Business Studies
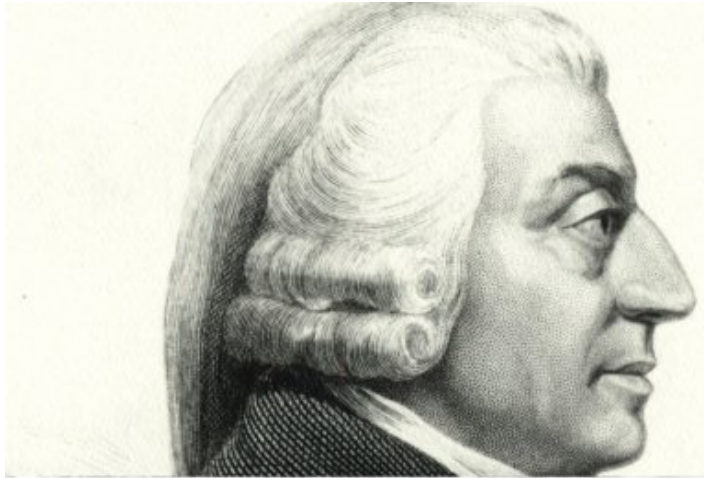# L1 - so you've got an idea

Jack Lang and Stewart McTavish

jal1   sam56

41,890,320

THE WEALTH
OF NATIONS

Adam Smith

The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes, and which consist always either in the immediate produce of that labour, or in what is purchased with that produce from other nations.

According, therefore, as this produce, or what is purchased with it, bears a greater or smaller proportion to the number of those who are to consume it, the nation will be better or worse supplied with all the necessaries and conveniences for which it has occasion.
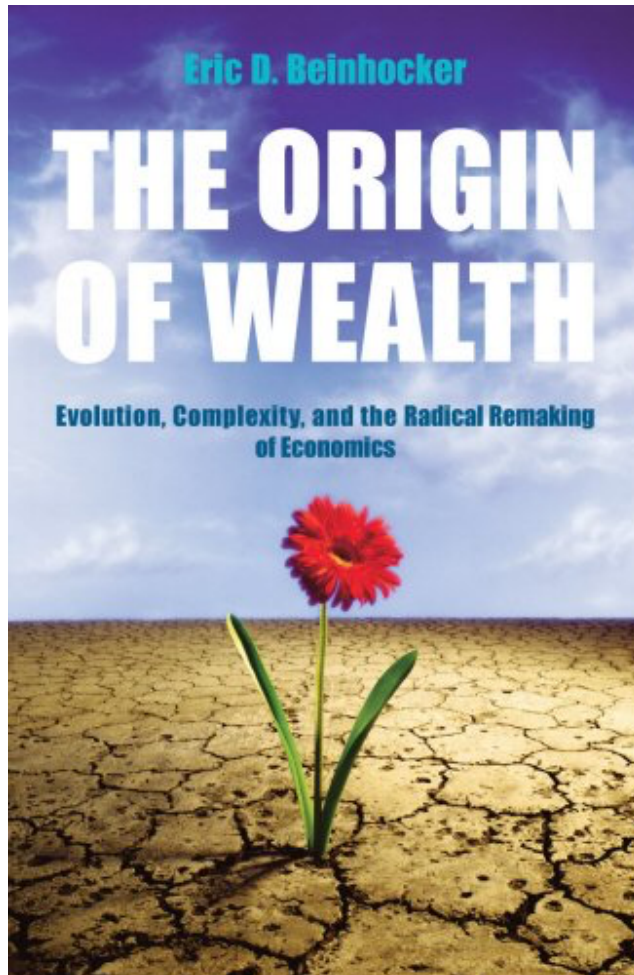
But this proportion must in every nation be regulated by two different circumstances: first, by the skill, dexterity, and judgment with which its labour is generally applied; and, secondly, by the proportion between the number of those who are employed in useful labour, and that of those who are not so employed.
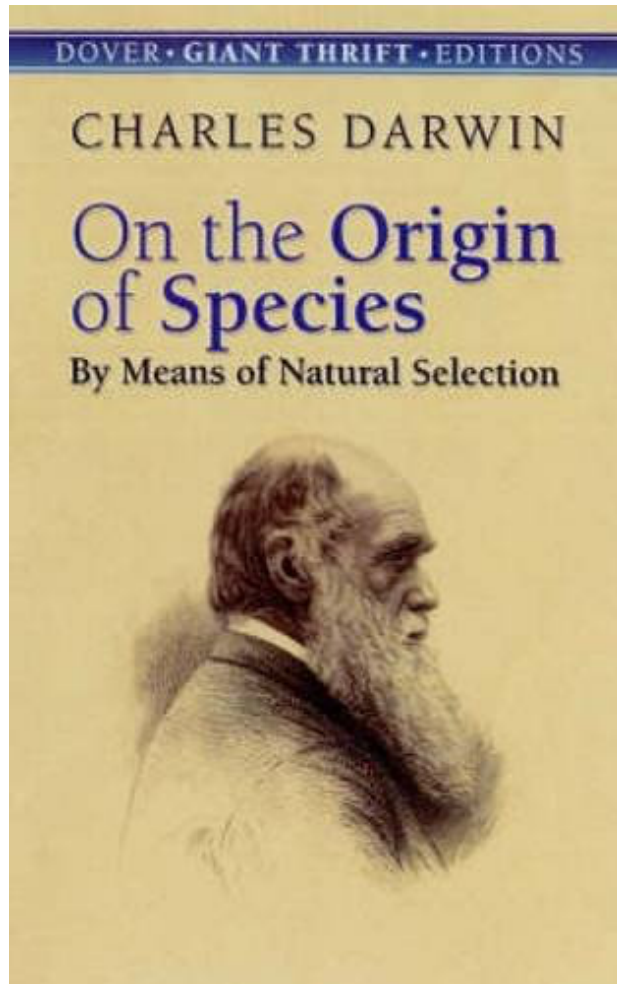
Owing to this struggle, variations, however slight and from whatever cause proceeding, if they be in any degree profitable to the individuals of a species, in their infinitely complex relations to other organic beings and to their physical conditions of life, will tend to the preservation of such individuals, and will generally be inherited by the offspring.

