

DESIGNING A SMARTPHONE APP FOR HEALTH PROMOTION IN ADOLESCENTS CANCER SURVIVORS: MILA CELESTIAL BLOOM

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OVERVIEW

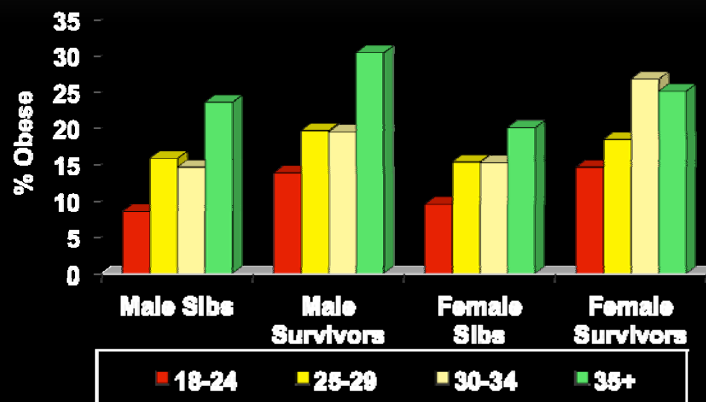
- Background on pediatric cancer
 - The Development Process of Mila Celestial Blooms
 - Initial results from play testing
-

PEDIATRIC CANCER

- ~12,000 children each year, with slightly increasing Incidence rates
- > 300,000 survivors
- young people are living longer
- Survivors are risk for a number of late effects which can be complicated by unhealthy lifestyles

American Cancer Society, 2012.

Obesity



Oeffinger et al., 2003, Journal of Clinical Oncology

Children's Oncology Group Recommendations

Good nutrition and regular exercise offer many benefits to childhood cancer survivors

- Promote healing of tissues and organs damaged by cancer and treatment
 - Building strength and endurance
 - Reducing the risk of adult cancers and other diseases
 - Decreasing stress and providing a feeling of well-being
-

SELF-MANAGEMENT INTERVENTIONS ARE NEEDED

- There are few interventions available
 - Existing interventions :
 - Have high attrition rates
 - Not designed to reach this geographically dispersed population
 - Not engaging or developmentally tailored
-

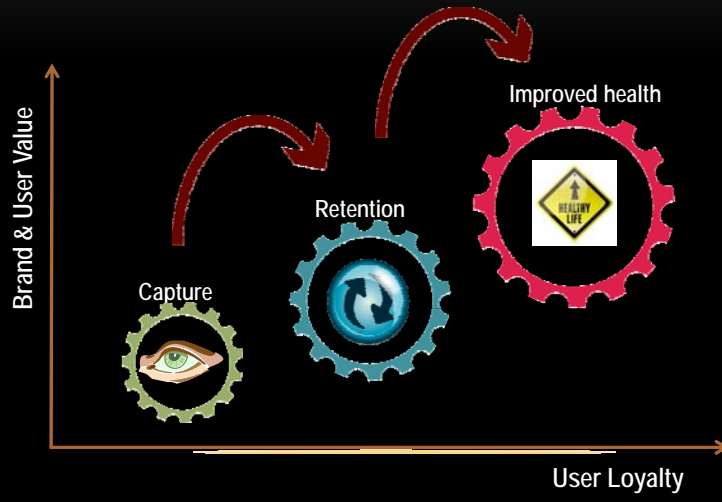
Take an App and Txt me in the morning



The Power of Self-Monitoring

- Monitoring can also help patients develop insights into patterns that affect their health.
- Monitoring provides patients with feedback, which can encourage continued change
- For monitoring to be effective it must be engaging

HOW DO WE CROSS THE LOYALTY CHASM?



9



GAMIFICATION

The use of game elements and game design techniques to enhance engagement in non-game contexts

Kevin Werbach – Gamification Coursera

POINTS BADGES LEVELS AND SOMETIMES AVATARS

4447
Excellent

★

🏆

LEVEL UP!

