OUTLINE

- Administrative Details:
  - Due Midnight: Weekly Group Meeting Report and Detailed Design (Detailed Description/Block Diagram(s), Schedule, Cost Estimate). Optional Prototype/model-proof of concept description.
  - Due Wednesday 3/15 at 3PM: Project Presentation
  - Due Tuesday 3/21 at Midnight: Project Report

- Lecture
  - Design For Success – Growing beyond 1st Generation

- Panel of Speakers: “On being an engineer”
Final Presentation

- Date: Wednesday 3/15
- Time: 3:30-6:30PM
- Location: 103 Littlefield Center
- Format: 30-minute presentation
  - Set up: 5 minutes – Please let us know in advance if you plan to use your own laptop
  - Presentation: 20 minutes
  - Questions: 5 minutes
  - Presentation by ALL team members
- Guests:
  - Project Advisors
  - Family & Friends
- Dinner & Cake at 6:30PM
FINAL PRESENTATION TIME SLOTS

- 3:30-4:00: StableEyes
- 4:00-4:30: pre-POSTURE-us
- 4:30-5:00: Laundreasy
- 5:00-5:30: Refugee Warmth First
- 5:30-6:00: EduTech
- 6:00-6:30: OptiLife MD

6:30pm: Dinner and cake (show of hands if interested)
Date: Tuesday 3/21
Time: Midnight

Please submit report electronically (not paper) to Andrea & My (make sure you have correct email addresses).

No late submission will be accepted – no exceptions!

Format:

- Each team member must write at least one section. Please indicate clearly name(s) of author(s) for each section.
- Please select one member to be the editor of report and indicate who that is in the report.
Design For Success
Growing beyond the 1st Generation
SECOND GENERATION DESIGN

THE DESIGN PROCESS

1. Identify Problem
2. Brainstorm
3. Design
4. Build
5. Redesign
6. Test & Evaluate
7. Share Solution

Start here

Or here
REASONS TO BUILD 2<sup>ND</sup>-GENERATION PRODUCTS

- Maintain or increase sales
- Fix bugs
- Add features
- Improve design
- Exploit technological advances
- Create “buzz”
HOW IS 2\textsuperscript{ND}-GENERATION PRODUCT DESIGN DIFFERENT FROM INITIAL DESIGN

Starting from the initial product, the 2\textsuperscript{nd}-gen design can:

- Build on success
- Learn from mistakes
- Learn from competitors
- Listen to customers
- Adopt new technologies
PRODUCT ROADMAP

If you don't know where you are going, it's impossible to determine the best way to get there

- A product roadmap maps out the evolution of a product over a 3-5 year time horizon
  - Outline schedule for product releases
  - Overviews their primary and secondary features.

- Can be for internal or external use
  - Purpose in each case is different

- Market requirements, which drive new features, typically determined by “marketing department”
STEPS TO GENERATING A PRODUCT ROADMAP

- Determine what type of roadmap is required
  - Internal or external
- Research systems that will factor into the roadmap
  - Product releases determined by analysis of market trends and shifts, competitive behavior, technology forecasts, and company priorities
- Determine market requirements; prioritize features
  - Marketing Requirements Document (MRD) provides this info
- Create a time frame to bring the product to market
  - Must be agreed to by engineering as well as marketing/sales. Should also capitalize on market conditions
- Create the product roadmap document.
  - Typically features a graphic representation of the time frame, as well as relevant explanations
- Discuss and finalize with all relevant parties
- Make changes as needed
What is an iPhone?

- Wide-screen iPod with touch control.
- Revolutionary mobile phone.
- Break-through Internet communication device.
I skate to where the puck is going to be, not where it has been.

