



Design Sprints and Usability Testing

Innovative, fast-paced methods for creating user-friendly digital health interventions

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Anthony Threatt, PhD, MArch
Lyndsay Nelson, PhD

#DesignSprintWorkshop
SBM Workshop April 11, 2018

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Introductions




Tony Threatt, PhD, MArch
Senior User Experience (UX)
Designer

Master of All Things Design Sprint


 @tonyphd

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Introductions



Lyndsay Nelson, PhD
Research Assistant Professor

Usability Wizard

Twitter Averse

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Introductions



William Martinez, MD, MS
Assistant Professor

Knowledgeable enough
to be dangerous

 @DrWillMartinez

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Disclosures & COI

none

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Learning Objectives

Demonstrate how to pair Design Sprint methodology with mixed-methods usability assessments for developing digital health interventions

Apply Design Sprint techniques and plan an approach to usability assessment for creating your own digital health interventions that appeal to users and support their use

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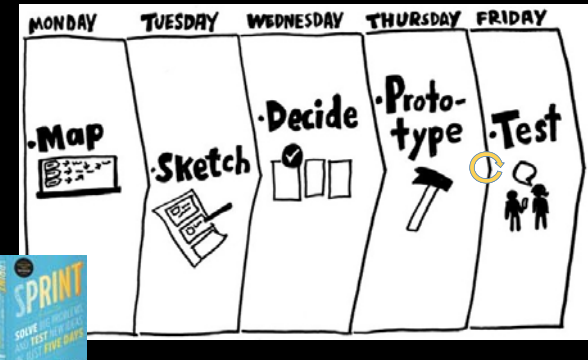
Case Study

Diabetes Dashboard within a Patient Web Portal



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Design Sprint



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How to Create Your Team

Decider

Team members

Facilitator

No more than 8 people

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Design Sprint – Day 1

Understanding and Mapping

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Day 1

1 LONG TERM GOAL

2 MAP THE FUTURE

3 QUESTION THE FUTURE

4 REFRAME CURRENT PROBLEMS INTO QUESTIONS

5 ORGANIZE + VOTE ON THE MOST PRIORITY QUESTIONS

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Understand

Who are the users?

What are their needs?

What is the context?

How does this fail?

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Always Be Capturing

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Mapping

User	Discover	Learn	Use	Goal	
Patient	Email or letter	Website landing page	Find doctor and view available dates and times	Select and submit desired date and time	Confirmed scheduled appointment

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Diabetes Dashboard Map

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Ask the Experts

Questions

- What will make this project a success?
- How does it go wrong?
- What has been tried in the past?
- What was learned?
- What's wrong or missing from the map?

Who?

- Patients with T2DM
- Patient Portal Super Users
- Diabetes Educators
- Clinic Nurses
- Behavioral Scientists
- HIT Experts
- Physicians

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How Might We...

HOW MIGHT WE
EMPOWER PATIENTS TO
GET DATA
CHECKED?

HOW MIGHT WE
EMPOWER THE PATIENT
IN THEIR
HEALTHCARE?

HOW MIGHT WE
CREATE & MORE
URGENCY
WITH PATIENTS?

HOW MIGHT WE
EMPOWER PATIENTS TO
OVERCOME
STAMMUNG
BLOCKS?

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Organize...

FEMININE

How many (or few) patients? (M) patients?

How... action... occurs? Goals?

How... create... the goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

EMPOWER PATIENTS

How... action... occurs? Goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

SOCIAL SUPPORTS

How... action... occurs? Goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

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Select...

FEMININE

How many (or few) patients? (M) patients?

How... action... occurs? Goals?

How... create... the goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

EMPOWER PATIENTS

How... action... occurs? Goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

SOCIAL SUPPORTS

How... action... occurs? Goals?

How... create... the goals? (M) patients?

How... create... the goals? (M) patients?