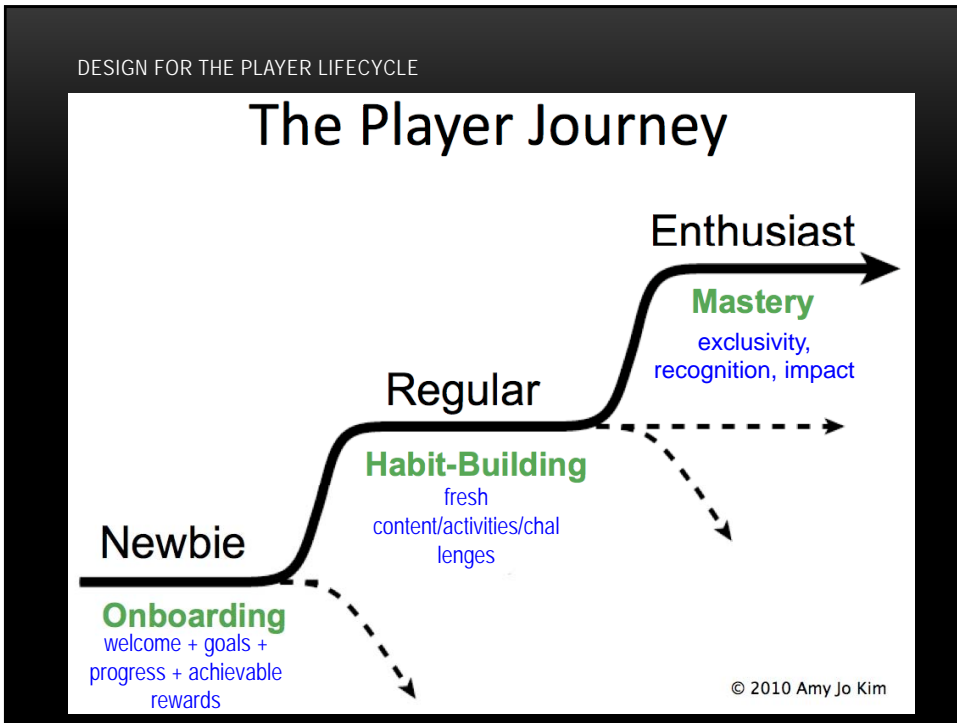
I: BEGINNER

★ ★ ★

REWARD: 200 🪙

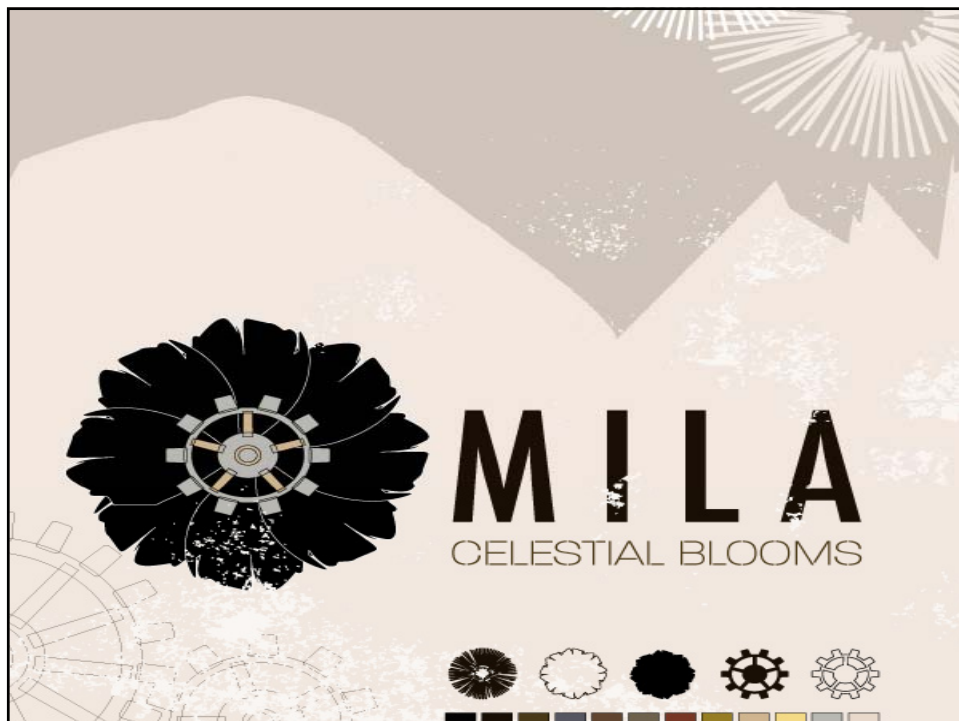
OTSP

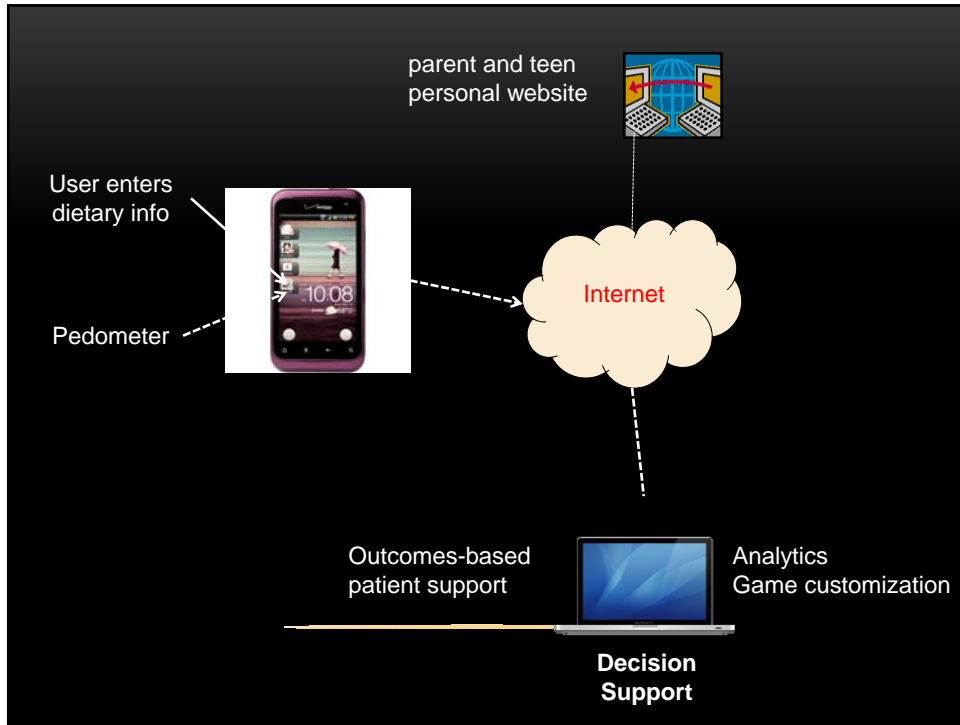
meez.com



BEHAVIORAL CONCEPTS

- Behavioral Learning Theory
 - Classical and operant conditioning
 - reinforcement/ reward schedules
 - Behavioral Economics
 - Loss Aversion
 - Self-Determination Theory
