Successful Entrepreneurship for Microsystems

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May 28, 2015
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svyelime@eng.ucsd.edu

Tutor – Ashwin Raman
asraman@ucsd.edu

Course presented at UCSD CSE 190, Spring Quarter 2015
Final Presentation

Friday, June 5, 2015
EBU3B – 1202
530 pm – 9 pm (Pizza ~630)
Each TEAM - 7 minute presentations, plus 3 minutes of Q&A
Presentations due to Sneha by 4pm on Friday, June 5th

Final Report

Due - Sunday, June 7, 2015 no later than midnight
OUTSOURCING

- **When to use**
  - Not your core-competency
  - Need quick entry/service
  - Conserve capital
  - Does not compromise your IP

- **Some ‘watchouts’**
  - “Make” vs “Buy”
  - Margin stacking
  - Supplier Management
    - Meet your goals for Schedule, Performance, Quality, Reliability,…
Margin Stacking

[Diagram showing a stacked bar chart with Supplier Cost on the x-axis and Price on the y-axis. The chart shows different layers of cost and price, with specific values indicated for each layer.]
Company X
SoC IC

“General Contractor”

Masks  FAB  Assembly  Package  Test

Supplier Cost :
1 m  1 d  1 a  1 p  1 t  1 s

Marked-up Cost (typ) :
1.1 m  1.3 d  1.1 a  1.1 p  1.1 t  1 s

Price for Company X :
1.3^a x [ 1.1 m  1.3 d  1.1 a  1.1 p  1.1 t  1 s ]

Notes:

- this markup could vary (1.0 - 1.3), depending on price negotiation
- m  mask cost, could be amortized over unit volume
- d  die cost
- a  assembly cost
- p  package cost
- t  test cost
- s  product and other support cost
Mark-up vs Margin

**MARKUP** = \[P - C\] / C

or, \( P = [1 + MU] \times C \)

**MARGIN** = \[P - C\] / P

or, \( P = C / [1 - GM] \)

*aka* Gross Profit Margin

**Example:**
- \( C = $10 \)
- \( MU = 30\% \)
- \( P = $13 \)

Margin = ?
Lifecycle of a Startup development – the 4 phases

Global Planning

Design

Prototyping

Production

Grants, Incubators, FFF...

Angel

Series A

Series B
Lifecycle of a Fabless IC development – activity highlights

“System” Architecture / Design / Simulation / Verification

FPGA Implementation
Reference Design
Customer Evaluation
“Proof of Concept”

Customer Samples
Reference Boards
Customer Evaluation
Design Acceptance

Global Planning
High Level Design
Floor Planning

IC Design
Chip Design
RTL
NL

Physical Design
NL
GDSII

Analog IP Design

IC Prototyping
FAT
Debug

IC Production
IC Qualification
Prod. Ramp
Hi volume

Series A
Series B

30 – 50% of TT$
Manage your Internal Development Schedule

Typical ASIC Development Cycle

- **Year 0**
  - Start Design
  - FPGA Ref Board
  - Tapeout
  - Software α
  - Initial Silicon

- **Year 1**
  - ES
  - QS
  - Prod HW/SW
  - Prod Ramp
  - Software β
  - Initial Silicon Ramp
  - Initial Product Ramp

- **Year 2**
  - Prod
  - Launch
  - Prod
  - Hi Volume
  - Software Prod.
  - Volume Production
Manage Development Schedules – Internal and Customer’s
System vs. IC Development Cycle

a. At the System company:

Start Product Design

Launch

Concept

HW/SW Dev

Demo

Qual

Trial Mkt

Build

Hi Volume

Year 0

Year 1

Year 2

b. At the Fabless IC company:

FPGA

Ref Board

Tapeout

ES

QS

Prod HW/SW

Launch

Volume Orders

Start Design

ASIC DESIGN

Proto

Prod Ramp

Hi Volume

Year 0

Year 1

Year 2
Value Chain using “Strategic”/”Partnership” approach

Fabless success depends on a strong Eco-system of suppliers and partners
Multi-Tiers of Value Chain and Ecosystems

