Successful Entrepreneurship for Microsystems

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RECESS event New Ventures presentations

- **USKey** – detect and alarm for laptop theft
- **Aqua Design Innovations** – improved filtering for aquarium using plants
- **Portable Detection of Airborne Pathogens** – allergy/sickness detection
- **Call Meh** – Video Chat Website
- **Wastelites** – Bio Fuel for lites in third world countries
Presentation Key Elements

- **What** is your offering – a “Tag” line?
- **What** is the problem you solve?
- **What** is your solution?
- **How** you do it?
- **Who** will buy it?
  - How much will they pay?
- **How** will you Market it? Channels?
- **Who** is your competition?
- **What** is the Business Model?
  - **How** will you make Revenue? Profit?
“HUG”

A mobile app that makes efficient your social media experience
Or adds efficiency to your social media experience
Or organizes and adds efficiency to your social media experience
Current situation
The Hug way

- Selected
- Friends
- News
- Interests
- ..
Hug – how we do it

- A proprietary AI algorithm that is an “Aggregator”
Hug – Who is the Competition?

➢ What is your UVP / Differentiation?
Target Market

- Initial Customer feedback
  - x/20 potential customers say they are very interested to Hug it!
- College students and young adults
  - Alpha – selected 10 students at UCSD, and 10 ‘friends of friends
  - Beta – sample of 100 UCSD students, and 100 other young adults
  - iStore and Google Play store
Market Analysis

- Size of market in terms of numbers.
  E.g., the number of 20-year olds, if that's your target demographic.

- Size of market in terms of dollar value.
  E.g., based on sales of similar products or other metrics.

- How much of the market will you capture?

- Competition: who are the other players in the field?

- Other relevant details.
Business Considerations

- Revenue from iStore/PlayStore
- Revenue from Google Adsense ads
- <20 employees
Exit Strategy

- License
- Get acquired
Business Model Canvas
Team

- Ben Inada
- Steven Nguyen
- Christine Pham
- Brandon Schade
“DigiBag”

A “Smart” bag that synchs electronic devices, and sets an alert for missing devices
Current situation – the Problem

- We all carry a plethora of electronic devices in our backpacks, briefcases, purses
- How often have you missed having the right power charger, head-set,...?
DigiBag’s solution!

DigiBag
Smart Electronics

Laptop Charger
iPad Charger
Phone Charger
Head-set
...

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DigiBag – how we do it

- Smart Electronics unit built from off-the-shelf component initially allows devices to be connected via NFC
- Follow on devices will be built using FPGA’s, and a custom designed Integrated Circuit
Product Roadmap

Phase 1
- Smart Electronics built using off-the-shelf components
- Bags procured from overseas
- Final assembly in San Diego
- Marketed thru online sales – Amazon, eBay etc.

Phase 2
- Smart Electronics built using an FPGA
- Bags procured from overseas
- Final assembly in San Diego
- Marketed thru online sales – Amazon, eBay etc.
- Will seek to license to name brand backpack and briefcase manufacturers – Samsonite, Swiss,.. 

Phase 3
- Smart Electronics built using an FPGA
- Bags procured from overseas
- Final assembly in San Diego
- Marketed thru online sales – Amazon, eBay etc.
- Will seek to license to name brand backpack and briefcase manufacturers – Samsonite, Swiss,..
Target Market

- Initial Customer feedback
  - x/20 potential customers say they are very interested in DigiBag
- College students and young professional
  - Alpha – selected 10 students at UCSD, and 10 ‘friends of friends
  - Beta – sample of 100 UCSD students, and 100 other young adults
Market Analysis

- Size of market in terms of numbers.
  E.g., the number of 20-year olds, if that's your target demographic.
- Size of market in terms of dollar value.
  E.g., based on sales of similar products or other metrics.
- How much of the market will you capture?
- Competition: who are the other players in the field?
- Other relevant details.
Income Statement
Exit Strategy

- License
- Get acquired
Business Model Canvas
Team

- Adam Fisher
- Rand Pehrson
- Kevin Nevalsky
- Ashley Yung
Fabless Company Lifecycle and Phases

**The Start-up / Small Co. Phase**
- Company Formation
- Funding
- Target Product
- Implementation Methodology
- Design
- Target Customer(s)
- Process Technology
- Package
- Cost
- Exit Strategies...

- Few Designs
- Revenue ≤ $100M

**Growth Phase: Mid-size Co’s**
- 10’s of Designs
- Revenue ≤ $1 B

**Top-tier Phase: Large Co’s**
- MANY Designs
- Revenue ≥ $1 B

- Altera [$1.954B]
- Broadcom [$6.589B]
- Marvell [$3.62B]
- MediaTek [$3.907B]
- nVidia [$3.543B]
- Qualcomm [$10.991B]
- ST-Ericsson [$2.3B]
- Xilinx [$2.31B]
- AMD [$6.494B]
- ...
- ...

