The Innovator's Dilemma

Extra slides

“The market will be very small”

- Mobile phones: "There will be 10 million mobile phone users in 2000 at maximum, predominantly used in cars"
  - McKinsey advice to AT&T which lead them not to further invest in their mobile invention, 1990.
- Computers: "I think there is a world market for maybe 5 computers."
  - Attributed to Thomas Watson, chairman of IBM, on seeing the first mainframe computer in 1943.
- Xerox: “World potential market for copying machines is 5000 at most"
  - IBM, to the eventual founders of Xerox, saying the photocopier had no market large enough to justify production, 1959.
- Computers: "computers in the future may have only 1000 vacuum tubes and weigh only 1.5 tons."
  - Popular Mechanics, March 1949.

“There will never be a market” - 1

- Computers: "No one will need more than 637 kilobytes of memory for a personal computer."
  - Attributed to Bill Gates, 1985.
- Trains: "No one will pay good money to get from A to B in one hour by train, when he can ride his horse in one day for free."
  - King William I of Prussia, on hearing of the invention of trains, 1864.
- Telephones: "it's a great invention, but who would want to use it anyway?"
  - Rutherford B. Hayes, U.S. President, after a demonstration of Alexander Bell's telephone, 1876.

“There will never be a market” - 2

- Airplanes: “Airplanes are interesting toys but of no military value."
  - Marechal Ferdinand Foch, Professor of Strategy, Ecole Superieure de Guerre, 1904.
- Cars: "The horse is here to stay but the automobile is only a novelty - a fad."
  - The president of the Michigan Savings Bank advising Henry Ford's lawyer not to invest in the Ford Motor Co., 1903.
- Electric Light: "... good enough for our transatlantic friends ... but unworthy of the attention of practical or scientific men."
  - British Parliamentary Committee, referring to Edisons light bulb, 1878.

“There will never be a market” - 3

- Television: “won't last because people will soon get tired of staring at a plywood box every night."
  - Darryl Zanuck, movie producer, 20th Century Fox, 1946.
- SMS: "Nobody is going to spend 50cts per SMS for a teletext based chat service"
  - Guus Jansen, Director of Marketing and Business Development at Telfort, 1998.
- Digital photography: "Why would we change a winning formula?"
  - Attributed board discussion at Polaroid about the need to invest in digital photography, 1999.

“Could be done, but…”

- Internet: "Transmission of documents via telephone wires is possible in principle, but the apparatus required is so expensive that it will never practical."
  - Dennis Gabor, British physicist and author of Inventing the Future, 1962.
- Vacuum cleaners: "Nuclear-powered vacuum cleaners will probably be a reality in 10 years."
  - Alex Lewyt, president of vacuum cleaner company Lewyt Corp., in the New York Times in 1955.

“Can never be done” - 1

- Airplanes: "Heavier-than-air flying machines are impossible."
  - Lord Kelvin, British mathematician and physicist, president of the British Royal Society, 1895.
- Airplanes: "Man will not fly for 50 years."
  - Wilbur Wright, American aviation pioneer, to brother Orville, after a disappointing flying experiment, 1901 (their first successful flight was in 1903).
- Atomic power: "There is no likelihood man can ever tap the power of the atom."
  - Robert Millikan, American physicist and Nobel Prize winner, 1923.

“Can never be done” - 2

- Moon landing: "To place a man in a multi-stage rocket (…) of the moon (…), perhaps land alive, and then return to earth - all that constitutes a wild dream worthy of Jules Verne."
  - Lee DeForest, American radio pioneer and inventor of the vacuum tube, in 1926.
- Cars: “The automobile has practically reached the limit of its development (…) - during the past year no improvements of a radical nature have been introduced."
  - Scientific American, Jan. 2 edition, 1909.

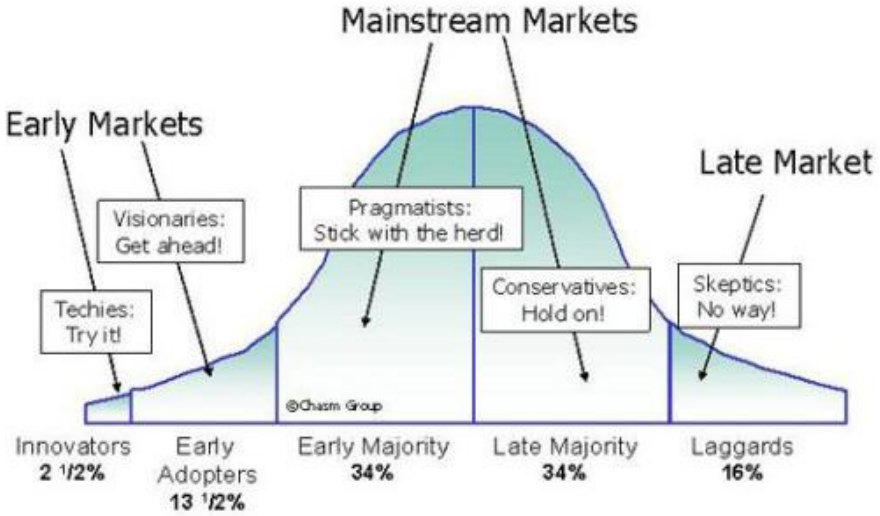
Other quotes

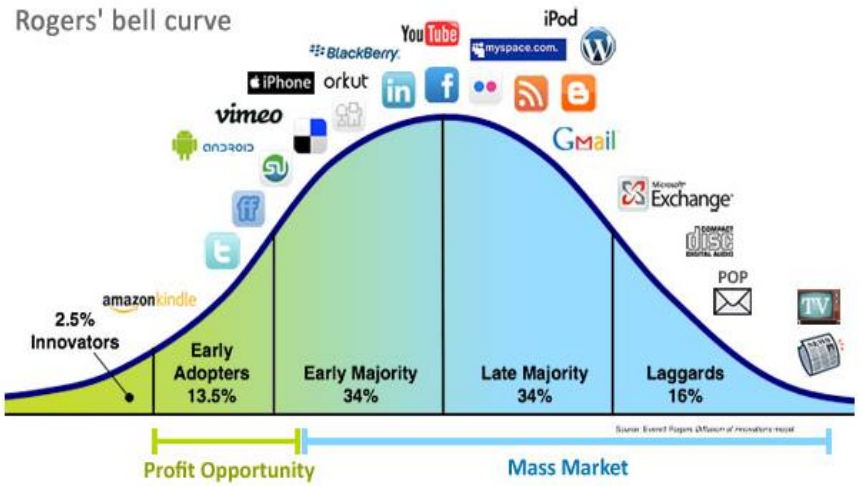
- Apple: “We went to Hewlett-Packard, and they said, 'Hey, we don't need you. You haven't got through college yet.'"
  - Steve Jobs, founder of Apple Computer Inc., on his and Steve Wozniak's early attempts to distribute their personal computer.
- Japanese Cars: "With over fifteen types of foreign cars already on sale here, the Japanese auto industry isn’t likely to carve out a big share of the market for itself."
  - Business Week, August 2, 1968.
- Telephones: “The Americans have need of the telephone, but we do not. We have plenty of messenger boys."
  - Sir William Preece, Chief Engineer, British Post Office, 1878.