The offspring, also, will thus have a better chance of surviving, for, of the many individuals of any species which are periodically born, but a small number can survive. I have called this principle, by which each slight variation, if useful, is preserved, by the term natural selection, in order to mark its relation to man's power of selection.

But the expression often used by Mr. Herbert Spencer, of the Survival of the Fittest, is more accurate, and is sometimes equally convenient. We have seen that man by selection can certainly produce great results, and can adapt organic beings to his own uses, through the accumulation of slight but useful variations, given to him by the hand of Nature. But Natural Selection, we shall hereafter see, is a power incessantly ready for action, and is as immeasurably superior to man's feeble efforts, as the works of Nature are to those of Art.
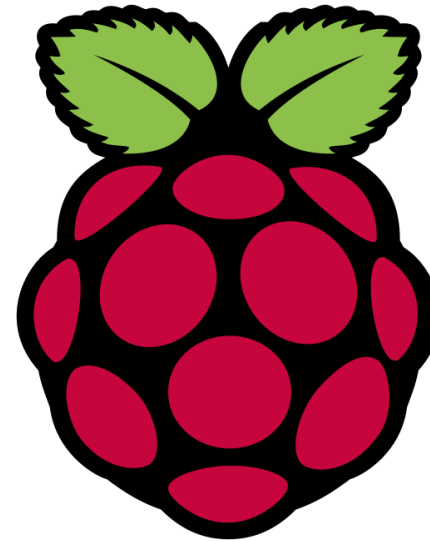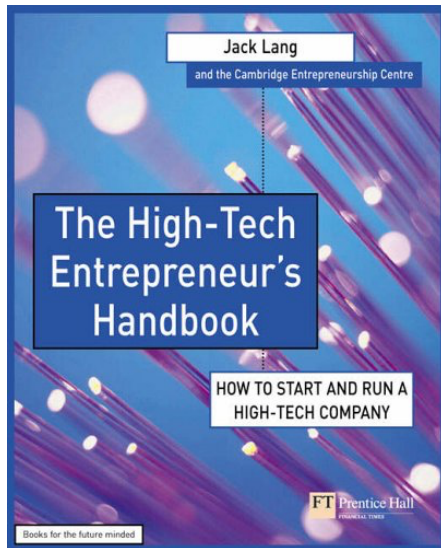
Eric D. Beinhocker

THE ORIGIN OF WEALTH

Evolution, Complexity, and the Radical Remaking of Economics

"Owing to this struggle, Perhaps one needs 'design without a designer' to explain biological evolution, but why do we need 'design without a designer' to explain the process of wealth creation in the economomy when we have lot of human designers around? Aren't we the gods of out own economic creation? We are accustomed to thinking of human rationality and creativity a the primary driving forces behind wealth creation. Wealth, after all, is created by smart, innovative people coming up with new ideas for products and services and lots of hard work to make and sell the. I will argue that human rationality and creativity do play an important role in wealth creation, but not the role we usually think of. Rationality and creativity feed and shape the workings of the evolutionary algorithm in the economy, but do not replace it."