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HMW Informs Map

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Small Group Exercise

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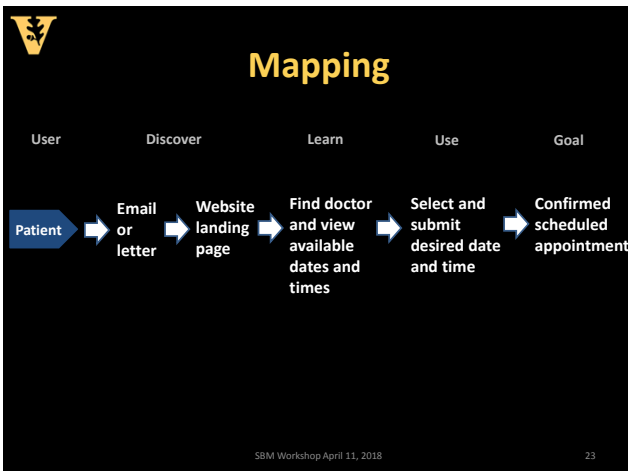
Map Your Intervention

Introduction (3min)

Map (10 min)

Debrief (2 min)

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Instructions

Given your problem:

Who is your user?

What is your end goal?

What is step 1?

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Debrief

You have a workflow map.

You now have steps to create an intervention workflow.

You have team alignment about the steps.

Questions?

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Design Sprint – Day 2

Sketch Competing Solutions

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Day 2

LIGHTNING BOLTS OF SUPPORT

PICK A PROBLEM AREA/HIGHEST RISK TO SKETCH SOLUTIONS

NOTES

IDEAS


SOLUTION SKETCH

COPY OR

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health data speedometer


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Sketching

- Introduction (3min)
- Crazy 8s (4 min)
- 3part Solution Sketch (6 min)
- Debrief (2 min)

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Instructions


- Given your workflow map, sketch 1 specific screen
- You will sketch it 8 times

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Sketch - Crazy 8s

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Instructions


- Select 1 crazy 8 sketch
- Sketch a 3 part sketch
- What happens before?
- What happens during?
- What happens after?

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Sketching – 3part Sketch

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Debrief

- You now have a 3part sketch.
- You will use that sketch + your workflow map to create a storyboard in the next step.
- Questions?


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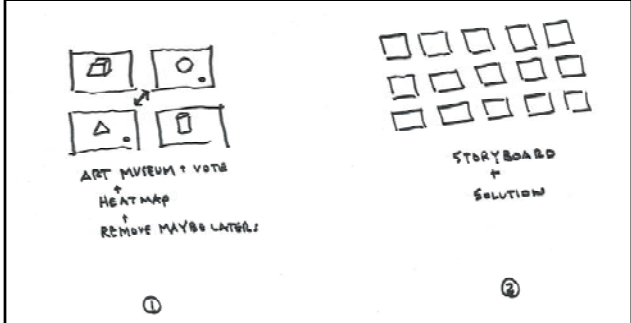
Design Sprint – Day 3

Making difficult decisions and turning ideas into testable hypotheses

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Day 3



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Decision Making Process

Hand-drawn diagrams and notes on a yellow background. The diagrams include a flowchart with 'Decision' at the top, 'Brain Surge (AIC)' below it, and 'Action' and 'Resource' at the bottom. Another diagram shows a person with a brain and a percentage '80%'. A third diagram shows a person with a brain and '80% PLM'. The notes include 'Submit Super Get Advice', 'AIC', and 'Creator Silent till End'.

Art Museum Heat Map Speed Critique Vote Decider Decides

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Decision Making Process

Hand-drawn diagrams and notes on a yellow background, similar to slide 41 but with green dots added to the diagrams. The diagrams include a flowchart with 'Decision' at the top, 'Brain Surge (AIC)' below it, and 'Action' and 'Resource' at the bottom. Another diagram shows a person with a brain and a percentage '80%'. A third diagram shows a person with a brain and '80% PLM'. The notes include 'Submit Super Get Advice', 'AIC', and 'Creator Silent till End'.

Art Museum Heat Map Speed Critique Vote Decider Decides

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Decision Making Process

Discuss
(facilitator leads, 3 min/solution)

Scribe

Creator Silent till End

Art Museum Heat Map Speed Critique Vote Decider Decides

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Decision Making Process

Hand-drawn diagrams and notes on a yellow background, similar to slide 41 but with red and green dots added to the diagrams. The diagrams include a flowchart with 'Decision' at the top, 'Brain Surge (AIC)' below it, and 'Action' and 'Resource' at the bottom. Another diagram shows a person with a brain and a percentage '80%'. A third diagram shows a person with a brain and '80% PLM'. The notes include 'Submit Super Get Advice', 'AIC', and 'Creator Silent till End'.

