Making the Leap

Big Bang 2015/16
Do you have something the world needs?

Persian soldiers brought moldy breads on campaigns to treat infections.

150 BC
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1870’s  European scientists including Lister, Tyndall, Pasteur, Joubert find penicillin molds inhibit bacterial growth.

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1929

On the Antibacterial Action of Cultures of a Penicillium, with Special Reference to Their Use in the Isolation of B. influenzae

Alexander Fleming, F.R.C.S.
From the Laboratory of the Westminster Hospital, London, England

Reprinted from the British Journal of Experimental Pathology 10:226-234, 1929

While working with staphylococcus variants a number of cultures were set aside on the laboratory bench and examined from time to time. It was noticed that a large colony of a contaminating mould the staphylococcus culture became transparent and were obviously undergoing lysis (see figure 1). Cultures of this mould were made and experiments conducted with a view to ascertaining something of the properties of the bacteriolytic substance which had evidently been formed in the mould culture and which had diffused into the surrounding medium. It was found that broth in which the mould had been grown at room temperature for one or two weeks had acquired marked antibacterial property.

The pH of these broths was found to be usually slightly alkaline, the pH varying from 5.5 to 9. Acid is produced in these or four days in glucose and sucrose broth. There is no acid production in seven days in lactose, mannite or dextrose broth. Growth is slow at 37°C and is most rapid about 30°C. No growth is observed under anaerobic conditions.

In morphology this organism is a penicillum and in all its characters most closely resembles P. notatum. Bissett (1923) states that he has never found P. notatum in nature and that it is an “animal de laboratoire.” This penicillum is far more common in the air of the laboratory.

Is the Antibacterial Body Elaborated in Culture to All Molds?

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Howard Florey and team at Oxford begins investigating therapeutic potential of penicillin.

Oxford's first human trials prove penicillin's value. By year's end, commercial development begins in U.S.
Four lessons for innovation (and Big Bang!)

1. It’s not about the idea

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I saw for the first time everything in practical operation. It was all before me. I saw the thing had not gone so far but that I had a chance. I saw that what had been done had never been made practically useful.

— Thomas Edison

I invented nothing new. I simply assembled into a car the discoveries of other men behind whom were centuries of work. . . . So it is with every new thing...

— Henry Ford
You don’t need a new idea. Find a good idea and make it work.
The electric lighting system is now perfected. I will now bend all my time and energies to its introduction to the public... I’m going to be a business man, I’m a regular contractor for electric lighting plants and I’m going to take a long vacation in the matter of invention.

— Thomas Edison
It's about commitment: yours and others'

“[Penicillin broth] was used in a few cases as a local antiseptic, but although it gave reasonably good results the trouble of making it seemed not worth while.

— Alexander Fleming
(looking back in 1940)
Do you have something the world needs?

Innovation is not risky. It’s uncertain.
Bad news / Good news

Innovation is risky, yet much of that risk should properly be defined as uncertainty.

- **Risk (proper)** is measurable but irreducible
- **Uncertainty** is risk that not measurable but is reducible (aka Knightian Risk)

Innovation hinges on *commitment in the face of uncertainty*, not *discovery in the face of ignorance*.

*Dr. A. N. Richards (1964)*
Innovation hinges on *commitment in the face of uncertainty*, not *discovery in the face of ignorance*.

What’s holding you back?
Lifecycle of a new venture

Manage for uncertainty and commitment
Manage for market, product & process development
Manage for building the company
Manage for growing the business

Gen1
1st 3-9 Months
Gen2
(startup)
Gen3
(transition)
Gen4
(business)

Focus on reducing uncertainty: yours and others

Find and resolve the biggest uncertainties first.

Do it quickly and cheaply ($5, $50, $500, $5,000...)

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The network *is* the innovation

Innovation involves *seeing, building, and maintaining committed and lasting networks* connecting people, ideas, technologies, and other resources.
The project involved much more than biochemistry. It was an interlocking problem in logistics, like a military campaign in which the organization of the supplies, equipment, personnel, and reconnaissance need for advance are all interdependent.

— Gwyn MacFarlane
“[Florey] recognized the limits of his own knowledge and deliberately chose as collaborators people who could supply what he lacked. In his published work he had as partners a cytologist, radiologist, a bacteriologist, a haematologist, a biochemist, and several specialized physiologists.

— Gwyn MacFarlane
Who do you know that has them?

Who do you know who might know who has them?

Find and build the right network

What knowledge, abilities, or resources do you need to move forward?
Lifecycle of a new venture

Stage of Venture Development

- Research Grants
  - Development Grants (e.g., SBIR)
- Friends, Family, & Founders ($5-$50k)
- Angel Investors ($50-$500k)
- Early Stage Venture Capital ($500k-$2M+)
- Venture Capital ($2M-$50M)
- Private Equity, Project Financing ($2M-$50M)
- IPO, Merger, or Acquisition ($2M-$50M)

Revenue Growth

Valley of Death

- Net Cash Flow
- Basic Research
- Applied Research
- Proof of Concept
- Target Market
- Business Plan
- Founding Team
- Engineering Prototypes
- Supplier Contracts
- Production Prototypes
- Distribution Contracts
- Product Introduction

Net Cash Flow

# of New Ventures

Basic Research

Applied Research

Proof of Concept

Target Market

Business Plan

Stage of Venture Development

- Revenue Growth
- Valley of Death

- Net Cash Flow

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Basic Research

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- Valley of Death

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These programs help you determine the best path, the best first steps, and the best first network.

The rest is up to you.

You build a network one handshake at a time.

So what are your next partner’s uncertainties?
What are the uncertainties?

YOUR BUSINESS MODEL

Technology

Business

Market
The 10-slide deck is your first $5 experiment

The mindset

It’s better to be specifically wrong than vaguely right...
Title Slide
The Idea (as elevator pitch)
The Problem, solution, and Value
The Market
The Technology
The Business
The Uncertainties
The Team
The Status, Milestones, and funding
The Summary & Next Steps