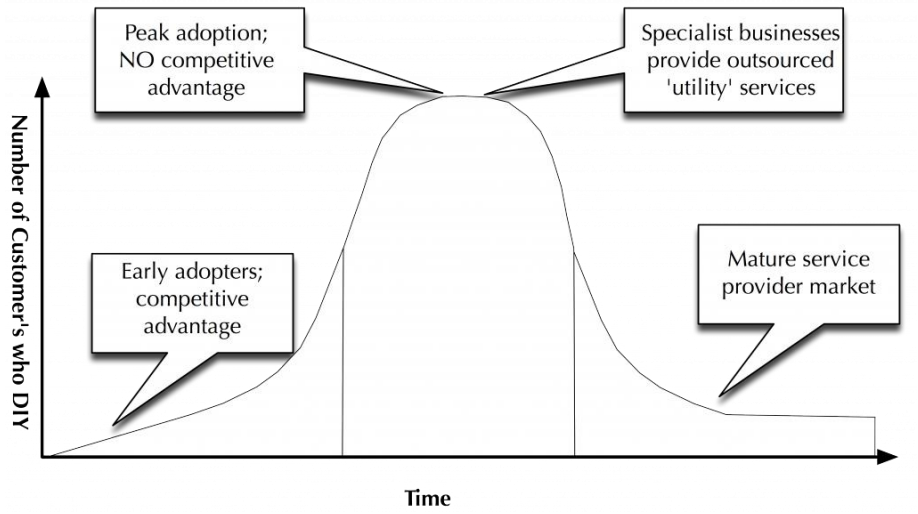
Established vs Disruptive Techs

Established Technology	Disruptive Technology
Silver halide photographic film	Digital photography
Wireline telephony	Mobile telephony
Circuit-switched telecommunications networks	Packet-switched communications networks
Notebook computers	Hand-held digital appliances
Desktop personal computers	Sony Playstation II, Internet appliances
Full-service stock brokerage	On-line stock brokerage
New York & NASDAQ stock exchanges	Electronic Communications Networks (ECNs)
Full-fee underwriting of new equity and debt issues	Dutch auctions of new equity and debt issues, conducted on the Internet
Credit decisions based upon the personal judgment of bank lending officers	Automated lending decisions based upon credit scoring systems
Bricks & mortar retailing	On-line retailing
Industrial materials distributors	Internet-based sites such as Chemdex and E-steel
Printed greeting cards	Free greeting cards, downloadable over the Internet
Electric utility companies	Distributed power generation (gas turbines, micro-turbines, fuel cells)
Graduate schools of management	Corporate universities and in-house management training programs
Classroom and campus-based instruction	Distance education, typically enabled by the Internet
Standard textbooks	Custom-assembled, modular digital textbooks
Offset printing	Digital printing
Manned fighter and bomber aircraft	Unmanned aircraft
Microsoft Windows operating systems and applications software written in C ++ .	Internet Protocols (IP), and Java software protocols
Medical doctors	Nurse practitioners
General hospitals	Outpatient clinics and in-home patient care
Open surgery	Arthroscopic and endoscopic surgery
Cardiac bypass surgery	Angioplasty
Magnetic resonance imaging (MRI) and Computer Tomography (CT) Scanning	Ultrasound—initially floor-standing machines, ultimately portable machines