Art Museum Heat Map Speed Critique Vote Decider Decides

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Decision Making Process

Decision Making Process

Decision

Action

Resource

80% PLM

Art Museum > Heat Map > Speed Critique > Vote > Decider Decides

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Map → HMW → Solutions

Map

Solutions

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Diabetes Dashboard Storyboard

Diabetes Dashboard Storyboard

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Small Group Exercise


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Storyboarding

- Introduction (3min)
- Storyboarding (10 min)
- Debrief (2 min)


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Instructions

- Given your workflow map and selected 3-part sketch, create one storyboard
- Create 5 equal sized large squares
- Draw the final square screen
- Draw the opening screen
- Place 3 part sketches where they go on the storyboard
- Fill in the storyboard

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Debrief

- You now have an intervention storyboard.
- You would use that to develop a prototype to test with a defined set of end users.
- Questions?

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Design Sprint – Day 4

Creating a high-fidelity prototype

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Day 4

BUILD PROTOTYPE

①

PIECE TOGETHER PROTOTYPE + DO A RUN THROUGH

②

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<https://youtu.be/C8UQ0LV4i1o>

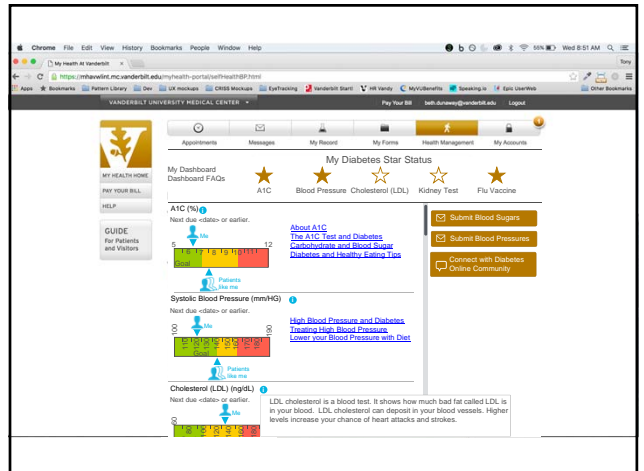
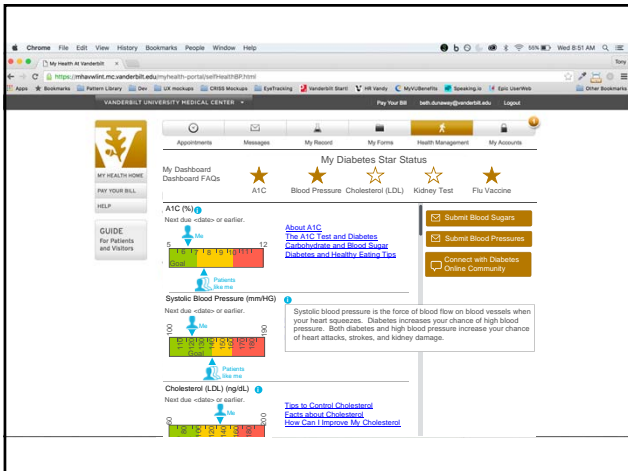
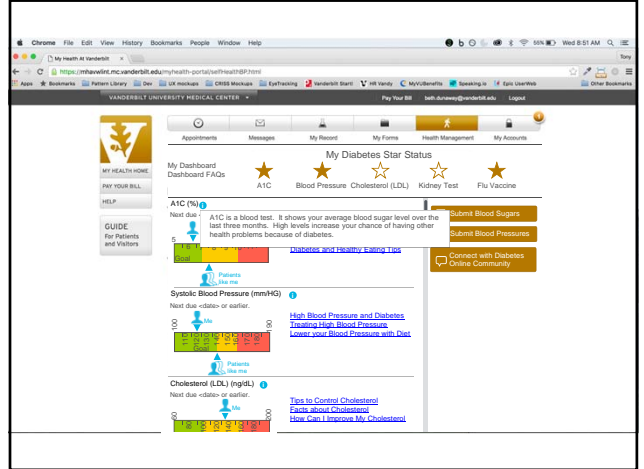
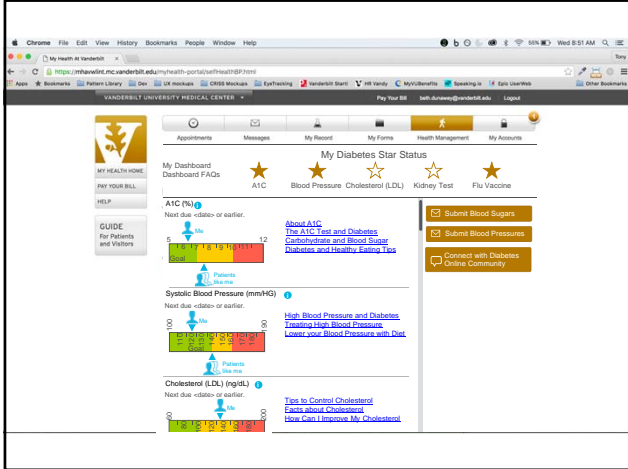
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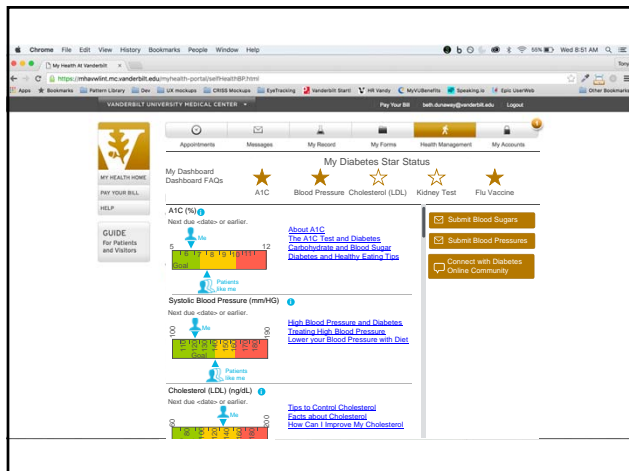
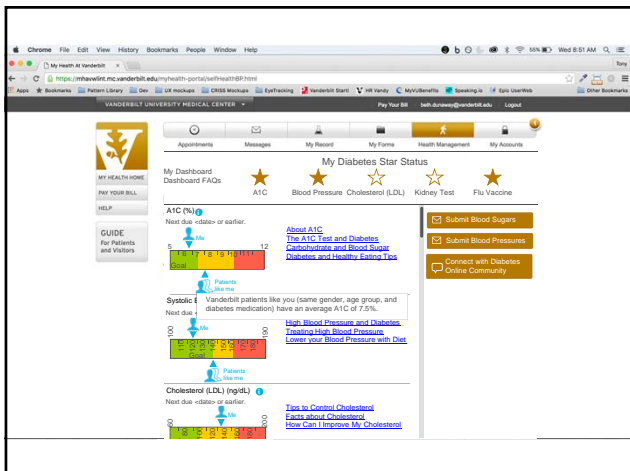
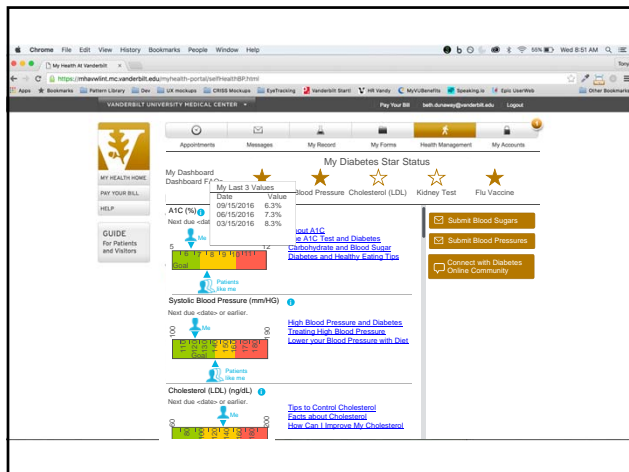
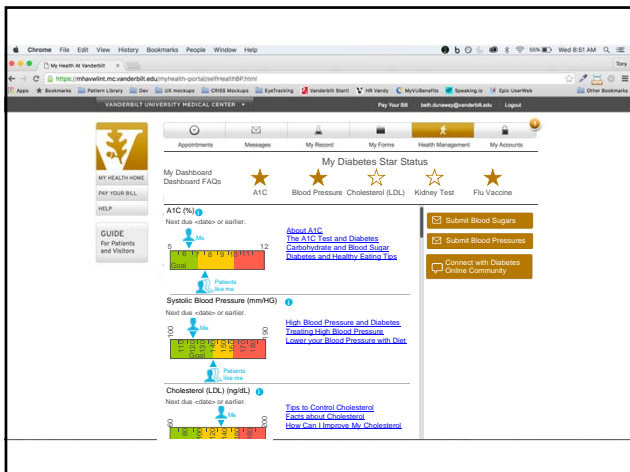
Initial Dashboard Prototype

