

June 6, 2011

# Accessible Voting Technology Initiative

**Presenters:**

Daniel Castro, Project Director, ITIF Consortium

Whitney Quesenbery, Project Coordinator, ITIF Consortium



# Summary

**Project Name: Accessible Voting Technology Initiative**

**Project Duration: 3 Years**

**Grant Award: \$2.5M**

**Grant Recipient: Information Technology and Innovation  
Foundation (ITIF)**

# Presenters

## Daniel Castro, Project Director

Daniel Castro is a Senior Analyst at the Information Technology and Innovation Foundation (ITIF) with experience in the private, non-profit and government sectors. He has authored or co-authored over 30 publications at ITIF, published journal articles, and has been an invited speaker on technology policy at conferences in the United States, Latin America and Asia.

At ITIF, he has brought together academics, voting system vendors, policymakers, election officials, members of the media, and the public to foster a more robust dialogue on voting technology policy. Mr. Castro has organized a public conference on the Voluntary Voting System Guidelines (VVSG), a public policy forum to discuss voting technology policy, and an event on Capitol Hill to showcase innovations in voting system technology. In addition, he has authored articles on voting technology, participated in an EAC roundtable on the VVSG, and served on the advisory panel of the Voting Systems Risk Assessment (VSRA) conducted by the University of Southern Alabama. Currently, he is the Project Director and Co-Principal Investigator of the EAC-sponsored Military Heroes Initiative to research improvements in voting accessibility for recently injured military personnel.



# Presenters

## Whitney Quesenbery, Project Coordinator

Whitney Quesenbery is the director of the Usability Professionals' Association (UPA) Usability in Civic Life/Voting and Usability Project where she works on usability training and ballot testing for election officials. Ms. Quesenbery served on EAC TGDC Advisory Committee, where she chaired the sub-committee on Human Factors and Privacy during the development of voting systems guidelines (VVSG 2005 and VVSG 2007). She was on the advisory board of an FEC project creating guidance on usability in elections and was a director for Design for Democracy. She is a co-author of the Brennan Center "Better Ballots" and a contributor to "The Machinery of Democracy."

Her interest in usability in civic life is not restricted to elections. As UPA's representative on TEITAC, the Access Board advisory committee, she worked on updating the "Section 508" accessibility regulation. She is a Fellow of the Society for Technical Communication and has been honored with a UPA President's Award. Professionally, she is a user researcher and usability expert, working on large-scale web sites including National Cancer Institute's cancer.gov, IEEE, and The Open University. Past projects include work on hospital and financial management systems, as well as early e-publishing and multimedia leading the design team for an innovative pre-web multimedia news channel, Dow Jones Information Network. She is author of *Storytelling for User Experience* (2010, Rosenfeld Media), and *Global UX* (anticipated 2011 from Morgan Kaufmann).



# Agenda

- **Introduction and Overview**
- **What is “Design Thinking”?**
- **Project Details**

# Introduction and Overview

“Design thinking is a human centered approach to innovation: [it] includes understanding people as inspiration, prototyping, building to think, using stories, having an inspired and inspiring culture.”

- Tim Brown, CEO, IDEO

# Introduction and Overview

## **Problem:**

“Americans with disabilities face many obstacles to voting including physical, cultural, economic, educational and political barriers. Although much has been done to increase voting accessibility, more progress is needed.”

# Introduction and Overview

## Target Population:

“This project will include voters with disabilities, including individuals with varying levels of sensory disability (blindness, low vision, hearing loss, and deafness), cognitive and intellectual disability, motor mobility and dexterity disability, communication and language-related disability, and disabilities common among older adults.”

# Introduction and Overview

## Methodology:

“We propose to undertake a rigorous evaluation of the barriers and facilitators to voting for people with disabilities, to identify gaps where current technology fails to fill user needs and where new solutions can have the most impact, and to make recommendations on how to integrate these changes into the current election environment.”

“Our approach focuses on the user experience rather than the technology.”

- ITIF Consortium

# Introduction and Overview

## Objective:

“To use a design-led innovation process to translate research, observations and insights into actionable steps to change voting system technologies and processes in ways that will improve the voting experience for people with disabilities”

# Introduction and Overview

## Criteria for Success:

- Usable
  - Supporting all voters in marking their ballot accurately and efficiently
- Accessible
  - Enabling people with disabilities to participate independently and privately
- Flexible
  - Fits within election management practices from traditional polling places to vote centers and vote-by-mail
- Secure and auditable
  - Making it possible to recount and audit elections
- Affordable and robust
  - Within the means of even a small election district

# Introduction and Overview

## Team:

- Information Technology and Innovation Foundation
- Georgia Institute of Technology
  - Center for Assistive Technology and Environmental Access (CATEA)
- Carnegie Mellon University
  - Human-Computer Interaction Institute (HCII)
  - The Quality of Life Technology Center (QoLT)
- University of Washington
  - Department of Rehabilitation Medicine
  - Center for Technology and Disability Studies

# Introduction and Overview

## Team:

- University of Utah
  - Department of Political Science
- University of Colorado
  - Assistive Technology Partners
- National Federation of the Blind
- IDEO

