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# Real World Web Design and Development

# Introduction

- Have you written a web page? Of course you have. Do you wonder what web design and development is like in real world?
- This talk will introduce the common challenges in web design and development, as well as tools and methodology to continuously build a product that meets all stakeholders' expectation.

# Agenda

- Requirements: What they are and why they are important
- Prototypes as communication tool
- How web designers and developers work together
- (Code sample) How to continuously build a product
- Resources

# About Me

- Front end Developer at Bloomberg L.P.
  - Jan 2015 to Present
  - Full stack dev for OpenFIGI.com
  - Technology knowledge sharing
  - Web development consulting
- Prototyper, Developer at Siemens Corporate Research
  - Feb 2011 to Jan 2015
- MS in Information Science from University of Pittsburgh
- BE in Computer Science and Tech from Beijing Jiaotong University

# Let's build a to-do list

- A to-do list is like “HelloWorld” in front end web development.

# “What are the requirements?”

- Tools we use to maintain requirements
  - Vision document
  - Backlog
  - User stories
  - Use cases

# A Vision Document Example

## 1. Introduction

This document outlines the requirements of the To-Do List application. The purpose of this document is to (1) identify problems (2) outline features, and (3) identify restriction and challenges.

## 2. Problem Statement

The problem of...

affects...

causing the impact of...

# A Vision Document Example

3. A successful solution would provide
  - a one-glance to-do list
  - the ability to add and mark items in the list
4. Product features
  - Display to-do list
  - Add an item in to-do list
  - Mark an item in to-do list
  - Remove an item in to-do list
  - ...



# A Vision Document Example

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## 5. Restrictions and Challenges

...

# A Backlog Example

Type	Title	Points
02/08 – 02/12		
Feature	Display to-do list	3
Feature	Add to-do item	4
Bug	Empty to-do item is also added	2
Usability	(De)select item more easily	1
Continuous Integration	Set up build tools	5

# A User Story Example

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As a student, I want to maintain a list of to-do items e.g. my assignments.  
As a developer, I want to be able to add an item to my to-do list.

# A Use Case Example

Use case: Add an item to to-do list

Primary Actor: To-do list owner

Scope: A to-do List

Description: The to-do list owner adds an item to the existing list

Postconditions: The new item is added to the list and saved for future retrieval.

Preconditions: The list is already existing.

Basic flow:

1. The system provides a place for user's input for the new to-do item.

# A Use Case Example

Basic flow:

1. The system provides a place for user's input for the new to-do item.
2. The user provides input of the content of the to-do item, and selects the function to submit the to-do item.
3. The system checks the to-do item is valid.
4. The system adds the valid item to the list, saves the item, and confirms with the user the operation has been successful.
5. The user acknowledges the status.

# A Use Case Example

Alternative Flows:

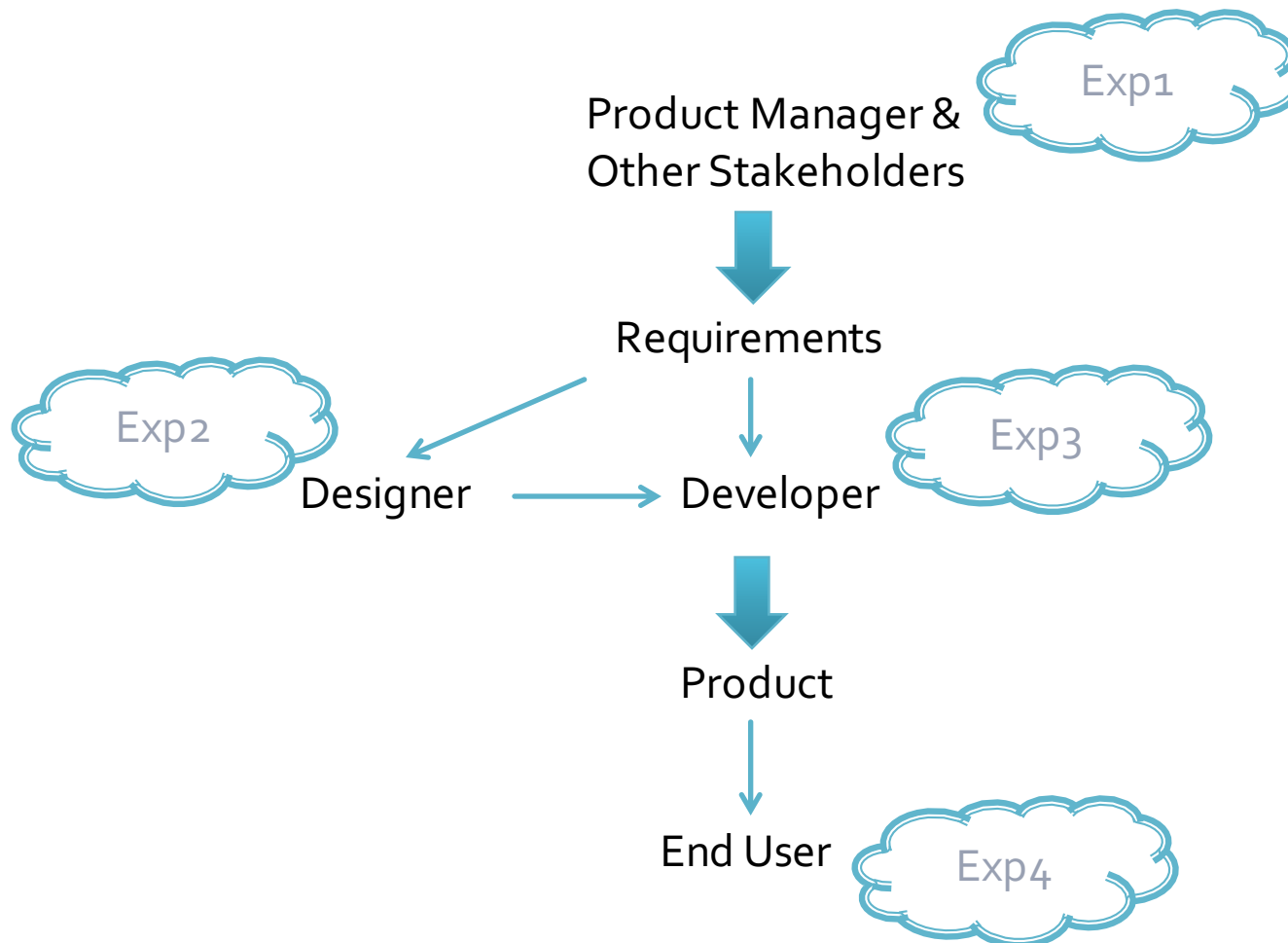
3a. If the system finds out that the item is empty, then

3a-1. The system alerts the user that the content is empty, and demands a valid input

3a-2. The user provides a valid input

[Go to 3]