PP Supplier’s Supplier → PP’s Supplier → Product Provider → Customer → Customer’s Supplier

Value Chain ↔ Supply Chain

Technology

PCB Foundry Packages

MANY Opportunities for Innovation & Electronics Development
Electronics Value Chain...Auto Nav System

Display
Touchscreen Overlay
MCU 32 bit 32 MHz 1 MB Flash 64 KB RAM
16-Channel 10-bit ADC
Regulator DC_DC converter
Power Management IC

OMAP Processor, ARM11
Dual core 400 MHz
MCU 32-bit 32 MHz 128 I/Os
MCU 32-bit 400 MHz
Gyroscope
GPS Receiver
Flash 8GB MLC
Flash 4GB
CD/DVD Drive

Chrysler 300
Hyundai Sonata

Source: IHI Electronics360 130813

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Smartphones – Looking Inside

Source: iFixit iPhone5
### Table 1: Preliminary Teardown Bill of Materials and Manufacturing Cost Estimate for the Apple iPhone 5s (Cost in US Dollars)

<table>
<thead>
<tr>
<th>Components / Hardware Elements</th>
<th>Details</th>
<th>16GB</th>
<th>32GB</th>
<th>64GB</th>
</tr>
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<tbody>
<tr>
<td>Pricing without contract</td>
<td></td>
<td>$649.00</td>
<td>$749.00</td>
<td>$849.00</td>
</tr>
<tr>
<td>Implied Margin</td>
<td></td>
<td>69%</td>
<td>72%</td>
<td>74%</td>
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<tr>
<td>Total BOM Cost</td>
<td></td>
<td>$190.70</td>
<td>$200.10</td>
<td>$210.30</td>
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<tr>
<td>Manufacturing Cost</td>
<td></td>
<td>$8.00</td>
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<td>$8.00</td>
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<tr>
<td>BOM + Manufacturing</td>
<td></td>
<td>$198.70</td>
<td>$208.10</td>
<td>$218.30</td>
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<tr>
<td><strong>Major Cost Drivers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAND Flash</td>
<td></td>
<td>$9.40</td>
<td>$18.80</td>
<td>$29.00</td>
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<tr>
<td>DRAM</td>
<td>1GB LPDDR3</td>
<td>$11.00</td>
<td>$11.00</td>
<td>$11.00</td>
</tr>
<tr>
<td>Display &amp; Touch Screen</td>
<td>4&quot; Retina Display w/ Touch</td>
<td>$41.00</td>
<td>$41.00</td>
<td>$41.00</td>
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<tr>
<td>Processor</td>
<td>64-Bit A7 Processor + M7 Co-Processor</td>
<td>$19.00</td>
<td>$19.00</td>
<td>$19.00</td>
</tr>
<tr>
<td>Camera(s)</td>
<td>8MP (1.5-micron) + 1.2MP</td>
<td>$13.00</td>
<td>$13.00</td>
<td>$13.00</td>
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<tr>
<td>Wireless Section - BB/RF/PA</td>
<td>Qualcomm MDM9615M+WTR1605L+Front End</td>
<td>$32.00</td>
<td>$32.00</td>
<td>$32.00</td>
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<tr>
<td>User Interface &amp; Sensors</td>
<td>Includes fingerprint sensor assembly</td>
<td>$15.00</td>
<td>$15.00</td>
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</tr>
<tr>
<td>WLAN / BT / FM / GPS</td>
<td>Murata Dual-Band Wireless-N Module</td>
<td>$4.20</td>
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<tr>
<td>Power Management</td>
<td>Dialog + Qualcomm</td>
<td>$7.50</td>
<td>$7.50</td>
<td>$7.50</td>
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<tr>
<td>Battery</td>
<td>3.8V~1560mAh</td>
<td>$3.60</td>
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<tr>
<td>Mechanical / Electro-Mechanical</td>
<td></td>
<td>$28.00</td>
<td>$28.00</td>
<td>$28.00</td>
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<tr>
<td>Box Contents</td>
<td></td>
<td>$7.00</td>
<td>$7.00</td>
<td>$7.00</td>
</tr>
</tbody>
</table>