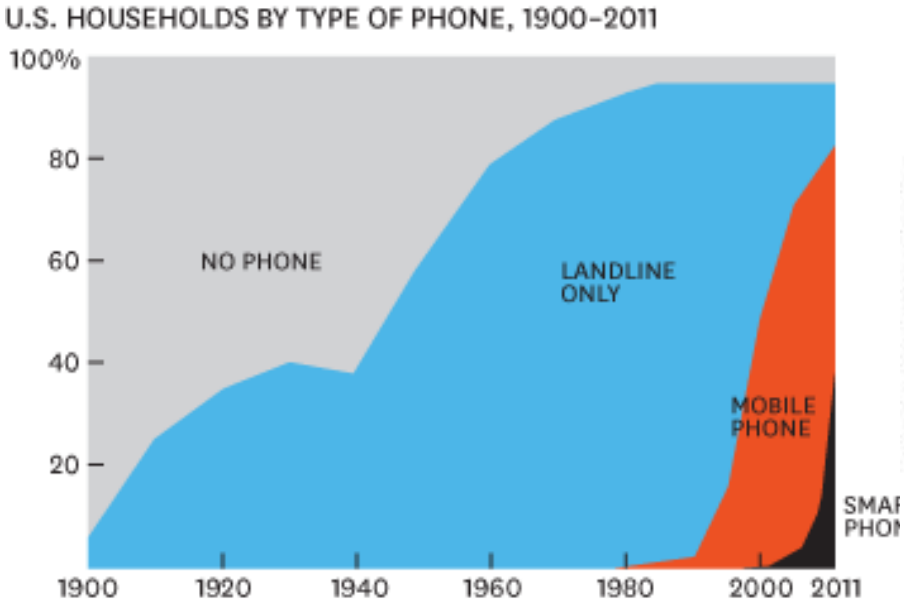
Diffusion of Innovations

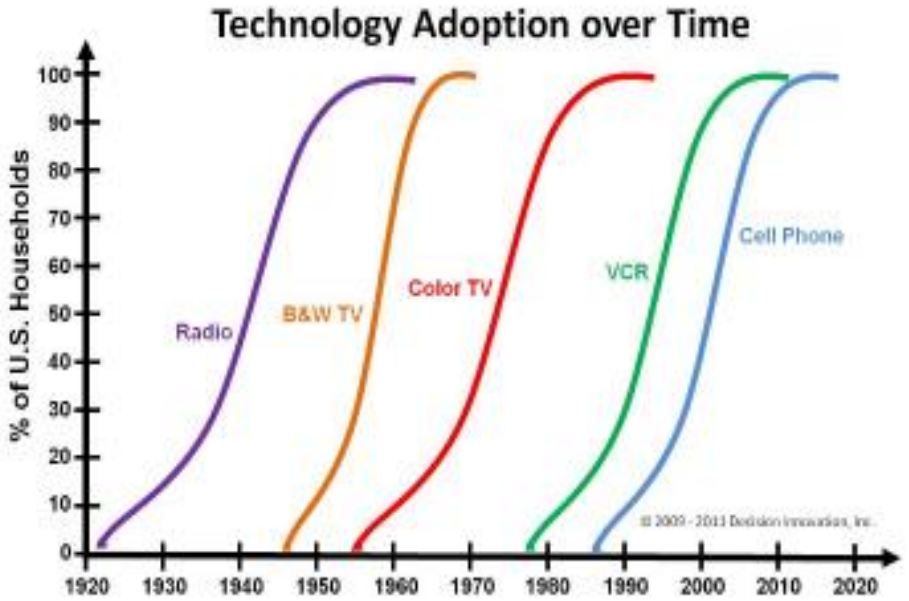


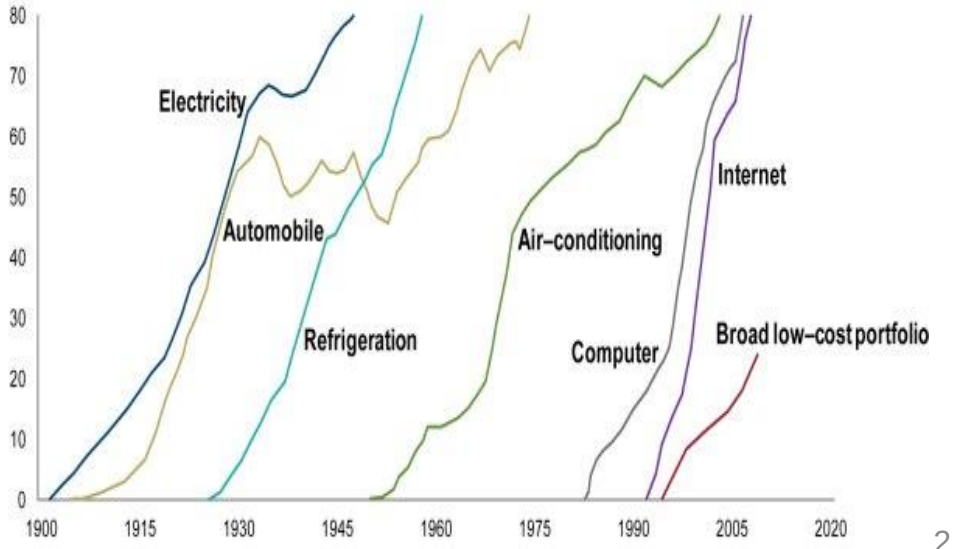




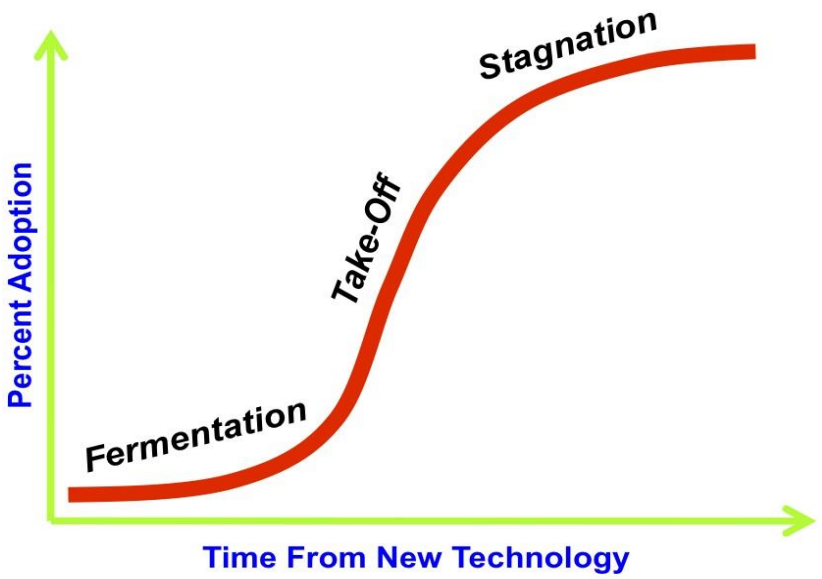
Innovation Adoption

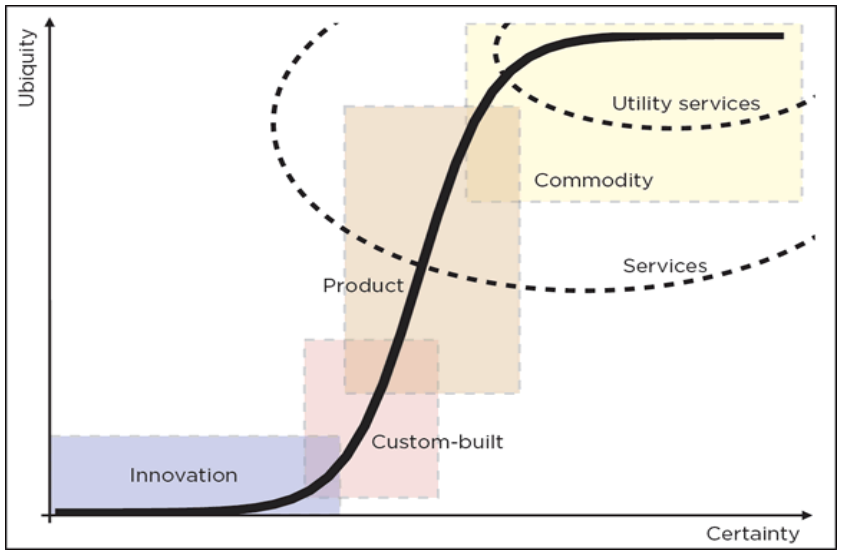


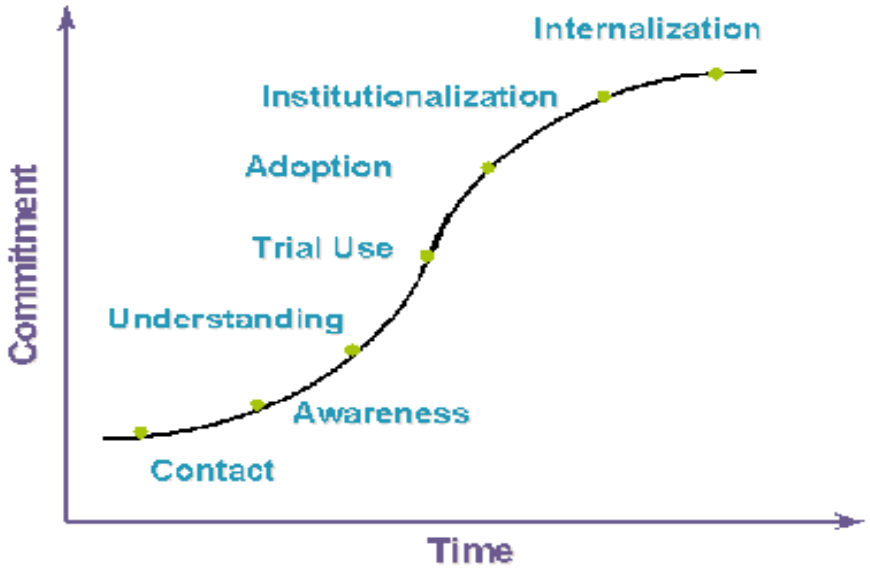


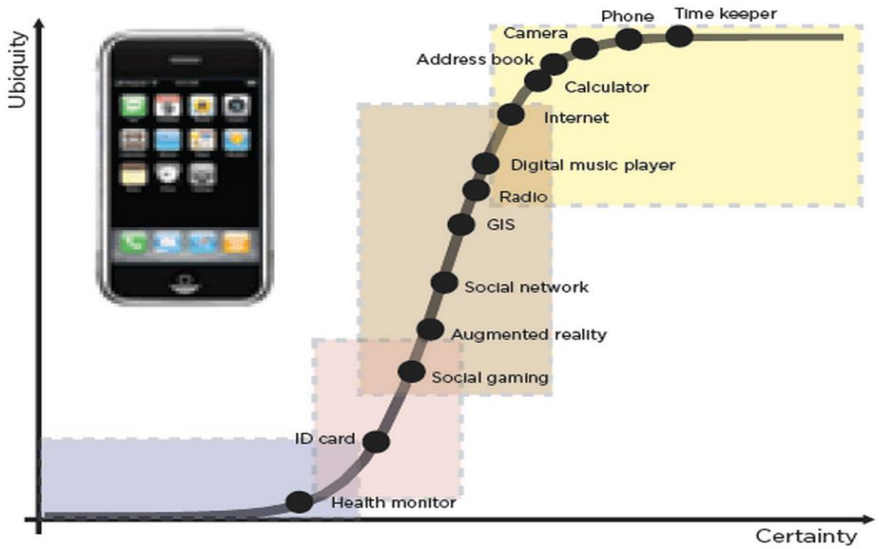


Innovation Growth (S-Shaped)