 - increasing intrinsic motivation by building competence, autonomy, and relatedness
-





A GOOD BRAND:

- Delivers message clearly
- Confirms credibility
- Establishes loyalty

You know challenge.

You break through.

A new mission:

Team up,

Get fit,

Seize more.

You have what it takes.

We've got your back.

So go ahead—

Reach higher,

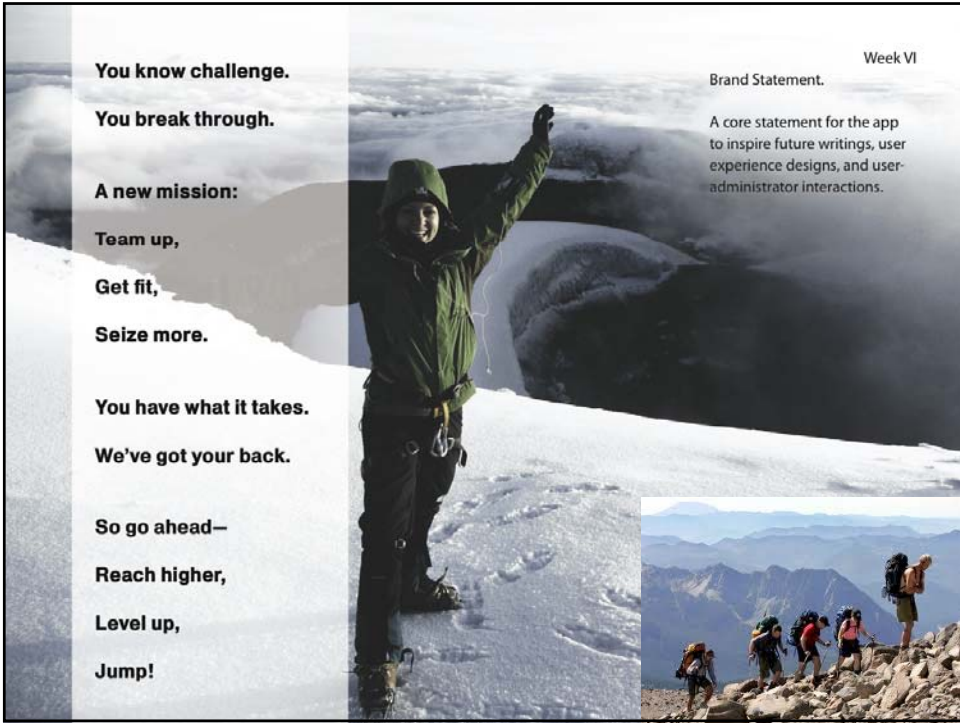
Level up,

Jump!

