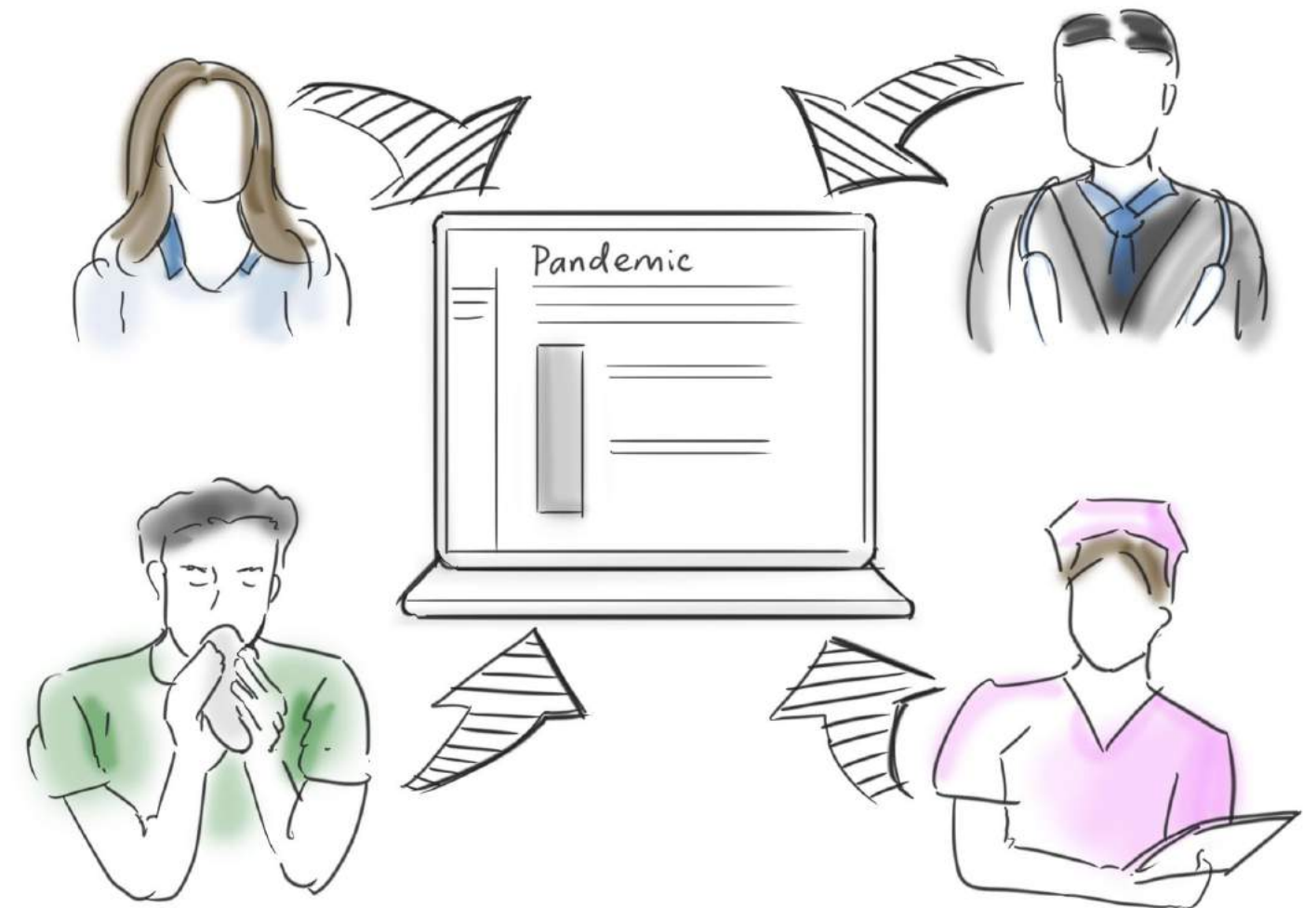
Doctor Training Status DB and Chat

Problem

Doctors need a system keeping track of training the statuses of medical staff in case of emergency. They also need a way to communicate more efficiently between doctors and medical staff.

Solution

Create a database showing the training statuses and availability of all doctors at a hospital and include a hospital-wide chat function allowing doctors to communicate.

Doctor Training Status DB and Chat

Benefits

Allows for direct doctor-to-doctor communication and manages updated and clear records of training and expertise. This app would also give doctors the ability to see which doctors are occupied or available.