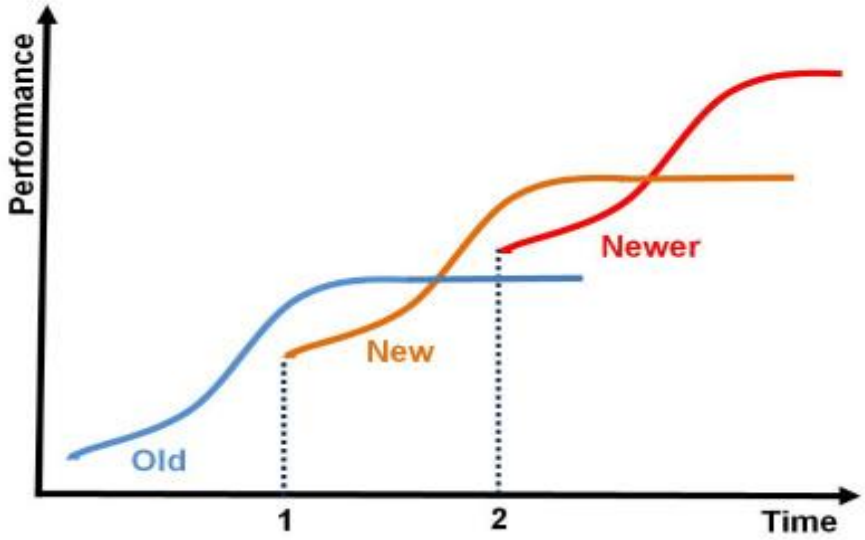


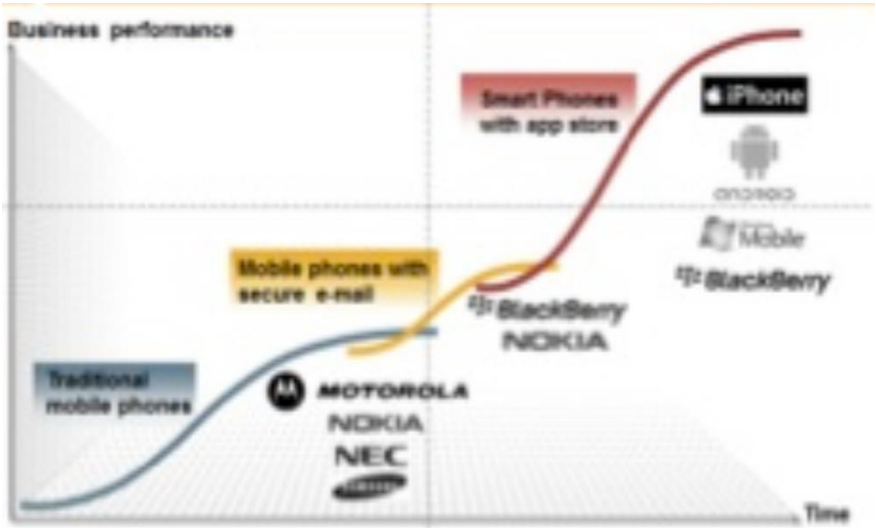


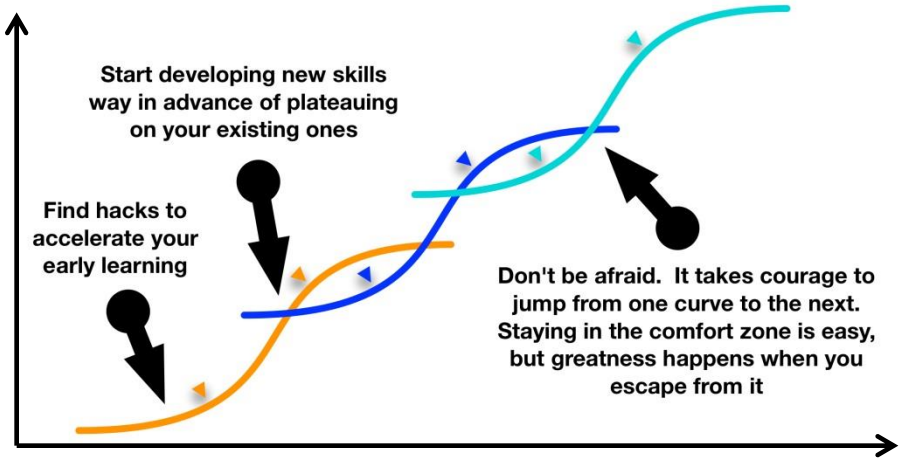


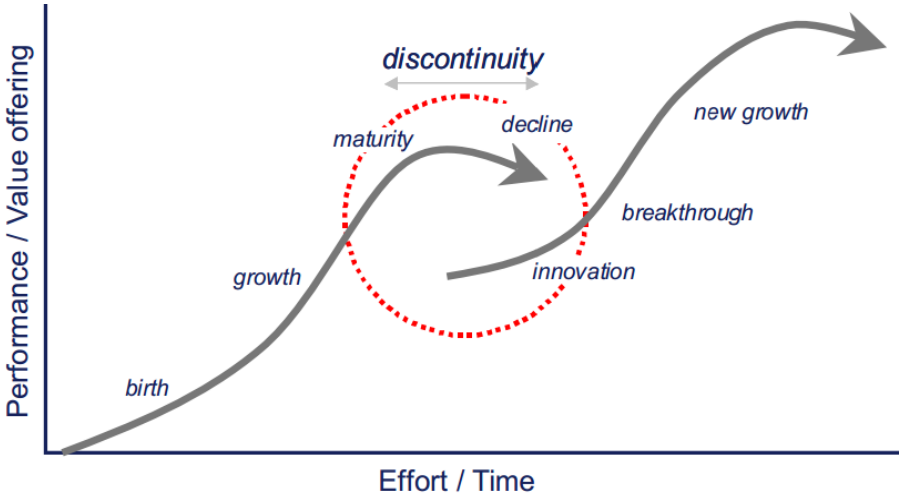


Innovation cycles