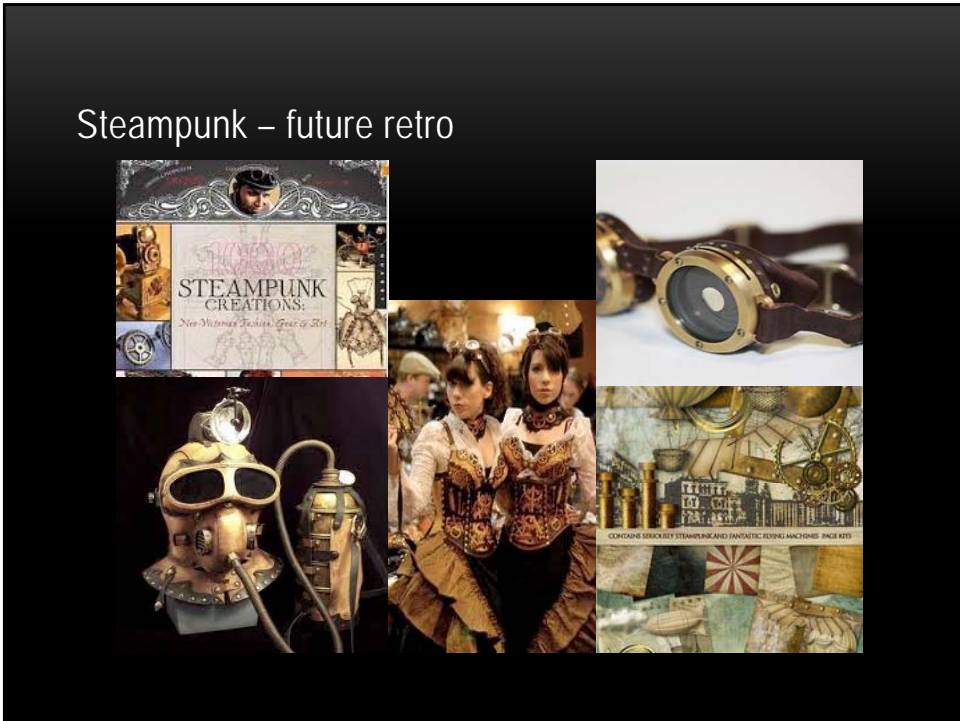
Week VI

Brand Statement.

A core statement for the app to inspire future writings, user experience designs, and user-administrator interactions.

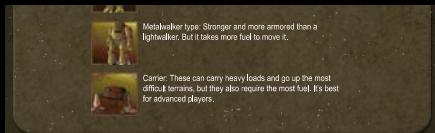


Steampunk – future retro



The collage features several elements: a book cover titled 'STEAMPUNK CREATIONS: New Victorian Fashions, Gear & Art' with a decorative border; a close-up of a brass pocket watch with a leather strap; a scuba diver's helmet with a headlamp and oxygen tank; two women in ornate steampunk costumes with corsets and goggles; and a background image of a steampunk-themed interior with gears and machinery.

MILA BLOOM: THE GAME



¶ Earn points by logging foods, logging your exercises, or syncing your pedometer. The harder an activity is that you log, the more points you get, and the closer you'll be to completing your expedition.



EXPEDITIONS AND CHALLENGES

Expedition 1

- You find a curious petal. Help Janna, the camp's scientist discover the what gives it its hue

Challenge 1

- To be a good scientist, you must learn about measurement. Prove you know about this: snap a pic of a serving of your favorite snack and post it for the Sherpa to see along with its nutritional content

Reply 1

- Nice work! Upon closer observation, you discover that the vibrant hue is from tiny crystals that coat the flower. Janna pays in some lahks for your hard work

COMIC BOOK

ENDURANCE

EXPEDITION 2

The Fjan ancients tried to tell their young people that the secret to clearing toxins from the atmosphere lay in MILA's roots. "A strong Earth is essential for clean air," said Mio, the eldest Fjan shaman before the separation. Because most of the youth didn't believe him, or want to see what was happening, Mio and a few other elders took to the outskirts of their society.

By caves that protected them from the harshest toxins, they added on elaborate mountainside pods. They evolved to become the Metricom pods that Janna's generation knew as their only home. Brewing tea with roots of MILA, the older shamans grew used to the thinner air and their bodies became stronger away from the thickening dirty air below.

Before they perished from age, Mio made a final journey in the hopes that his descendants would know the powers of MILA... to Antarctica.

But only one being knows where it is the beautiful leopard queen Aliyah, who lives at Mount Kilimanjaro. You must travel to the nearest city: **MOSHI, TANZANIA.**

It's particularly important to pay attention to the topography here, so walking attentively counts. Along the way, you'll meet blue monkeys and antelopes who point you towards Aliyah. She reveals something new: other Fjan descendants live in Australia. She gives you a gift of a tea flask to take to them.