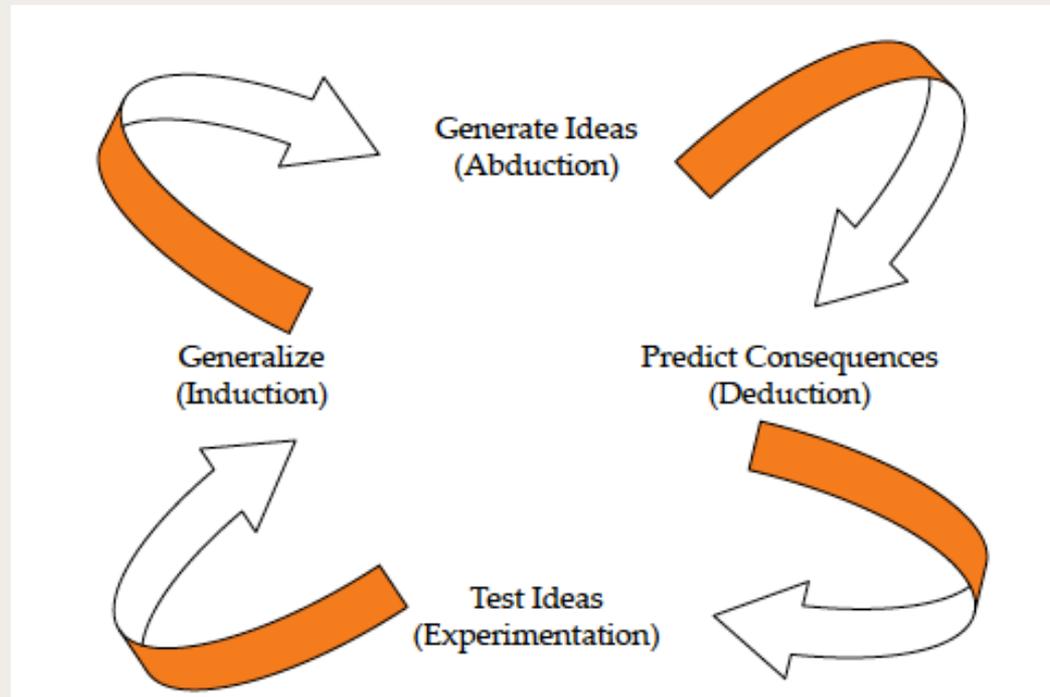
# What is “Design Thinking”?

“Design is not just what it looks like and feels like. Design is how it works.”

- Steve Jobs

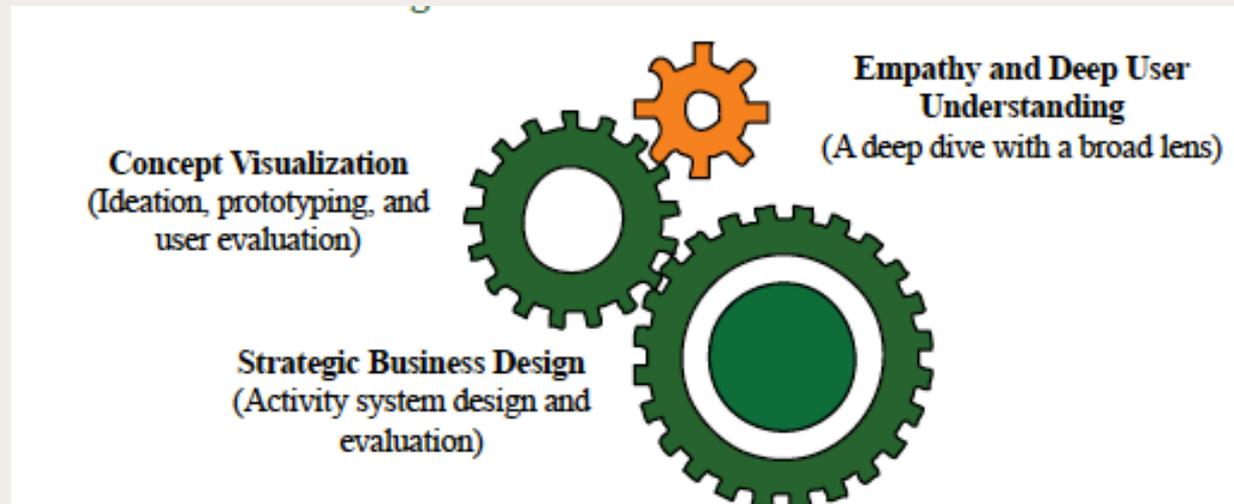
# What is “Design Thinking”?

Design uses many kinds of thinking



# What is “Design Thinking”?

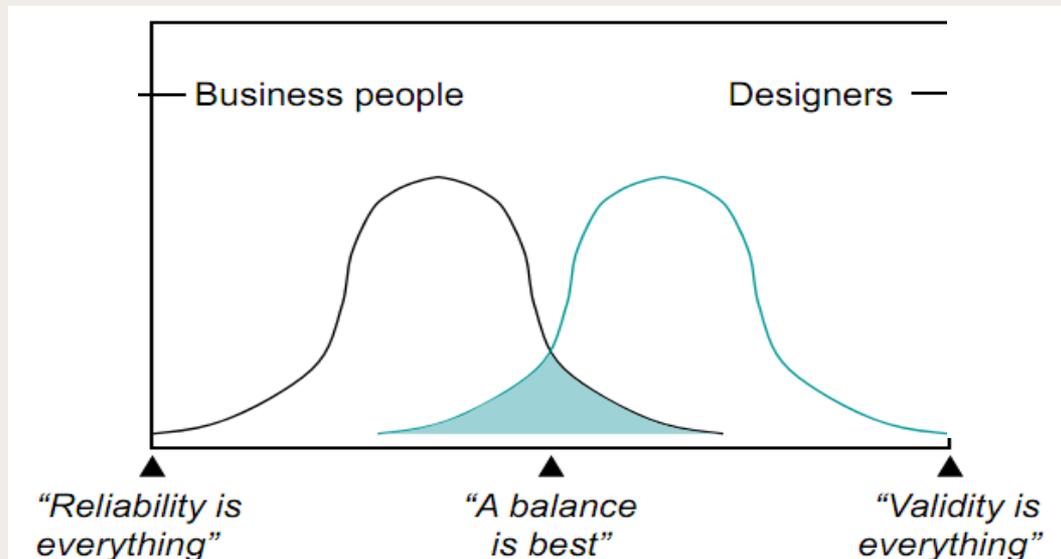
The gears of business design must all fit together