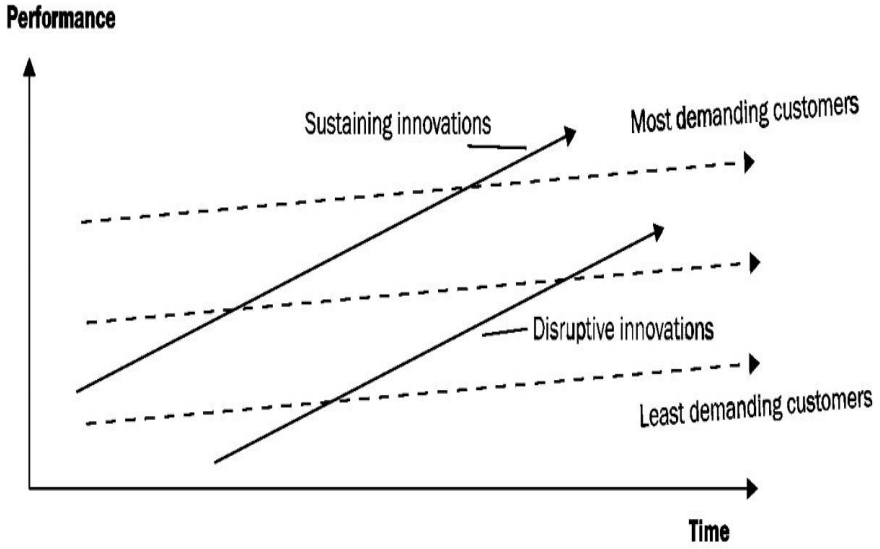


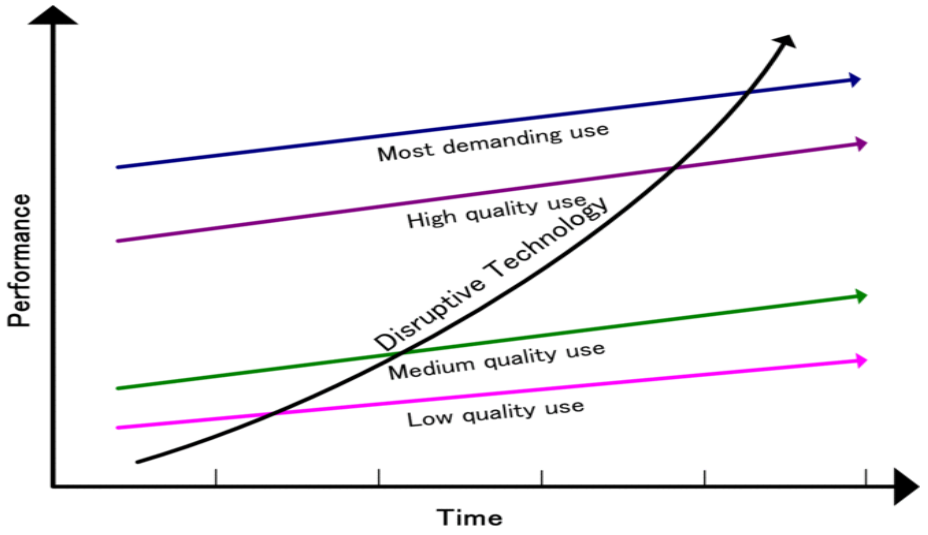


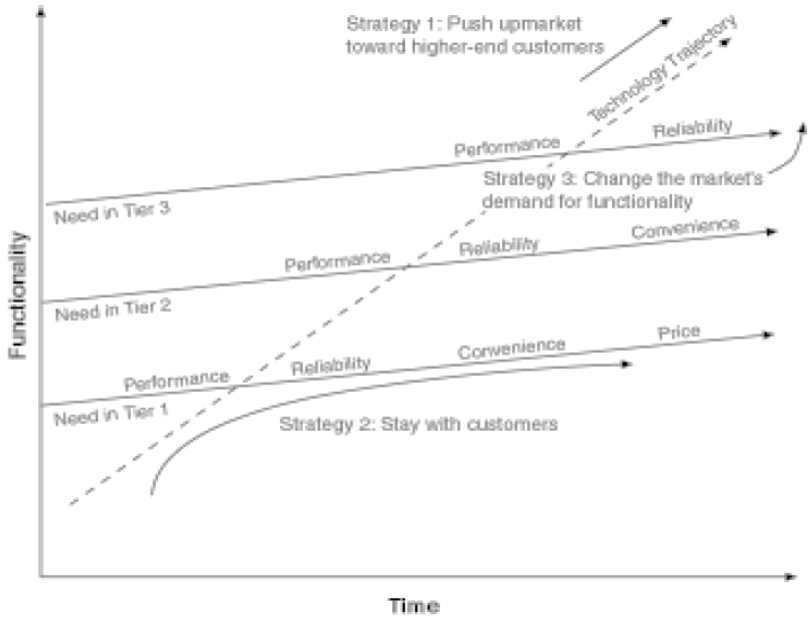


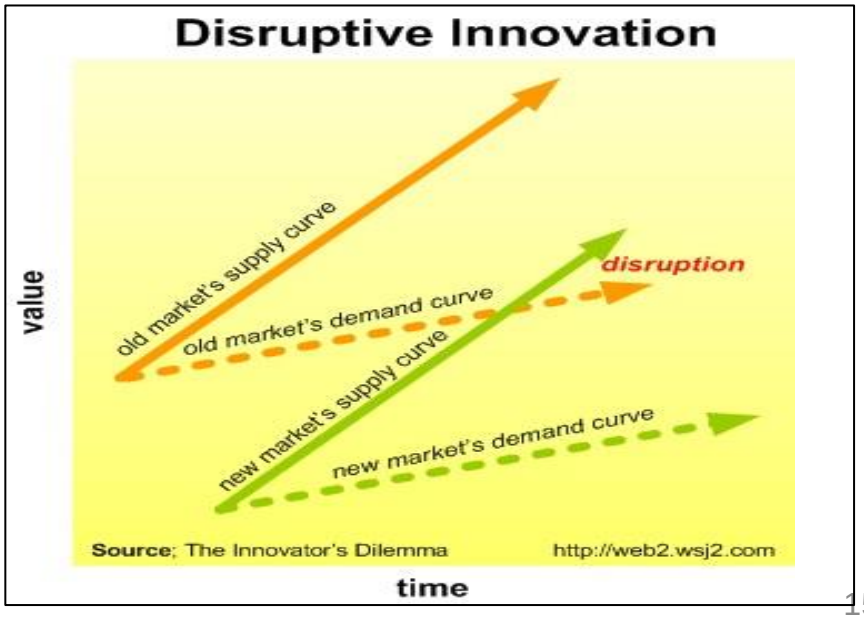


Theory of disruptive innovation