Drawbacks

Unfortunately, this would require all hospital staff to use updated technology and the app would also require maintenance. Furthermore, doctors will need to have the device on them, in order to check the chat function.
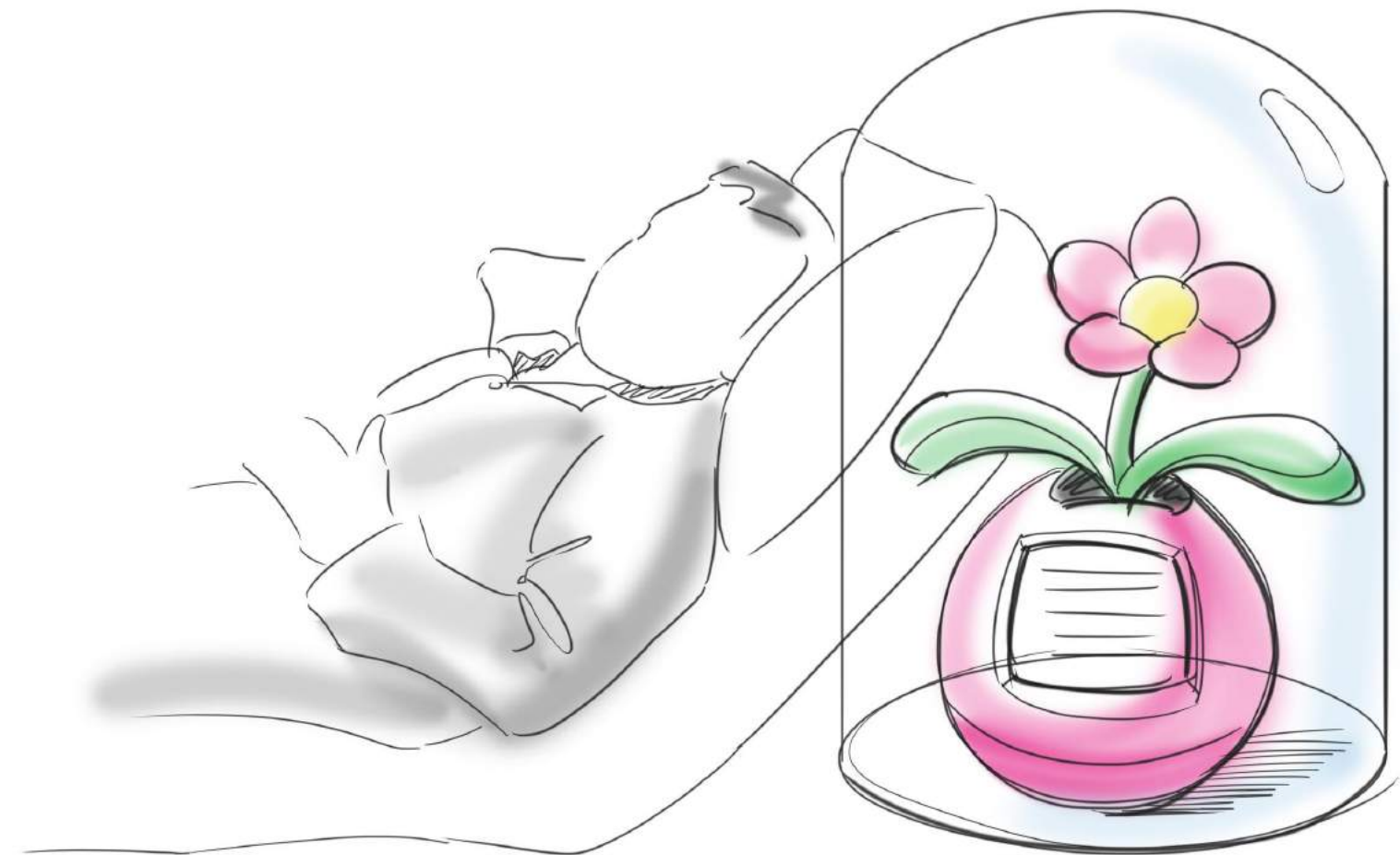
Communication Flower for Patients

Problem

Patients need a way to communicate with loved ones in a way that they can feel connected while in the hospital with a life-threatening illness

Solution

A flower with contamination protective container displaying messages sent from loved ones. Its leaves will wave when receiving a message. Patients use voice commands to play through messages

Communication Flower for Patients

Benefits
The flower helps bring a positive energy into the room, and can be low cost, if recycled pagers are used. It will also allow family & friends to communicate patient through one-way radio communication.