1. Deep understanding – reframe the problem to understand the whole person and context
2. Concept visualization – springboard for creative solutions
3. Strategic design – creating the whole system, including operation, delivery, business and customer activities.

# What is “Design Thinking”?

## Finding the Balance Between Reliability and Validity



### Business people ask:

Does it produce a predictable result?  
Minimize bias, new variables,  
quantifiable data

### Designers ask:

Does it solve the problem?  
Maximize context, consider all  
relevant variables, does it work

# What is “Design Thinking”?

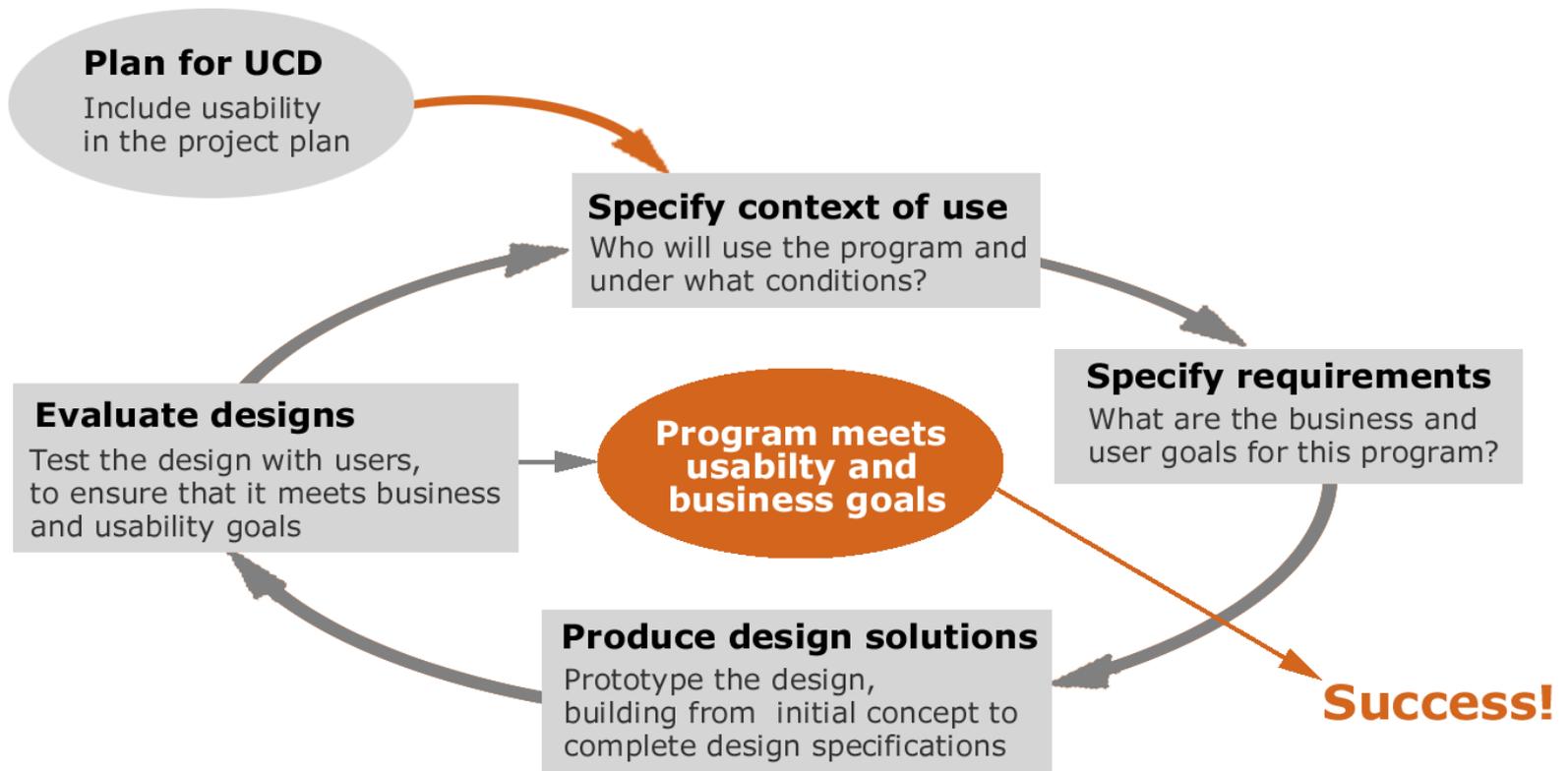
Design studios are collaborative problem solving

They bring together many people into a shared space for open, collaborative work to solve a problem



