

- Technology and business change, disruption
- “Amazon didn’t create a new business model”
- I’m CS
- Technology and business (not models)
- History for context



## └ Light

- Lamp lighters out of work
- Different install/repair skills
- Fewer bulb changers



## └ Transport

- cars, buses, cities, infrastructure (cleaning)

end: street cleaner

Looks hot out, cold drink? Plan in advance...

## └ Refrigeration



New England ice trade, 1856

- Cut and store; scale up; luxury
- Indian - built 1842 - business collapsed in 1880 from steam process
- Frederick Tudor, Ice King of the World; American, established the ice trade; shipped ice to Caribbean, Europe, India from Boston (100 days); first ship went to Martinique
- Legal squabbles - ownership of ice sources
- Plant ice; steam process; refrigeration systems

end: NE ice trade

## └ Music



- LP's -> CD's -> iTunes (electronic purchase) -> discovery services
- Similar for video: VHS -> DVD -> rental -> Netflix DVD -> Netflix streaming and discovery (e.g., youtube)

end:

## └ Photography



- Ernest Shackleton's ship, the Endurance. Slowly crushed. Photographer Frank Hurley dove for plates.
- Edwin Land, 1947 camera. First instant camera. Niche market compared to roll film.
- MIT story, Columbia lab, 9th floor (U.S.) window, first inexpensive polarizing film, led to founding Polaroid Corporation.
- Evolution of technology (quicktake only Si Valley, really)
- Now two main markets left, and photographers get paid less, due also to internet stock photography

end:



## └ Cleaning

- Cleaning takes time
- Or hire someone
- Or a machine does it
- Maybe a bit left to do by hand

end: guy with bucket

## └ Real Estate

Real Estate



The screenshot shows the Redfin website homepage. At the top, there's a banner with a woman smiling and the text "Redfin Is Real Estate Redefined". Below the banner, there's a search bar with fields for "City, Zip, Address, School" and dropdown menus for "Radius" (1 mi, 5 mi, 10 mi) and "Sort by" (Price, Distance). A large image of a house is visible, along with some text about saving thousands in fees when your agent and website work together.

- Anglosaxon world: agents
- France: p2p
- Increasingly: internet
- Redfin: hybrid

end: redfin

## └ Personal Transport



- UK, US
- Cities now
- London response (adopt new business techniques). French response (old business techniques).
- One rebranding effort
- Outside cities, ride sharing (more efficient than decades past)
- Self-driving cars (taxis, car dealers (ownership), data, urban infrastructure (parking, safety margins); public health; Cars-as-a-Service)

end: Google car

transition: want to make a phone call, 30 years ago became possible

## └ Mobile communication



- Initially, filling non-existent need
- Disruption 1 (and running out of phone numbers)
- Disruption 2 (iPhone 29 Jun 2007)
- iphone (30-50m sold per quarter); android (50-90m sold per quarter)
- Instagram (10/2010 release; 4/2012 1e8 active users and fb purchase at \$1e9)
- Phone now tcp/ip device
- Democratization, ubiquitous networks; non-wiring the third world

end: fb drone

transition: what pays for this?

## └ Advertising



- Newspapers sell copies, but mostly sell advertising. News is the waste product.
- Hearst Castle, San Simeon; William Randolph Hearst
- Now waste product is search, maps, news, social, email
- Meanwhile, newspapers ripe for disruption; 24 Jan 1986 typesetters strike; Musée de l'Imprimerie

end:

## └ Translation

Translation



- Most translation is now machine
- Humans internet delivery (non-local clients), TZ shift, lower wages
- Democratization: individuals, web browsers, translate.google.com
- Mechanical Turk (\$1/hr), captchas
- (The Turk, 1770 ff, Wolfgang von Kempelen)

end: The Turk

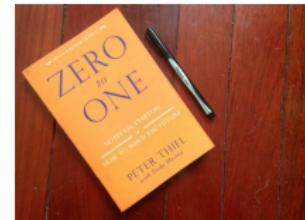
└ Books



- Self-publishing used to be unrespectable, now majority
- Long tail effect (below cost of advance, publisher's efforts)
- Niche audiences possible
- Blogs, wikipedia (encyclopedias killed by PC's)
- At high end, more profit (e.g., J. K. Rowlings ebook versions)
- Kindle Scout = crowd sourced
- Not clear yet how this will affect book publishing and book-related businesses

end:

## └ Tech Startups



- AWS, Google etc. means low startup costs
- Most services available free or for rent (cheap)
- Example: Whatsapp, 600m users, 50 people, \$19b
- Peter Thiel (Paypal, Palantir) - good ideas should seem like bad ideas to most people

end: Zero to One

└ Risk



- Risk is derivative of something (often price) with respect to something (high dimensional manifold (hopefully))
- 1e6 computer hours per day [press]
- Pricing accuracy determines profit expectations
- Story about interactive counterparty risk (start with RT and ON risk)

end:

└ Education,



## Problems:

- Free (for now)
- Identifying people
- Preventing cheats
- Recognition of diplomas

Maybe one or two universities per major language.

end: ring