



Seven Trends That Will Dramatically Change Business

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Ground Rules

- This session is for you, so please participate.
- These are tricks and tips that worked for me, but might not be right for everyone or every situation. Please consult a coach or physician to find a program that is best for you.
- No animals were harmed during the creation of this presentation. Please support your pet rescue groups.



Trends, not prognosticating

- Trends Not Covered
 - Artificial intelligence
 - Robotics and factory automation
 - Hyper-connectivity
 - IOT
 - Politics
 - Global warming



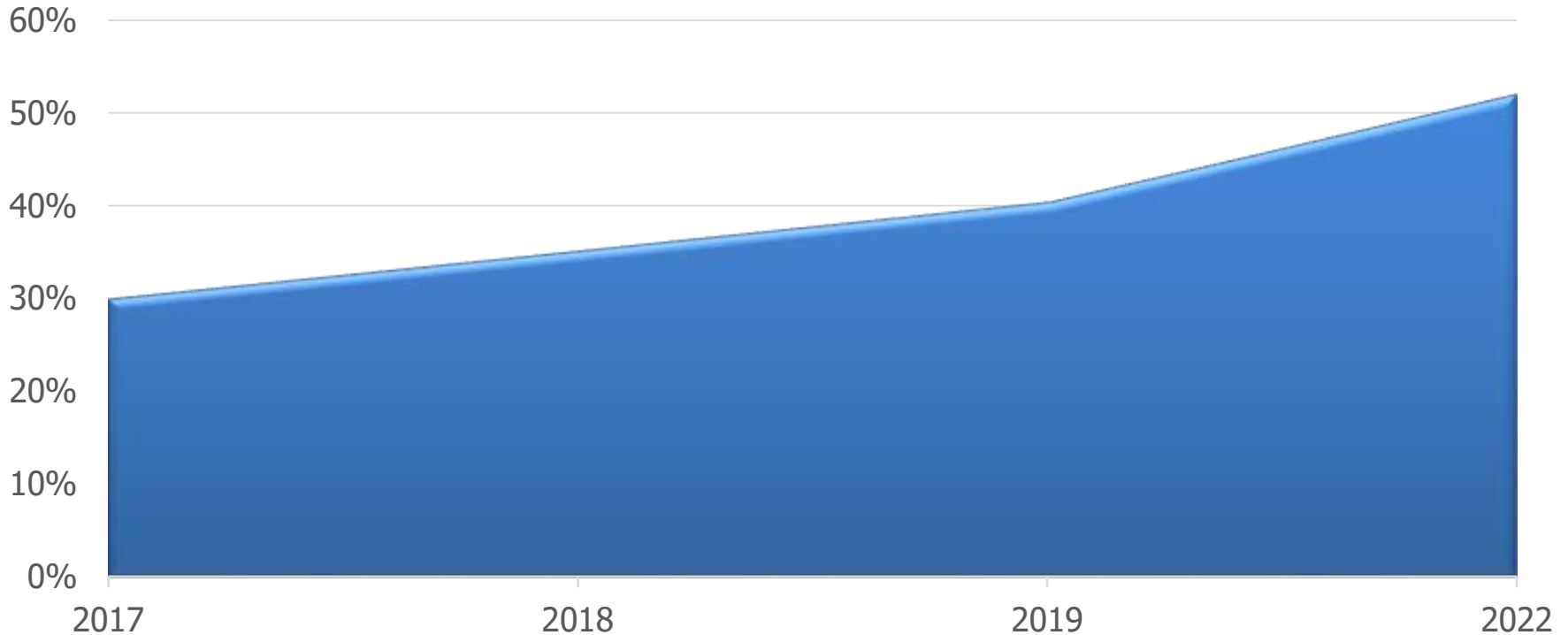
Hans's Seven Trends to Watch

1. Peer to Peer Economy
2. Increased Stratification
3. Nation States vs Corporations
4. Rise of the Content Producers
5. Singularity: Data Will be Free!
6. Battle for Resources
7. Building a Better Person



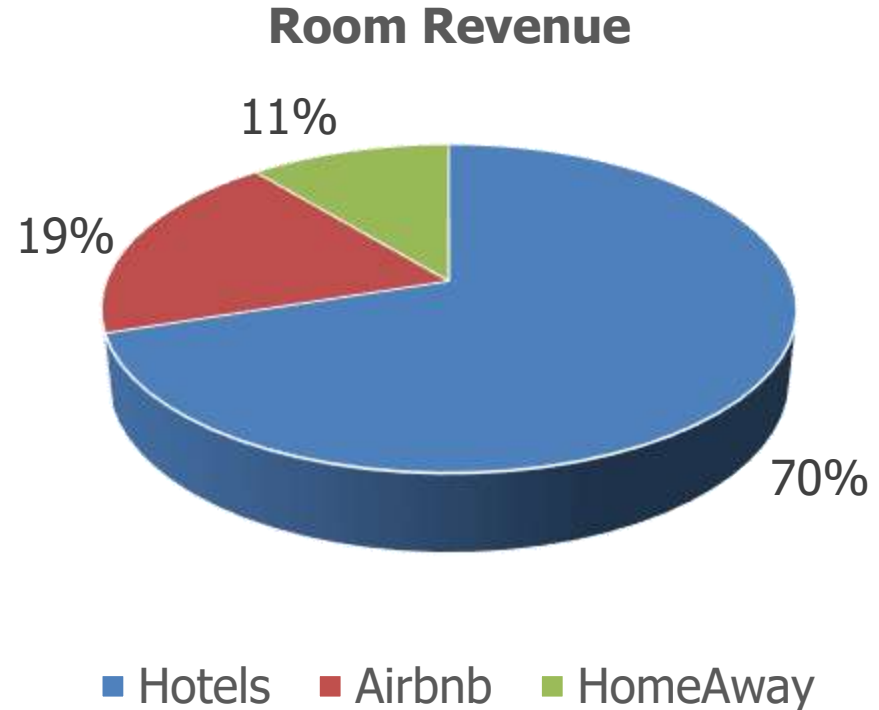
PEER TO PEER ECONOMY

Peer to Peer – Mobile Payments



- <https://www.emarketer.com/content/the-mobile-series-mobile-peer-to-peer-payments-infographic>

Ride Sharing and Room Nights



- <https://www.vox.com/2018/3/15/17126058/uber-lyft-taxis-new-york-city-rides>
- <https://www.forbes.com/sites/michaelgoldstein/2018/06/08/uber-lyft-taxi-drivers/#587813d059f0>

Peer to Peer - Personal Services

Task Rabbit

- 140,000 members
- 350,000 tasks

Scams and Fakes

- 2019 Super Bowl:
\$24 million fake tickets and merchandise
- 2017 Events:
More than 5 million fake tickets sold