# What is “Design Thinking”?

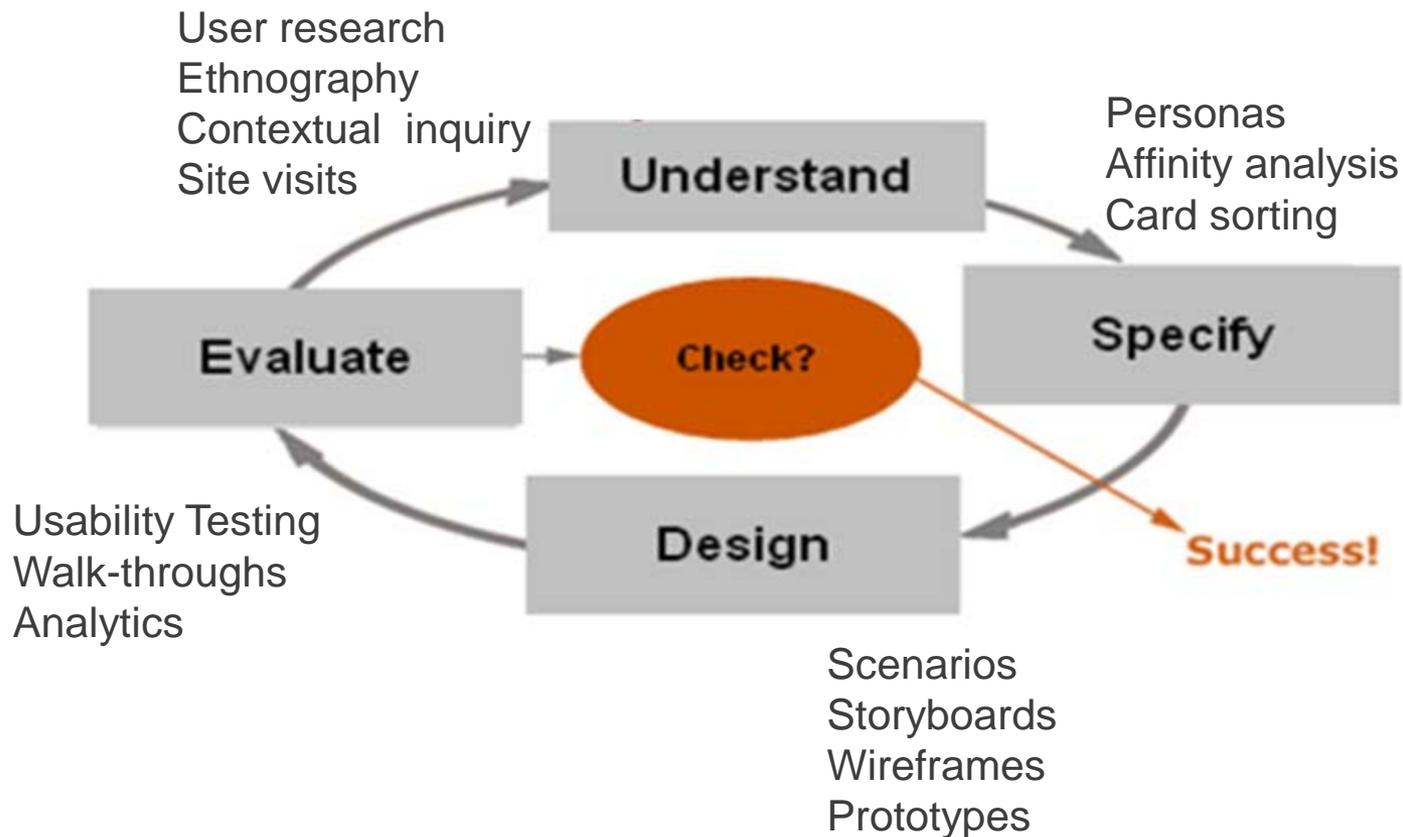
User-centered design (UCD) is a process for usability



ISO 9241-210

# What is “Design Thinking”?

**UCD is a toolkit of techniques, throughout a project**



# What is “Design Thinking”?

**Personas are compiled portraits of users**

**Personas are a well-established technique for communicating both quantitative and qualitative data from user research.**

**This persona is from AEGIS, an EU project promoting Open Accessibility Everywhere**

**Another set of general personas of persons with disability are available at the W3C Web Accessibility Initiative**



Age:	32
Marital status:	Single
Children:	None
Education:	Basic Secondary School
Job:	Unemployed
Impairment:	Cerebral Palsy

## meet Jane Brown...

Jane lives in a sheltered housing where she is supported by a number of care assistants. She has been living here since the age of 24. Until then, she lived with her parents. She has not been able to progress further in education because of the limitations caused by her disability.

Due to cerebral palsy, Jane has severe motor and speech impairments. She is a wheelchair user and non-speaking. She has almost daily epileptic seizures. Her severe athetosis limits her hand functionality as well and she is unlikely to gain employment. She enjoys music and is particularly interested in ballet.

## technology use

Jane communicates by controlling VOCA software by means of two hand switches. This computer can also allow her limited access to the Internet and she communicates with friends by email. She uses on-screen scanning keyboards with symbols and auditory scanning support to communicate with others and control her computer



Jane doesn't use a mobile phone.



## problems

Jane's communication and computer systems are not very portable and she finds it difficult to have access to communication and computer use away from her home. She is unable to use a mobile phone. She is not a very good reader and symbolic and TTS support would help her understand web pages and received emails better.