Source: GSA
Circa 2011
A few case-study examples

- **Entropic Communications**
  - 2010 Revenue: $210M
  - Cable-connected home entertainment, MoCA

- **Qualcomm**
  - Founded: 1985, IPO: 1991
  - 2010 Revenue: $10,991M
  - CDMA/Wireless Chip-sets and Licensing

- **Silicon Image**
  - 2010 Revenue: $191M
  - Digital Video interface, HDMI

- **Rambus**
  - 2010 Revenue: $323M
  - Memory interface Licensing
A Case Study: Qualcomm – Fabless and IP Company

“Qualcomm started with a creative mentality that called for groundbreaking ideas, novel implementations next and minimal corporate bureaucracy last”
(D. Mock)

Based on:
• David Mock, “The Qualcomm Equation”, American Management Ass., 2005)

Source: J. Van der Spiegel, UPenn
Case Study – Qualcomm

- History:
  - [http://www.qualcomm.com/who_we_are/history.html](http://www.qualcomm.com/who_we_are/history.html)
  - Founded in 1985 by Irwin Jacobs, Andrew Viterbi, and 5 others
  - QUALity COMMunications

- Intellectual Property
  - Patents in digital signal processing
  - Currently ~7200 patents

- First Product
  - OmniTRACS – satellite based commercial mobile system for the transportation industry
    - Currently the largest such system

- CDMA (code division multiple access) technology
  - Introduced in 1989, shortly after approval of TDMA (time division multiple access) technology by the Telecommunications Industry Association
  - After a long drawn out battle, CDMA has become widely used
  - First cellular phone based on CDMA technology introduced ~1990-91
  - Currently, 3G phones based on CDMA technology are pervasive
  - 145 telecommunications equipment manufacturers license technology from Qualcomm
Qualcomm Company Lifecycle

CDMA Technology

- QUALCOMM proposes a superior wireless telecom solution called CDMA
- Full-scale CDMA R&D underway
- Sprint PCS selects CDMA technology for nationwide network
- Regulatory body accepts U.S. PCS standard
- 1st commercial CDMA system deployed in Hong Kong
- Commercial CDMA service launches in South Korea
- PCS PrimeCo activates national PCS service in U.S.
- High volume shipments of CDMA chipsets begin
- Landmark agreements pave the way for QUALCOMM’s CDMA to become the world standard for the next generation of wireless telecom (called 3G)
- Over 41 million cdmaOne subscribers worldwide

89 90 91 92 93 94 95 96 97 98 99

Source: www.qualcomm.com
Intel Corporation and The Future of the Microprocessor Business


Source: J. Van der Spiegel, UPenn
Brief History INTEL

- 1968: Intel was founded by A. Grove, R. Noyce, and G. Moore (all from Fairchild)
- Focus was on memory chips: DRAM.
  - Positioned itself as the “Memory Company”
  - Considered memory its core business
  - Memories provided 90% of revenues in the ‘70’s
- Up to that time Magnetic core or ferrite-cores memories were the main memories in computers:
  - Large and Slow
First 1K DRAM

- Many companies tried to manufacture DRAM in the late ’60s and early ’70s.
- Intel focused on MOS technology and succeeded in 1970
- 1970: Intel introduced the first 1Kbyte DRAM (1103):
  - Instant success, replacing core magnetic memories
  - Smaller, faster
  - Intel enjoyed 2 years of market dominance
DRAM product time line

Figure 2. DRAM product introduction timeline, 1968–1985.

Year: 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85

Source: Intel documents, Dataquest

(Burgelman, INTEL, Standford Univ. Case Study)
Intel’s DRAM Market Share


Brief History

- **1971**: Intel introduces the 4004:
  - 4-bit processor; BCD arithmetic
  - Designed for Busicom’s calculators
  - Intel got nonexclusive rights for the 4004!
  - Intel considered originally the microprocessor as a means to sell more memories

- **8-bit microprocessors**
  - 8008: 8-bit, poorly designed
  - **8080** (1974): 8-bit databus and 16–bit address bus
  - **6800** (1975) from Motorola:
    - Much cleaner architecture than the 8080
  - Aggressive marketing by Intel and availability of software for the 8080 gave Intel a lead.
PC market before and after the 386

Before 1985

Licence

Licence

Intel

Licence

Up to 286

IBM

After 1985

OEM

OEM

OEM

OEM

From 386

Intel

Industry became more horizontal; became more dependent on each other

(Source: Intel Corp, R. Casadesus-Mananell; HBS)