Successful Entrepreneurship for Microsystems

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October 2, 2014
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Course presented at UCSD CSE 190, Fall Quarter 2014
CSE 190 About the Instructor – Rakesh Kumar, Ph.D., IEEE Life Fellow

- President (2012-13) of the IEEE Solid-State Circuits Society with approximately 10,000 members
- TCX President and CEO (2001 - present)
- Ei2 President and CEO (2005 – 10)
- UCSD Entrepreneurism Center – Technology and Business Advisor (2012 – present)
- Workshops/courses on Semiconductor innovation, entrepreneurship and opportunities
  - Adjunct Professor, Yonsei University, Seoul, South Korea
- 40 years Semiconductor Industry Experience
  - TCX (13 years)
  - Cadence Design Systems (6 years)
  - Unisys (19 years)
  - Motorola (2 years)

  - A primer for entrepreneurs, as well as the experienced on the breadth of issues in the formation, and operation cycle of fabless semiconductor companies
- Author of numerous publications and presentations
- Distinguished Lecturer for the IEEE Solid-State Circuits, and Electron Devices Societies
CSE 190 About the TA – Sneha Venkatesh Yelimeli

- Graduate student, UCSD Computer Science and Engineering
- Background in web/mobile development and machine learning.
  - Part of the Calatrava core team (calatrava.github.com) – an open-source framework for cross platform mobile application development.
  - Worked with a start-up called BloomReach to build their online product recommendation system that will go live for 20 merchants like Staples etc.
  - Received Young Prodigy Award (sponsored by Amdocs Inc.) for the most Innovative Project in India
- TA for “Mobile Development and Entrepreneurship” SP14
CSE 190 Objectives

- Encourage Innovation...the opportunities are HUGE!
- Encourage Entrepreneurship
- Familiarize students with the “How-To’s” for setting up, and implementing a Start-up company related to the many facets of Microsystems
  - Many of these themes will be applicable to “Intrapreneurship” - setting up and implementation of Projects within large Corporations

We will not design any new Mobile Apps, Algorithms, Architectures, Integrated Circuits, etc.

BROADEN your Horizons
CSE 190 Broadening your Horizons

Biz  Customer  Marketing  Sales  Finance  ……

μ Systems

SW
Architecture
Apps
Chip Design
Process
Packaging
Test
Reliability
Quality
CSE 190 Piazza Signup Survey

A. Have Ideas, Serious  
   5  19%
B. Have Ideas, Some thoughts  
   6  23%
C. Have Ideas, Don’t know how  
   5  19%
D. No Ideas, But some day  
   9  35%
E. No Ideas, Never  
   1  4%

Data from Spring 2014 class
CSE 190 Syllabus

Note – details are likely to be modified/adjusted

Week 1: Course Introduction, Developing a Microsystem idea – key success elements
Student Individual Presentations 0 (initial thoughts of an Idea/Product?)

Week 2: Typical Microsystems, Industry background, Microsystem Value Chains, Market drivers, and development Lifecycle
Student TEAM presentations 1

Week 3: Innovation and Start-up Lifecycle, Typical reasons for failure, possible Business models, funding and exit strategies. Considerations in developing a Business Plan, and a vision for the end-in-mind.

Week 4: Case studies (Large, Medium, Start-up companies), Guest Lecturers, Lean Startup, Business Model Canvas

Week 5: Student TEAM Presentations 2 (Revised thoughts about your Idea/Product? Who is the Customer? Do you have a “must-have” opportunity?)

Week 6: Anatomy of a successful start-up company
Week 7: Guest Lecturers

Week 8: The holistic view - It’s not just the Technology…the “peripherals” – Marketing, Sales, Finance, IP,…..

Week 9: Who’s the Competition? How to Differentiate your product. How to Protect your Idea.
Week 10: Guest Lecturers

Week 11: Student TEAM Presentations 3 (Startup Business Plan/Canvas)
Thursday, Dec 11th, EBU3B 1202, 5-8pm, Guest judges from the industry, and within UCSD

Week 12: Final Report due
CSE 190 - Reference Texts

- Rakesh Kumar, “Fabless Semiconductor Implementation”, McGraw Hill
- Ash Maurya, “Running Lean”, O’Reilly Media
- Harvard Business Review articles online
CSE 190 Logistics

➢ We will use Piazza.com

➢ Office Hours:
  ➢ Kumar – Tuesdays and Thursdays 3pm – 4:45pm, EBU3B 2128
  ➢ Sneha YV – Wednesdays 10am – 11am, EBU3B B250A