# How expectations are NOT met

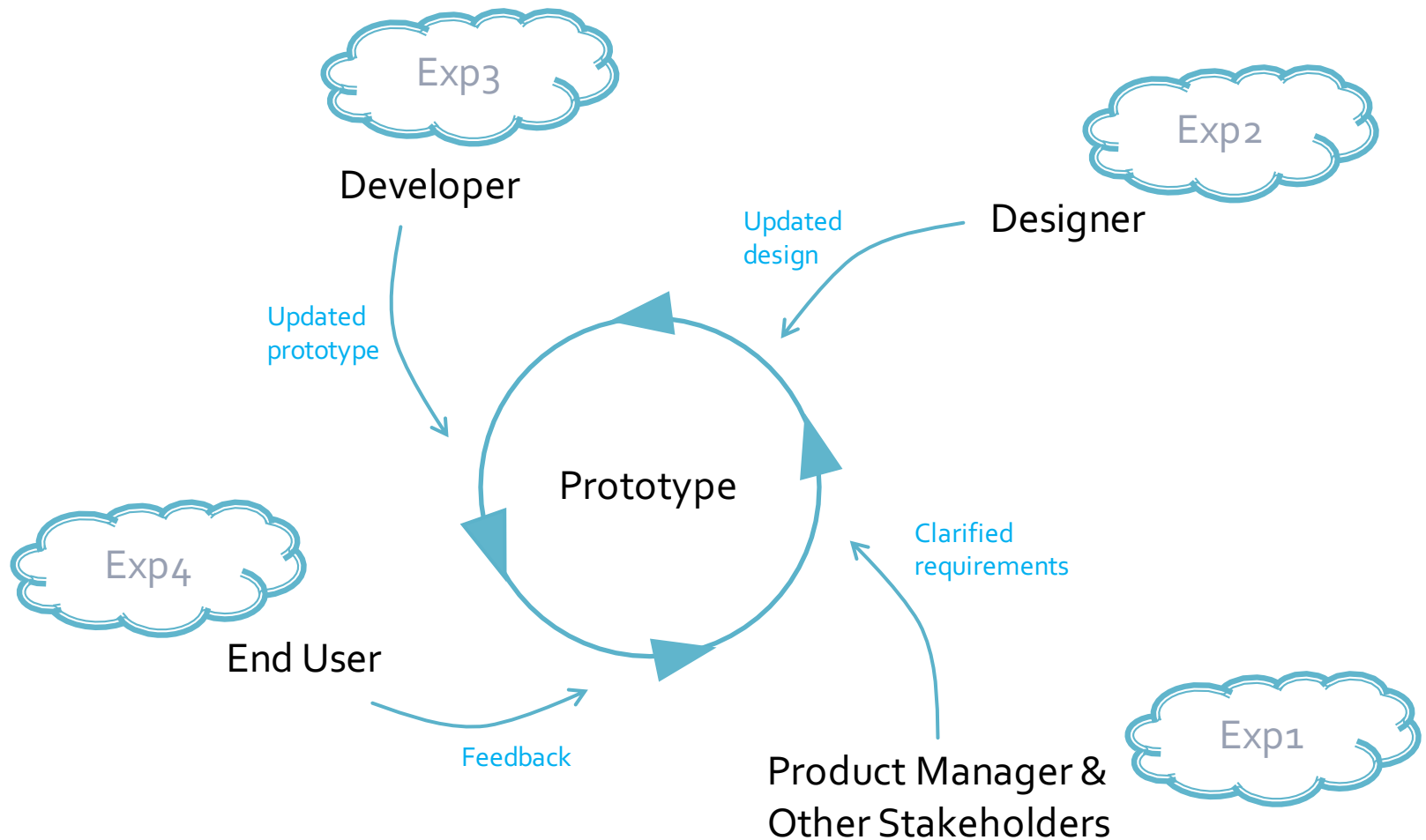


# Prototyping

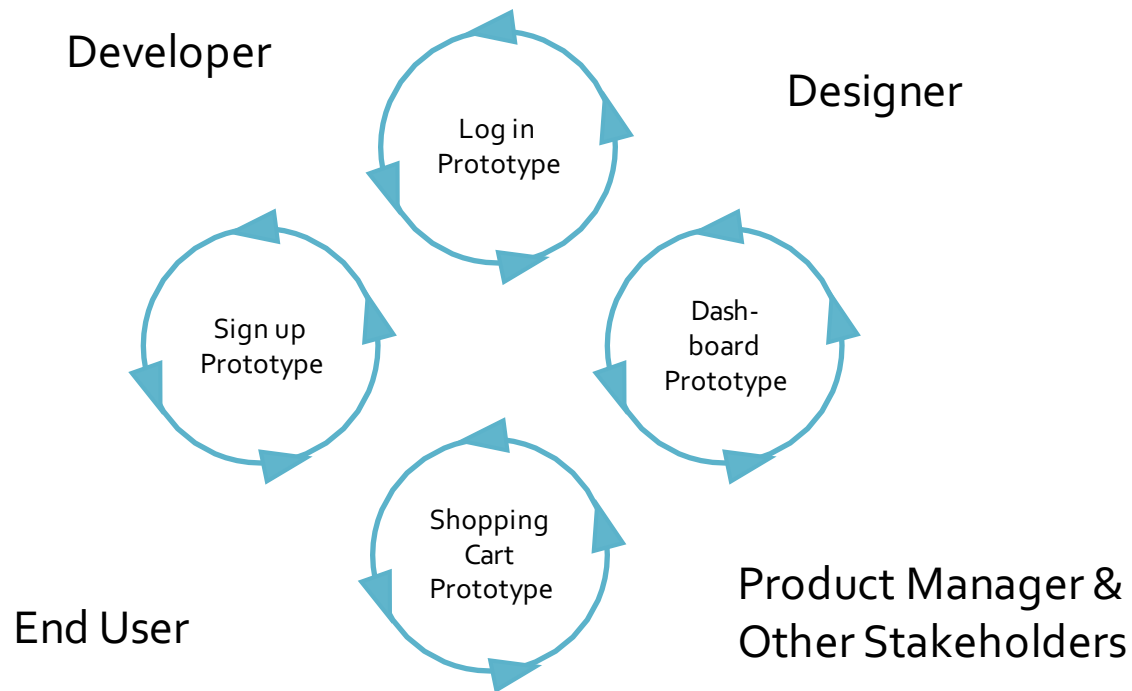
- A Prototype is
  - A tool for communication
  - Incomplete
  - Fast
  - (Ideally) to be built/modified by both designers and developers



# Prototyping



# Prototyping



# Paper Prototype



# Other Prototypes

- Microsoft PowerPoint: a storyboard to illustrate a series of user-system interaction (use case).
- Interactive: a minimal running program that provides the UI interactions to the user.
  - <http://plnkr.co/edit/g53RAnFEE2r8PWeCQmLO?p=preview>
- When building a prototype
  - Keep it fast
  - Keep it small
  - Keep it “ugly”

# Prototype --> Product?

- In front end web development, we can integrate a prototype into the product we are building.