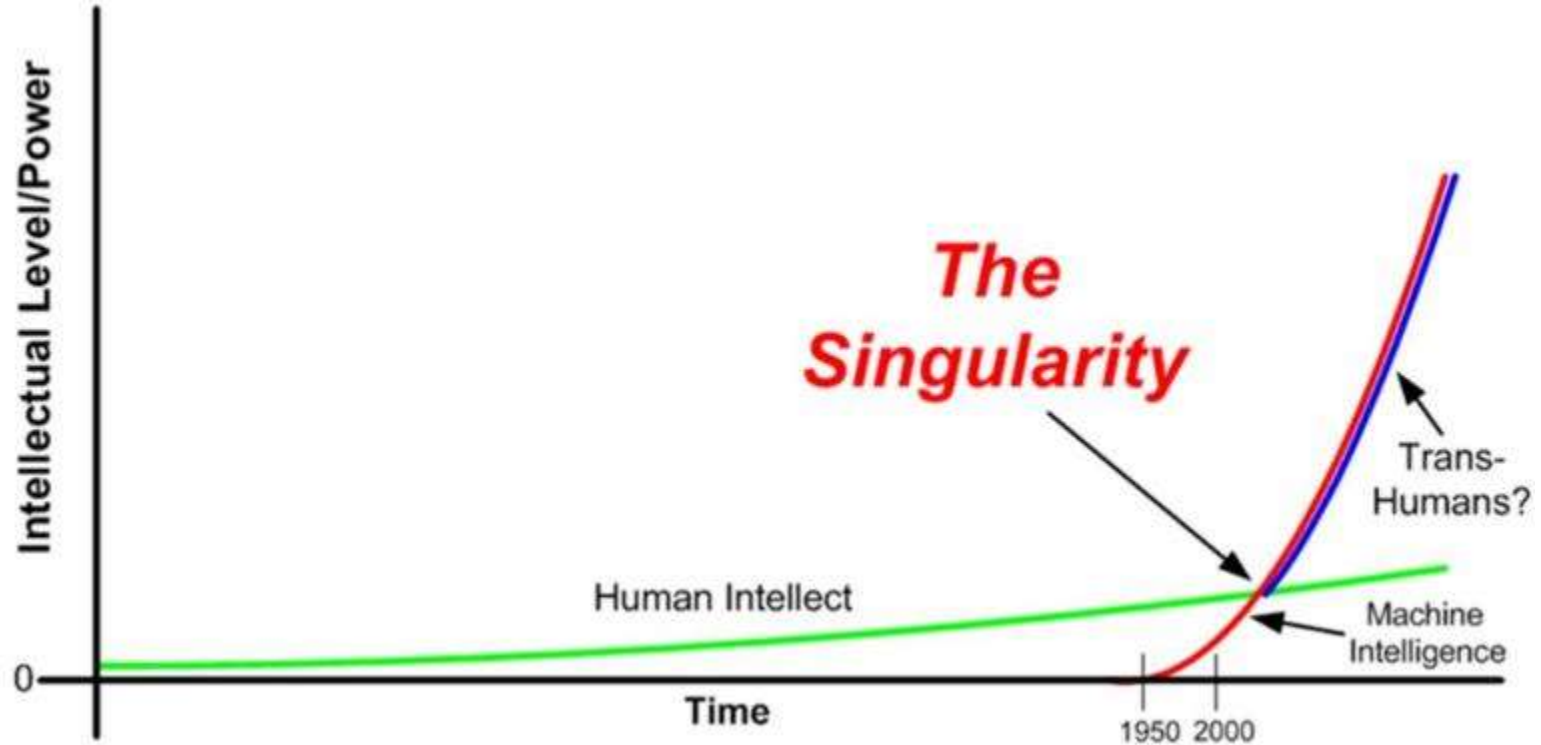
- <https://expandedramblings.com/index.php/taskrabbit-statistics-and-facts/>
- <https://www.marketwatch.com/story/fake-super-bowl-tickets-and-merchandise-are-a-24-million-business-for-criminals-2019-02-01>
- <https://www.digitalmusicnews.com/2017/12/08/fake-tickets-scam-protect/>

How to Apply

- Update your product roadmaps and capabilities
 - Is Peer to Peer a competitor or channel?
 - Define new markets, segments, and users
 - Can you become an enabler for peer services?

SINGULARITY: DATA WILL BE FREE!

Technological Singularity



- <https://www.sramanamitra.com/2017/07/05/man-and-superman-life-near-an-approaching-technology-singularity/>

Lessons from Chess



- 1770 Mechanical Turk by Wolfgang von Kempelen
- 1997 Deep Blue (IBM) supercomputer beats Garry Kasparov
- 2017 AlphaZero (Google) defeats Stockfish
- 2018 Garry Kasparov “Merge with technology”

- https://en.wikipedia.org/wiki/The_Turk
- <https://www.theringer.com/tech/2018/11/8/18069092/chess-alphazero-alphago-go-stockfish-artificial-intelligence-future>
- https://www.theregister.co.uk/2018/05/10/heres_what_garry_kasparov_an_old_world_chess_champion_thinks_of_ai/

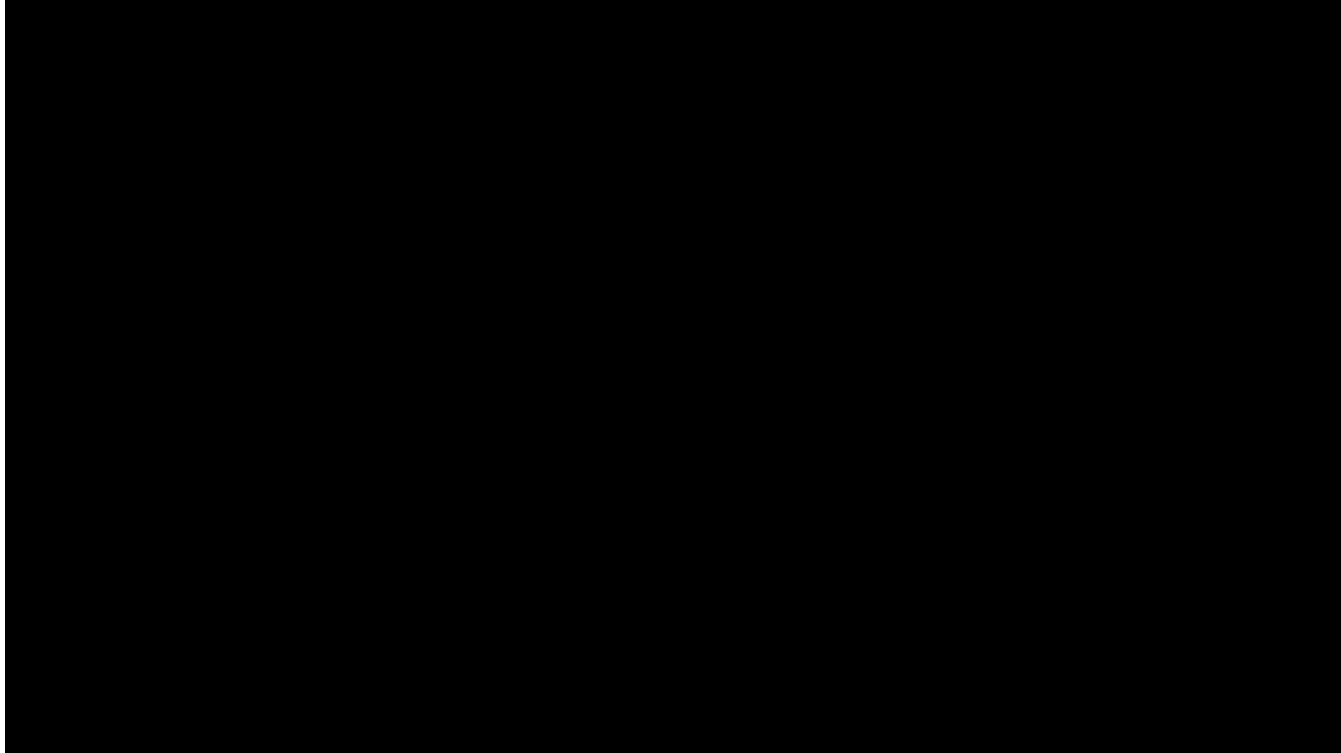
Diagnosis - Awesome

Detecting cancer in slides of lymph node cells

- Automated Diagnostic: 92% accurate
- Human Pathologist: 96% accurate
- Combined: 99.5% accurate

- <https://healthcare-in-europe.com/en/news/artificial-intelligence-diagnoses-with-high-accuracy.html>