# What is “Design Thinking”?

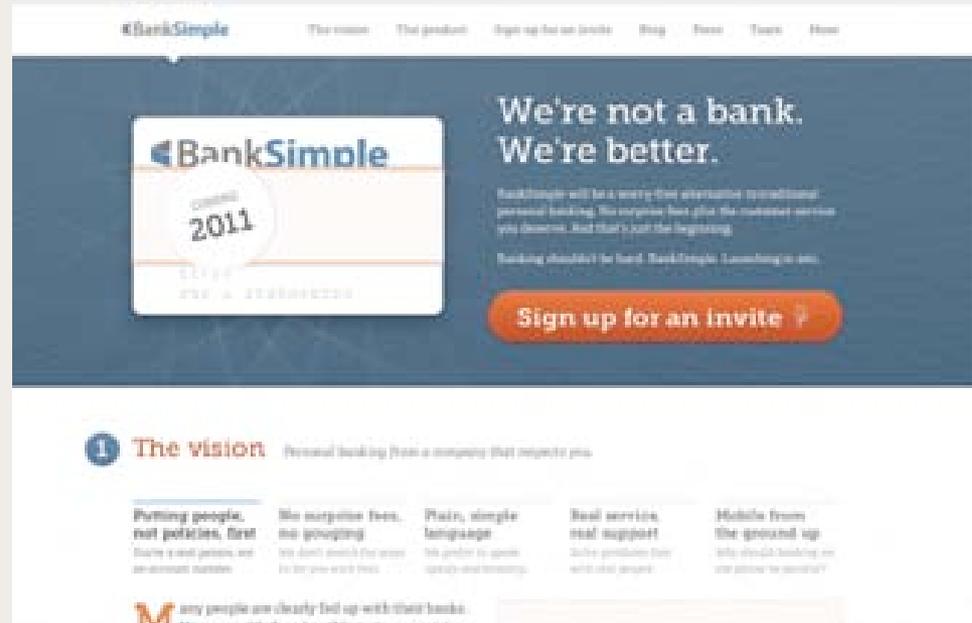
## Case Studies

- **BankSimple**
- **Adaptive Path - Charmr Diabetes Management**
- **MAYA Design - Carnegie Library**

# What is “Design Thinking”?

## Case Study: BankSimple

Create a new kind of personal banking that puts people first and helps customers manage their money.



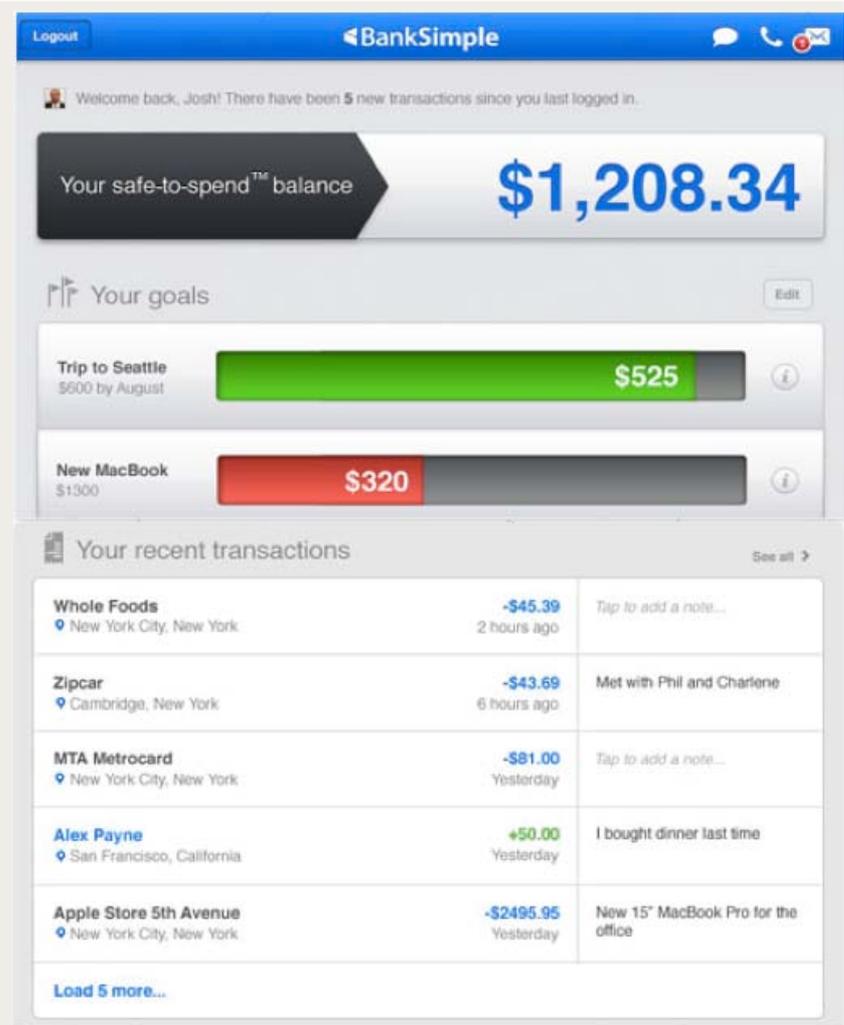
# What is “Design Thinking”?

## Case Study: BankSimple

### Reframe the Question

BankSimple changed the question to “how can we help our customers manage their money?”