Wayne Gretzky
iPHONE KEY FEATURES

- Multi-touch touchscreen display
- Minimal hardware user interface
- Built-in non removable rechargeable battery
iPHONES TIMELINE

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

Photo Credit: http://www.mediaonlinevn.com/hot-news/10-nam-voi-hon-1-ty-chiec-iphone-duoc-ban-ra/
PROBLEMS WITH 1ST-GENERATION iPHONE (circa 2007)

- Initial price was too high - $599
  - It was lowered to $399
- Phone runs on AT&T's poky EDGE network
- Users can't perform email searches or record video
- Browser won't run programs written in Java or Flash
Some of the most requested features:

- Multimedia Messaging Service (MMS) – iPhone3 (2009)
- Cut, Copy & Paste – iPhone3GS (2010)
- Multi-tasking – iPhone4 (2011)
- Voice recognition – iPhone4S (2012)
- Support 4G LTE Network – iPhone5 (2014)
- Bigger Screen – iPhone 6+ (2014)

Steve Jobs in 2010: “no one's going to buy” a phone so big “you can't get your hand around it”

- Water Resistant – iPhone 7 (2016)
SOME PROBLEMS ALONG THE WAY...

- **iPhone4S** *(2012)*
  - Antenna gate problem

- **iPhone5** *(2014)*
  - Map problem

- **iPhone7** *(2016)*
  - Head phone
DEALING WITH PROBLEMS

iPhone5’s Map Problem: Sept. 2012

- Apple Maps replaces Google Maps which had been the default map application on iPhones
- Its release was met with considerable criticism due to many errors
  - Including improper labeling of places to unmapped roads
  - Also lacked Google’s Street View and transit directions

Named one of the Top 10 technology 'fails' of 2012 by CNN in December 2012
To our customers,

At Apple, we strive to make world-class products that deliver the best experience possible to our customers. With the launch of our new Maps last week, we fell short on this commitment. We are extremely sorry for the frustration this has caused our customers and we are doing everything we can to make Maps better.

We launched Maps initially with the first version of iOS. As time progressed, we wanted to provide our customers with even better Maps including features such as turn-by-turn directions, voice integration, Flyover and vector-based maps. In order to do this, we had to create a new version of Maps from the ground up.

There are already more than 100 million iOS devices using the new Apple Maps, with more and more joining us every day. In just over a week, iOS users with the new Maps have already searched for nearly half a billion locations. The more our customers use our Maps the better it will get and we greatly appreciate all of the feedback we have received from you.

While we’re improving Maps, you can try alternatives by downloading map apps from the App Store like Bing, MapQuest and Waze, or use Google or Nokia maps by going to their websites and creating an icon on your home screen to their web app.

Everything we do at Apple is aimed at making our products the best in the world. We know that you expect that from us, and we will keep working non-stop until Maps lives up to the same incredibly high standard.

Tim Cook; Apple’s CEO

And over time they fixed the problems
Number of iPhones Sold Worldwide

WHY IS THE iPHONE A SUCCESS?

- The iPhone is pretty
- It’s touchy-feely
- It will make other phones better
- It’s not a phone, it’s a platform
- It is but a ghost of iPhones yet to come

SPEAKING OF OTHER SMART PHONES

A product is not a company

Entrepreneurship is not really building a product, it's not having an idea, it's not being in the right place at the right time. It's fundamentally company building.

— Eric Ries —

The lean startup

INSTEAD OF RISKING ANYTHING NEW, LET'S PLAY IT SAFE BY CONTINUING OUR SLOW DECLINE INTO OBSOLESCENCE.
What makes a company great?

- Leadership
- Culture
- People

My passion has been to build an enduring company where people were motivated to make great products. Everything else was secondary. Sure, it was great to make a profit, because that was what allowed you to make great products. But the products, not the profits were the motivation.

— Steve Jobs —

Top 10 U.S. companies to work for

1. Google
2. Bain & Company
3. Nestle Purina PetCare
4. F5 Networks
5. Boston Consulting Group
6. Chevron
7. HEB
8. In-N-Out Burger
10. Mayo Clinic

Those who build great companies understand that the ultimate throttle on growth for any great company is not markets, or technology, or competition, or products. It is one thing above all others: the ability to get and keep enough of the right people.

— James C. Collins —
Starting a Company: Some good questions

Part I: Pre-founding: “Should you do a startup”

Part II: Founding Team Dilemmas

Part III: Beyond the Founding: Hires and Investors

Conclusions: “Beyond the Beginning”
GROUP EXERCISE

How would your team design the next generation of Twitter?
TODAY’S PANEL OF SPEAKERS

“On being an engineer”

WREN DOUGHERTY
NATHAN HALL-SNYDER
YANG HONG
SALLY THORNTON