Successful Entrepreneurship for Microsystems

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October 21, 2014
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Course presented at UCSD CSE 190, Fall Quarter 2014
The “Productization / Commercialization” Lifecycle
...Basic Research to High Volume Production
The “Productization / Commercialization” Lifecycle
...Idea to High Volume Production
Definition Of Technology Readiness Levels

TRL 1 Basic principles observed and reported: Transition from scientific research to applied research. Essential characteristics and behaviors of systems and architectures. Descriptive tools are mathematical formulations or algorithms.

TRL 2 Technology concept and/or application formulated: Applied research. Theory and scientific principles are focused on specific application area to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.

TRL 3 Analytical and experimental critical function and/or characteristic proof-of-concept: Proof of concept validation. Active Research and Development (R&D) is initiated with analytical and laboratory studies. Demonstration of technical feasibility using breadboard or brassboard implementations that are exercised with representative data.

TRL 4 Component/subsystem validation in laboratory environment: Standalone prototyping implementation and test. Integration of technology elements. Experiments with full-scale problems or data sets.

TRL 5 System/subsystem/component validation in relevant environment: Thorough testing of prototyping in representative environment. Basic technology elements integrated with reasonably realistic supporting elements. Prototyping implementations conform to target environment and interfaces.

TRL 6 System/subsystem model or prototyping demonstration in a relevant end-to-end environment (ground or space): Prototyping implementations on full-scale realistic problems. Partially integrated with existing systems. Limited documentation available. Engineering feasibility fully demonstrated in actual system application.

TRL 7 System prototyping demonstration in an operational environment (ground or space): System prototyping demonstration in operational environment. System is at or near scale of the operational system, with most functions available for demonstration and test. Well integrated with collateral and ancillary systems. Limited documentation available.

TRL 8 Actual system completed and "mission qualified" through test and demonstration in an operational environment (ground or space): End of system development. Fully integrated with operational hardware and software systems. Most user documentation, training documentation, and maintenance documentation completed. All functionality tested in simulated and operational scenarios. Verification and Validation (V&V) completed.

TRL 9 Actual system "mission proven" through successful mission operations (ground or space): Fully integrated with operational hardware/software systems. Actual system has been thoroughly demonstrated and tested in its operational environment. All documentation completed. Successful operational experience. Sustaining engineering support in place.
Lifecycle of a “Microsystem” development – the 4 phases

- Global Planning
- IC Design
- Prototyping
- Production

Series A

Series B

30 – 50% of TT$
Lifecycle of a Fabless IC development – activity highlights

“System” Architecture / Design / Simulation / Verification

FPGA Implementation
Reference Design
Customer Evaluation “Proof of Concept”

Global Planning
High Level Design
Floor Planning

IC Design
Chip Design
RTL
Physical Design
NL
GDSII
Analog IP Design

IC Prototyping
IC Production
IC Qualification
Prod. Ramp
Debug
Hi volume

Series A
Series B

30 – 50% of TT$
Create product that solves a *real* Customer Problem…
A “*must-have*” for the customer
…a *Differentiated* solution

A systematic approach to *planning and execution*
Entrepreneurial Checklist

- Execution
- Customer
- Credibility
- Rev. A success
- Patent / Publish
- Product Definition
- Specs
- Team
- Biz Plan
- Funding
- Differentiation
- “Must-have”
- Planning
What’s Needed for a “must-have”, differentiated solution

An Idea
A Customer Problem
Customers…Marketing/Sales to reach them
Your Solution
No one else can offer

Revenue potential
Cost that offers Profit potential

An Operations Plan

Funds
…

A “Business Plan” or “Business Model Canvas”
Key Requirements for Business Plan & Funding

- A Biz Plan Document (usually ~20 pages)
- An Overview Presentation (usually ~10 slides)
- An “Elevator Pitch”
Business Plan – a typical Outline

- 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
  Competitions

- 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
The New Focus

SHOULD it be Built?

CAN it be Built?
The New Focus

Vetting Product Ideas

Hashtag: #leanstartup

ASH MAURYA
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ash@spark59.com
http://www.ashmaurya.com

Ref: https://www.youtube.com/watch?v=EOhzUMseaHs
Please review the following video:
https://www.youtube.com/watch?v=EOhzUMseaHs

What are the top 3 learnings from Ash Maurya’s Introductory video? Why do you consider these important

…a 1-page summary.
Business Model Canvas

Problem
Top 3 problems

Solution
Top 3 features

Unique Value Proposition
Single, clear, compelling message that states why you are different and worth paying attention

Unfair Advantage
Can’t be easily copied or bought

Customer Segments
Target customers

Key Metrics
Key activities you measure

Channels
Path to customers

Cost Structure
Customer Acquisition Costs
Distribution Costs
Hosting
People, etc.

Revenue Streams
Revenue Model
Life Time Value
Revenue
Gross Margin

Lean Canvas is adapted from The Business Model Canvas (http://www.businessmodelgeneration.com) and is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported License.

http://practicetrumpstheory.com/business-model/