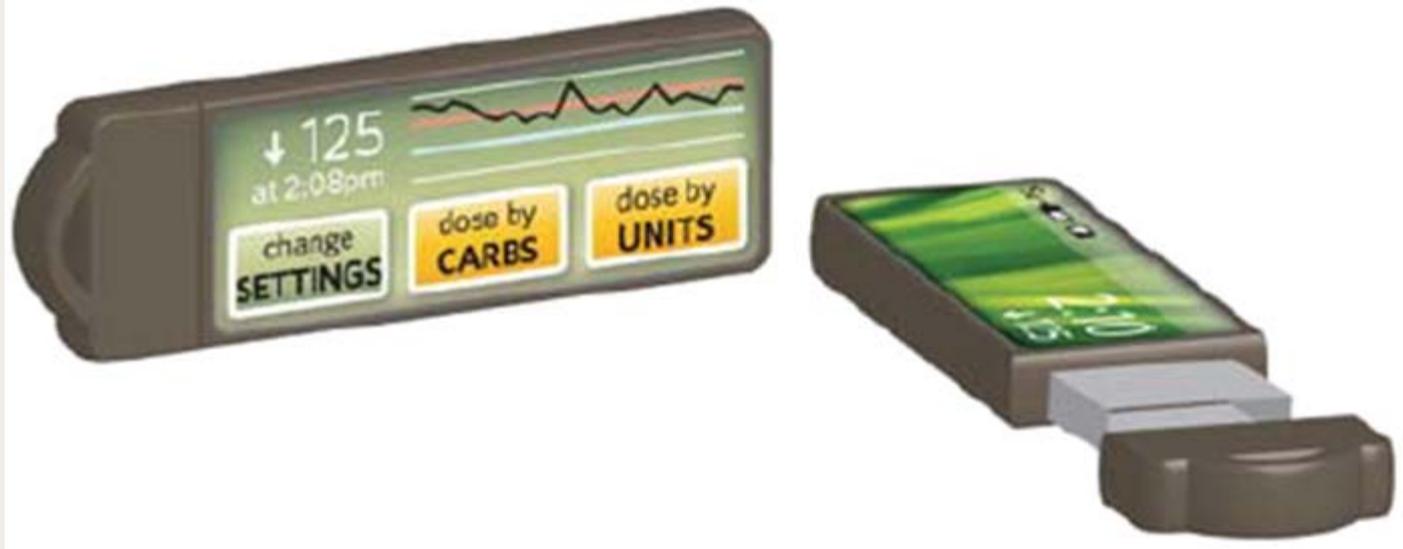
Starting from scratch, they are rethinking banking with modern technology.



# What is “Design Thinking”?

## Case Study: Adaptive Path - Charmr Diabetes Management

Design a device to allow people with diabetes to manage their insulin pumps that is less bulky, keeps users in control, aesthetically pleasing, and provides better feedback in managing insulin levels.



# What is “Design Thinking”?

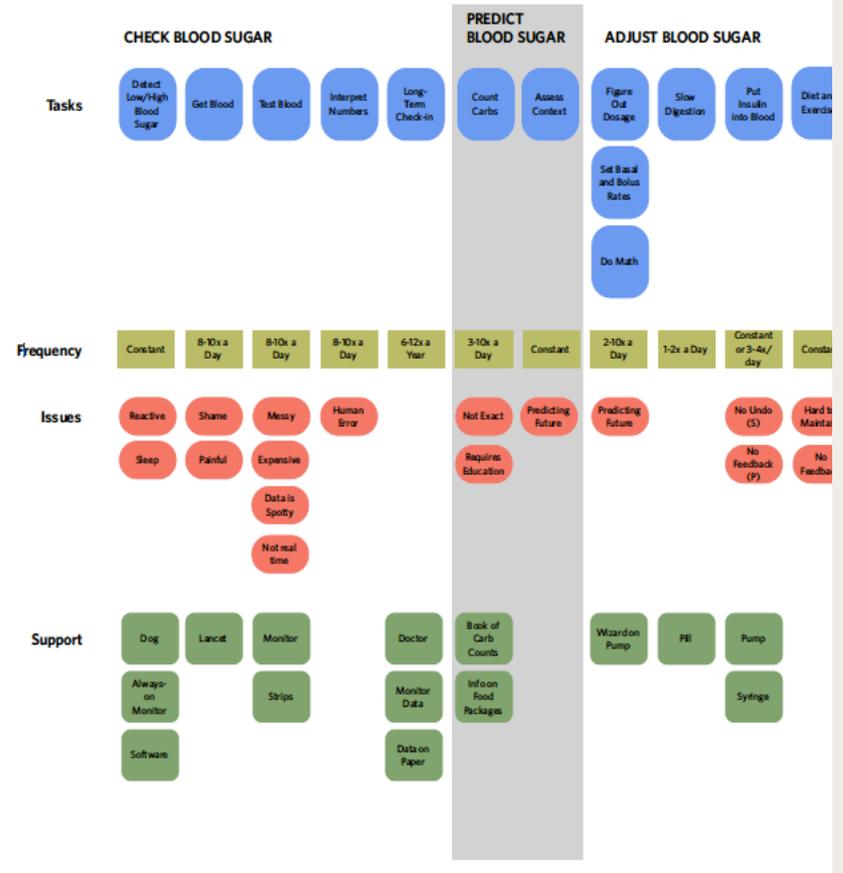
## Case Study: Adaptive Path - Charmr Diabetes Management

Start from what people do and need

The inspiration for Charmr was an open letter to Steve Jobs asking why diabetes technology can't be elegant as the iPod.

Adaptive Path started by spending time with diabetics learning about their daily routines and challenges.

Diabetes Management Alignment Diagram



# What is “Design Thinking”?

## Case Study: Adaptive Path - Charmr Diabetes Management

Brainstorm many design concepts

From the user research, Adaptive Path came up with 6 primary design principles.

They held brainstorming sessions to come up with over 100 concepts, which they revised and prioritized to come up with their design.



