EnpRisk - Lecture Notes Week 13

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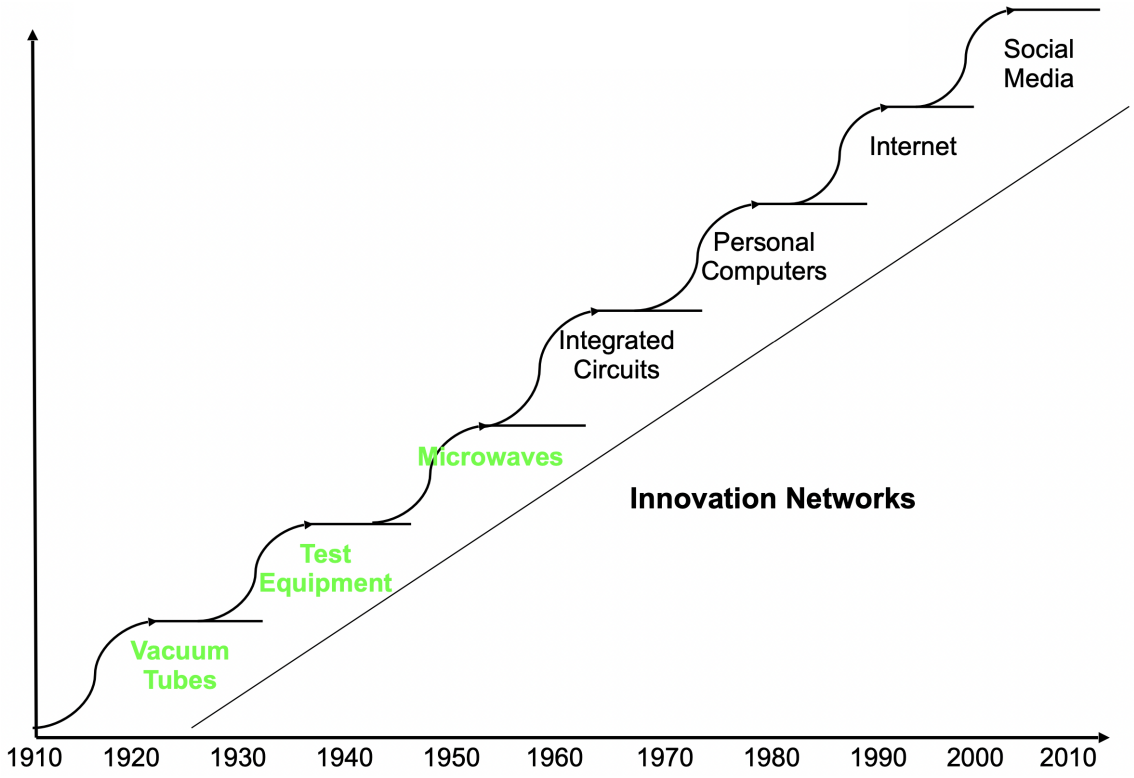
1 How to Prepare for the Great Shifts

1.1 The Secret History of Silicon Valley

Short overview of the Silicon Valley:

- Terman/Stanford/Government is responsible for entrpreneurial culture of Silicon Valley
- Military primed the pump as a customer for key Valley technologies (Semiconductors, computers, the Internet etc.)
- Venture Capital turned the Valley to volume corporate and consumer applications
- Berkeley continued its focus on Big Science and National Labs



In particulare, the time of "Microwaves" also included **defenese!**

For example, during WWII one encountered the first electronic war. Germany created the first air defense systems, i.e. integrated electronic air defense networks which covered France, the Low Countries, and into northern Germany. By AQugust 1941, only 10% of British bombers got to within 10 miles of their target.

In response, the Harvard Radio Research Lab (RRL) was created which focused on signals intelligence and electronic warfare:

- Reduce losses to fighters and flak
- Find and understand German air defense
- Jam and confuse German air defense
- Top secrete 800-person lab

The Harvard RRL was separate from MIT's Radiation Laboratory and ran all electronic warfare in WWII. It consisted of 800 people and was active from 1941 until 1944. The director was *Frederick Terman* from the Stanford University, a Stanford Professor of engineering 1926.