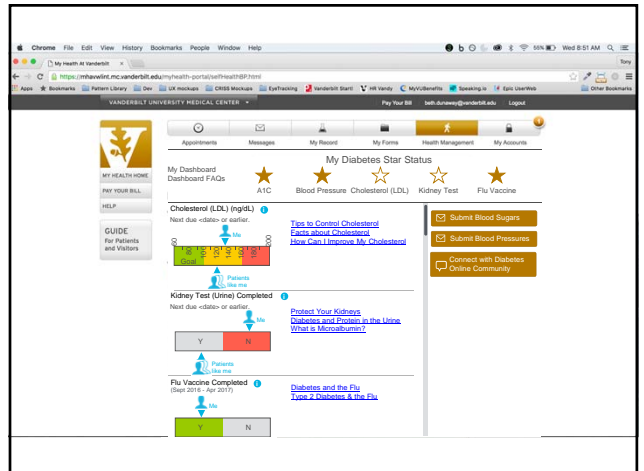
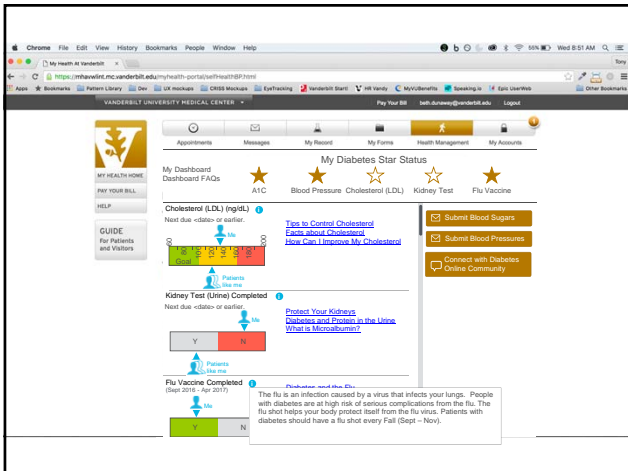
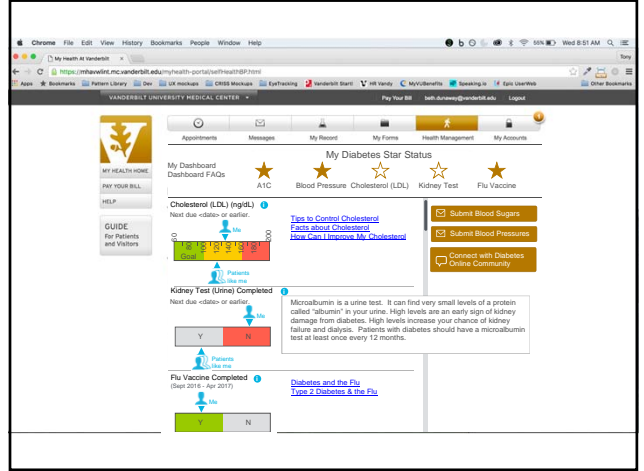
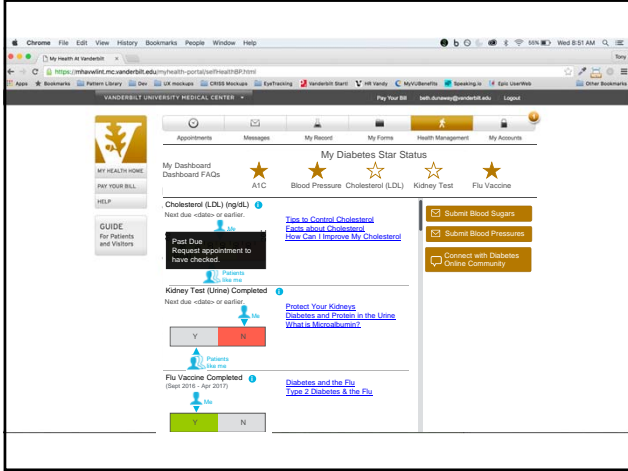
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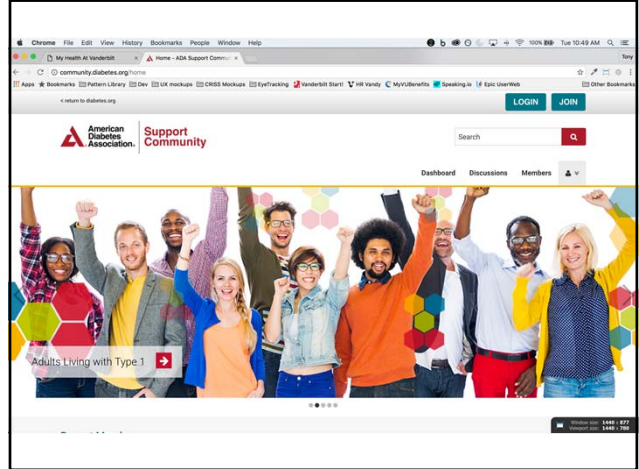
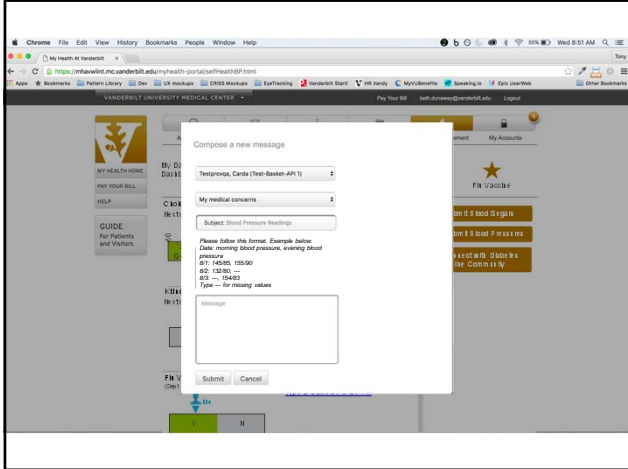
Final Dashboard Prototype