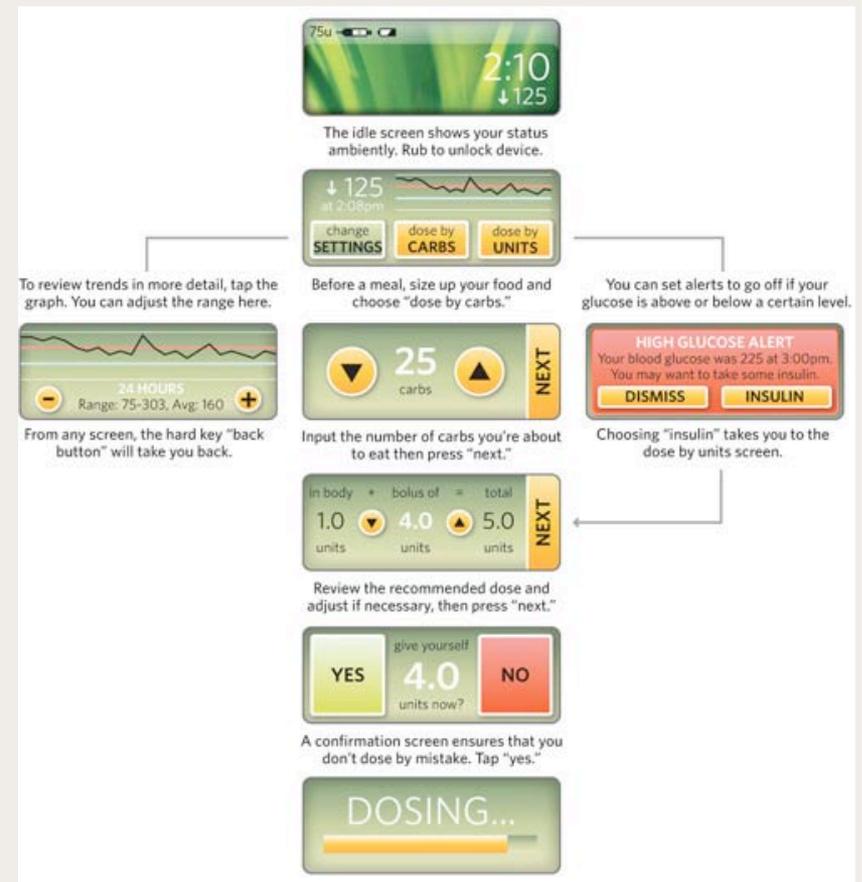
# What is “Design Thinking”?

## Case Study: Adaptive Path - Charmr Diabetes Management

### Design to give people control

On a device smaller than an iPod Nano, they made the information visible and the controls simple.

The Charmr was designed with a minimal number of screens and to look friendly, not like a scientific instrument.



# What is “Design Thinking”?

## Case Study: MAYA Design - Carnegie Library

How to re-create a library to be a preferred destination for information and social interaction?



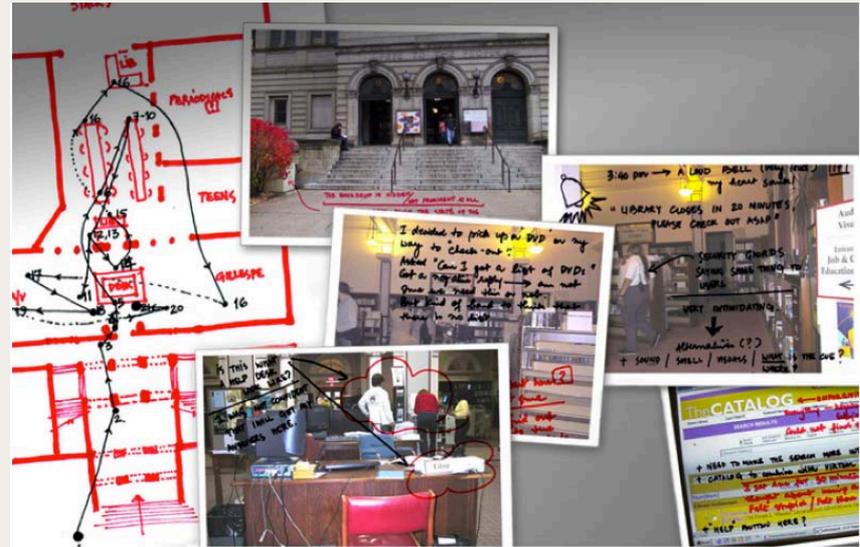
# What is “Design Thinking”?

## Case Study: MAYA Design - Carnegie Library

### Observe interactions in context

MAYA began by going to the library to observe, shadow staff and patrons, and interviews to understand how people thought about the library.

They documented what they learned with annotated photos and diagrams.