Deep Voice = Deeper Concerns



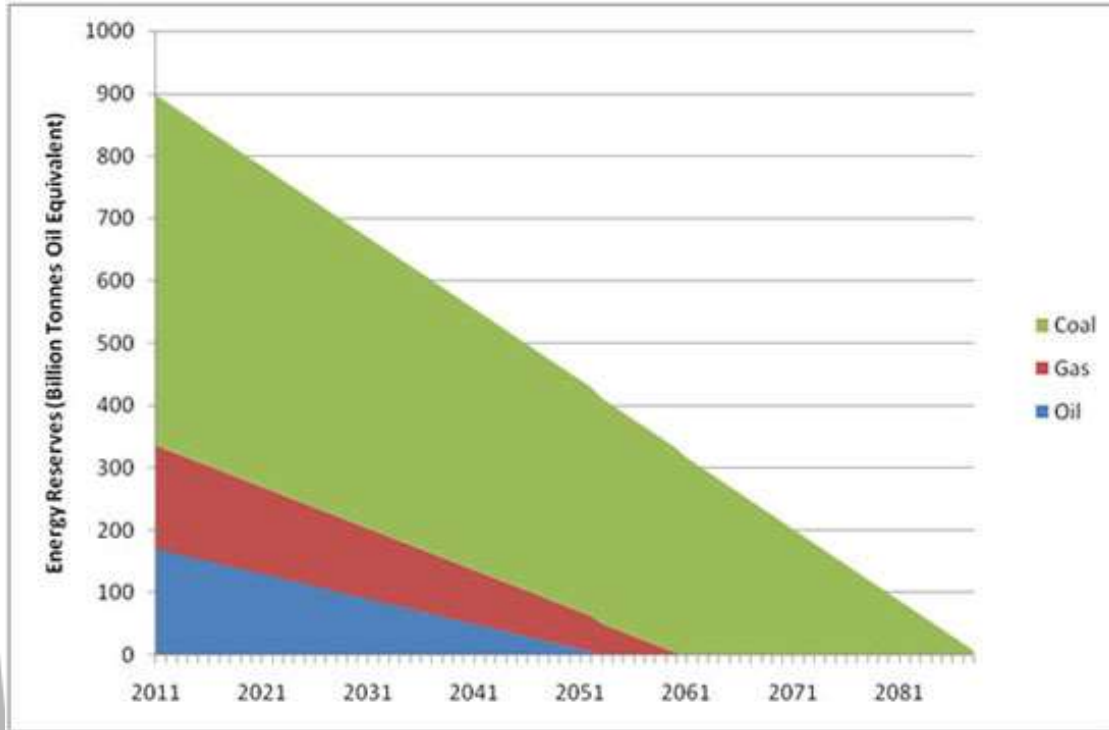
- <https://youtu.be/cQ54GDm1eL0>

How to Apply

- Increase automating information processing
- Combine people with A.I. analysis
- Build in checks and balances

BATTLE FOR RESOURCES

The End of Fossil Fuels



Adjusted to Fill Gap:

- Oil – 53 years
- Gas – 52 years
- Coal – 150 years

Reserve and consumption data from CIA World Factbook and Statista cited below.

- <https://www.ecotricity.co.uk/our-green-energy/energy-independence/the-end-of-fossil-fuels>
- <https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html>
- <https://www.statista.com/>

Perception Triggers Reality

- 2005 Governor Purdue declares emergency after hurricane Katrina, triggers shortage in Georgia
- 2016 Governor Deal declares emergency after pipeline leak in Alabama, triggers shortage in Georgia

- <https://www.ajc.com/blog/investigations/gas-shortage-prompted-angry-emails-governor/Qe104UXd4roY2Ff0Mv6jJ/>
- <https://newschannel9.com/news/local/georgia-governor-deal-declares-state-of-emergency-in-wake-of-pipeline-problems>
- https://www.sourcewatch.org/index.php/Hurricane_Katrina:_Gas_and_Oil_Shortage

Mismatch of Training and Jobs

- 80% of construction firms having a hard time finding qualified workers
- 68% more infrastructure jobs (next five years) than there are people trained to fill them
- Caterpillar partners with mikeroweWORKS to fill its 18,000 service technician positions

• <https://www.forbes.com/sites/kathycaprino/2018/08/30/dirtiest-man-on-tv-mike-rowe-takes-on-americas-skills-gap-problem/#1bd71b676da5>
• https://www.cat.com/en_US/articles/customer-stories/dealers/caterpillar-and-catdealerspartnerwithmikerowetohelpclosekillgap.html
• <https://www.agc.org/news/2018/01/03/seventy-five-percent-construction-firms-plan-expand-headcount-2018-contractors-are-0>
• <https://www.npr.org/sections/ed/2018/04/25/605092520/high-paying-trade-jobs-sit-empty-while-high-school-grads-line-up-for-university>

How to Apply

- Manage your supply chain – Hardscape example
- Partnerships and acquisitions – control your assets
- Train your future workforce
 - Caterpillar/mikeroweWORKS
 - Google partners with 25 community colleges to offer IT Support Professional Certificate

- https://www.cat.com/en_US/articles/customer-stories/dealers/caterpillar-and-catdealerspartnerwithmikerowetohelpcloseskillgap.html
- <https://edtechmagazine.com/higher/article/2018/07/major-companies-partner-colleges-education-opportunities-emerging-tech>

NATION STATES VS CORPORATIONS

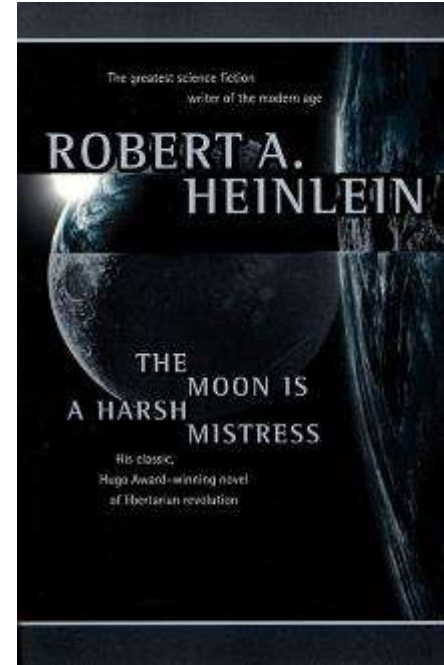
One World Government

Star Trek



- <https://www.startrek.com>
- https://smile.amazon.com/s?i=digital-text&rh=p_27%3ARobert+A.+Heinlein&s=relevancerank&text=Robert+A.+Heinlein&ref=dp_byline_sr_ebooks_1

Robert Heinlein



European Data Privacy Law

- Implemented May 25, 2018
- No data breach required
- 91 fines already imposed, mainly for collecting personal data for marketing
- Fined Google 50 million euros (\$57 USD, \$77 CAD)
- <https://news.bloomberglaw.com/privacy-and-data-security/insight-91-fines-already-under-european-data-privacy-law-what-else-to-expect-in-2019>

Venezuela – Prosperity to Poverty

1998 Hugo Chavez changes constitution

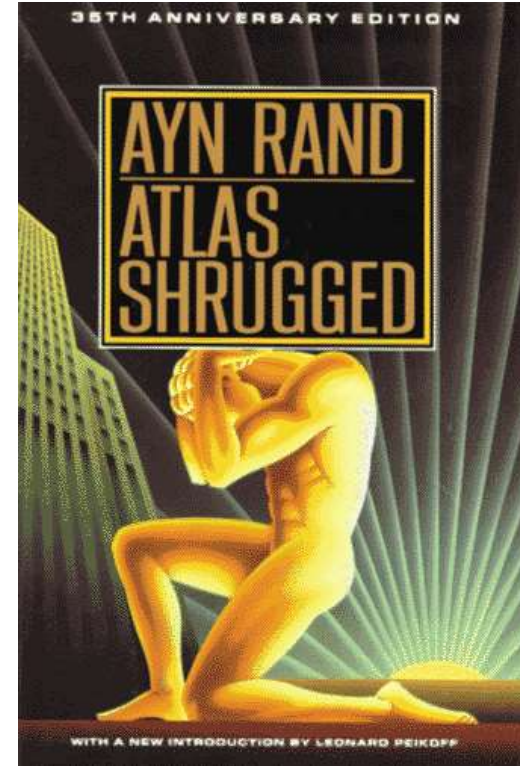
2001 Redistributes farm land

2005 Seizes “estates”

2005 Regulates press for “slander”

2007 Nationalizes banks and foreign oil companies

2012 Implements price controls



- <https://www.bbc.com/news/world-latin-america-19652436>
- <https://www.aynrand.org/novels/atlas-shrugged>

Cost of Doing Business

Amazon vs NYC

- New Headquarters in Queens
 - Governor Cuomo: 107,000 jobs, \$27.5b tax revenue over 25 years
 - Amazon: 25,000 FTE high-paying jobs, \$2.5b neighborhood investment in Long Island City
 - Amazon to receive \$3 billion in tax incentives
 - Backlash from New York locals and politicians
 - Withdrew from consideration
- <https://www.businessinsider.com/amazon-hq2-canceled-plans-new-york-city-headquarters-2019-2>
 - <https://www.technologyreview.com/s/612601/how-google-took-on-china-and-lost/>

Google vs China

- Project Dragonfly – Filtered Google search
- 2009: Google has 34% search traffic, Baidu 58%
- 2010 Google ceases operations due to filtering
- Great Firewall: China blocks YouTube, Facebook, and Twitter after Xinjiang riots