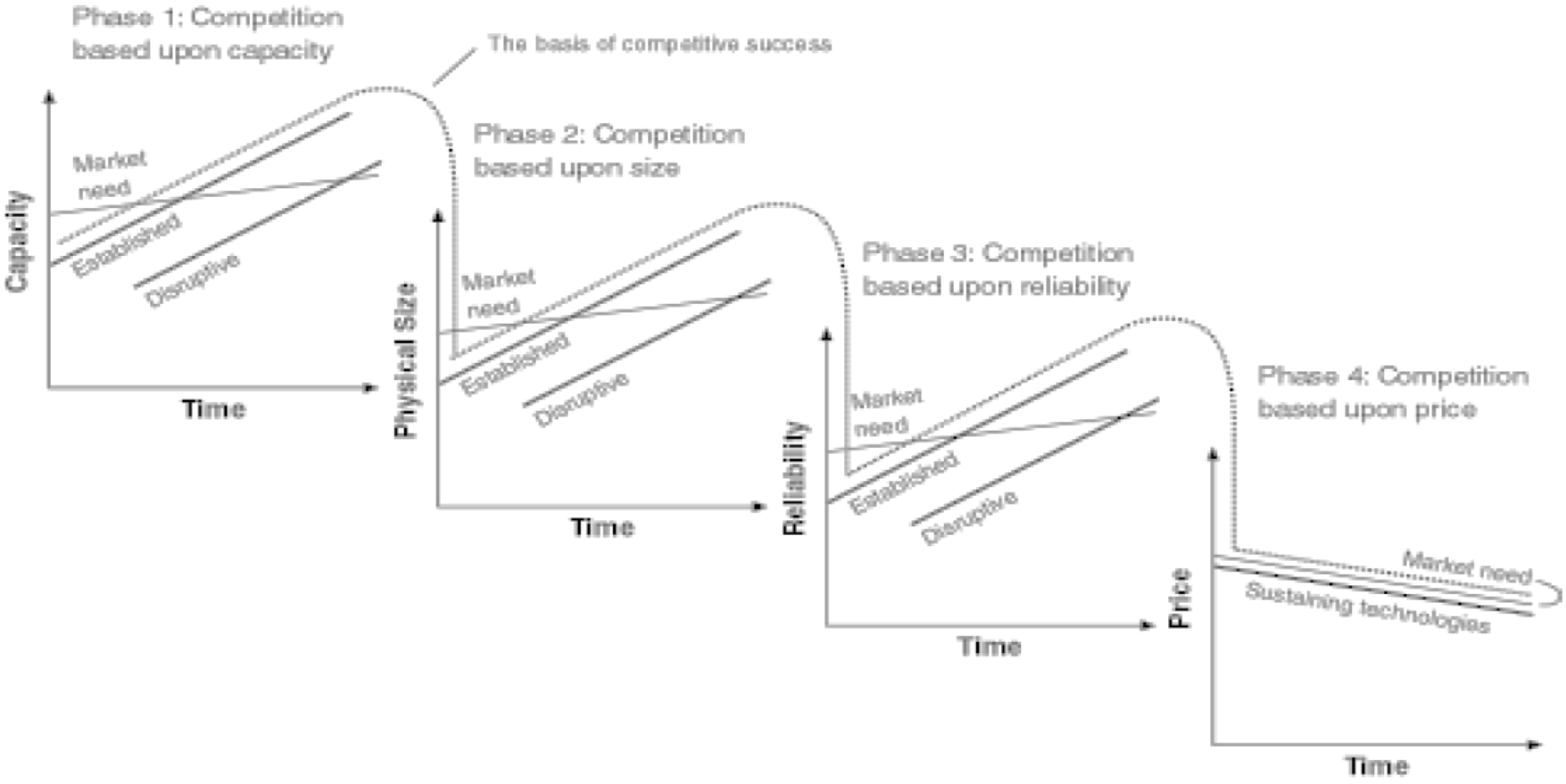




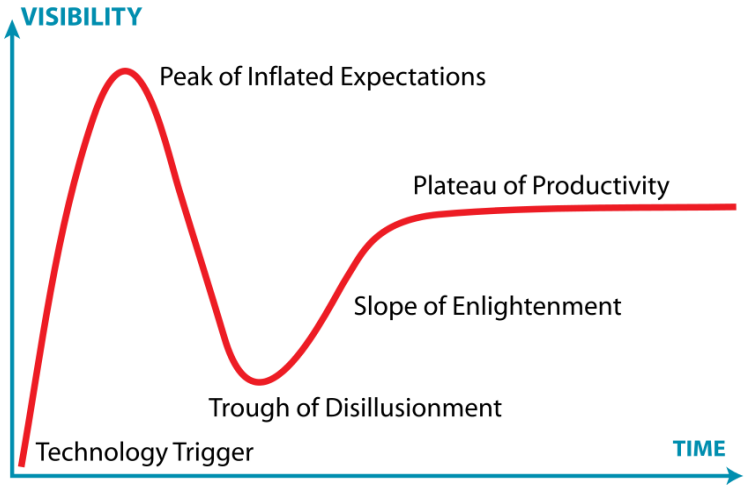


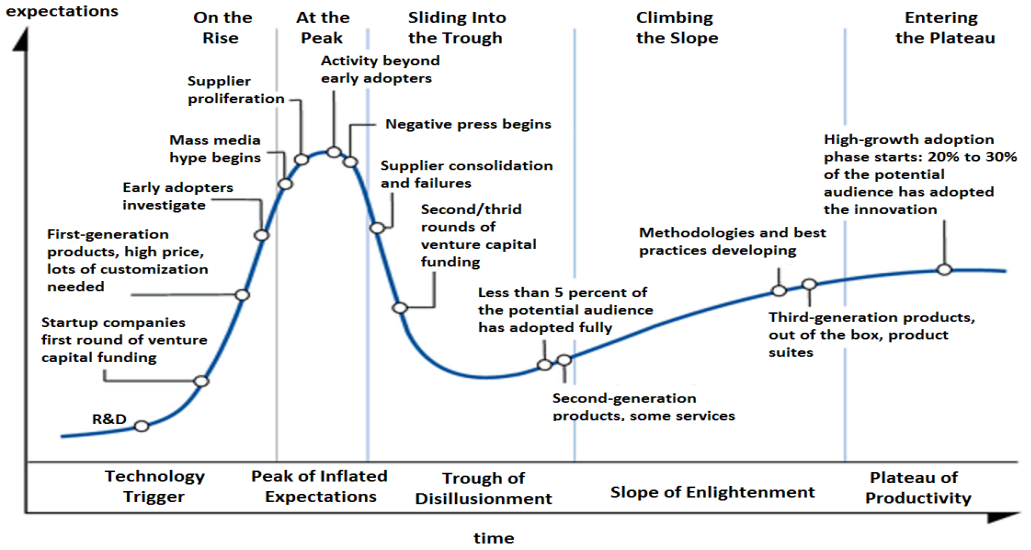


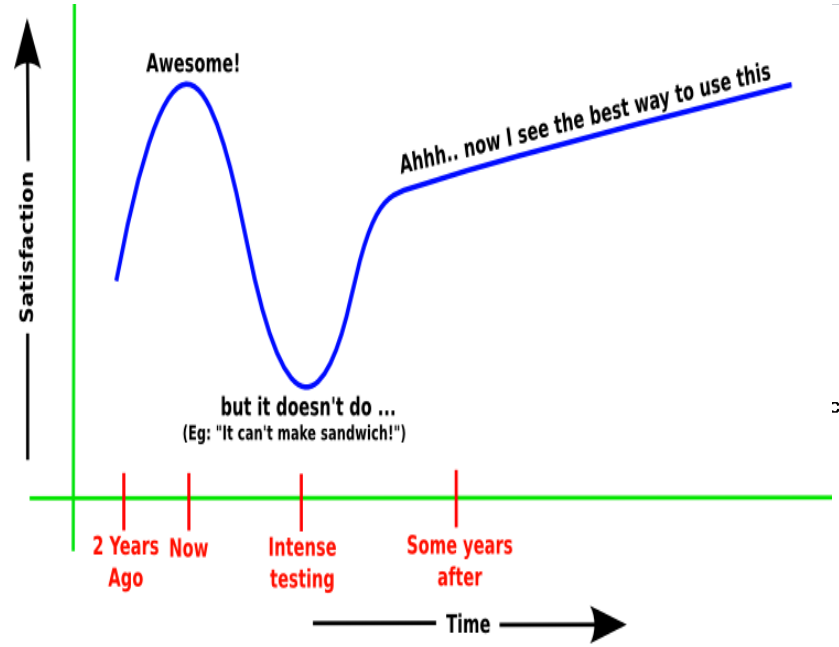
Performance -> Reliability -> Convenience -> Price