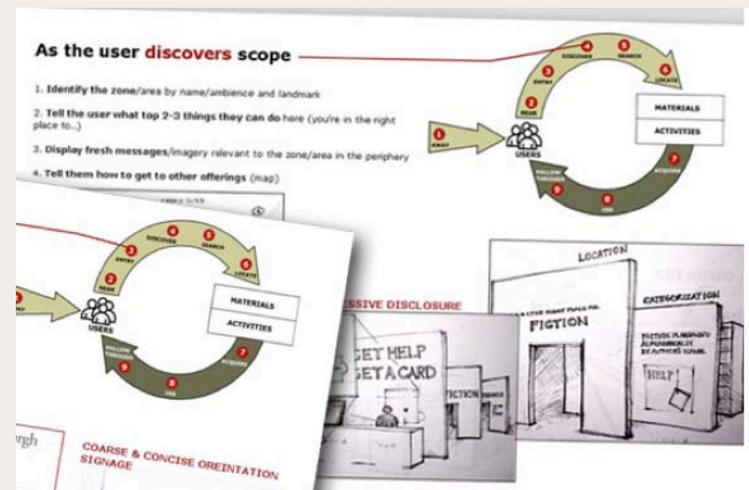


# What is “Design Thinking”?

## Case Study: MAYA Design - Carnegie Library

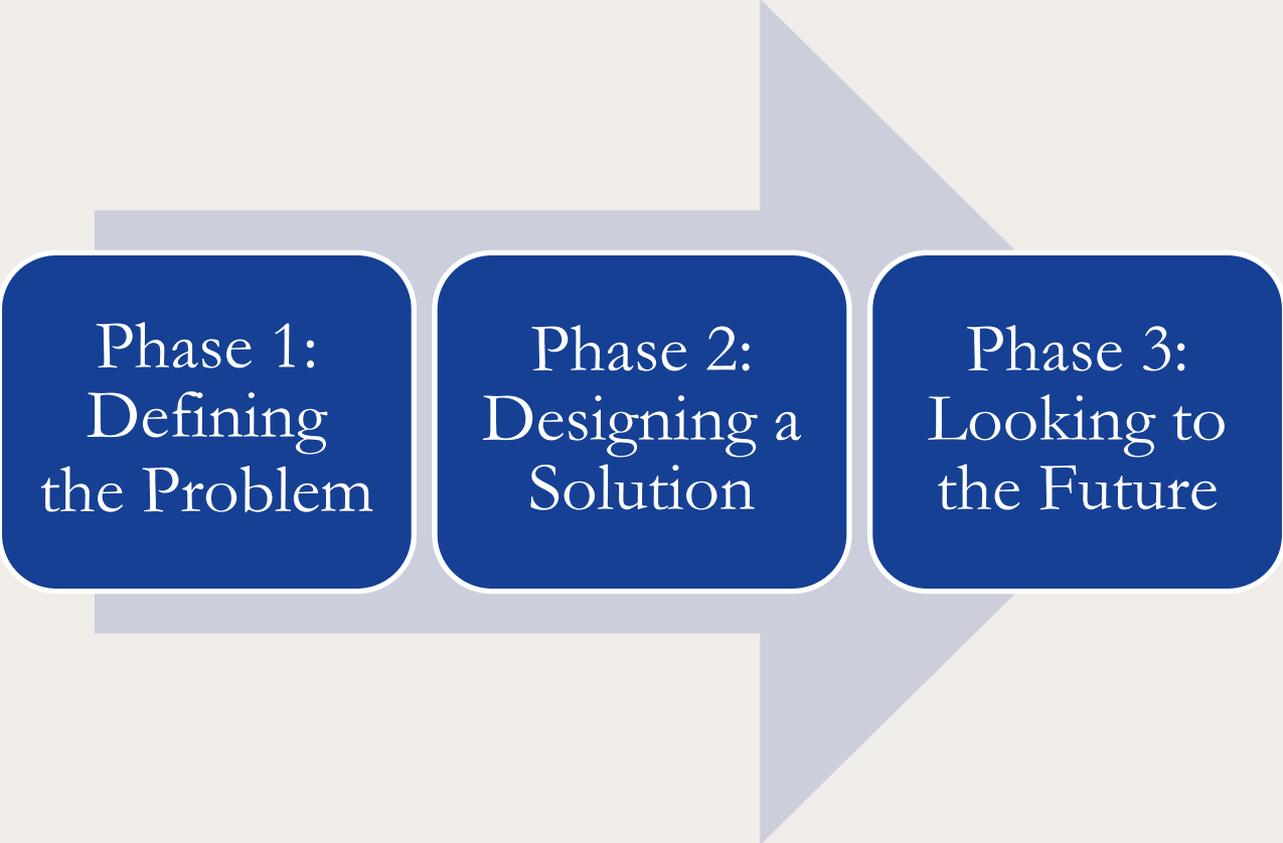
Refine design concepts to fit into the environment

Starting from a collection of ideas, MAYA refined the concepts through rapid prototyping, and detailed work with the physical environment of the library.



# Project Details

# Project Details



Phase 1:  
Defining  
the Problem

Phase 2:  
Designing a  
Solution

Phase 3:  
Looking to  
the Future

“To develop an accessible voting solution acceptable to all stakeholders, we will use a design-oriented approach to bring together the needs of voters, the potential of technology, and the requirements of election officials.”

- ITIF Consortium

# Project Details

## Phase 1: Defining the Problem

- Social and environmental barriers to participation
- Current election management practices for accessible voting
- Current systems and promising technology
- Innovative assistive technologies
- Other requirements?
  - Open Design Competition
  - Design Workshop(s)

# Project Details

## Phase 2: Designing a Solution

- Targeted sub-grants to research and develop promising concepts, prototypes or technologies
- Usability and accessibility testing of prototypes

# Project Details

## Phase 3: Looking to the Future

- Issue targeted sub-grant(s) for under-researched issues  
Possibilities include:
  - Under-researched disabilities
  - Review of state laws to examine implications of design
  - Development of training for election workers and voter education materials
  - Accessible cryptographic voting systems
- Summary of findings and public dissemination

# Thank you!

Email: [dcastro@itif.org](mailto:dcastro@itif.org)

Twitter: [@castrotech](https://twitter.com/castrotech)

Web: [www.itif.org](http://www.itif.org)