…

"As we will see, despite all the strengths and virtues of human rationality, prediction in a system as complex as the economy over anything but the very short term is next to impossible. We use our brains as best we can in economic decision making, but then we experiment and tinker our way into an unpredictable future, keeping an building on what works and discarding what does not. Our intentionality, rationality, and creativity do matter as a driving force in them economic but they matter as part of a larger evolutionary process."

280 ventures
90 member - 190 alumni

PragmatIC
raised >£20m

audio analytic
raised >£5m

Undo
Fix software bugs in minutes, not weeks
raised >$5m

GeoSpock
raised >$10m

Metail®
raised >$19m

SYNDICATE ROOM
Intelligent Equity Crowdfunding
raised >$7.5m

aqdot
raised >$7m

thisway
raised >$2.5m

Focal Point
POSITIONING
raised >$2m

SPECTRAL EDGE
raised >$2.5m

unikernel
acquired undisclosed

Cambridge Nanosystems
acquired undisclosed

ilumink
acquired undisclosed

MAGIC PONY
TECHNOLOGY
acquired reported $150m

freeAgent
IPO Nov 2016
market cap ~£55m

why we do this

Try to encourage you to realise that you can change
the world in big or small way (and make money
doing it)

Expose you to people that have been in your
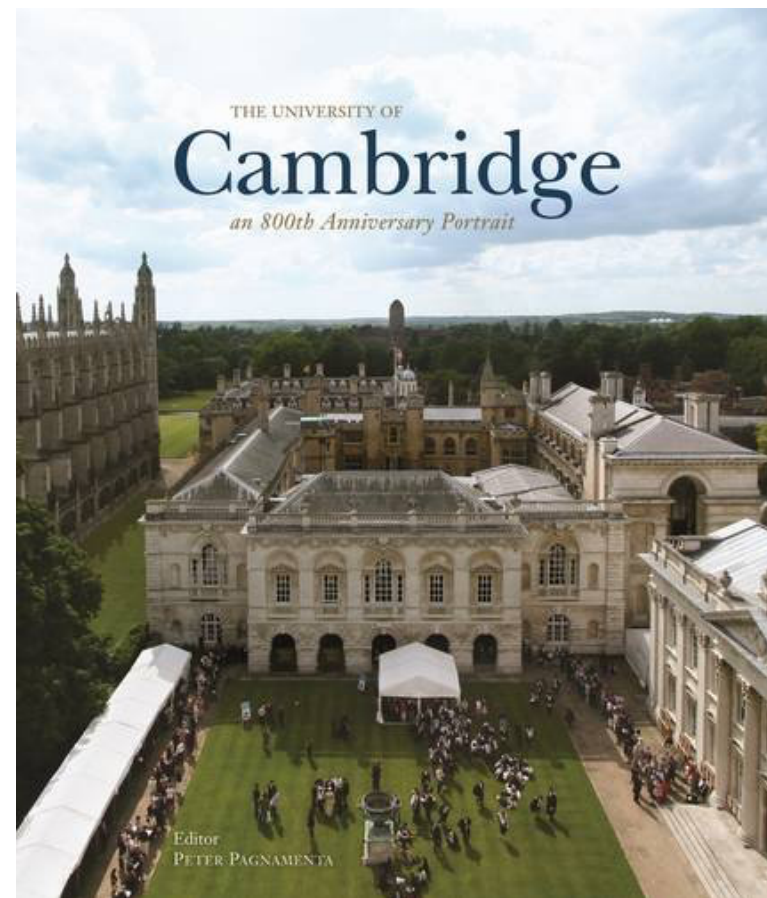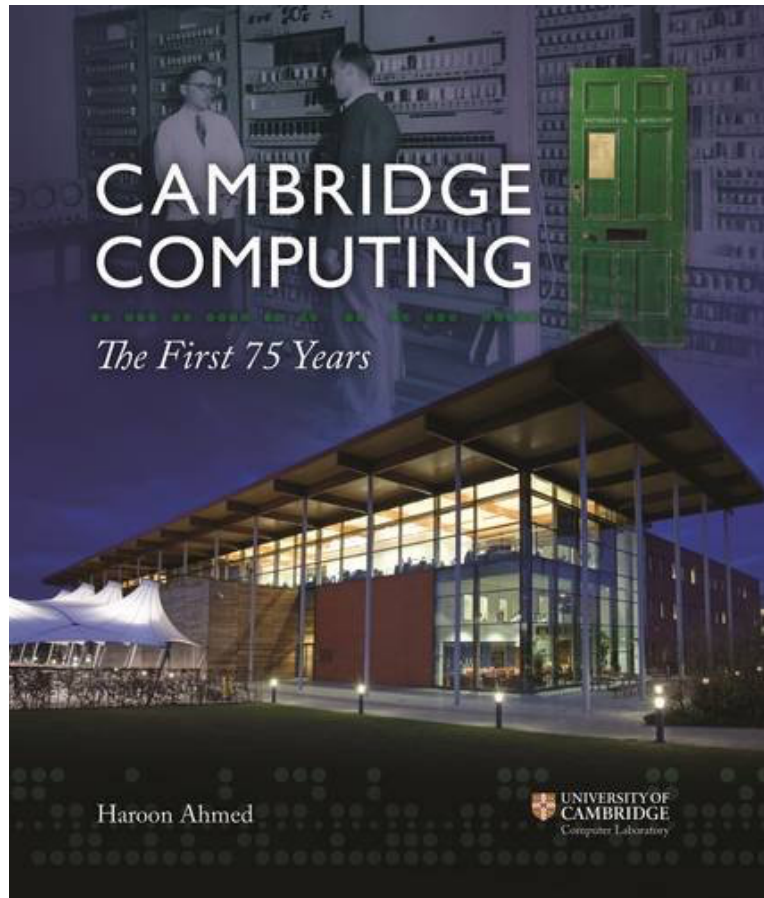position and are doing it