Drawbacks
As the infected patient will come in contact with the protective container, it will have to be incinerated after use. Also, the radio technology only allows for one-way communication, it does not have the capability of two-way communication.
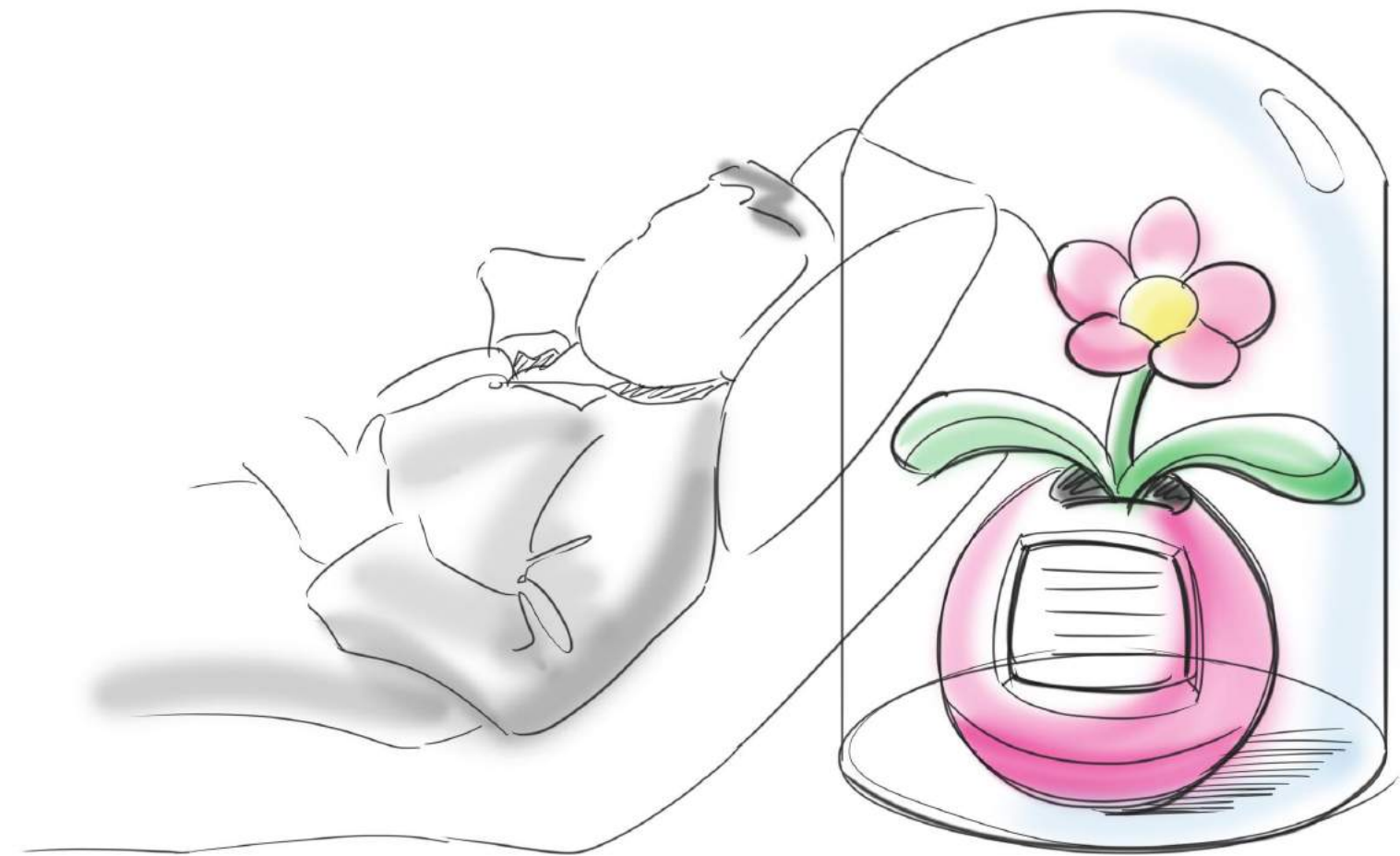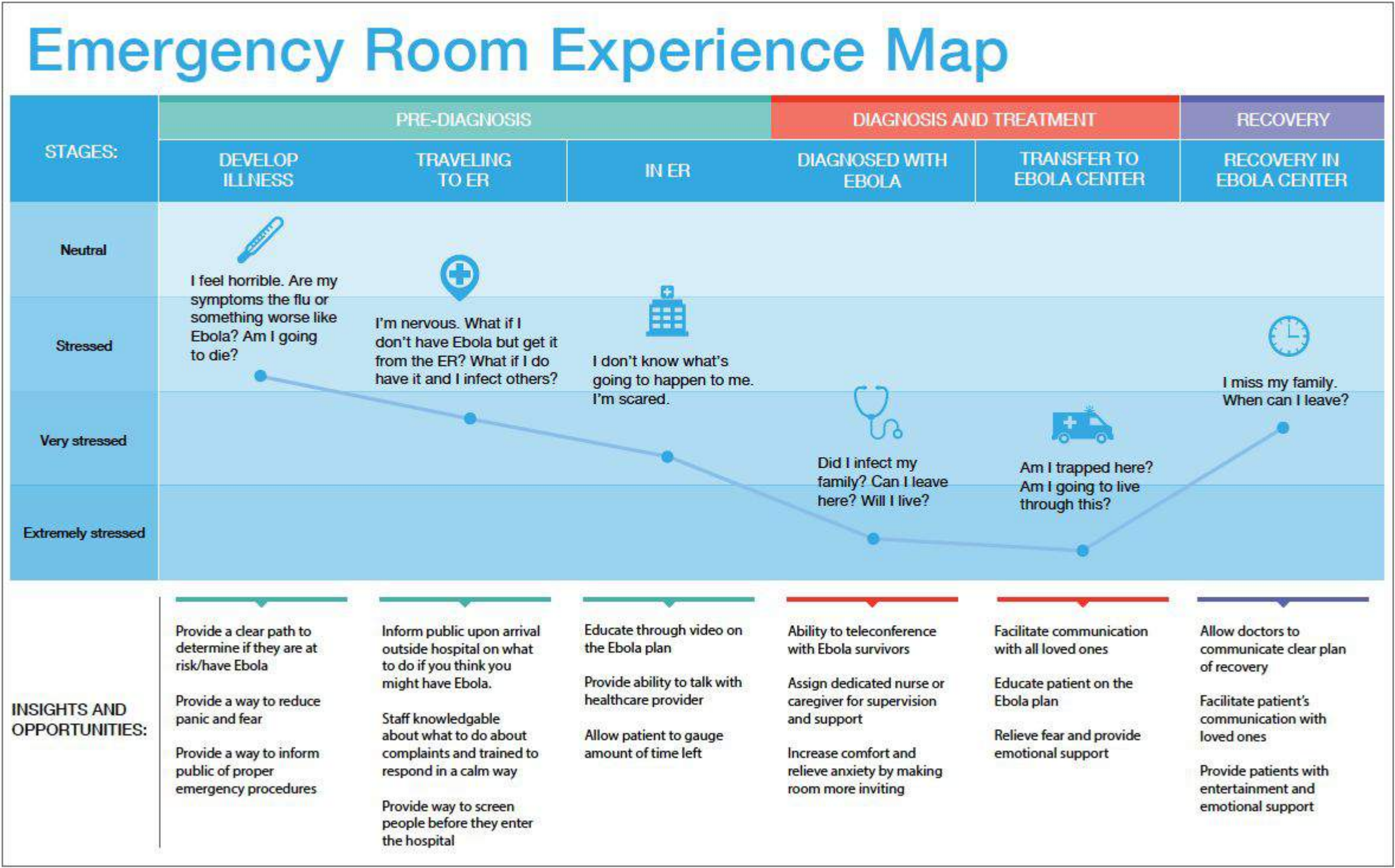
Updated Journey + Experience Map