THIS WEEK, you'll walk set lengths to measure how far you've come, and chart a map of a 14 mile around where you live.



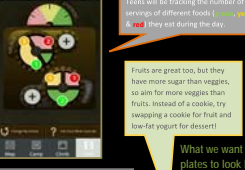
PARENT NEWSLETTERS

MILA: PARENT

Introduction to MiLA

Introduction to MiLA... (The text is intentionally obscured and appears to be a placeholder or a very faint, illegible version of the introduction text.)

- #### GOALS
- Week 1: Orientation**
 - Get to know the app.
 - Week 2: General Nutrition/Portion Sizing**
 - Familiarize teens with general nutrition topics (e.g., importance of nutrition, what is healthy).
 - Help teens find ways to improve their nutrition.
 - Help teens find ways to better monitor their portion sizes.



- #### Tips for supporting your teen
- DO try to eat healthful diet along with your teen
 - DO provide a variety of healthful meal & snack options
 - DO invite teens to help shop and prep meals
 - DON'T nag
 - DON'T eat the foods your teen is trying to avoid – especially around
 - DON'T use food as a punishment or reward

AS A PARENT, HOW CAN I HELP?

Want your family to eat healthier? It all starts with a healthy shopping list. If your cupboards and fridge contain mostly healthy foods, everyone in your family is likely to eat better. -WeMD

For a list of shopping tips, visit: <http://www.westend.com/parenting/raising-fit-kids/food/family-grocery-shopping-tips>

- Low-fat plain yogurt
- 2% milk
- Whole grain cereal
- Whole wheat pasta
- Boneless, skinless chicken breast
- Low-sodium black beans
- Balsamic vinegar
- Olive oil

medium bowl, toss steak slices with 1 tablespoon soy sauce and 1 crushed garlic clove. Let stand 5 minutes.

- Meanwhile, cut onion in half, then thinly slice crosswise. Cut red pepper into 1/4-inch-thick slices. Set vegetables aside.
- In deep nonstick 12-inch skillet, heat 1 teaspoon oil over medium-high heat until very hot but not smoking. Add half of meat and stir-fry 30 to 45 seconds or just until meat is no longer pink. Transfer to plate. Repeat with remaining meat, without adding additional oil.
- In same skillet, heat remaining 1 teaspoon oil until hot. Add onion and mushrooms; cover and cook 3 to 4 minutes or until mushrooms are browned, stirring occasionally.
- Add remaining vegetables, ginger, water, and remaining soy sauce and garlic to skillet. Cook 5 to 6 minutes or until vegetables are tender-crisp, stirring frequently. Remove skillet from heat; stir in beef with its juices. Serve over rice.

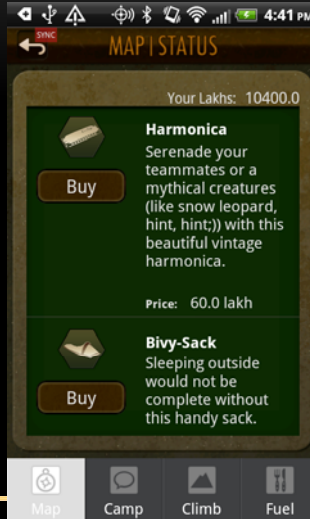
*Adapted from Delish (<http://www.delish.com/recipefinder/stir-fried-steak-vegetables-2363>)

For more on portion sizes and printable portion guides, visit: <http://www.webmd.com/diet/healthful-portion-sizes>

Map is the home screen where participants see their avatar, game progress, and history.



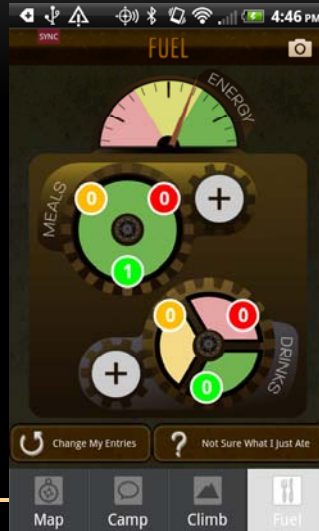
More detailed information on progress (points, badges, level) and virtual store



