Successful Entrepreneurship for Microsystems

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EXTENDING LIFE, IMPROVING HEALTH
San Diego’s universities, biomedical institutes and companies have created a “medtech” hub that is making advances in everything from detecting cancer to diagnosing concussions to spotting stress in troops.

Temporary tattoo sensors/communicators
UC San Diego
Scientists have created tiny, flexible electronic sensors that can monitor such things as seizures and sleep patterns.
Towards a Successful Startup

…“Plan A” – an iterative process

Problem / Need

Customer

Your Company

Top Line
Bottom Line

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

A systematic approach to \textit{planning and execution}
Entrepreneurial Checklist

Execution

Customer

Product Definition
Specs

Team
Biz Plan
Funding

Rev. A success

Differentiation

“Must-have”

Planning

Patent / Publish

Credibility

Entrepreneurial Checklist

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What’s Needed for a “must-have”, differentiated solution …and a **Successful Startup Company**

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**”
So, How does one make all this happen??
The “Productization / Commercialization” Lifecycle
...Idea to High Volume Production

Technology Release Levels, Ref. nasa.gov

1 2 4 5 7 9
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.
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 “Productization / Commercialization” Lifecycle
...Idea to High Volume Production

Technology Release Levels, Ref. nasa.gov

1st Demo/Sample

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The New Focus

Ref: https://www.youtube.com/watch?v=EOhzUMseaHs
The New Focus

https://www.youtube.com/watch?v=EOhzUMseaHs
In-class Quiz 3-1

1. For the new Entrepreneur focus, is it more important to first get a Business Plan or a Business Model Canvas?
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.