Leading & Empowering Innovation
Quotes

• “When we all think alike, then no one is thinking.” ~ Walter Lippmann
• “Innovation distinguishes between a leader and a follower.” ~ Steve Jobs
• “There’s a way to do it better – find it!” ~ Thomas Edison
• “Capital isn’t so important in business. Experience isn’t so important. You can get both these things. **What is important is ideas.** If you have ideas, you have the main asset you need, and there isn’t any limit to what you can do with your business or your life.” ~ Harvey Firestone

• “Everything that can be invented has been invented.” ~ Charles H. Duell, US Patent Office Director, 1899
• “There is no likelihood man can ever tap the power of the atom.” ~ Robert Miliham, Nobel Prize in Physics, 1923
• “There is no chance that the iPhone is going to get any significant market share.” ~ Steve Ballmer, 2007
How many of these have you heard?

- We don’t do that here
- We tried that already
- That never works
- Not in our budget
- Not an interesting problem
- We don’t have time
- Boss / Execs will never go for it
- It’s out of scope
- It’s too risky
- It won’t make enough money
- It’s too hard
- That isn’t what people want

- We’ve always done it this way
- It won’t work
- That’s the dumbest thing I have ever heard
- That’s not my problem
- You can’t do that
- I don’t know how
- I don’t think I can
- I didn’t know that
- Why should I care?
What is Innovation?

In reality, the definition of innovation depends on your perspective...
Innovation: Perspectives

- Invention
- Problem Solving
- User or Market Need
- Creativity
- Business Model
Innovation

TYPES:
- Product
- Business Model
- Process
- Service
- Market

DEGREES:
- Incremental (Continuous, Cautious, Calculated)
- Radical (Discontinuous, Risky)
- Disruptive (New Platform/Product/Industry)
  - New Platform
  - New Product
  - New Industry
  - Customers, Users, Markets and Applications are NOT Immediately Obvious

IMPACT: Increased Profits – or – Reduced Costs
2017: iPhone is 10 years old!
Why is Innovation a Hot Topic?

We are Approaching a Technological Tipping Point!
Technology Adoption
Faster and Faster

CONSUMPTION SPREADS FASTER TODAY

Telephone
75 years

Cellphone
15 years

Source: NYT
We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before.

Numbers

• By 2025 there will be over 100 billion devices connected to digital networks!
• Sensors at modern power plants generate over 2TB of data per plant per day
• By 2019 the Industrial Internet will generate 49x the data of the Consumer Internet
• 90% of the world’s data has been produced in the last 24 months
• Total data produced in human history, from the very first cave paintings through 2003…

... is now produced EVERY 2 DAYS!
Linear growth requires linear thinking – “what’s next?”
Exponential growth requires exponential thinking...
A Chessboard of Rice

According to one legend, a very wealthy King is fascinated by the game of chess and offers its inventor a reward of his choosing. The inventor, Sessa, simply asks the King for a chessboard of rice in order to feed his family.
One grain of rice on the first square, two on the second square, four on next square, eight on the next, and so on across the board.

The King laughs and quickly agrees to this meager request.
Initially, the request appears modest.

However, after consulting his advisors who perform extensive calculations, the King discovers that this is a mountain of rice...
...approximately the size of Mount Everest.
First half of the chessboard = 100,000 kilograms of rice

Second half of the chessboard = 2 billion times the first half

Entire chessboard = 461 billion metric tons of rice – or – 18 quintillion grains of rice
The performance and cost of core digital technologies (bandwidth, computing power and storage) have been improving at an exponential rate. According to Moore’s Law, this trend will continue indefinitely.
From a technology standpoint, we are only halfway across the chessboard. Transitioning to the second half of the board represents a tipping point. Are we ready for the avalanche of new capabilities and technologies beyond the tipping point?
Are we ready for greatly increased customer expectations? What about rapidly expanding capabilities?

If we approach the future with a linear mindset then we will not be successful. We must begin to think exponentially!
Beyond the tipping point, entire industries will change or disappear. Large-scale global systems changes will occur.

Significantly more complex problems will be encountered beyond the tipping point? How do we prepare for these challenges?
Reframing Problems
But Be Careful...

Hype
Hype

GARTNER HYPE CYCLE

Technology Trigger: A potential technology breakthrough kicks things off. Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist and commercial viability is unproven.

Peak of Inflated Expectations: Early publicity produces a number of success stories — often accompanied by scores of failures. Some companies take action; many do not.