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Design Sprint – Day 5

Prototype assessment using a mixed-methods approach

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User Test Your Prototype

- Usability testing helps ensure interventions work as intended
 - Recruit target users
 - 5 is magic number
 - Use multiple rounds of testing
 - Collect both qualitative and quantitative data

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User Testing Methods

Adapted from Nielsen Norman Group

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Usability Questionnaires

- Computer Usability Satisfaction Questionnaire (CUSQ)¹
- System Usability Scale (SUS)²
- Health Information Technology Usability Evaluation Scale (Health-ITUES)³

¹ Lewis JR. *Int J Hum Comput Interact* 2009
² Brooke J. In *Usability evaluation in industry* 1996
³Schanil et al. *JMIR mHealth and UHealth* 2018

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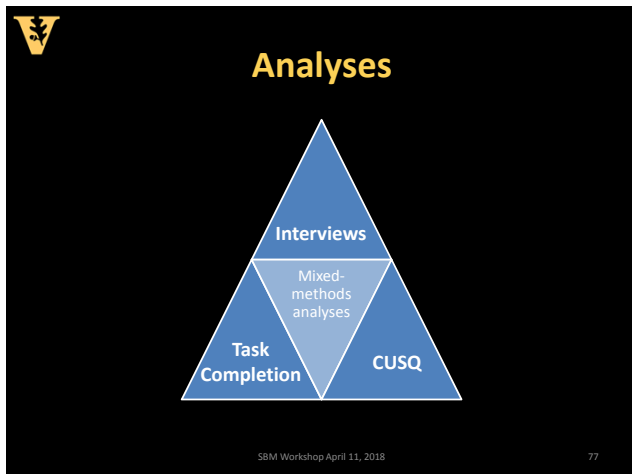
Sample SUS items

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I found the various functions in this system well-integrated.
4. I think that I would need the support of a technical person to be able to use this system.