**Source:** IHS, September 2013
## Electronics Value Chain ... Smartphones

BoM (Bill of Materials) ... iPhone5

(Costs in U.S. Dollars)

<table>
<thead>
<tr>
<th>Components / Hardware Elements</th>
<th>iPhone 5 Hardware Comments</th>
<th>16GByte</th>
<th>32GByte</th>
<th>64GByte</th>
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<tbody>
<tr>
<td>Pricing without Contract</td>
<td></td>
<td>$649</td>
<td>$749</td>
<td>$849</td>
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<tr>
<td>Total BOM Cost</td>
<td></td>
<td>$199</td>
<td>$209</td>
<td>$230</td>
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<tr>
<td>Manufacturing Cost</td>
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<td>$8.00</td>
<td>$8.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>BOM + Manufacturing</td>
<td></td>
<td>$207</td>
<td>$217</td>
<td>$238</td>
</tr>
<tr>
<td><strong>Major Cost Drivers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAND Flash</td>
<td></td>
<td>$10.40</td>
<td>$20.80</td>
<td>$41.60</td>
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<tr>
<td>DRAM</td>
<td>1 GByte LPDDR2</td>
<td>$10.45</td>
<td>$10.45</td>
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<tr>
<td>Display &amp; Touchscreen</td>
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<td>$44.00</td>
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<tr>
<td>Processor</td>
<td>A6 Processor</td>
<td>$17.50</td>
<td>$17.50</td>
<td>$17.50</td>
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<td>Camera(s)</td>
<td>8 Megapixel + 1.2 Megapixel</td>
<td>$18.00</td>
<td>$18.00</td>
<td>$18.00</td>
</tr>
<tr>
<td>Wireless Section - BB/RF/PA</td>
<td>Qualcomm MDM9615+RTR8600+Front End*</td>
<td>$34.00</td>
<td>$34.00</td>
<td>$34.00</td>
</tr>
<tr>
<td>User Interface &amp; Sensors</td>
<td></td>
<td>$6.50</td>
<td>$6.50</td>
<td>$6.50</td>
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<tr>
<td>BT / WLAN</td>
<td>BTv4.0 + Dual-Band Wireless-N</td>
<td>$5.00</td>
<td>$5.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Power Management</td>
<td></td>
<td>$8.50</td>
<td>$8.50</td>
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<td>Battery</td>
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<td>$4.50</td>
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<td>Mechanical / Electro-Mechanical</td>
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<td>$33.00</td>
<td>$33.00</td>
<td>$33.00</td>
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<tr>
<td>Box Contents</td>
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<tr>
<td><strong>Total Cost</strong></td>
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<td>$207</td>
<td>$217</td>
<td>$238</td>
</tr>
</tbody>
</table>

* - Assumed

Source: IHS iSuppli Research, September 2012
### iPhone5 vs, iPhone4 Bill of Materials ("BoM")

#### IHS iSuppli Table: Preliminary iPhone 5 vs. iPhone 4S Cost Estimates

<table>
<thead>
<tr>
<th>Components / Hardware Elements</th>
<th>iPhone 5 Hardware Comments</th>
<th>16GB3</th>
<th>32GB4</th>
<th>64GB5</th>
<th>iPhone 4S Hardware Comments</th>
<th>16GB32</th>
<th>32GB43</th>
<th>64GB54</th>
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<tbody>
<tr>
<td>Pricing without Contract</td>
<td></td>
<td>$649</td>
<td>$749</td>
<td>$849</td>
<td></td>
<td>$649</td>
<td>$749</td>
<td>$849</td>
</tr>
<tr>
<td>Implied Margin</td>
<td></td>
<td>68%</td>
<td>71%</td>
<td>72%</td>
<td></td>
<td>70%</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td>Total BOM Cost</td>
<td></td>
<td>$199</td>
<td>$209</td>
<td>$230</td>
<td></td>
<td>$188</td>
<td>$207</td>
<td>$245</td>
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<tr>
<td>Manufacturing Cost</td>
<td></td>
<td>$8.00</td>
<td>$8.00</td>
<td>$8.00</td>
<td></td>
<td>$8.00</td>
<td>$8.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>BOM + Manufacturing</td>
<td></td>
<td>$207</td>
<td>$217</td>
<td>$238</td>
<td></td>
<td>$196</td>
<td>$215</td>
<td>$253</td>
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</table>