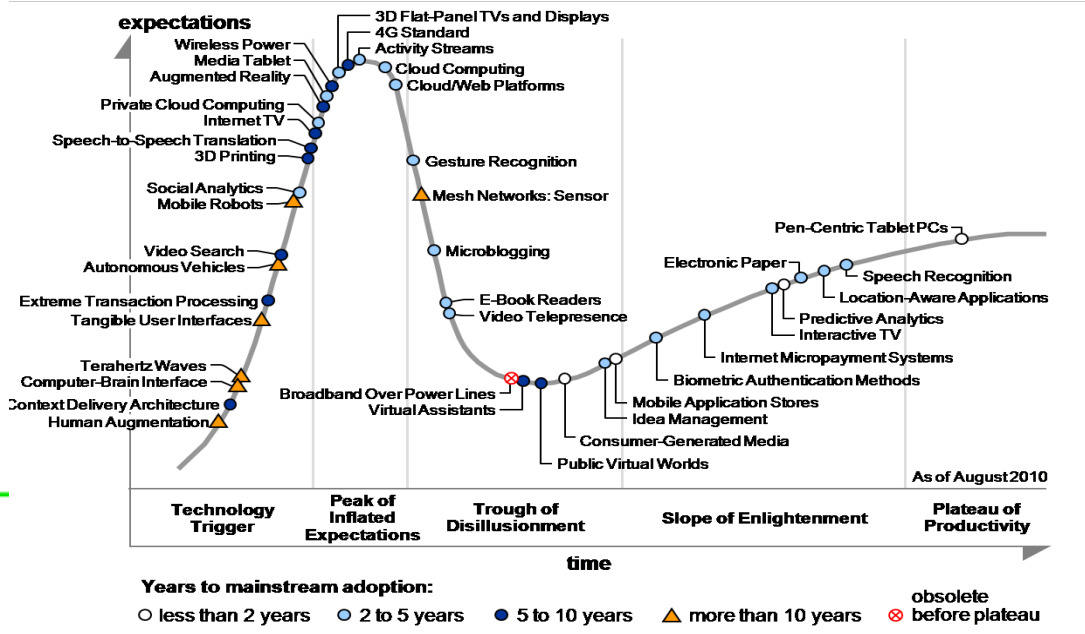


Hype cycle

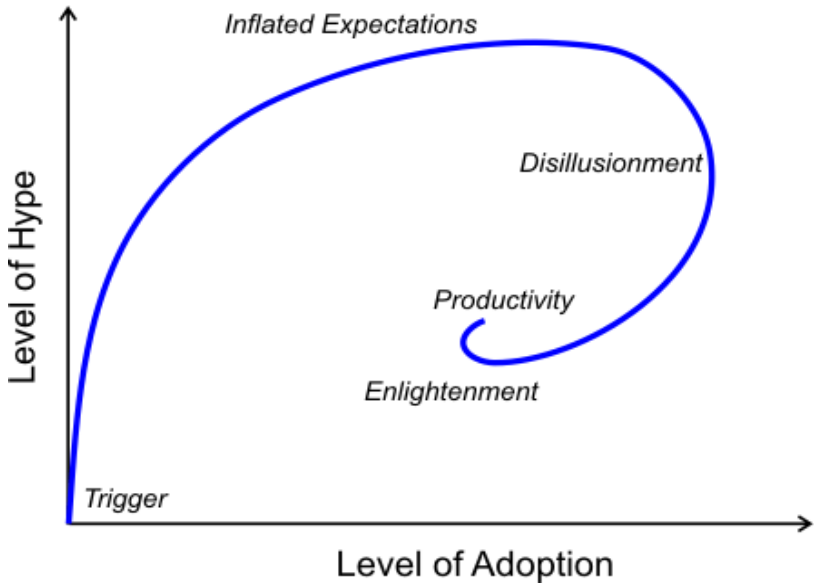

VISIBILITY
Peak of Inflated Expectations
Plateau of Productivity
Slope of Enlightenment
Trough of Disillusionment
Technology Trigger
TIME

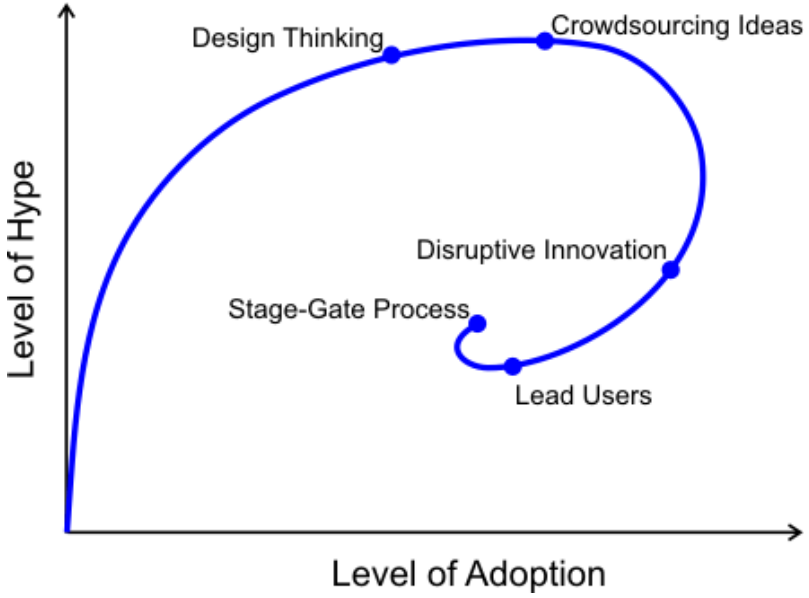

expectations
On the Rise
At the Peak
Sliding Into the Trough
Climbing the Slope
Entering the Plateau
Activity beyond early adopters
Supplier proliferation
Negative press begins
Mass media hype begins
Supplier consolidation and failures
Early adopters investigate
Second/thrid rounds of venture capital funding
First-generation products, high price, lots of customization needed
Methodologies and best practices developing
High-growth adoption phase starts: 20% to 30% of the potential audience has adopted the innovation
Less than 5 percent of the potential audience has adopted fully
Third-generation products, out of the box, product suites
Startup companies first round of venture capital funding
Second-generation products, some services
R&D
Technology Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
time

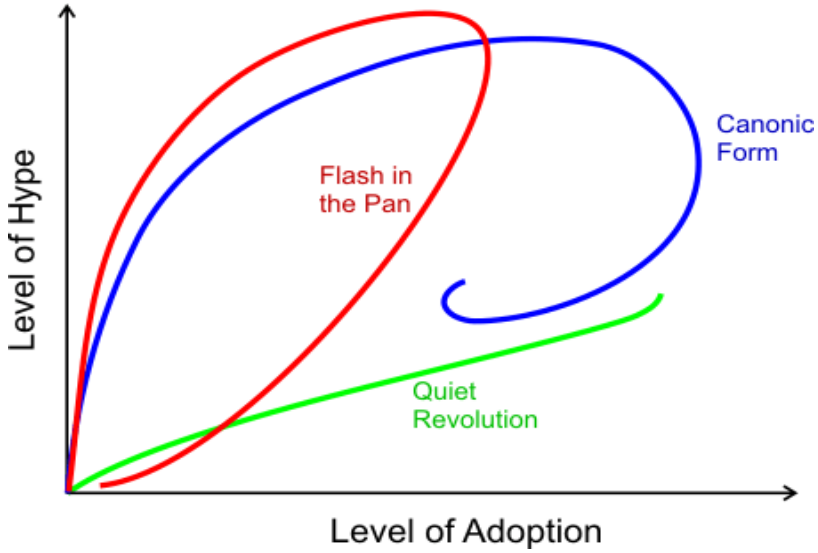

Satisfaction
Awesome!
Ahhh.. now I see the best way to use this
but it doesn't do ...
(Eg: "It can't make sandwich!")
2 Years Ago
Now
Intense testing
Some years after
Time


expectations
3D Flat-Panel TVs and Displays
4G Standard
Activity Streams
Wireless Power
Media Tablet
Augmented Reality
Cloud Computing
Cloud/Web Platforms
Private Cloud Computing
Internet TV
Speech-to-Speech Translation
3D Printing
Gesture Recognition
Social Analytics
Mobile Robots
Mesh Networks: Sensor
Pen-Centric Tablet PCs
Video Search
Autonomous Vehicles
Microblogging
Electronic Paper
Speech Recognition
Extreme Transaction Processing
Tangible User Interfaces
E-Book Readers
Video Telepresence
Location-Aware Applications
Predictive Analytics
Interactive TV
Terahertz Waves
Computer-Brain Interface
Internet Micropayment Systems
Biometric Authentication Methods
Broadband Over Power Lines
Virtual Assistants
Mobile Application Stores
Idea Management
Consumer-Generated Media
Public Virtual Worlds
As of August 2010
Technology Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
time
Years to mainstream adoption:
less than 2 years
2 to 5 years
5 to 10 years
more than 10 years
obsolete before plateau