During this stage, we received additional info from our SME, Dr. Phil Green. He took the time to also complete a journey map, which we incorporated into our original Journey and Experience Map from Stage 1. He provided a lot of insight into the journey an Ebola patient makes, from developing an illness, to recovering in the Ebola center. The updated Journey and Experience Map can be found on the next two pages.

Journey Map of Emergency Room

TIMELINE OF JOURNEY STAGES	DEVELOP ILLNESS	TRAVELING TO ER	IN ER	DIAGNOSED WITH EBOLA	TRANSFER TO EBOLA CENTER	RECOVERY IN EBOLA CENTER
TOUCHPOINTS Who or what are they interacting with?	• WebMD and other sites • Family and friends • Smart phone • Laptop • Call doctor or nurse hotline	• Car/parking • Ambulance • Driver • Friends and family • Navigation • Entrance	• Registration • Triage nurse • ER nurse • ER doctor • Other people waiting • Accompanying family • Waiting room chair	• ER Doctor • Infectious disease doctor • Nurse • Medical equipment • Exam table	• ER Doctor • Medics • Nurses • Department of Health • Transfer vehicle	• Doctor • Nurse • Video conferencing • Messages and calls • Medical equipment
CUSTOMER'S NEED What is their top need? What needs are not being met?	• Pain relief • ER nearby • Reliable doctor • Reliable information • Available resources	• Find the emergency room • Find parking • Expediency • Safe assessment	• Expediency • Knowledge of situation • Clear plans from doctor • Safety • Assurance	• Pain relief • Relief of panic/fear • Emotional support • Reassurance • Clear communication • Accurate diagnosis • Support during isolation	• Relief from fear of isolation and strange surroundings • Clarification on transfer location • Communication to family on new location	• Knowledge of care plan • Support from loved ones • Communication with doctors and family • Reassurance • Emotional support
THOUGHTS & FEELINGS What are their innermost thoughts at this precise moment?	• Panic • Pain • Anxiety/Dread • "My symptoms are the flu." • "Am I going to die?"	• Panic • Anxiety/Dread • "What if I don't have it but contract it in the ER" • "What if I infect others in the waiting room?	• Fear • Relief at being at hospital • Anxiety/Dread • Hopeful • Fatigue • "I'm scared."	• Panic • Fear • Anxiety • "Will I live?" • "Did I infect my family?" • "Can I leave?"	• Fear • Panic • Despair • "Am I trapped?" • "Will I live?"	• Fear • Anxiety • Hope of recovery • Eagerness to communicate with loved ones • Despondency • "When can I leave?"
CONTEXT What else in the environment might influence them?	• Proximity of outbreak • Exposure to contagion • Past ER experiences • Family and friends • Location • Time of day	• Emotional support • Hospital competency • Professionalism • Distance to hospital • Traffic/parking • Time of day	• Temperature and comfort of waiting room • Length of waiting period • Noise level • Calmness and clarity of staff • Sick patients nearby	• Expression of nurse/doctor • Comfort of exam room • Video education • Video conferencing • Contact with family • Others with same diagnosis	• Communication with family or religious person • People in hazmat suits • Comfort of transportation	• Room decor • Comfort of room • Care from doctors • Video conferencing and other communication options • Degree of isolation
INSIGHTS & OPPORTUNITIES What can you do to help them meet their needs, make the experience easier, or more enjoyable?	• Provide a clear path to determine if they are at risk/have ebola • Provide a way to reduce panic • Provide a way to inform public of proper emergency procedures	• Inform public upon arrival outside hospital on what to do if you think you might have Ebola. • Staff knowledgable about what to do about complaints and trained to respond in a calm way • Provide way to screen people before they enter hospital	• Educate through video on the plan • Provide ability to talk with healthcare provider • Allow patient to gauge amount of time left	• Ability to teleconference with Ebola survivors • Assign dedicated nurse or caregiver for supervision and support • Increase comfort and relieve anxiety by making room more inviting	• Facilitate communication with all loved ones • Educate patient on the Ebola plan • Relieve fear and provide emotional support	• Allow doctors to communicate clear plan of recovery • Facilitate patient's communication with loved ones • Provide patients with entertainment and emotional support

