Lecture 4

Product and Technology life Cycles
October 10, 2013
HW and Presentations

- HW is assigned weekly and is due on Tuesday at noon
- HW is required of each team
- All HW should be in pdf form
- We will get back with marked and commented results in a few days
- If your team will be speaking then you should also have a ppt presentation. Does not need to be submitted.
- Presentations should last no longer than 10 minutes. 5 is fine
- All Team members should participate
- Everyone participates in short discussion of HW presentations
- We will have one Team presenting before each Lecture
How are technologies adopted?
The Technology Adoption Model

A measure of the rate of adoption of a cluster of new technologies by a community over time.

Early Adopters

Late Majority

Majority

Laggards

Rate of Adoption
Consider adaptation of a new technology

• Age  
• Income  
• Geography  
• Education  
• Sex  
Why should a customer adopt a new technology?

Early adopter?

Late majority?
Can corporate customers be characterized in a similar way?

• Are there companies who are leaders?
• Are there companies who are followers?
• What determines whether a company will be aggressive in adopting a new technology?
• Who are the leaders in
  – Aviation?
  – Computers?
  – Biotech?
  – Energy?
  – Medical devices?
A new medical imaging methodology (MRI+)

“Can I recover my Fees from insurer and keep my patients?”

“Can I build my practice by doing better surgery?”

“I love writing papers and Peer approval”

Top 100 Teaching Institutions

Mass of US Hospitals
The Technology Adoption Model
What about cell phones?

A measure of the rate of adoption of a cluster of new technologies by a community over time
The Technology Adoption Model

What about Big Data for Industrial processes?

A measure of the rate of adoption of a cluster of new technologies by a community over time.
The Technology Adoption Model

A measure of the rate of adoption of a cluster of new technologies by a community over time

Beware of the Gap!
That is technology
What about individual products?
Product Life Cycle

- Intro
- Growth
- Maturity
- Decline

Sales Volume

Time
### Product Life Cycle

**Intro, Growth, Maturity, Decline**

- Where is the investment highest?
- Where does manufacturing process change the most?
- Where should you invest in a new product?
- Where are the largest profits earned?
- Where are there the most competitors?
- Where should you get out of the business (kill the product)?
- Where is cannibalization (replacing an “obsolete” product) a good idea?
- Where is it a bad idea?
Question: How do you make “predictable” increases in sales if any product has a finite lifetime?
Add new products at the right time
Product Life Cycle

OK you add new products, but this generates new uncertainties
Product Life Cycle

Challenges

- Timing of these introductions
- Market acceptance
- Costs
Consider timing

• Introduce new products too quickly

• Introduce new products too slowly
Product/Technology Platforms

To lower cost of introduction, introduce a lot of products from the same technology
Product Introduction
Technology and Market Acceptance

• Because something can be made does not mean that it should be made or that anybody will buy it
How do you know if someone will want to use your technology?
Technology driven vs Market driven

• Technology Driven- we have a technology- now what do we do with it. What examples can you think of.

• Market driven- we have a need- what is the best way of satisfying it, i.e. what is the solution (partial or complete) to a problem

• A good company has a great knowledge of market needs
Hypothesis:

In recent years, Technology is changing our lives faster than ever before
Consider the election of 1860

Lincoln vs Douglas Nov 6,
Abraham Lincoln voted at the Sangamon County Court House in Springfield, Illinois in mid-afternoon, modestly cutting his own name from the ballot.
That evening he went to the local telegraph office and waited for reports on election returns from across the country.
“Those who saw [Lincoln] at the time,” as the New York Times observed, “say it would have been impossible for a bystander to tell that that tall, lean, wiry, good-natured, easy-going gentleman...was the choice of the people to fill the most important office in the nation.” (By Don Sailer)
Impact of Telegraph

- 1838 Patent
- 1851 75 companies 21000 miles of wire
- 1864 100,000 miles

Before the telegraph, information travelled at the rate of a horse galloping or a carrier pigeon
## Inventions

<table>
<thead>
<tr>
<th>Year</th>
<th>Inventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>??</td>
</tr>
<tr>
<td>2010</td>
<td>Social Networking, pocket computer (Iphone), YouTube</td>
</tr>
<tr>
<td>2000</td>
<td>Cell Phones, Internet, GPS, free phone calls,</td>
</tr>
<tr>
<td>1990</td>
<td>PCs, “Supercomputer”, walkman,</td>
</tr>
<tr>
<td>1980</td>
<td>Hand held calculator, microprocessors, word processors, Ethernet, Visicalc (excel), wide popular air travel</td>
</tr>
<tr>
<td>1970</td>
<td>Space Travel, Satellite Communication, photocopier, room air conditioning, laser, IC, audio cassette, arpanet,</td>
</tr>
<tr>
<td>1960</td>
<td>Jet Planes for transport, Video Tape recorder, transistor Radio, oral contraceptives, solar cell, Fortran, Polio vaccine</td>
</tr>
<tr>
<td>1950</td>
<td>Computer, kidney dialysis, nuclear weapons, microwave oven, transistor, Antibiotics</td>
</tr>
<tr>
<td>1940</td>
<td>Nylon, Air transport</td>
</tr>
<tr>
<td>1930</td>
<td>Cheap Cars, Radio, Home appliances, short wave radio, Insulin for Diabetics</td>
</tr>
<tr>
<td>1920</td>
<td>Airplanes, zipper, frozen food</td>
</tr>
<tr>
<td>1910</td>
<td>Safety razor, ductile tungsten</td>
</tr>
</tbody>
</table>
CONSUMPTION SPREADS FASTER TODAY

Derek Thompson  Atlantic Magazine April 7, 2012
1920s

• Between 1923 and 1930, 60 percent of American families purchased radios
1920s

Model T

Model A
Cars

• In 1929 5.3 M cars shipped a record until 1949
Flying frequency

How many air trips, if any, have you taken on a commercial airliner in the past 12 months -- counting each round trip as one trip?

<table>
<thead>
<tr>
<th>None</th>
<th>One to two</th>
<th>Three to four</th>
<th>Five or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>52%</td>
<td>29%</td>
<td>8%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Dec. 11-14, 2006

But when did this really start?

• "For the first time the ordinary man began to fly with us," observed Juan Trippe, longtime head of Pan American. By 1955 more Americans were traveling by air than by railroad.

• Traffic Jams in the Sky
  So many ordinary people began to fly that the industry had to struggle to serve them.

Boardings more than doubled from 17.3 million in 1950 to 38 million in 1958.

By 1955 more Americans were traveling by air than by railroad.
Transition in the 50s
1957-2013

• Speed Essentially the same
• Fuel economy
  – 1960 and 2000  55% overall fuel efficiency gain
• Aviation Safety – fatal accidents
  – 1950s and 1960s  once every 200,000 flights.
  – 2013  once every 2 million flights.
Cost dropped with de-regulation

Air Travel: Real Cost per Mile (with fees) 1979 to 2011

Source: Airlines for America

Carpe Diem Blog
Can you have predicted this?

• Perhaps easier when a product is already launched and accepted.

• Hard at the very beginning
Missed Forecasts at the beginning

A “reasonable” forecaster would not have predicted
The computer in 1940
The transistor in 1945
The Laser in 1950
Comsats in 1955
LSI in 1960
Handheld calculators and microcomputers in 1965
Cellphones in 1980
The Internet in 1990
With Exceptions
Consider Arthur C. Clarke

“Extra-Terrestrial Relays: Can Rocket Stations Give World-wide Radio Coverage?”
– Wireless World Oct, 1945