How to Apply

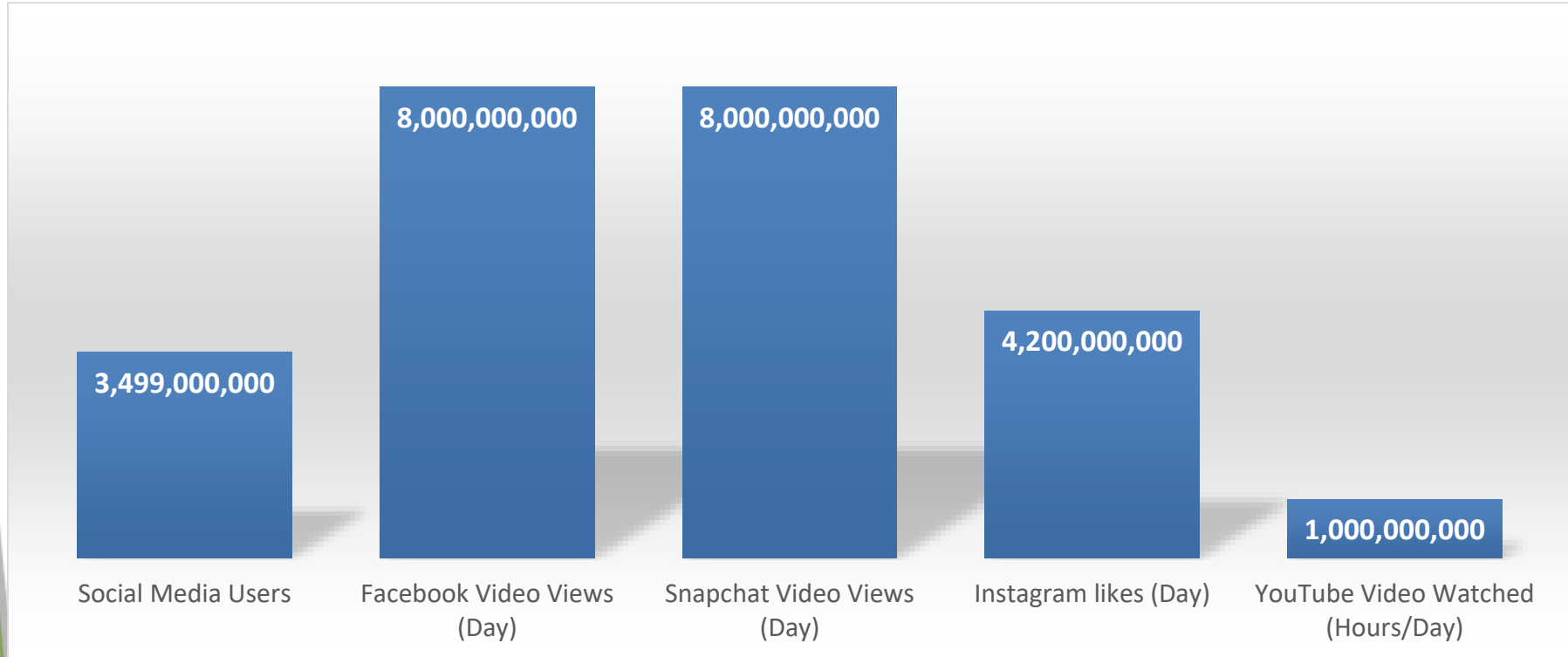
- Trace regulations and policies (risk-based requirements as an asset)
- Develop international workforce and market strategies
- Include political, economic, and geographic factors in your continuity and disaster recovery plans

RISE OF THE CONTENT PRODUCERS

Modern Humanity

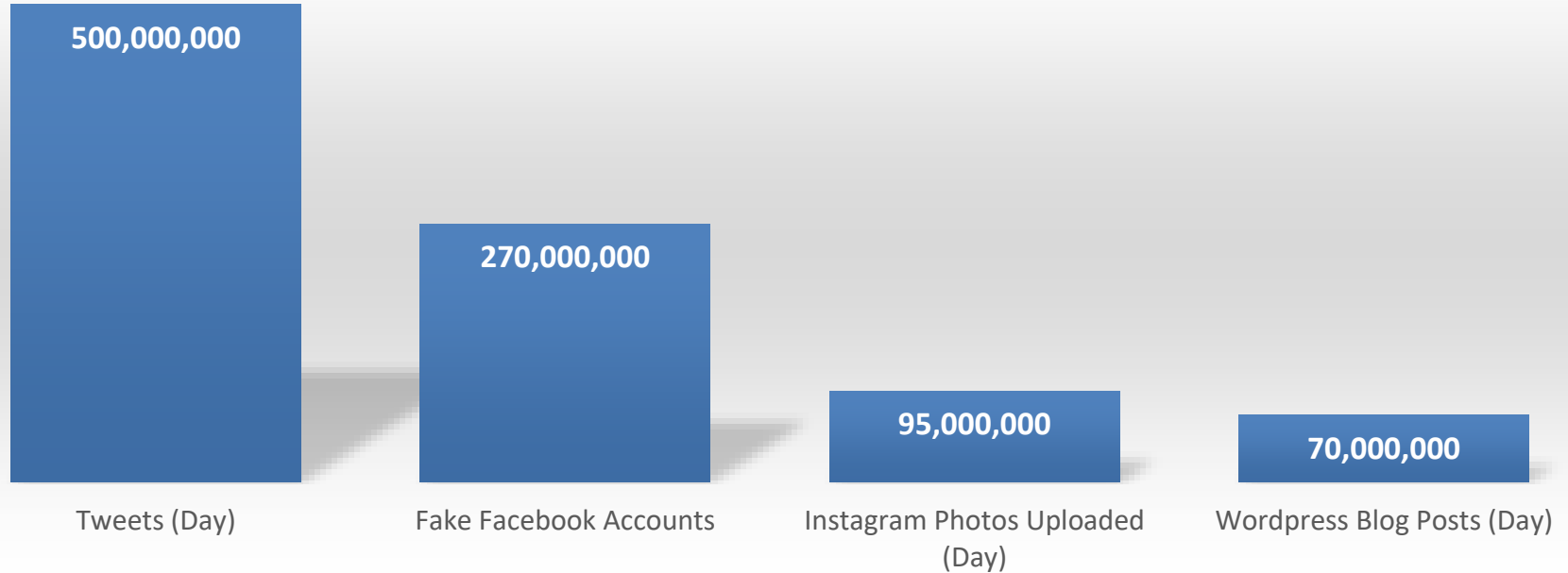


Social Media by the Numbers May 2019



- <https://www.brandwatch.com/blog/amazing-social-media-statistics-and-facts>

Social Media by the Numbers May 2019



- <https://www.brandwatch.com/blog/amazing-social-media-statistics-and-facts>

Economics of YouTube and Influencers

- 300 hours of video are uploaded to YouTube every minute
- Top 3 percent of YouTube's most-viewed channels earn \$12,000 each per year
- Top 10 YouTube Channels earn \$180 million per year
- Patreon:
 - <https://www.patreon.com/>
 - Crowd funded media
- Micro-influencer
 - 10,000 to 50,000 followers
 - \$1,000 to \$20,000 per post
- Influencers
 - 1 million followers
 - \$10,000 to \$100,000 per post

- <https://www.brandwatch.com/blog/amazing-social-media-statistics-and-facts>
- <https://www.vox.com/the-goods/2018/11/28/18116875/influencer-marketing-social-media-engagement-instagram-youtube>
- <https://www.forbes.com/sites/natalierobehmed/2018/12/03/highest-paid-youtube-stars-2018-markiplier-jake-paul-pewdiepie-and-more/#10eeb750909a>

2018 Highest YouTuber Earners

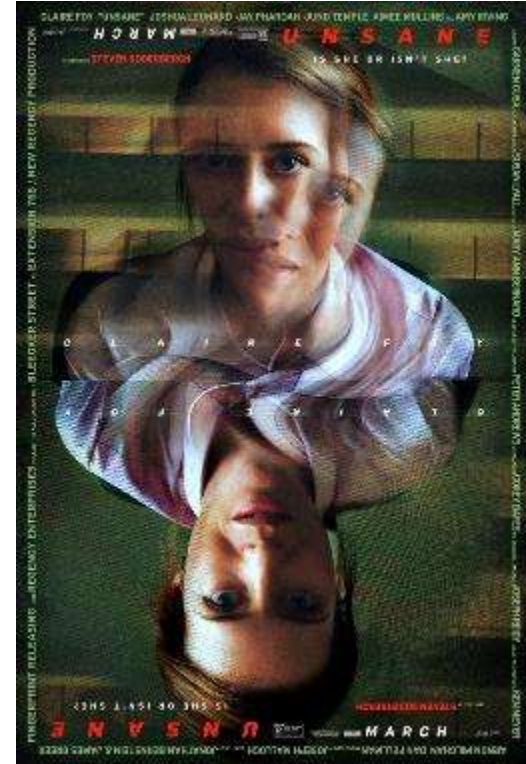
1. Ryan ToysReview: \$22 million
2. Jake Paul: \$21.5 million
3. Dude Perfect: \$20 million
4. DanTDM: \$18.5 million
5. Jeffree Star: \$18 million
6. Markiplier: \$17.5 million
7. Vanoss Gaming: \$17 million
8. Jacksepticeye: \$16 million
9. PewDiePie: \$15.5 million
10. Logan Paul: \$14.5 million