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Experience Map Visualization

Emergency Room Experience Map

STAGES:	PRE-DIAGNOSIS			DIAGNOSIS AND TREATMENT		RECOVERY
	DEVELOP ILLNESS	TRAVELING TO ER	IN ER	DIAGNOSED WITH EBOLA	TRANSFER TO EBOLA CENTER	RECOVERY IN EBOLA CENTER

Neutral

Stressed

I feel horrible. Are my symptoms the flu or something worse like Ebola? Am I going to die?

I'm nervous. What if I don't have Ebola but get it from the ER? What if I do have it and I infect others?

I don't know what's going to happen to me. I'm scared.

I miss my family. When can I leave?

Very stressed

Did I infect my family? Can I leave here? Will I live?

Am I trapped here? Am I going to live through this?

Extremely stressed

INSIGHTS AND OPPORTUNITIES:

Provide a clear path to determine if they are at risk/have Ebola

Provide a way to reduce panic and fear

Provide a way to inform public of proper emergency procedures

Inform public upon arrival outside hospital on what to do if you think you might have Ebola.

Staff knowledgable about what to do about complaints and trained to respond in a calm way

Provide way to screen people before they enter the hospital

Educate through video on the Ebola plan

Provide ability to talk with healthcare provider

Allow patient to gauge amount of time left

Ability to teleconference with Ebola survivors

Assign dedicated nurse or caregiver for supervision and support

Increase comfort and relieve anxiety by making room more inviting

Facilitate communication with all loved ones

Educate patient on the Ebola plan

Relieve fear and provide emotional support

Allow doctors to communicate clear plan of recovery

Facilitate patient's communication with loved ones

Provide patients with entertainment and emotional support

Stage 4

Changing the Flower to a Snowglobe

We chose to change our original idea of a "Communication Flower for Patients" to a "Snowglobe Phone Dock", based on peer feedback we received. People felt that using recycled pagers to keep the cost low, detracted from the concepts core functionality. By replacing it with a phone dock, two-way communication is now available, which was a major drawback for the flower idea, as it only allowed one-way radio communication.

Selecting a Final Concept

- We used the same criteria as in Stage 2 to evaluate our final 3 concepts. The goal was to find the strongest concept, which we would focus on for this stage. The Concept Evaluation can be found on the next page.

- In the end, the Snowglobe Phone Dock scored the highest, with a score of 28. However, the next idea was very close, with a score of 27. Since there was only a 1 point difference, our team explored other ways to compare the two concepts.

- Ultimately, we decided on the Snowglobe Phone Dock, because it maps to the Recovery portion of an Ebola patient's experience. Although this may not be the longest stage, it's a very important one, since it's the last stage a patient will remember. It's also the stage where the patient is most likely to have been separated from their family for an extended period of time.

