Capstone Overview I
Design in the Age of Innovation

Bruce Jacob
Keystone Professor
Electrical & Computer Engineering
University of Maryland at College Park
Modern Entrepreneurship:

The high-tech cottage industry
Important development in last 20 yrs:
Important development in last 20 yrs:
Important development in last 20 yrs:

Manufacturing as a Service
The Basic Idea

You → Design Blueprint → Factory → Manufactured Device
The Basic Idea

You → Design Blueprints → Factories

You → Manufactured Device → Assembly
Some Blueprints
... & what they became
Some (other) Blueprints
& what they became
Pros & Cons: High-Tech Cottage Industry

- Can’t Possibly compete with big companies
- Might fail
- Can’t afford it
- Window of opportunity?

- Idea already proven in marketplace (shareware, boutique electronics)
- Win/win situation (even company failure is good résumé material)
- Low risk/reward ratio
- Start soon

Bottom line: a path well worth exploring
Pros & Cons: High-Tech Cottage Industry

• Idea already proven in marketplace (shareware, boutique electronics)
• Win/win situation (even company failure is good résumé material)
• Low risk/reward ratio
• Start soon

Bottom line: a path well worth exploring
A High-Tech Example
Perspective:

*Innovation is good design & good design is iteration*
What is **Science**?

The process of not accepting the first result, or the second, or the third …

**Innovation** is the same thing: it is the burning need to refine and to improve and **not** to accept the first design, or second, or third …
Excellent Advice

Big companies cannot innovate, whereas startups **must**.

Startups are engineer-dominated; **founders** (engineers) are rewarded for company’s success.

Upon maturity, startups become management-dominated; **executives** (non-engineers) are rewarded for company’s success.

(thus #1, above)

**Goal: break this cycle**
What’s Broken?
Also: What do people NEED?

For example — access to telecommunications improves the standard of living of everyone
Wealth:
Having something other people want
What is Wealth?
What is Wealth?

Wealth

Not Wealth
What is Wealth?

“User data integrity is more valuable than the money in our wallets”

Google reliability talk
Replay

• Not all startups need to be software startups: you can start a *de facto* manufacturing company in your dorm room

• Figure out *what is broken* (and you can fix); figure out *what people need* (and you can provide)

• *Wealth ≠ money*
Questions?
(thank you for your kind attention)

Bruce Jacob
blj@umd.edu
www.ece.umd.edu/~blj

... or just Google “professor guitar maryland”