Terman's post-war strategy was as follows:

- Focus on microwaves and electronics (not going to be left out ov governemtns $ this time)
- Recruit 11 former members of RRL as faculty
- Set up the Electronics Research Laboratory (ERL)
- First Office of Naval Research (ONR) contract in 1946
- By 1950, Stanford was the MIT of the West

The Cold War battlefield moves 500 miles east. Countermeasures become critical and Stanford becomes the center of excellence for the CIA, NSA, Navy, and the Air Force. Stanford house a 400-person weapons lab in the engineering department.

After all of that, Terman changed the startup/University rules:

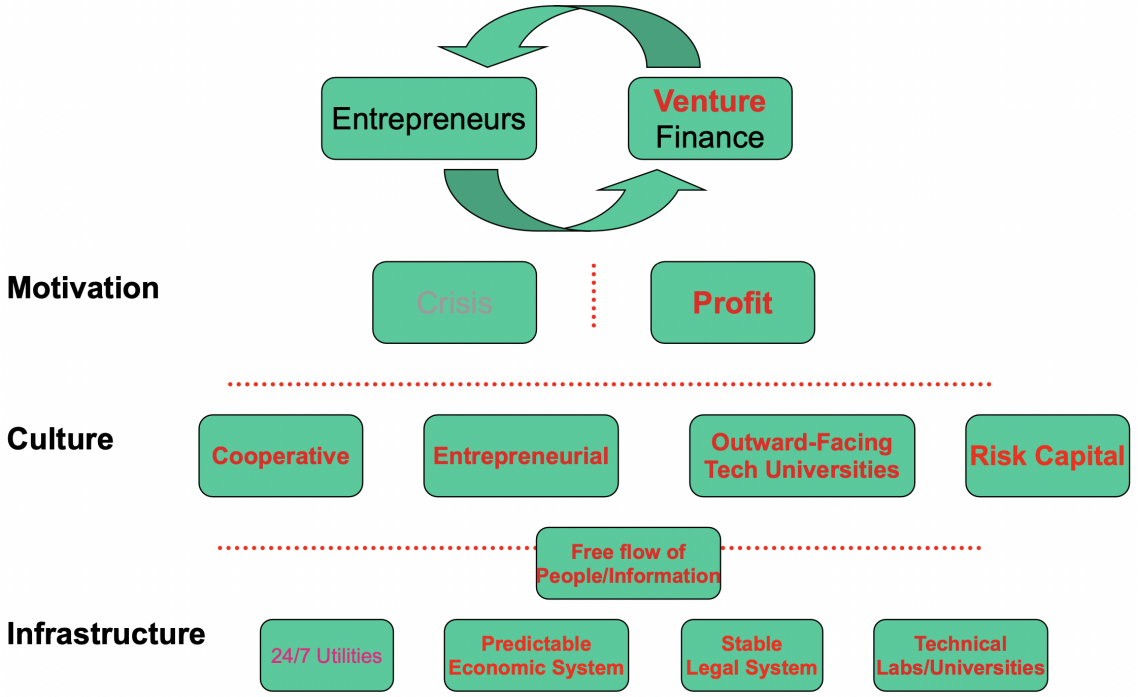
- Graduate students were encourages to start companies
- Professors were encouraged to consult for these companies
- Terman and other professors took board seats
- Technology transfer and IP licensing was made easy
- Getting out into the real world was good for your academic career
- Failure was accepted as part of the culture

Terman's strategy was a follows:

1. Sit on every possible Military Advisory board (build network and relationships)
2. Reach out to military customers to understand their needs. Then craft a prototype in Stanford's labs (generate revenue for the university and strengthen its military relationship)
3. If the customer liked the prototype, encourage a student to found a company and manufacture at scale (inspired entrepreneurship and hard work in the students in the university's labs)
4. Put a Stanford faculty (or Terman) on the board or as a consultant with the new company (train Stanford faculty in business and turn them into better teachers and researchers)
5. Provide office space in the Stanford Industrial Park (ensure that the startup stays close and helps the entrepreneurial ecosystem reach a higher density)

The *Other Father of Sillicon Valley* was William Shockley. He was the Co-inventor of the transistor for which he won a Nobel Prize in 1956 anf founded Shockley Transistor 1955, the first semiconductor company in California.

Silicon Valley's 2nd engine of entrepreneurship was *venture capital.* Raise money from pension funds, private universities, and wealthy individuals - the limited partners. Investment professionals manage the fund - the general partners, i.e. the VC's.



Venture capital turned the Valley to volume corporate and consumer applications.