#### Major Cost Drivers

<table>
<thead>
<tr>
<th>Component Type</th>
<th>Component Description</th>
<th>iPhone 5</th>
<th>iPhone 4S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Memory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAND Flash</td>
<td></td>
<td>$10.40</td>
<td>$19.20</td>
</tr>
<tr>
<td>DRAM</td>
<td>1GB LPDDR2</td>
<td>$10.45</td>
<td>$9.10</td>
</tr>
<tr>
<td><strong>Display &amp; Touchscreen</strong></td>
<td>4&quot; Retina Display w/ In-Cell Touch</td>
<td>$44.00</td>
<td>$37.00</td>
</tr>
<tr>
<td></td>
<td>3.5&quot; Retina Display w/ Touch</td>
<td>$44.00</td>
<td>$37.00</td>
</tr>
<tr>
<td><strong>Processor</strong></td>
<td>A6 Processor</td>
<td>$17.50</td>
<td>$15.00</td>
</tr>
<tr>
<td></td>
<td>A5 Processor</td>
<td>$17.50</td>
<td>$15.00</td>
</tr>
<tr>
<td><strong>Camera(s)</strong></td>
<td>8MP + 1.2MP</td>
<td>$18.00</td>
<td>$17.60</td>
</tr>
<tr>
<td></td>
<td>Qualcomm</td>
<td>$18.00</td>
<td>$17.60</td>
</tr>
<tr>
<td><strong>Wireless Section - BB/RF/PA</strong></td>
<td>MDM9615M+RTR8600 +Front End</td>
<td>$34.00</td>
<td>$23.50</td>
</tr>
<tr>
<td></td>
<td>Qualcomm</td>
<td>$34.00</td>
<td>$23.50</td>
</tr>
<tr>
<td><strong>User Interface &amp; Sensors</strong></td>
<td></td>
<td>$6.50</td>
<td>$6.85</td>
</tr>
<tr>
<td><strong>WLAN / BT / FM / GPS</strong></td>
<td>Murata Dual-Band Wireless-N Module</td>
<td>$5.00</td>
<td>$6.50</td>
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<tr>
<td></td>
<td>Murata Single-Band Wireless-N Module</td>
<td>$5.00</td>
<td>$6.50</td>
</tr>
<tr>
<td><strong>Power Management</strong></td>
<td>Dialog + Qualcomm</td>
<td>$8.50</td>
<td>$7.20</td>
</tr>
<tr>
<td></td>
<td>Dialog + Qualcomm</td>
<td>$8.50</td>
<td>$7.20</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>3.8V ~1400mAh</td>
<td>$4.50</td>
<td>$5.90</td>
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<tr>
<td></td>
<td>3.7V ~1400mAh</td>
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<td>$5.90</td>
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<tr>
<td><strong>Mechanical / Electro-Mechanical</strong></td>
<td></td>
<td>$33.00</td>
<td>$33.00</td>
</tr>
<tr>
<td><strong>Box Contents</strong></td>
<td></td>
<td>$7.00</td>
<td>$7.00</td>
</tr>
</tbody>
</table>

*Source: IHS iSuppli Research, September 2012*
### Samsung Galaxy S4/S3 Bill of Materials ("BoM")