- <https://www.forbes.com/sites/natalierobehmed/2018/12/03/highest-paid-youtube-stars-2018-markiplier-jake-paul-pewdiepie-and-more/#10eeb750909a>

12 Movies Shot with an iPhone

- "Unsane"
 - "Tangerine"
 - "9 Rides"
 - "I Play With the Phrase Each Other"
 - "Night Fishing"
 - "Uneasy Lies the Mind"
 - "Searching for Sugar Man"
 - "Detour"
 - "Romance in NYC"
 - "Framed"
 - "DragonBorne"
 - "The Editor"
- <https://variety.com/2018/film/news/unsane-tangerine-films-iphones-1202730676/>
 - <https://bleeckerstreetmedia.com/unsane>



How to Apply

- Develop media and be genuine
- Use as an internal enabler of knowledge management
- Become an enabler for the next transformation

BUILDING A BETTER PERSON

It Was Never Your Job

- “Technology Has Already Taken Over 90% Of The Jobs Humans Used To Do”
- Only 2% of people in America produce all our food
- Millions of transportation jobs eliminated: the horse-drawn carriage
- Railroad works declined from 3% to 0.1% of the workforce while moving 3 times more freight
- NASA manually calculated flight trajectories
- <https://www.forbes.com/sites/quora/2018/01/18/technology-has-already-taken-over-90-of-the-jobs-humans-used-to-do/#257c605c1bdd>

The Shift Continues

- By 2020, 20% of the retail market will shift online, +60% to Amazon alone
- Amazon earns 2X revenue per employee of Walmart
- 100,000 Amazon robots and workers earning \$15/hour save the company \$22 million annually per warehouse
- <https://www.newsweek.com/2018/11/30/ai-and-automation-will-replace-most-human-workers-because-they-dont-have-be-1225552.html>

Making Better People - Literally



- <https://youtu.be/A5rUC6NiQfo>

Human Testing Underway – 3 Babies



- He Jiankui, Southern University of Science and Technology in Shenzhen
- Twins born to have HIV immunity
- Reality: Deletion of CCR5 to enhance cognition

• <https://www.cambridge.org/core/journals/mrs-bulletin/news/crispr-implications-for-materials-science>

How to Apply

- Develop talent management roadmap
- Outsource non-key functions
- Plan for product and resource obsolescence

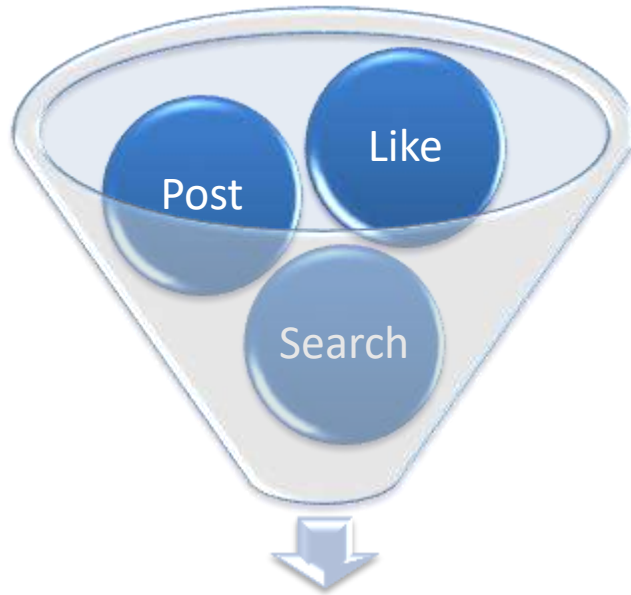
INCREASED STRATIFICATION

Confirmation Bias



- <http://chainsawsuit.com/comic/2014/09/16/on-research/>

Facebook Matching Algorithm Example



Promoted Content

- Filters 1,500 posts per day into 300
- Tested emotional manipulation in posts on 700,000 users
- Russian hackers used confirmation bias to promote discourse during US elections

- <https://www.theguardian.com/technology/2014/jun/30/facebook-news-feed-filters-emotion-study>
- <https://www.theguardian.com/technology/2014/jun/30/facebook-emotion-study-breached-ethical-guidelines-researchers-say>
- <https://globalsecurityreview.com/russia-manipulated-u-s-voters-social-media/>

Fakespot: Fake and Unreliable Reviews

- 52% of Walmart
- 30% of Amazon
- 30% of Sephora
- <5% of Best Buy



- <https://www.cbsnews.com/news/buyer-beware-a-scurge-of-fake-online-reviews-is-hitting-amazon-walmart-and-other-major-retailers/>

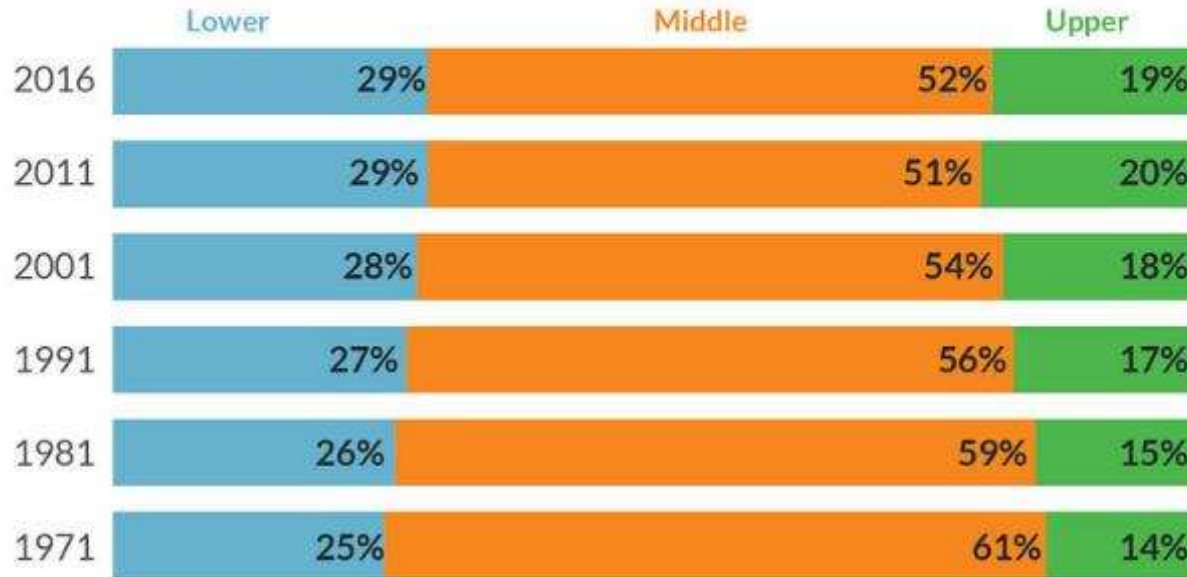
A Rising Tide Lifts All Boats



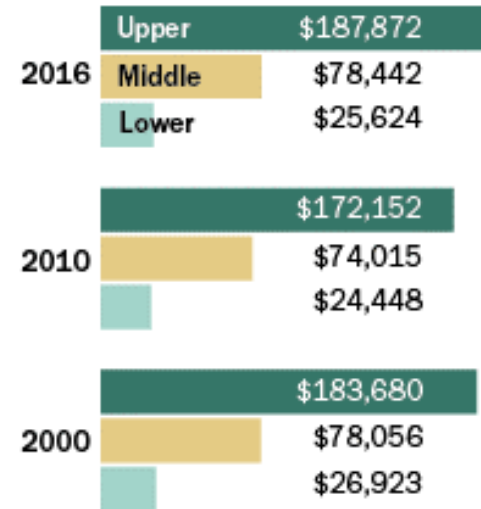
The Shrinking Middle Class

Share of adults living in middle-income households is almost unchanged since 2011

Percent of adults in each income tier



Median incomes of households, by income tier, in 2016 dollars and scaled to reflect a three-person household



- <https://www.pewresearch.org/fact-tank/2018/09/06/the-american-middle-class-is-stable-in-size-but-losing-ground-financially-to-upper-income-families/>

How to Apply

- Create a plan to your manage information/social feeds, think skeptically, and validate everything
- Proactively manage and promote your business's presence and ranking
- Prepare a damage control plan before the damage occurs

Hans's Seven Trends to Watch

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 - @HansEckman



APPENDIX

INFO-TECH RESEARCH GROUP

Thank you to Info-Tech for allowing me the time to share this presentation with you. Here's background on how your enterprise could increase IT satisfaction by 12% for less than 50% the cost of a typical IT team member.