➢ Discussion Session:
  ➢ Sneha YV – Mondays 3pm – 3:50pm, Peterson 102

➢ Class Hours:
  ➢ T Th 5:00 – 6:20pm, (Pepper Canyon) PCYNH 121
  ➢ Th, December 11, 5:00 – 8:00pm, EBU3B 1202

➢ Finals week:
  ➢ None
CSE 190 Grading

- We will be using GradeSource.com

- Class Participation 30%
- Home Work / Reports 40%
- Presentations
  - TEAM 20%
  - Individual 10%

- Bonus points
  - Homework “extras”
  - Demonstrated interest in following thru with a Start-up
    - Moxie Center
    - Von Liebig Center
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The Age of Entrepreneurship

- High growth Startup companies are a major source of job growth in the US
- Many Innovators
- Many new Opportunities for Entrepreneurship
  - CloudComputing, Mobile Apps, Internet of Things,…
- “Easy” to start a new company!

After Ash Maurya, “Running Lean”
Small Business Statistics (USA)

- 28 M Small Businesses (< 500 employees)
  - 22 M with < 5 employees, < $50K Revenue
- > 50% of working population works for small Businesses
- > 65% of New Jobs created since 1995 by Small Businesses
- > 0.5M New businesses started every month…
  ……but more close down every month!

→ Poor Success Rate

Opportunity:
Create Smart Start-up Infrastructure to Improve Success Rate

Recent Acquisitions

Amazon

- Twitch  Aug 2014  Gaming  $1 B

Facebook:

- Instagram  April 2012 (2011, sA $7M)  Photo Sharing  $1 B
- Face.com  June 2012 (2010, sA $1M, t$5M)  Face Recognition Program  $0.1 B
- Oculus VR  Mar 2014 (2012, KS, t$90M)  Virtual Reality technology  $2 B

Google

- Dropcam  Jun 2014 (2009, $50M)  Home Monitoring  $0.5 B

Amazon, Facebook, Google

…the New Conglomerates

…or the New Platform owners…or ?
Changes are coming at an amazingly RAPID rate!
Entrepreneurship – some definitions

- In response to identified opportunities, the practice of
  - starting new organizations/businesses or
  - revitalizing mature organizations…., Wikipedia

- Innovation applied to the creation of a new product, a new production method or a new market…..QuickMBA

- Entrepreneurship creates significant wealth, rapidly and involves significant risk taking…..QuickMBA

- Entrepreneurs BUILD BUSINESSES through INNOVATIVE SOLUTIONS to UNMET CUSTOMER NEEDS.

- “Above all, innovation is not invention. It is a term of economics not technology.” *

- Entrepreneurs create discontinuities – They obsolete accepted practices and change behavior.

  StreetSmart Entrepreneuring  www.zeniegroup.com

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Microsystems are omnipresent! 
...Many Innovation and Entrepreneurial Opportunities
So, What’s the Problem?

*Most Startups are not successful!*

**Some Success criteria:**
- Be Profitable …before you run out of Resources/Funds
- Get acquired
- Go Public

*Most Startups focus on the Solution, and Not the CUSTOMER 😞*
Top reasons for failure – Fabless Startups

Create product that solves a real Customer Problem…
A “must-have” for the customer
…a Differentiated solution

- No customer engagement until it’s too late
- Not understanding and meeting customer expectations
- Overly aggressive product specifications
- The “kitchen-sink syndrome”
- Poor management of the Supply Chain

A systematic approach to planning and execution
Entrepreneurial Checklist

Execution

Customer

Product Definition

Team

Specs

Biz Plan

Funding

Rev. A success

Patent / Publish

Differentiation

“Must-have”

Planning

Credibilit
The New Focus

SHOULD it be Built?

CAN it be Built?
Entrepreneur Traits Checklist

- Confidence
- Self-Motivation
- Tenacity
- Understand your Limits
- Healthy disrespect for Rules
- Willingness to Fail

Ref: Jenny Q.Ta, Founder and CEO of Sqeeqee
Startup Success Story…You can do it, too!

https://www.youtube.com/watch?v=mHVJF9VaWfo
Ref: Stanford Graduate School of Business
1. Your Entrepreneurial IDEA?

2. What Customer problem does your idea solve?

3. Who are the potential Customers?

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? Revenue? # people?
HW 1 – Bonus (optional)
Due on Thursday, October 9th

1. Research one successful startup company (e.g., Face.com, Dropcam, Nest Labs, …)
2. Prepare a 1-page summary
   1. History – when founded, by who,
   2. Funding – amount, major investors,
   3. Product
   4. Who are their major customers?

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