- Thus, it's important that patients have something in their room, that lets the family communicate with them from afar.
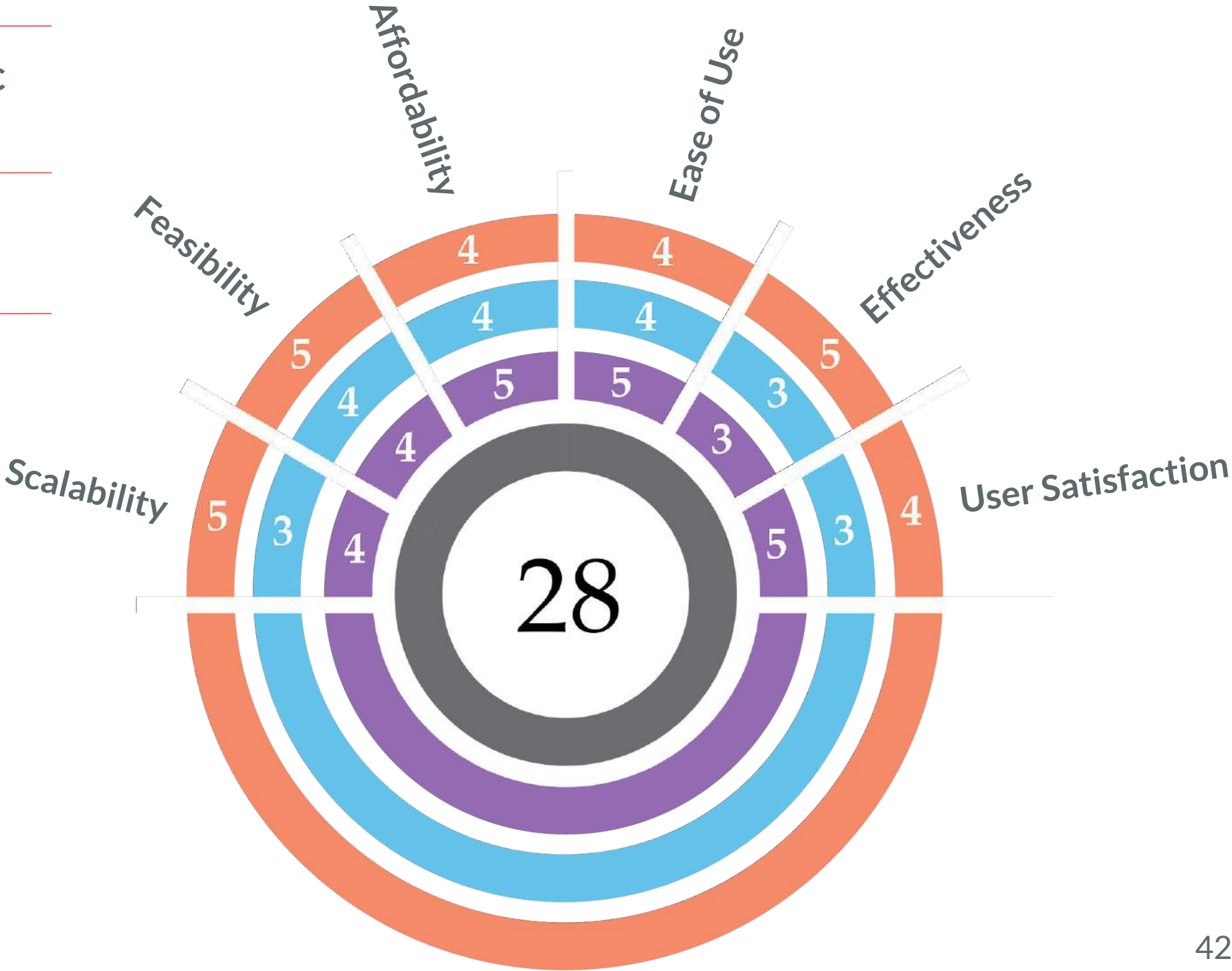
Concept Evaluation