Fuel Screen is where you can enter foods you've eaten



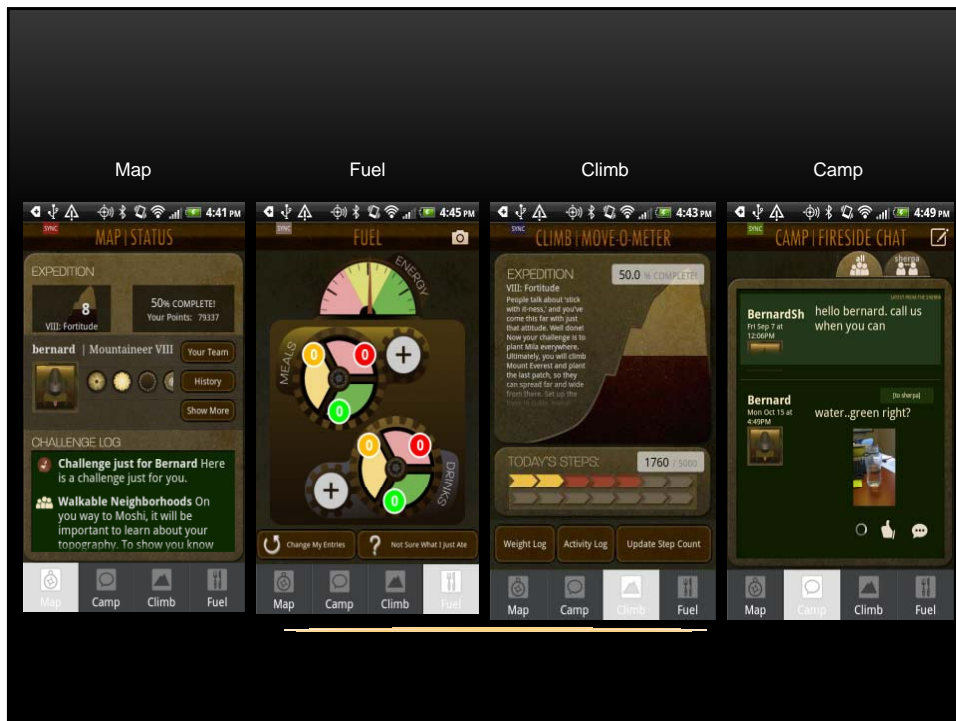
You can enter your food using the stop light diet theme

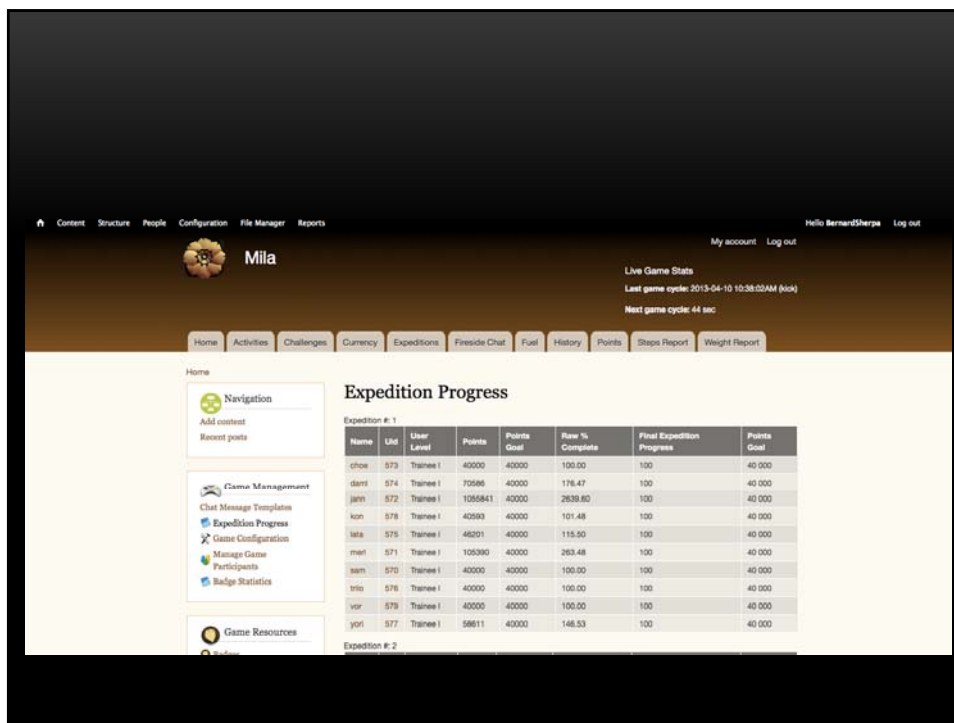
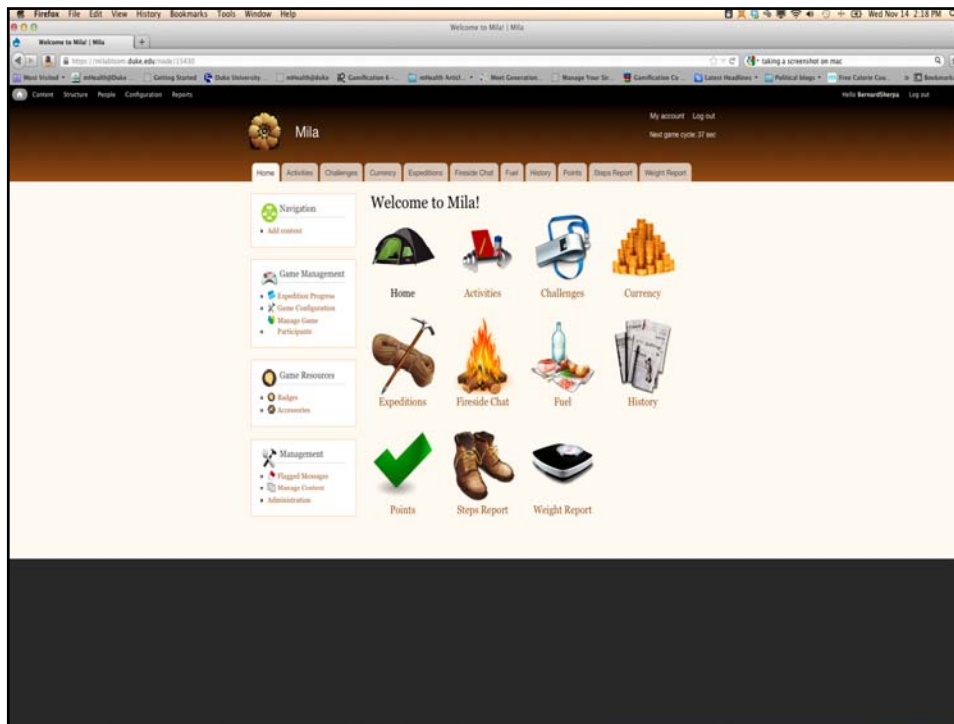