**Preliminary Samsung Galaxy S4 Virtual Teardown BOM Estimates (Pricing in U.S. Dollars)**

<table>
<thead>
<tr>
<th></th>
<th>Samsung Galaxy S4 (HSPA Version)</th>
<th>Samsung Galaxy S4 (LTE Version)</th>
<th>Samsung Galaxy S3 (HSPA Version)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total BOM Cost</strong></td>
<td>$236</td>
<td>$233</td>
<td>$205</td>
</tr>
<tr>
<td><strong>Manufacturing Cost</strong></td>
<td>$6.50</td>
<td>$8.50</td>
<td>$8.00</td>
</tr>
<tr>
<td><strong>BOM + Manufacturing</strong></td>
<td>$244</td>
<td>$241</td>
<td>$213</td>
</tr>
</tbody>
</table>

#### Major Cost Drivers

- **Memory (NAND Flash + DRAM)**: 16GB eMMC + 2GB LPDDR3
  - Cost: $28.00
- **Display & Touchscreen**: 5" 1920x1080 Super AMOLED (441ppi), w/ Gorilla®Glass3 by Corning
  - Cost: $75.00
- **Processor**
  - Samsung Exynos 5 Octa (5410)
  - Cost: $30.00
- **Camera(s)**
  - 13MP + 2MP
  - Cost: $20.00
- **Wireless Section - BB/RF/PA**
  - Possibly contains Intel PMB9820 + PMB5745 + Front End
  - Cost: $16.00
- **User Interface & Sensors**
  - Contains accelerometer, RGB Light, e-compass, Gyro, Barometer, Temperature & Humidity, IR Gesture
  - Cost: $16.00
- **WLAN / BT / FM / GPS**
  - Possibly contains Broadcom BCM4335 + BCM47521
  - Cost: $9.00
- **Power Management**
  - Samsung PMIC (TBD)
  - Cost: $8.00
- **Battery**
  - 3.8V, 2600mAh w/ NFC Antenna (TBD)
  - Cost: $5.60
- **Mechanical / Electro-Mechanical**
  - Cost: $22.00
- **Box Contents**
  - Cost: $6.00

**Source:** IHS iSuppli Research, March 2013

©2014 TCX Inc
### iPhone5 vs, iPhone4 Bill of Materials (“BoM”) 

<table>
<thead>
<tr>
<th>Components / Hardware Elements</th>
<th>Apple iPhone 5 (Pricing as of Sept, 2012)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>iPhone 5 Hardware Comments</td>
<td>16GB3</td>
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<tr>
<td>Pricing without Contract</td>
<td>$649</td>
<td>$749</td>
</tr>
<tr>
<td>Implied Margin</td>
<td>68%</td>
<td>71%</td>
</tr>
<tr>
<td>Total BOM Cost</td>
<td>$199</td>
<td>$209</td>
</tr>
<tr>
<td>Manufacturing Cost</td>
<td>$8.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>BOM + Manufacturing</td>
<td>$207</td>
<td>$217</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Cost Drivers</th>
<th>Apple iPhone 4S (Pricing as of Oct, 2011)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>iPhone 4S Hardware Comments</td>
<td>16GB32</td>
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<td>Pricing without Contract</td>
<td>$649</td>
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<td>Implied Margin</td>
<td>70%</td>
<td>71%</td>
</tr>
<tr>
<td>Total BOM Cost</td>
<td>$188</td>
<td>$207</td>
</tr>
<tr>
<td>Manufacturing Cost</td>
<td>$8.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>BOM + Manufacturing</td>
<td>$196</td>
<td>$215</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components / Hardware Elements</th>
<th>Major Cost Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAND Flash</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>DRAM</td>
<td>Qualcomm MDM6610+RTR8605 +Front End</td>
</tr>
<tr>
<td>Display &amp; Touchscreen</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>Processor</td>
<td>Qualcomm MDM6610+RTR8605 +Front End</td>
</tr>
<tr>
<td>Camera(s)</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>Wireless Section - BB/RF/PA</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>User Interface &amp; Sensors</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>WLAN / BT / FM / GPS</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
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<tr>
<td>Power Management</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>Battery</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>Mechanical /</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
<tr>
<td>Electro-Mechanical</td>
<td>Qualcomm MDM9615M+RTR8600 +Front End</td>
</tr>
</tbody>
</table>

Source: IHS iSuppli Research, September 2012
Fabless Eco-system Alignment Across Entire Value Chain is Required
HW 8 – Value Chain

...Due Thursday, June 4th
...This is a TEAM project. Only one submission per team is required.