27 ⭕ **Doctor Training Status DB with Chat**

21 ⭕ **Collaborative Pandemic Wiki**
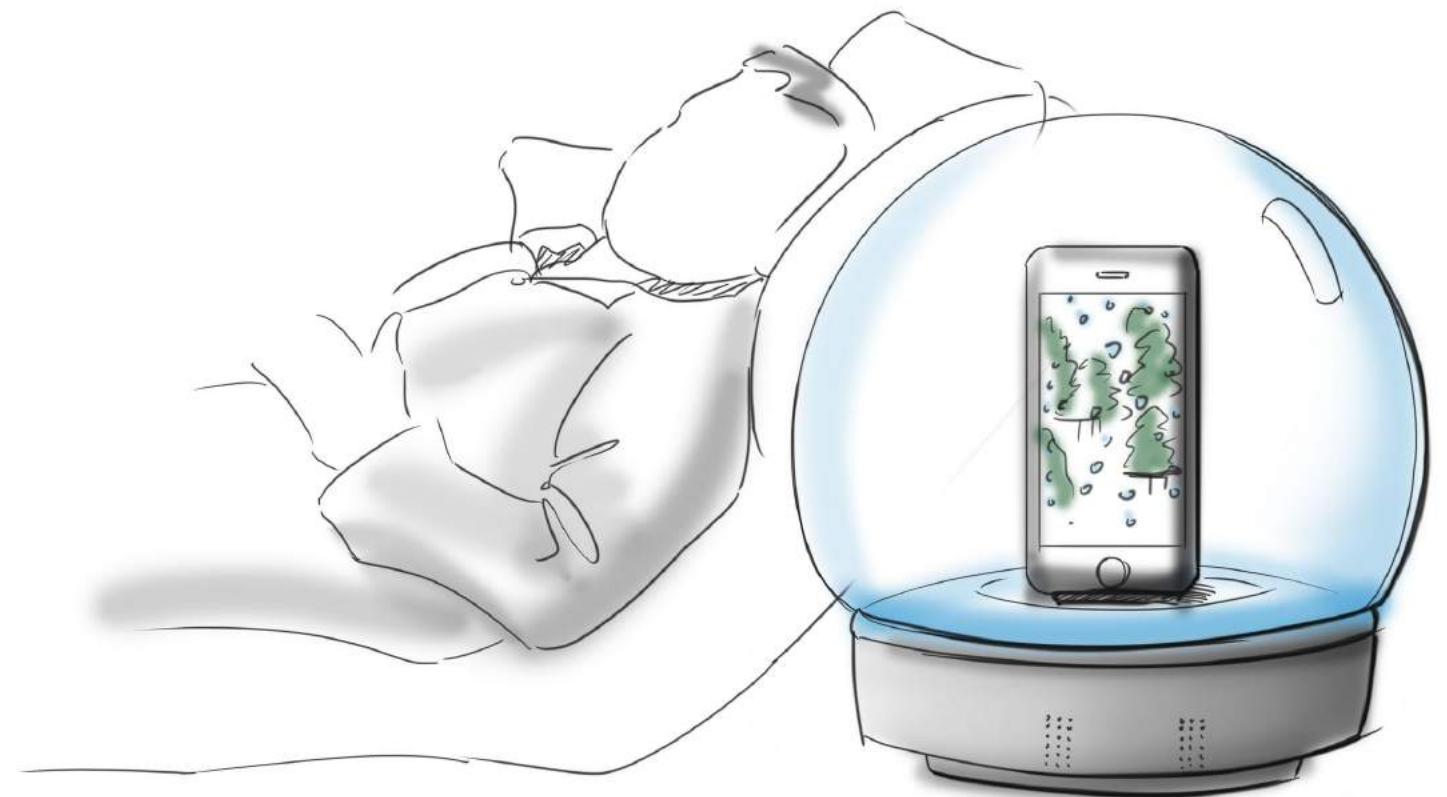
28 ⭕ **Snowglobe Phone Dock**

Final Concept: Snowglobe Phone Dock

Problem

Patients feel isolated from their loved ones while staying the hospital, especially over a long period of time. Furthermore, ebola symptoms include nausea, muscle pain, and hemorrhage which could impair their ability to use standard mobile technology

Solution

A mobile phone docked with a protective snowglobe cover that is programmed to respond to voice and touch inputs