Climb Screen is where you can enter your steps and physical activity



Camp Screen is where you can view info from others or your Sherpa

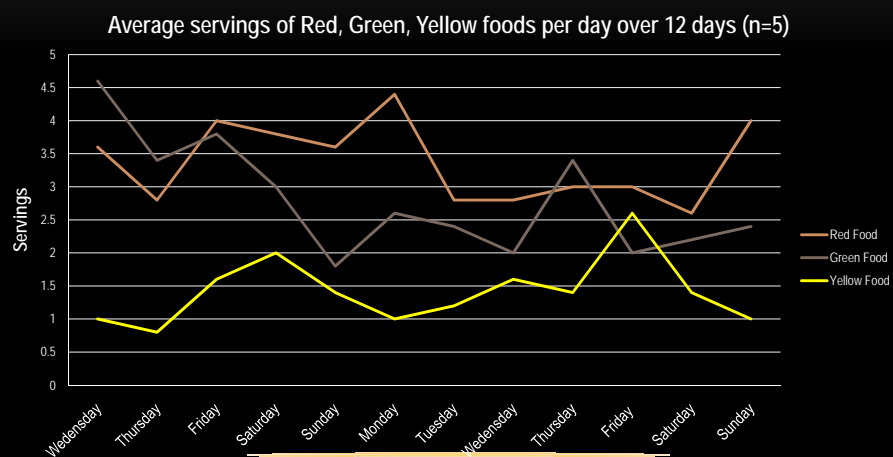




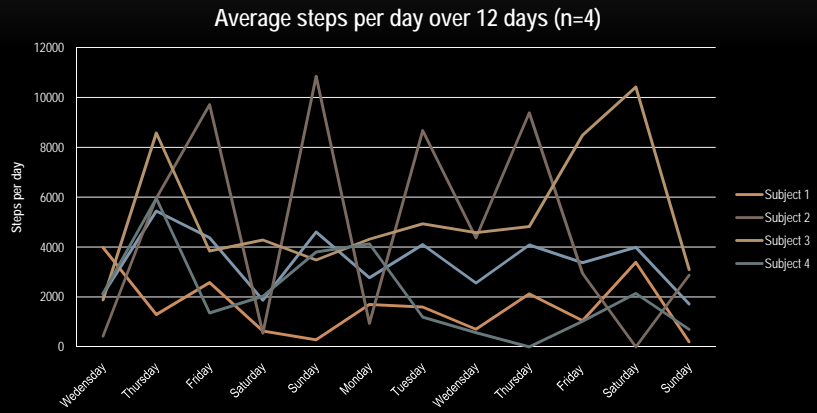
PLAY TESTING

- Healthy group of teens (n=5) ages 12-16 years volunteered to test the app
- Teens were given the app to use for 2 weeks
- Asked to use all aspects of the app and paid for use
- Brief focus-group conducted after 2 week period