- Create a Value Chain for your Project
  - Identify the suppliers including any “sub-contracting” work
  - What do you consider as the top 3 Risk areas?
CSE 190 - What we covered…

- Entrepreneurship Overview
- Projects and Projects selected, Round 1 presentation
- Microsystem – History, Market Drivers, Lifecycle
- Mobile Apps opportunities - Dr. Greg Hoovers’s session
- Intro to Business Plan, Business Model Canvas
- Presentation template, Sample Presentations
- Success Stories – Yapert (Mike Young), Nate Delson
- Microsystem Development Lifecycle, Roadmaps, and Schedules
- Lean Canvas, Business Plan, Product Positioning
- Financials – Income Statements, Balance Sheets, Dilution, Case studies
- Company Lifecycles
- Outsourcing, Value/Supply Chain
- Business Structure, Legal Considerations
- Presentations
Entrepreneurial Checklist

Execution

Customer

Product Definition
Specs

Team
Biz Plan
Funding

Differentiation

“Must-have”

Planning

Patent / Publish

Credibilit

Rev. A success
Towards a Successful Startup
…“Plan A” – an iterative process
CSE 190 – KEY Takeaways for Entrepreneurial Success

➢ TEAM

➢ ID the CUSTOMER and their PROBLEM

➢ Map your SOLUTION to the Customer Problem

➢ PIVOT

➢ EXECUTE

➢ Develop a Business CANVAS and a PLAN
  ➢ Funding
  ➢ Product Development
  ➢ Product “Manufacturing”
  ➢ Sales and Marketing
  ➢ ....
TEAM Formation

- You
- Team of Founders …*remember Financial implications*
- Hiring additional resources:
  - Start small
  - Use outsourcing where possible
  - Fill “gaps” in expertise and “disciplines”
- Look for “team-players”
  - Flexible individuals
  - “can-do” attitude
  - Hard workers
  - Share your personal and company vision/passion
  - …
- Avoid “crony-ism”
Talking to CUSTOMERS

- Walking in the Customer’s shoes
  - Pretend you were the customer
- Observe the Customer behavior, actions, reactions
- Regroup to review initial Observations
- Make first pass Assumptions – validate and Challenge them with “field data”

Ref: Giff Constable, “Talking to Humans”, 2014
CUSTOMER Discovery

1. Customer discovery is about gaining much deeper insight into your customer, or your partners, or your market
2. Being told your idea is cool is not useful; seeing behavior that validates your customer’s willingness to buy is very useful
3. Prepare an interview guide before you get out of the building
4. To ask the right questions, you need to understand your risks and assumptions
5. Get creative when trying to recruit people — if at first you don’t succeed, try something new
6. Sometimes observation is as powerful as interviews
7. Take good notes, especially on your key risks, so that you can calculate metrics later. Even better, set your target goals ahead of time!
8. Bring learning back and analyze your patterns as a team
9. Never stop asking hard questions about your business

Ref: Giff Constable, “Talking to Humans”, 2014
Customer Discovery – WHO to Learn from?
Target Early Adopters
…from Geoffrey Moore, “Crossing the Chasm”, “Dealing with Darwin”

Differentiation thru Disruptive Innovation
➡ Huge competitive advantage
…but needs “Crossing of the Chasm”

Pragmatist(s)
Niche
Few adopters
CUSTOMER Discovery – What to Learn?

- My target customer will be?
- The problem my customer wants to solve is?
- My customer’s need can be solved with?
- Why can’t my customer solve this today?
- The measurable outcome my customer wants to achieve is?
- My primary customer acquisition tactic will be?
- My earliest adopter will be?
- I will make money (revenue) by?
- My primary competition will be?
- I will beat my competitors primarily because of?
- My biggest risk to financial viability is?
- My biggest technical or engineering risk is?
- What assumptions do we have that, if proven wrong, would cause this business to fail? (Tip: include market size in this list)

Ref: Giff Constable, “Talking to Humans”, 2014
CUSTOMER Discovery – What to Learn?