1.2 The Social Bubble Hypothesis

A **social bubble** developing during a technological project is defined when several of the following symptoms are simultaneously present:

- strong growth of presence in the media, newspapers, books, blogs, grossips, cocktails, etc.
- flow of venture capital and Wall Street investments
- accelerated price growth of corresponding firms trading on organized stock markets
- proliferation of ventures of all kinds

1.2.1 Example: The Human Genome Project

In February 2001, Celera and HGP scientists published details of their drafts, describing the methods used and offering analysis of the sequence. However, anticipations of the commercial and medical applications of the HGP were highly inflated.

Today, it is acknowledge that insight into the genetic mapping and sequencing effort is only seen as a starting point for future research in biology and medicin. Contrary to claims during its development, the main fruits of the HGP have been accuring to the research community, and almost nothing to medicine and the general public.

Still, indirect technological gains values at > 750 Billion USD by Obama's administration.

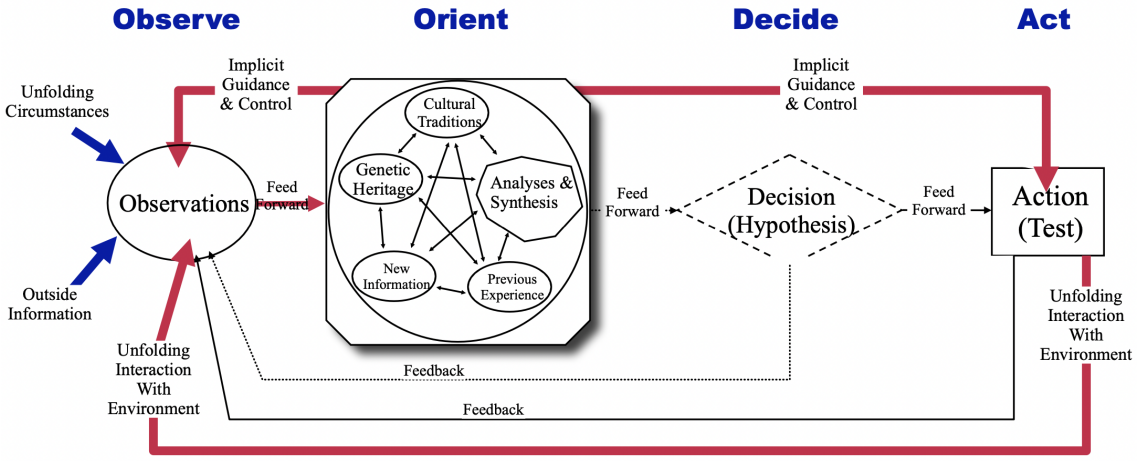
From 2004 to 2008, a bubble formed in *clean technologies,* such as solar, biofuels, batteries, and other renewable energy sources. This **clean-tech bubble** can be rationalised through the lens of the interactions between enthusiastic supporters weave a network of reinforcing feedbacks that lead to widespread endorsement and extraordinary commitment by those involved.

The clean-tech bubble was clearly a social bubble: the narrative of a "moral imperative" to combat climate change and achieve "salvation", the ballooning venture capital investments, and the massive government subisides weaved a network of self-reinforcing spirals that lead to over-optimsitic expectations, excessive enthusiasm, and over-investments.

Although the clean-tech bubble bust, we can identify some factors that indicate that the bubble did indeed catalyze technological progress in clean and renewable energy technologies.

1.3 John Boyd's Strategy in the 21st Century

The OODA (Observe, Orient, Decide and Act) loop with power:



The key take-aways is that *time is special.* Time is the only physical parameter with a direction. You don't have an unlimited supply, once it's gone, it's gone. Sure sign you're not using Boyd's strategies: you try to solve problems by throwing more time at them. A time-compressed company does the same thing as a pilot in an OODA loop. It's the competitor who acts on information faster who is in the best position to win.

1.3.1 Boyd's organizational climate

The principles of the Blitzkrieg:

Fingerspitzengefühl Zen-like quality of intuitive understanding. Ability to sense when the time is ripe for action. Built through years of progressively more challenging experience.

Einheit Has the connotation of "mutual trust" and implies a common outlook towards business problems. Built through common experience. Fingerspitzengefühl at the organizational level.

Schwerpunkt Any concept that gives focus and direction to our efforts. In ambiguous situations, answer the question, "What do I do next?". Requires leadership.

Auftragstaktik Tell team members what needs to be accomplished, get their agreement to accomplish it, then hold them strictly accountable for doing it - but don't prescribe how. Requires very high levels of mutual trust.