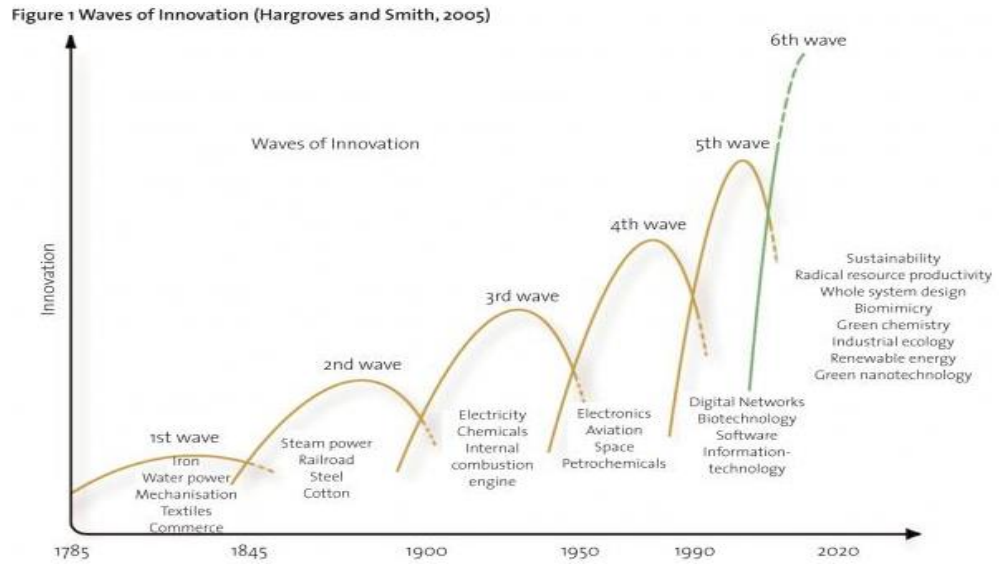
Hype vs Adoption

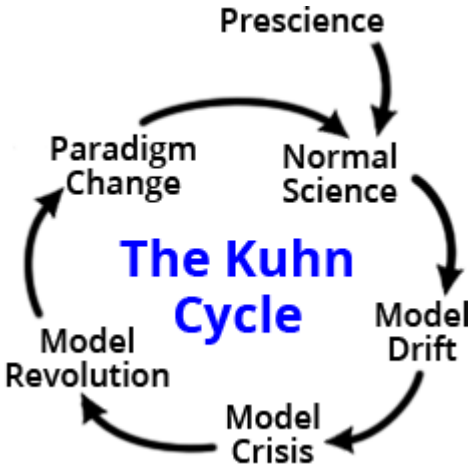


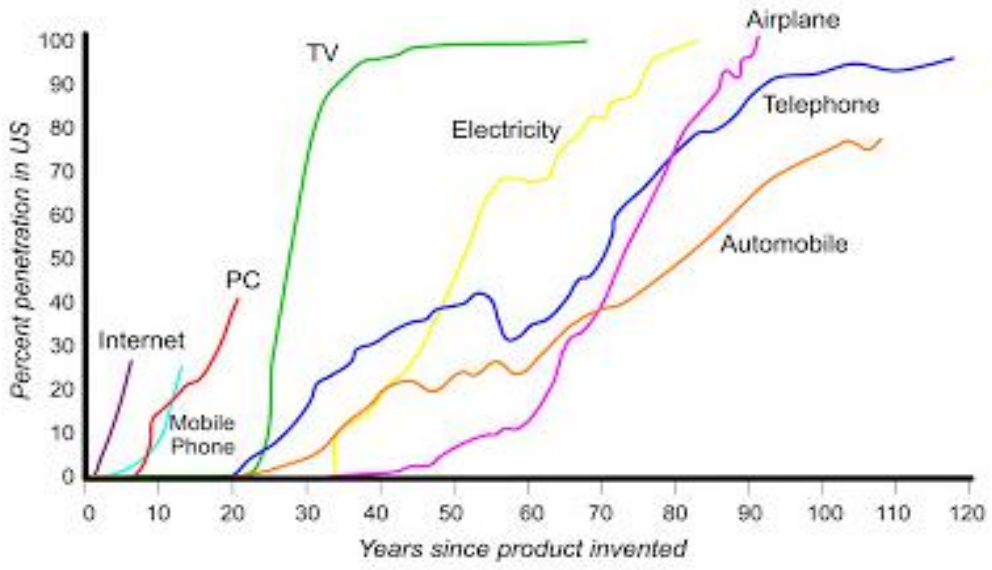


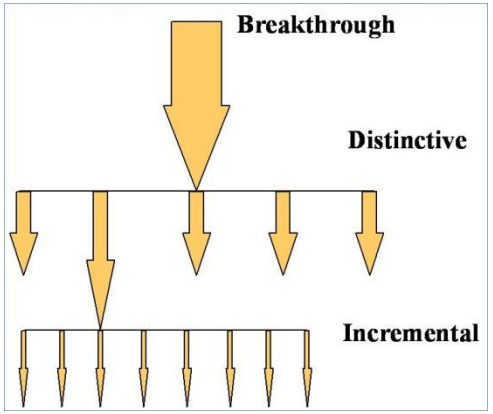


Innovation Speed

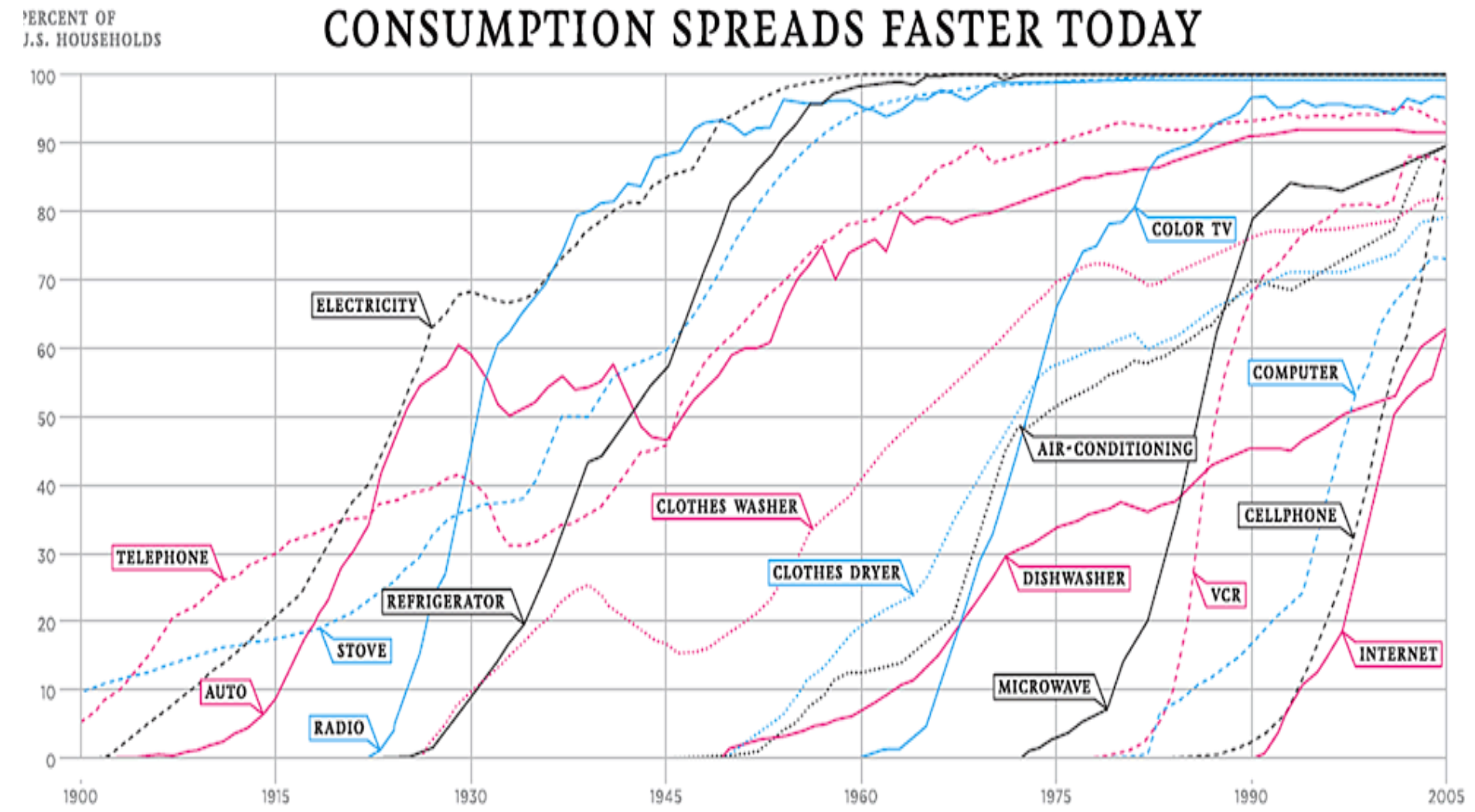








Innovations adoption



Breakthrough Process