- Get Stories, Not speculation
- Ask Open-ended Questions
- Test for Price
- Get feedback on a Prototype
- The “magic wand” Question

- Design Quantitative measures
- A Guide, not a Script
- Observation can be as powerful as Q&A

Ref: Giff Constable, “Talking to Humans”, 2014
CUSTOMER Discovery – Effective Interviewing

- In-person
- One person at a time, add a note taker if possible
- Start with a “warm up” and keep it Human
- Disarm your own biases
- GET THEM TO TELL A STORY
- LISTEN, DON’T TALK
- Understand Priority
- Drill down with follow up Questions
- PARROT BACK to confirm
  - Impress if you got it right, or be corrected!
- Do a Dry Run

Ref: Giff Constable, “Talking to Humans”, 2014
Exit Strategies

- Stay private
  - scale up company at least for some years, especially if profitable
- IPO (Initial Public Offering) - go public
- M&A (Merger and Acquisition) – merge with or get acquired by a larger company
### CSE 190 – Quick survey

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<thead>
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<th>Question</th>
<th>High</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Rate your ENTREPRENEURIAL KNOWLEDGE now relative to the beginning of this class</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>2</td>
<td>Rate your LEVEL OF INTEREST in being an Entrepreneur</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>How HELPFUL was this class if you were to pursue a STARTUP idea?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>4</td>
<td>Rate your satisfaction with this COURSE</td>
<td>5</td>
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<tr>
<td>5</td>
<td>Rate your satisfaction with the Professor</td>
<td>5</td>
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<td>6</td>
<td>Rate your satisfaction with the TA's</td>
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<td>7</td>
<td>How likely are you to RECOMMEND this course to others?</td>
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<td>8</td>
<td>Suggestions to improve the class</td>
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Final Report – Business Plan
…1 per Team, 2000 words max
…due on Sunday, June 7th…no later than midnight..
…use example Table of Contents from Class 8-2, content must include the following

1. Your Entrepreneurial IDEA?
2. What Customer problem does your idea solve?
3. Who are the potential Customers? A summary of your Customer Discovery to date.
4. Who is your Competition? How will you DIFFERENTIATE your product?
5. Who will make it?
6. How big a company do you want to build?
7. Income Statement - Revenue, Expenses, # Units sold, # people
8. Business Model Canvas
9. Introduce your Team

Final Report – Individual Summary …Optional, for extra credit
…1 per Individual, 1 page max

1. Your contributions to your team
2. Your top 3 learnings from the class and team?
Business Plan example Table of Contents

- Executive Summary
  - Objectives
  - Mission
  - Key to Success

- Company Summary
  - Startup Summary
  - Management Team
  - Technical Team
  - Company Locations and Facilities

- Market Analysis
  - Industry Overview
  - Market Size
  - Market Opportunities
  - Competition

- Product Summary
  - Product Description
  - Sourcing and Technologies
  - Product Development Schedules
  - Competitive Analysis
  - Product Advantages
  - Product Roadmaps

- Marketing and Sales Strategy
  - Targeted Markets
  - Customers
  - Strategic Alliances
  - Advertising and Promotion
  - Selling Tactics

- Manufacturing and Operations Plan
  - Wafer Sourcing
  - Backend Manufacturing Plan

- Organization and Personnel Plan
  - Organization
  - Personnel Plan

- Financial Plan
Final Report Example ToC

The Team

Entrepreneurial Idea

Vision

Idea in detail

dashApp and dashPack

Coaches & Personal Trainers

Customer Problem

Key Problems Addressed

Product Features

Solving the Customer Problems

Potential Customers

Competition and Manufacturing

Competition and Differentiation

Who will make it?

Company Info

Business Model Canvas

Income Statement

Description

Financial Statement

Financial Summary Explanation