It Just Makes Sense to . . .

Leverage Best-Practices

35,000
Members
sharing best
practices you
can Leverage

Millions spent
developing
tools and
templates
annually

Leverage direct
access to over
100 Analysts as
an extension of
your team

Use our
Massive
Data-Base of
Benchmarks
and Vendor
Assessments

Get up to
speed in a
fraction of
the time

Avoid starting from scratch

Systematically Improve IT Performance

Follow our standardized path to drive IT maturity & effectiveness for your department. Each leader on your team will work with a dedicated Info-Tech Executive Advisor to create customized annual roadmaps to address their specific challenges and opportunities. Whether your IT department is an Unstable Operator, an Innovative Champion, or at any stage in between, Info-Tech has the proven knowledge & skills, and years of practical IT management & advisory experience to help stabilize and optimize your IT operations.

Each Executive on Your Team Receives:

- ▶ A dedicated Executive Advisor to help diagnose and drive improvement within your organization.
- ▶ A customized Key Initiative Plan around your top priorities and a clear roadmap of how to improve their IT function.
- ▶ On-demand advisory support for all of your key projects.
- ▶ Complete online access to tools and best-practice resources.

Info-Tech Research Group Maturity Model



A Step by Step

Program to Systematically

Improve IT Performance

**Info-Tech provides
best-practice research
making your job easier.**

- ▶ Tools & Templates
- ▶ Step-by-Step Methodologies
- ▶ Benchmarking & Diagnostic Programs
- ▶ Training & Executive Coaching
- ▶ Insights & Advice from 20,000+Peers

01 MANAGE AND IMPROVE

Core IT Processes

02 FASTER AND MORE EFFECTIVELY COMPLETE YOUR

Technology Projects

03 TRAIN AND DEVELOP YOUR

IT Leadership Team

04 BUILD A DATA-DRIVEN

IT Strategy

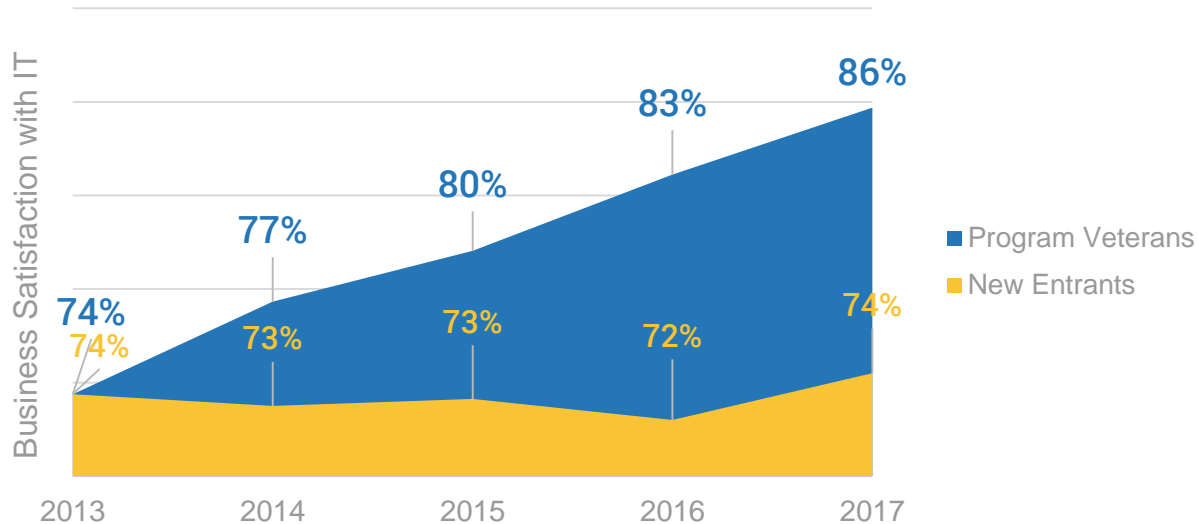
05 A STEP BY STEP PROGRAM TO

Systematically Improve IT

Performance Difference

For over 20 years Info-Tech has provided IT teams with practical advice that helps make measurable improvement.

Since launching our systematic program to improve IT performance in 2013, Info-Tech members have dramatically outperformed their peers by delivering superior levels of business satisfaction.



PEER TO PEER ECONOMY

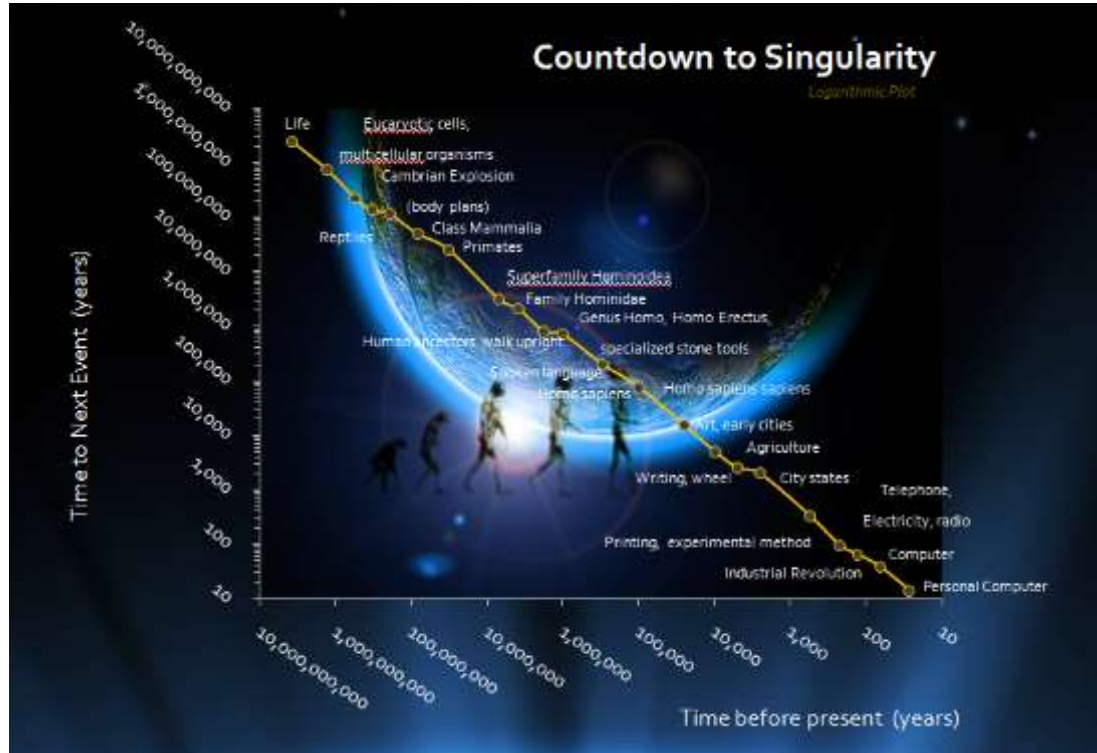
Peer Accommodations Outpace Brands



- <https://secondmeasure.com/datapoints/airbnb-sales-surpass-most-hotel-brands/>

SINGULARITY: DATA WILL BE FREE!