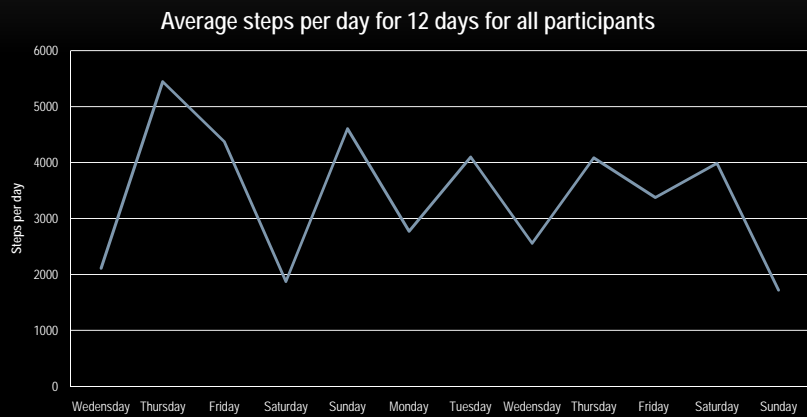
PLAY TESTING DATA (DIET)



PLAY TESTING DATA (PA)



PLAY TESTING DATA (PA)



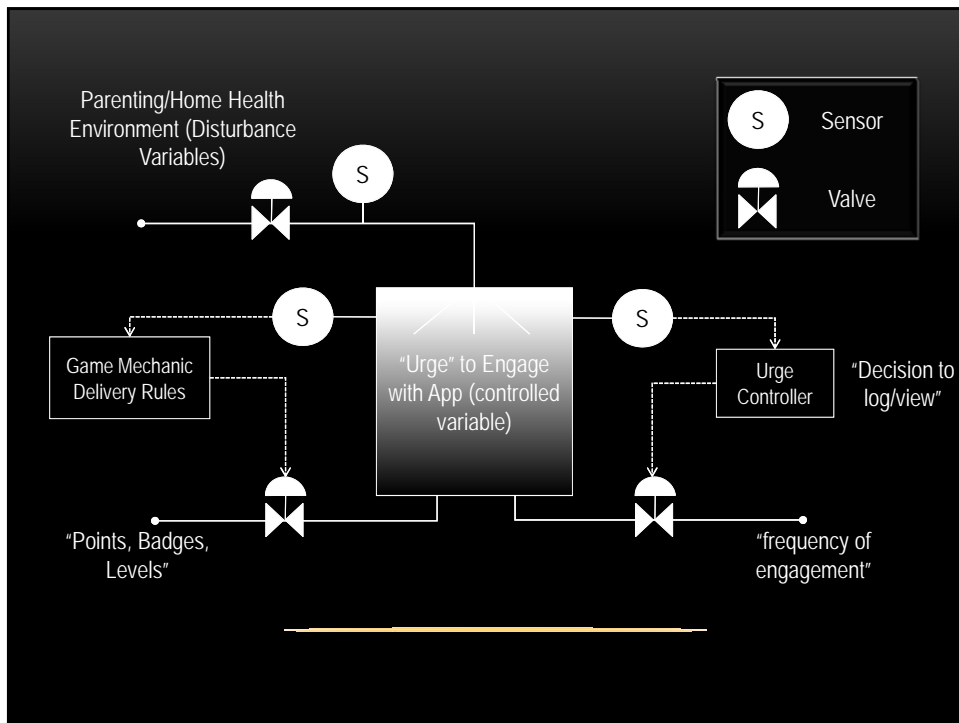
WHAT WE LEARNED FROM PLAY TESTING

- Detected a number of software bugs
 - Determined how to extract data
 - Game Elements and Design
 - Need better indicator of personal best
 - Bronze, silver, gold badges
 - Need better orientation to the game
 - More upfront work needed to explain the game (better "onboarding")
 - Need to improve the way we deliver "challenges"
-

NEXT STEPS

- Feasibility Study (ongoing)
 - 15 participants and 8 week intervention
 - How long will teens play?
 - Will they use it every day?
 - Will they change their behavior (diet and physical activity) in the desired direction?
 - Randomized Trial (grant proposal being planned)
 - Improve automated features and feedback
 - Design considerations
 - What is an appropriate control group?
 - Length of intervention? Boosters?
-

HOW CAN CONTROL THEORY BE APPLIED?



"If you never did, you should. These things are fun and fun is good"



DR. SEUSS

THANK YOU

Collaborators

Truls Ostbye, MD,PHD, MPH, MBA, Duke Medical Center, CFM

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National Cancer Institute

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