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User Testing with the Diabetes Dashboard

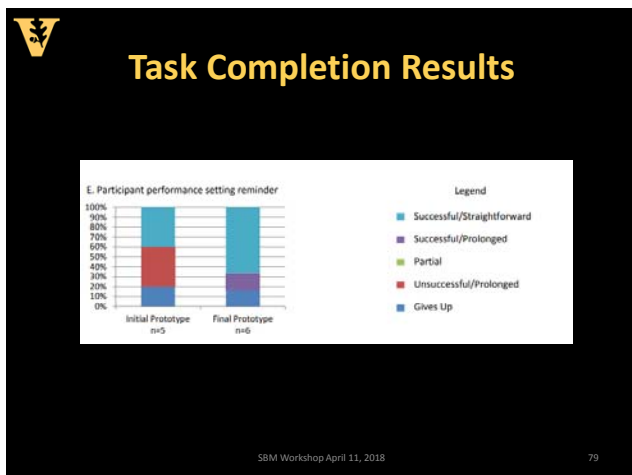
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Qualitative Results

Usability Element	Unique Concern Type and Example Quote
Design	Goal Setting Functionality <i>"The end date [for the goal], you're talking about the last day of your goal, I don't get that. Help me."</i>
	Reminder functionality <i>"That's a reminder, oh! That's a clock symbol. Gotcha. It could be clearer."</i>
Efficiency of Use	Redundancy <i>"I mean those two things [my medical concerns drop down menu] and the message subject [free text]."</i>
Content & Terminology	Online Community <i>"You're not going to be able to communicate with other patients and talk about the key things they do for support. That might be something you would add."</i>

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Small Group Exercise

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Prototype Testing Instructions

- Present example prototype to volunteer user
- Use think-aloud approach for eliciting opinions/reactions
- As user navigates prototype, others observe and take notes on his/her reactions

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Debrief

- Why would this process be valuable for designing an intervention?
- What types of insights could be realized using this methodology?
- Do you have other ideas for increasing the rigor of usability testing from an academic standpoint?

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Closing/Q&A

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Final Thoughts


Design Sprints provide a highly efficient, human-centered approach to:

- Rapidly understand the problem and audience
- Explore creative solutions
- Identify and map the best ideas
- Develop and test realistic prototypes

Yes, you need to carve out 5 days, but worth it considering overall time saved


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Sticky Notes

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Thank You!

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Link to slides:

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Design Sprint Links

<http://www.gv.com/sprint/>
<https://www.fastcodesign.com/1672887/how-to-conduct-your-own-google-design-sprint>
<https://www.fastcodesign.com/1672889/from-google-ventures-the-6-ingredients-you-need-to-run-a-design-sprint>
<https://www.thesprintbook.com>
<https://sprintstories.com>
<https://blog.ajsmart.com>
https://www.youtube.com/channel/UCeB_OpLspKjGikv1CYkWFFw
<https://blog.prototypr.io/a-google-design-sprint-gone-wrong-410dbb92f02b>

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Design Sprint Books



Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days


Jake Knapp
John Zeratsky



Design Sprint: A Practical Guidebook for Building Great Digital Products

Richard Banfield
C. Todd Lombardo
Trace Wax

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Usability References

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Brooke J. SUS-A quick and dirty usability scale. *Usability evaluation in industry*. 1996 Jun 11;189(194):4-7.

Schnall R, Cho H, Liu J. Health Information Technology Usability Evaluation Scale (Health-ITUES) for Usability Assessment of Mobile Health Technology: Validation Study. *JMIR mHealth and uHealth*. 2018;6(1):e4.

Sarkar U, Gourley GI, Lyles CR, Tieu L, Clarity C, Newmark L, Singh K, Bates DW. Usability of commercially available mobile applications for diverse patients. *Journal of general internal medicine*. 2016 Dec 1;31(12):1417-26.

- Uses Task-based Usability Measure

Lyles CR, Sarkar U, Osborn CY. Getting a technology-based diabetes intervention ready for prime time: a review of usability testing studies. *Current diabetes reports*. 2014 Oct 1;14(10):534.

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