Countdown to Singularity



- <https://www.kurzweilai.net/ask-ray-could-have-had-singularity-years-ago>

Deep Video

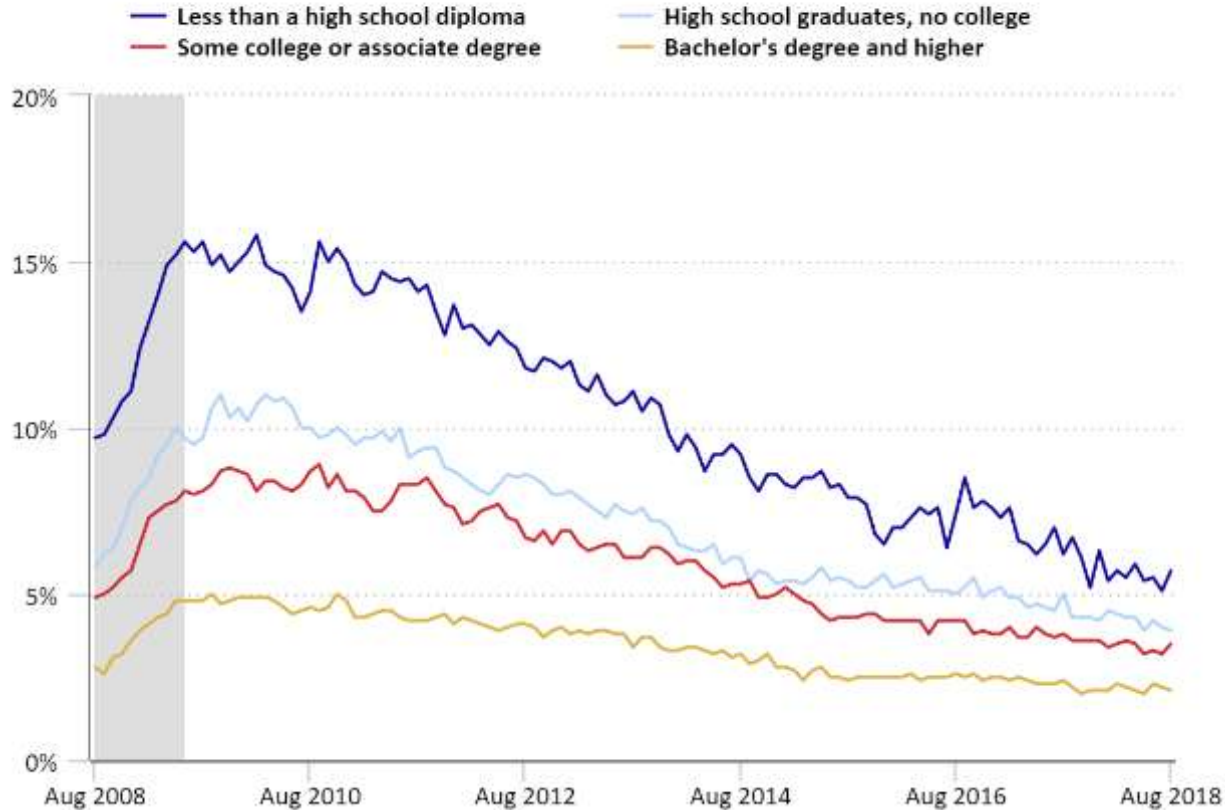
- Deep Video Portraits - SIGGRAPH 2018
 - <https://youtu.be/qc5P2bvfl44>
 - https://web.stanford.edu/~zollhofer/papers/DEMO2016_Face2Face/video.mp4
 - <https://youtu.be/cQ54GDm1eL0>
- <https://www.peerlyst.com/posts/how-to-generate-fake-videos-with-generative-adversarial-networks-deepfake-chiheb-chebbi>
- <https://medium.com/huia/live-deep-fakes-you-can-now-change-your-face-to-someone-elses-in-real-time-video-applications-a4727e06612f>
- <https://www.digitaltrends.com/cool-tech/deep-video-portraits-ai/>

Medical Diagnosis Comparison

- <https://www.newscientist.com/article/2193361-ai-can-diagnose-childhood-illnesses-better-than-some-doctors/>
 - When tested on previously unseen cases, the AI could diagnose glandular fever (also known as mononucleosis), roseola, influenza, chicken pox and hand-foot-mouth disease with between 90 and 97 per cent accuracy.
- <https://healthcare-in-europe.com/en/news/artificial-intelligence-diagnoses-with-high-accuracy.html>
 - In an objective evaluation in which researchers were given slides of lymph node cells and asked to determine whether or not they contained cancer, the team's automated diagnostic method proved accurate approximately 92 percent of the time, explained Khosla, adding, "This nearly matched the success rate of a human pathologist, whose results were 96 percent accurate."
 - "But the truly exciting thing was when we combined the pathologist's analysis with our automated computational diagnostic method, the result improved to 99.5 percent accuracy," said Beck. "Combining these two methods yielded a major reduction in errors."

BATTLE FOR RESOURCES

Unemployment rates for persons 25 years and older by educational attainment, August 2008 to August 2018, seasonally adjusted



https://www.bls.gov/opub/ted/2018/unemployment-rate-2-1-percent-for-college-grads-3-9-percent-for-high-school-grads-in-august-2018.htm?view_full

When Do Resources Run Out

- <https://www.globalcitizen.org/en/content/world-running-out-of-food-by-2023/>
 - Food: The United Nations Food and Agriculture Organization (FAO) estimates the world population will surpass 9.1 billion by 2050, at which point agricultural systems will not be able to supply enough food to feed everyone.
 - Water: By 2025, 50% of the world's population will be living in water stressed areas.
- https://www.business-standard.com/article/punditry/how-long-will-fossil-fuels-last-115092201397_1.html
 - It is argued that oil will run out in 53 years, natural gas in 54, and coal in 110.
- <https://www.ecotricity.co.uk/our-green-energy/energy-independence/the-end-of-fossil-fuels>

Mike Rowe and the Skill Gap

- <http://mikerowe.com/tag/worker-shortage/>
- <https://www.forbes.com/sites/kathycaprino/2018/08/30/dirtiest-man-on-tv-mike-rowe-takes-on-americas-skills-gap-problem/#1bd71b676da5>

NATION STATES VS CORPORATIONS

European Union's General Data Protection Regulation

- <https://www.wsj.com/articles/large-gdpr-fines-are-imminent-eu-privacy-regulators-say-11556829079>
 - The European Union's General Data Protection Regulation on data privacy came into force on May 25, 2018. This video explains how it could affect you, even if you don't live in the EU. (Originally published May 16, 2018)
- <https://www.nytimes.com/2019/01/21/technology/google-europe-gdpr-fine.html>
 - In the first major example, the French data protection authority announced Monday that it had fined Google 50 million euros, or about \$57 million, for not properly disclosing to users how data is collected across its services — including its search engine, Google Maps and YouTube — to present personalized advertisements.
- <https://news.bloomberglaw.com/privacy-and-data-security/insight-91-fines-already-under-european-data-privacy-law-what-else-to-expect-in-2019>
 - 91 Fines Already Under European Data Privacy Law
 - First, it's important to remember that regulators can take action whether or not a data breach has occurred, as evidenced by the €50 million fine imposed by the CNIL not for a data breach but relating to the processing of personal data for advertising purposes without first obtaining consent.
 - Moreover, a data breach is not necessarily a breach of GDPR. A recent airline breach in the UK is a good example—the company was hacked and suffered a breach that thus far has not been found to be a violation of GDPR. However, an organization that is in breach of data protection laws can be penalized, even if sensitive data has not been leaked or fallen into the wrong hands.

Venezuela: annexation of private property

- <https://www.bbc.com/news/world-latin-america-19652436>
 - 1998 - Hugo Chavez elected president amid disenchantment with established parties, launches 'Bolivarian Revolution' that brings in new constitution, socialist and populist economic, and social policies funded by high oil prices, alongside increasingly anti-US foreign policy.
 - 2001 - President Chavez uses enabling act to pass laws aimed at redistributing land and wealth. Concern grows in business and some labour circles that he is trying to concentrate economic and political power.
 - 2005 January - President Chavez signs decree on land reform to eliminate Venezuela's large estates and benefit rural poor. Ranchers say move is attack on private property.
 - 2005 March - New media regulations provide stiff fines and prison terms for slandering public figures.
 - 2007 January - President Chavez announces key energy and telecommunications companies will be nationalised under 18-month enabling act approved by parliament.
 - 2007 June - Two leading US oil companies, Exxon Mobil and ConocoPhillips, refuse to hand over majority control of their operations in the Orinoco Belt to the Venezuelan government, which then expropriates them.
 - 2007 December - President Chavez suffers his first defeat at the ballot box, when a referendum narrowly rejects proposals to increase government control over the Central Bank and the power to expropriate property.
 - 2010 January - President Chavez devalues the bolivar currency to boost revenue from oil exports after economy shrank 5.8% in last quarter of 2009.
 - 2012 April - Government extends price controls on more basic goods in the battle against inflation. President Chavez threatens to expropriate companies that do not comply with the price controls.
 - 2013 April - President Hugo Chavez dies at age 58 in March after a battle with cancer. Nicolas Maduro, his chosen successor, is elected president by a narrow margin. The opposition contests the result.