Trough of Disillusionment: Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investments continue only if the surviving providers improve their products to the satisfaction of early adopters.

Slope of Enlightenment: More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers. More enterprises fund pilots; conservative companies remain cautious.

Plateau of Productivity: Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are clearly paying off.
Hype

GARTNER HYPE CYCLE
EMERGING TECHNOLOGIES, 2016

[Diagram showing the hype cycle for emerging technologies, with various technologies on the x-axis and stages of hype cycle on the y-axis.]

Source: Gartner (July 2016)
Internet of Things
Internet of Things
Internet of Things

Expectations vs Reality
Ways that innovation happens:

- Accidents
- Intersections
- Not knowing status quo
Accidents:

Some innovative ideas are actually repurposed from other (often failed) experiments.
Intersections:

New ideas are often unexpected combinations of existing ideas. Where can we find inspiration?
Status Quo:
Not knowing “how things are done” can be an advantage.
Kremer Prize

Founded in 1959, the first Kremer prize was awarded for the first human-powered flight in 1977. The second was awarded two years later for the first human-powered flight from Britain to France.
“My secret weapon was a complete lack of experience in aircraft wing structural design, while at the same time, having a familiarity with hang gliders and fragile model airplanes. Our competitors also knew about hang gliders, but they were thwarted by knowing so much about standard techniques...I soon found that a dominant factor in the way our minds work is the buildup of patterns that enable us to simplify the assimilation of complex inputs. But the same patterning can be a weakness as well as a strength. The patterning makes it hard for a new idea to get fair treatment.”

Paul MacCready, Science Digest, March 1983
So, how do we innovate while avoiding all of the pitfalls?

How do we create an organization that both Executes and Innovates?
We must learn to:

- Develop Innovative Cultures
- Create Ambidextrous Organizations
An **Ambidextrous Organization** achieves breakthrough innovations while relentlessly improving the way the current mission is executed and the way customers are served.
Incremental: The Known

- Existing / Mature Business Model
- Successful / Scaled Product or Service

1) Process / Product Innovation
   - Continuous Improvement
   - Listen to Customers and the Market

2) Test

3) Execute
Radical: The Partially Known

• Rapidly Expanding Business
• Process or Product Nearing End of Lifecycle

1) Cultivate New Opportunities via Business Model Innovation or by Leveraging New Technologies

2) Lean Innovation

3) Test

4) Execute
Disruptive: The Unknown
• Not Tied to an Existing Product or Process
• Emerging Business
• Take Risks!

1) Search for Opportunities
2) Develop New / Disruptive Business Model, Technology or Opportunity
3) Lean Innovation / Testing
4) Test / Execute / Scale

* Needs to be Completely Separated from Operations! *
An Illustrated History of Apple

Apple, Inc. was incorporated in 1977 by Steve Jobs, Steve Wozniak, and Ronald Wayne, a year after the release of the company's first computer, the Apple I personal computing system. That year, Michael Scott was brought on as Apple's first president, and the company released its popular Apple II. By 1979, Apple had more than 250 employees and had moved its operations to Cupertino. In 1980, the Apple III hit the street and so did the company, going public on the NASDAQ stock exchange. The following is a pictorial timeline of Apple's major product releases and notable changes in management plotted against its stock price.

1981: Mike Markkula named Apple CEO; Jobs named chairman.
1983: John Sculley takes over as president and CEO.
1984: The Apple Macintosh is released. External disk drive required.
1985: Steve Jobs exits Apple; Launches the software company NeXT.
1986: Jobs establishes Pixar after purchasing LucasFilm's computer graphics group for $10 million.
1988: Apple Lisa is released as Apple's first personal computer.
1990: Powerbook 100 released; revolutionizes portable computer line.
1991: Powerbook 100 released; revolutionizes portable computer line.
1993: Apple is ahead of its time in the tablet market with the release of Newton.
1995: Gil Amelio joins Apple as CEO; Apple acquires Sony's 28% stake in Apple.
1997: Steve Jobs named interim CEO upon Amelio's ousting. Title is made permanent one year later.
2000: Say hello to the Apple iPod. Opens first retail store.
2001: The iPod makes computers cool.
2003: iTunes music store opens.
2007: The App Store follows one year later.
2010: Tablet computing grows up with the iPad.

TIMELINE: Stock price from 1980 to January 18, 2011

Computers
iPod
iTunes
iPhone
App Store
iPad
Wearables
Not an Easy Challenge...
Thank you!!!