Final Concept: Snowglobe Phone Dock

Features

- Medical staff pre-enters a list of important contacts for the patients
- Snowglobe is placed beside the bed and is activated by a simple touch
- Glow from the snowglobe creates a warm and calming ambiance
- Protective barrier allows technology to be reused
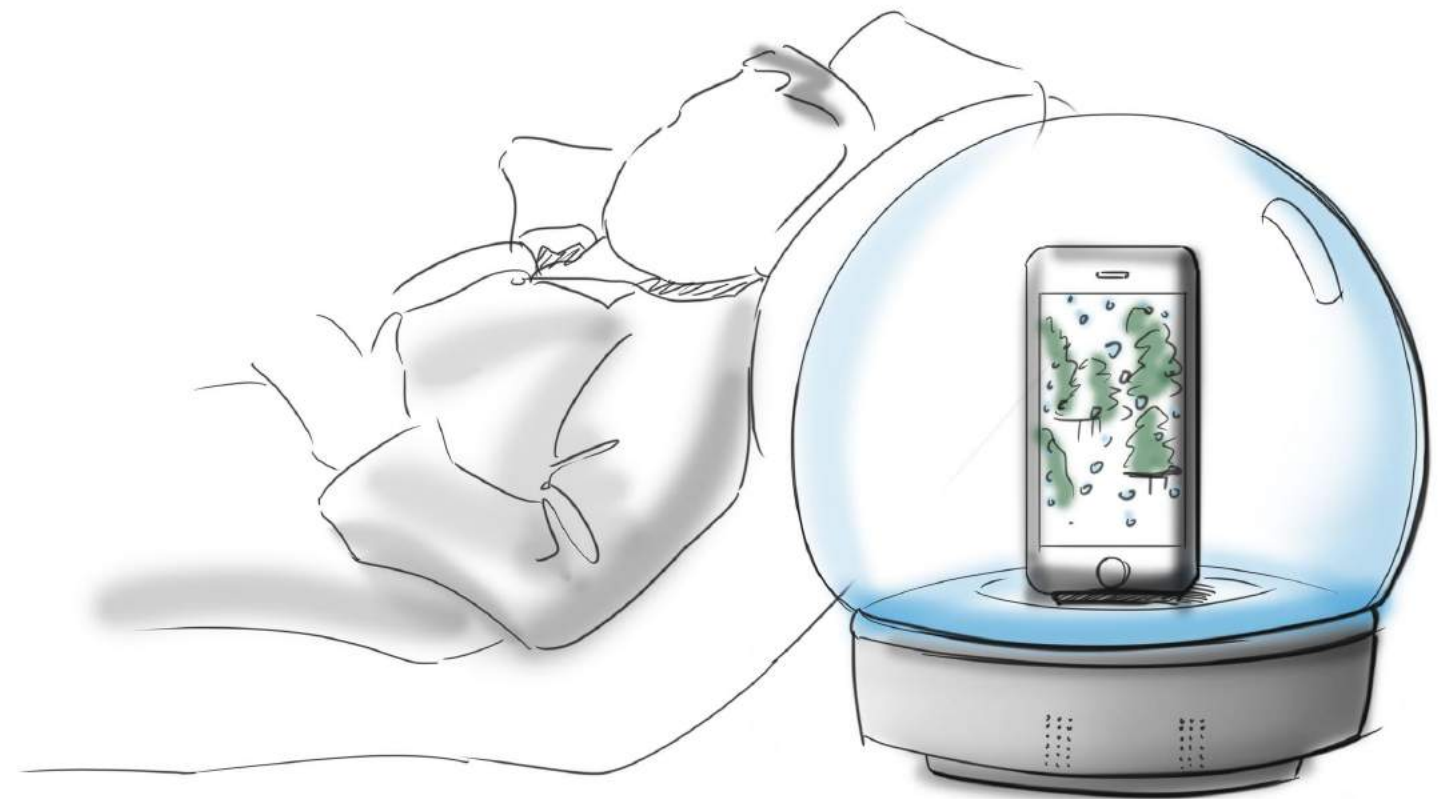
Visualizing the Final Concept

To help visualize the final concept, especially since it includes touch controls, we created a high-fidelity prototype and a storyboard. The high-fidelity prototype was used to illustrate the touch commands, while the storyboard showed how a patient would make and answer calls using the globe.

High-Fidelity Prototype

Touch Commands

- Touch to wake up "Siri Ebola Mode" and use voice commands to play through options for:

  - Outgoing call
  - Voicemail
  - Audio entertainment

- Touch to pick up an incoming call when snowglobe begins to softly hum and oscillate its glow

Anna Stevens is calling

TOUCH TO ANSWER

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Storyboard of Final Concept

Lessons Learned

- Feedback is invaluable when iterating a concept. A great example was the decision to change from the "Communication Flower for Patients" to the "Snowglobe Phone Dock".

- The metrics used to evaluate concepts should not only consider the user's perspective, but also the provider. In this case it was the doctors, but it could've also been the hospital itself.

- Having a Subject Matter Expert is critical when dealing with unfamiliar scenarios. I discovered many new things from Dr. Phil Green regarding hospitals and pandemics.

- If an SME is not available, creating a journey/experience map is a great way of understanding a user's journey or experience when using a product or service.

Conclusion

The US is still very unprepared for another pandemic. It lacks standardized guidelines when it comes to responding to a pandemic, as different states have their own guidelines. Although our idea of collaborative pandemic wiki is feasible, it still would require a lot of effort to implement, due to the complexities of the pandemic response structure.

In addition, communication between family and their loved ones who are sick is still very sparse, mostly due to HIPPA regulations which are in place to ensure medical data is secure. By providing with hospital issued phones for the phone dock, you can ensure that they're HIPPA compliant, as no other extraneous apps would be installed that could be a liability.

Finally, communication within a hospital still has issues, as doctors are forced to rely on email as the primary method of communication between doctors, besides pagers which are only one-way. However, larger hospitals do give their doctors work phones, so their is potential for a doctor status training database with interhospital chat to be implemented. But this would be on a hospital by hospital basis.

Moving Forward

1. Build a physical prototype of the Snowglobe Phone Dock, and continue to iterate the design

2. Run a color analysis to determine color of dock and oscillating ambient light

3. Conduct several usability tests with the prototype to determine if there's anything we overlooked

4. Contact hospitals and medical suppliers, and see if they'd be interested in the concept.

THANKS
FOR
READING

CHRISTOPHER CHUNG