Battle Between Google and China

- <https://www.technologyreview.com/s/612601/how-google-took-on-china-and-lost/>
 - The Intercept reported that the company was working on a secret prototype of a new, censored Chinese search engine, called Project Dragonfly. Amid a furor from human rights activists and some Google employees, US Vice President Mike Pence called on the company to kill Dragonfly, saying it would “strengthen Communist Party censorship and compromise the privacy of Chinese customers.” In mid-December, The Intercept reported that Google had suspended its development efforts in response to complaints from the company's own privacy team, who learned about the project from the investigative website's reporting.
 - By late 2009, Google controlled more than a third of the Chinese search market—a respectable share but well below Baidu's 58%, according to data from Analysys International.
 - On January 12, 2010, Google announced, “We have decided we are no longer willing to continue censoring our results on Google.cn, and so over the next few weeks we will be discussing with the Chinese government the basis on which we could operate an unfiltered search engine within the law, if at all.”
 - But officials refused to cede ground. “China welcomes international Internet businesses developing services in China according to the law,” a foreign ministry spokeswoman told Reuters at the time. Government control of information was—and remains—central to Chinese Communist Party doctrine. Six months earlier, following riots in Xinjiang, the government had blocked Facebook, Twitter, and Google's YouTube in one fell swoop, fortifying the “Great Firewall.” The government was making a bet: China and its technology sector did not need Google search to succeed.

RISE OF THE CONTENT PRODUCERS

Social Media Stats

- <https://www.vox.com/the-goods/2018/11/28/18116875/influencer-marketing-social-media-engagement-instagram-youtube>
- https://www.washingtonpost.com/news/the-switch/wp/2018/03/02/why-almost-no-one-is-making-a-living-on-youtube/?noredirect=on&utm_term=.6df845ffb94f
- <https://www.digitalmusicnews.com/2018/02/27/youtube-top-creators-revenue/>
- <https://www.thestreet.com/technology/how-much-do-youtubers-make-14743540>

BUILDING A BETTER PERSON

90% of Future Jobs Don't Exist

- False, we'll just do different jobs
- <https://www.forbes.com/sites/dereknewton/2018/12/28/the-myth-of-jobs-that-dont-exist-yet/>
 - The Dell report has a footnote there that leads to a 1999 Department of Labor report that does not include any reference to the idea that 65% of kids will take jobs that have not been invented. In fact, if you have the patience to slog through the more than 90 pages in that DOL report, you'll find it says the opposite. "In the midst of the creation of these new high tech jobs, most current jobs will endure," it says.
 - That same Dell report also, in further trying to lay the foundation for how we need to change teaching and learning, offered this nugget, "... freelancers are projected to make up 50% of the workforce in the United States by 2020." That gem has a footnote that leads to a Forbes article from 2016 that does indeed say, "By 2020, 50% of the U.S. workforce will be freelancers." But the author gives no link, source or footnote.

Cost of Robotics and Automation

- <https://www.forbes.com/sites/quora/2018/01/18/technology-has-already-taken-over-90-of-the-jobs-humans-used-to-do/#257c605c1bdd>
 - Technology Has Already Taken Over 90% Of The Jobs Humans Used To Do
 - One hundred years ago, the vast majority of people in the world worked on farms. The invention and proliferation of technology has made it possible so that a small minority of farmers (2% here in America) can provide food for all.
 - A little over one hundred years ago, there were millions of jobs related to the main mode of local transportation of the day: the horse-drawn carriage. All of those jobs building carriages, manufacturing buggy whips, raising horses and scooping up their excrement off the city streets. Again, progress and technology have all but eliminated those jobs, and here we are.
 - Seventy years ago, a little over 3% of the U.S. workforce was employed by the railroad industry moving freight and passengers around the country. Today, only 0.1% of the workforce is involved in the railroad industry, yet it moves nearly three times the amount of freight around the country [1].
 - As described in the movie Hidden Figures, NASA used to employ human computers to calculate flight trajectories that helped get our spaceships into the sky. Today the aggregate computing power of human computing from that era is dwarfed by the device sitting in your pocket.

Cost of Robotics and Automation

- <https://www.newsweek.com/2018/11/30/ai-and-automation-will-replace-most-human-workers-because-they-dont-have-be-1225552.html>
 - Analysts predict that by 2020, one-fifth of the multitrillion-dollar U.S. retail market will have shifted to the web and that Amazon alone will reap two-thirds of that bounty.
 - Thanks to automation and a killer business model, Amazon is so efficient that it reaps nearly twice the revenue per employee of Walmart, despite the fact that Walmart, too, has a substantial online presence. Worldwide, Amazon has installed over 100,000 robots to labor in “perfect symbiosis” with humans in its warehouses and has plans to install many thousands more. While it’s not clear what constitutes perfect symbiosis, the robots are said to save the company \$22 million annually, per warehouse. The company’s master plan of an autonomous future also includes goods delivered by drones and self-driving vehicles.
 - For while Amazon continues to open warehouses around the globe and staff them with many thousands of human beings, estimates are that every human on the Amazon payroll—whether full- or part-time—displaces two humans at traditional brick-and-mortar operations.
 - Every minute of every day, Google services 3.6 million searches in the United States alone. Spammers send 100 million emails. Snapchatters send 527,000 photos, and the Weather Channel broadcasts 18 million forecasts.
 - Small, specialty stores also have far more flexibility than large department stores. “Technology has reduced the cost of entry into new markets, so in retail there are fewer big, monolithic companies, but more small competitors,” he says. “Companies are diversifying to meet the specific needs and desires of consumers—everyone’s piece is getting smaller, but there are many more pieces.”
 - Technology has engendered a two-tiered retail landscape—with more high-end boutique-type stores appealing mostly to high-wage earners, and many more discount stores appealing to price-sensitive customers. “More than 1,000 discount stores opened in the U.S. this year alone, as did a large number of what we call ‘premier’ high-end niche stores,” Lobaugh says. What’s declining is what marketers call the “balanced” store—department stores and other retailers that balance quality and price for mid-market customers.

CRISPR: Future of Genetic Engineering

- <https://www.wired.com/story/what-is-crispr-gene-editing/>
- <https://www.youtube.com/watch?v=A5rUC6NiQfo>
- <https://innovativegenomics.org/resources/educational-materials/genome-engineering/>
- <https://www.cambridge.org/core/journals/mrs-bulletin/news/crispr-implications-for-materials-science>
- <https://www.cnbc.com/2019/05/21/china-awaits-third-genetically-modified-baby-amid-questions-of-crisprs-ethics.html>
- <https://www.nature.com/articles/d41586-019-00246-2>
- <https://www.technocracy.news/chinas-crispr-twins-might-have-brain-enhanced-intelligence/>

INCREASED STRATIFICATION

Facebook

- AI and information filtering, confirmation bias
 - <https://www.theguardian.com/technology/2014/jun/30/facebook-news-feed-filters-emotion-study>
 - Backstrom explained in August that Facebook's news feed algorithm boils down the 1,500 posts that could be shown a day in the average news feed into around 300 that it "prioritises"[sic].
 - <https://www.theguardian.com/technology/2014/jun/30/facebook-emotion-study-breached-ethical-guidelines-researchers-say>
 - Lack of 'informed consent' means that Facebook experiment on nearly 700,000 news feeds broke rules on tests on human subjects, say scientists
 - ...manipulated nearly 700,000 users' news feeds to see whether it would affect their emotions

State of the Middle Class

- <https://www.newsweek.com/2018/11/30/ai-and-automation-will-replace-most-human-workers-because-they-dont-have-be-1225552.html>
 - Perhaps it is not surprising that the decline of the “balanced” store correlated with the decline of the American middle class over the past decade. “Between 2007 and 2017, income gains—an average increase of \$50,000 in household income—went mostly to the top 20 percent of earners,” Lobaugh explains. “In fact, this group gained more than 100 percent of the increase, because the bottom 40 percent actually lost ground. The middle 40 percent gained \$10,000 per household. But their expenses increased—food, housing, transportation. Health care skyrocketed. On top of that came digital necessities—things like cellphones and data plans. That leaves most people very little money to spend on retail, which means they have become very, very price sensitive.”