# Let's build a to-do List

- A to-do list is like “HelloWorld” in front end web development.
- Real world precondition:
  - Vision document
  - Backlog
  - Use cases
  - (Ideally) Prototypes verified with stakeholders

# Working Together

- Designers deliver

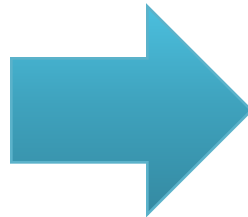
- Wireframes  
(structure)

- Storyboards  
(interaction)

- Visual style guides  
(visual detail)

Prototype

<http://plnkr.co/edit/gs3RAnFEE2r8PWeCQmLO?p=preview>



- Developers deliver

- HTML  
(structure)

- JavaScript  
(interaction)

- CSS  
(visual detail)

# Web Designer

- Page layout
- Typography
- Color
- Animation
- Interaction



# Web Developer

- Server/client architecture
- HTML
- CSS
- JavaScript
- Database, server side technology (Python, Node.js, ASP.NET, Java etc.)

# Wireframe

☐

Buy milk



Give presentation at temple

Add

# Storyboard

1

☐

Buy milk

☒

Give presentation at temple

Add

2

☐

Buy milk

☒

Give presentation at temple

Pay credit card

Add

3

☐

Buy milk

☒

Give presentation at temple

Pay credit card

Add



4

☐

Buy milk

☒

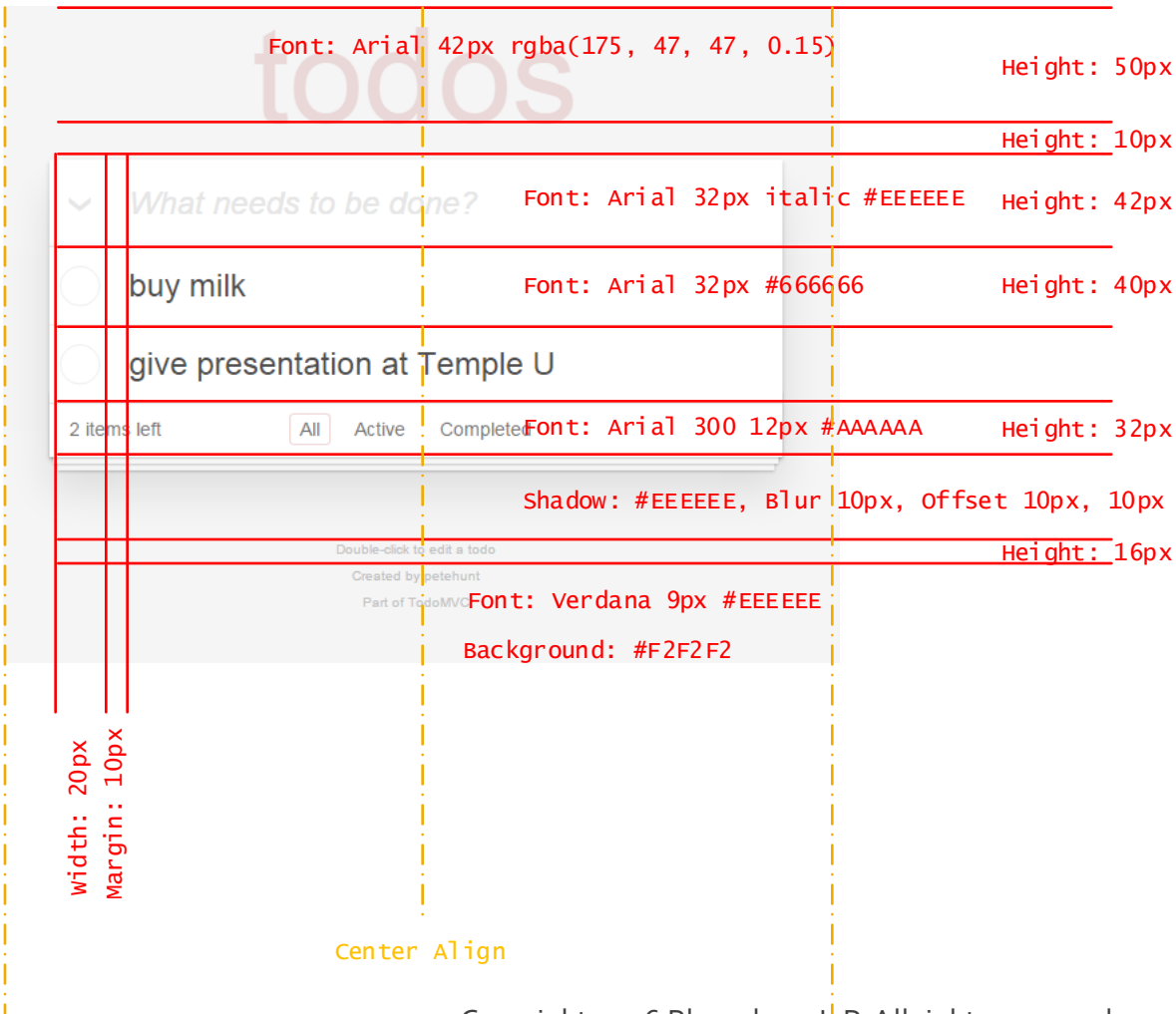
Give presentation at temple

☐

Pay credit card

Add

# Style Guides



<http://todomvc.com/examples/react/#/>

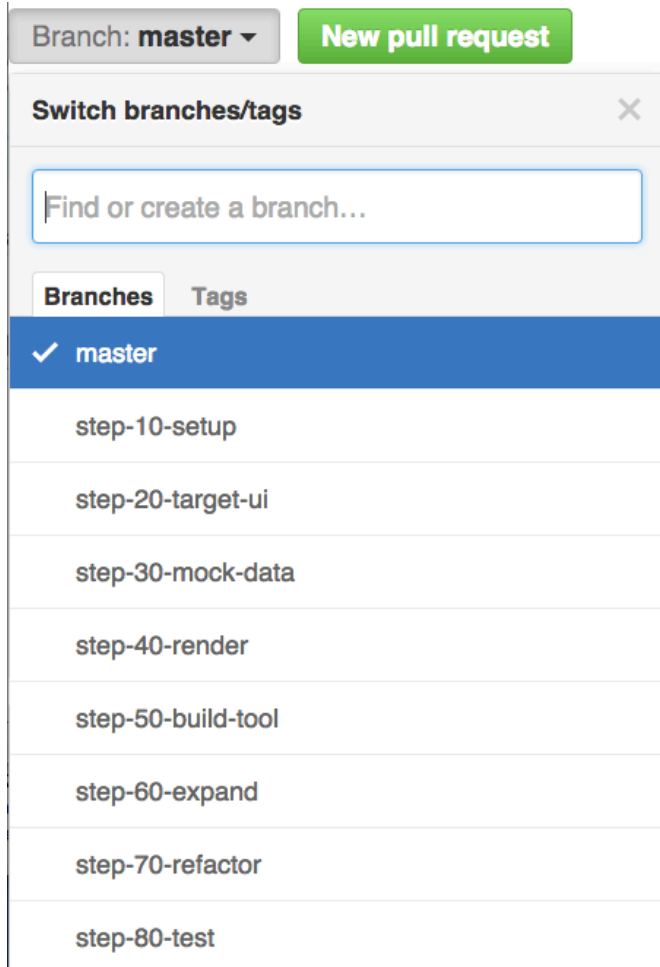
# Things a Front End Developer Needs

- System environment
- Running platform, aka the server and the browser
- Frameworks and libraries
- Development tools
  - IDE, Code editor
  - Version control system
  - Build tools

# Frameworks and Libraries

- A Framework
  - An abstraction of software
  - Defines how a system is constructed
  - Generic functionality can be changed with user-written code
- A Library
  - A collection of reusable objects and methods
  - Can be easily imported into a system
- Examples of Frameworks
  - Angular, Ember, Express-generator
- Examples of Libraries
  - jQuery, React, Bluebird

# Coding Walkthrough



<https://github.com/szhangpitt/todo-step-by-step>

# Resources

- [Book: Managing Software Requirements: A Use Case Approach](#)
- [Book: Cognitive Psychology and its Implications, Sixth Edition](#)
- [Link: Comparison of software prototyping tools](#)
- [Link: Google Web Fundamentals](#)
- [Link: Mozilla Developer Network](#)
- [Link: Writing Testable JavaScript](#)



# Summary

- Skill sets for designers and developers
- “What are the requirements?”
- Use prototypes as a communication tool to manage expectations.
- Start with something simple. Continuously integrate into product.

# Thank You

- Feel free to contact me with questions about working at Bloomberg, or about web design and development.
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