Highlight some of the key concepts and pieces of
knowledge to help you do that.

ideas to take to heart

Business is about the people

Trust networks are real and important

The job of an entrepreneur is to reduce risk by
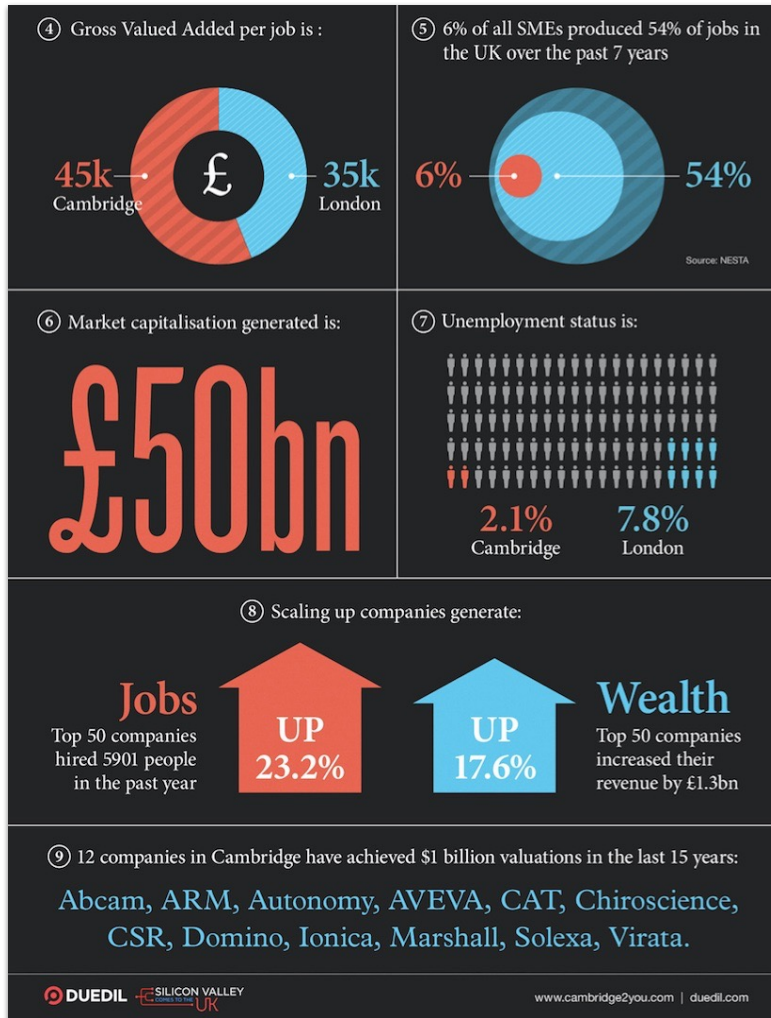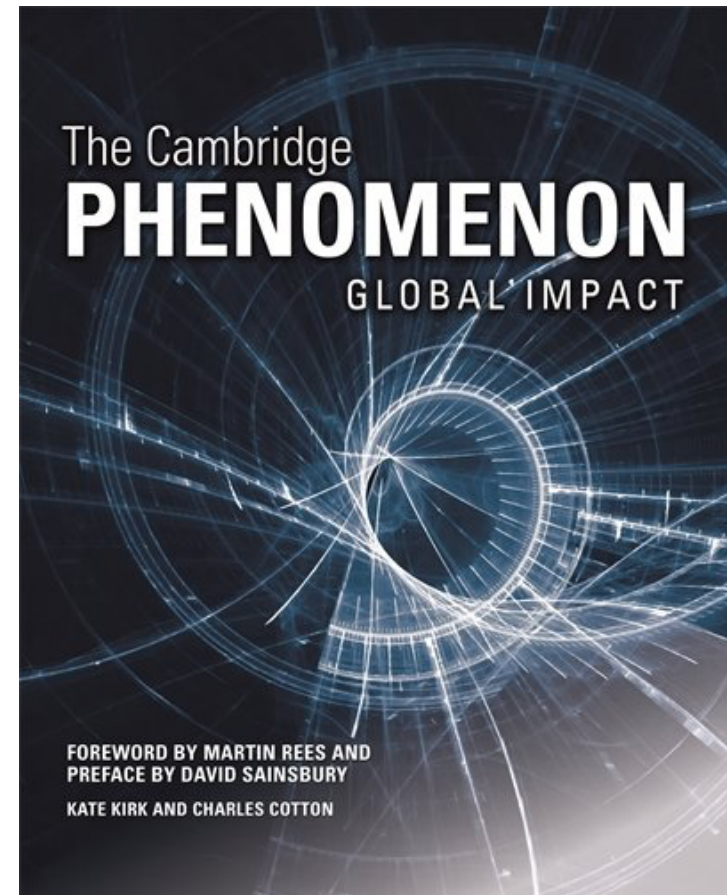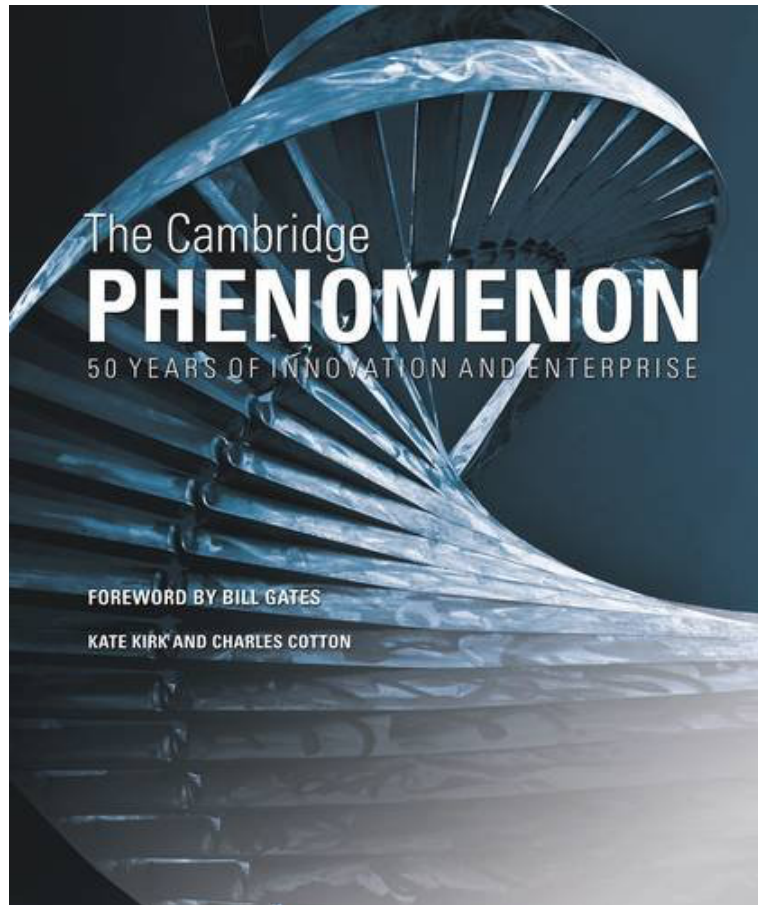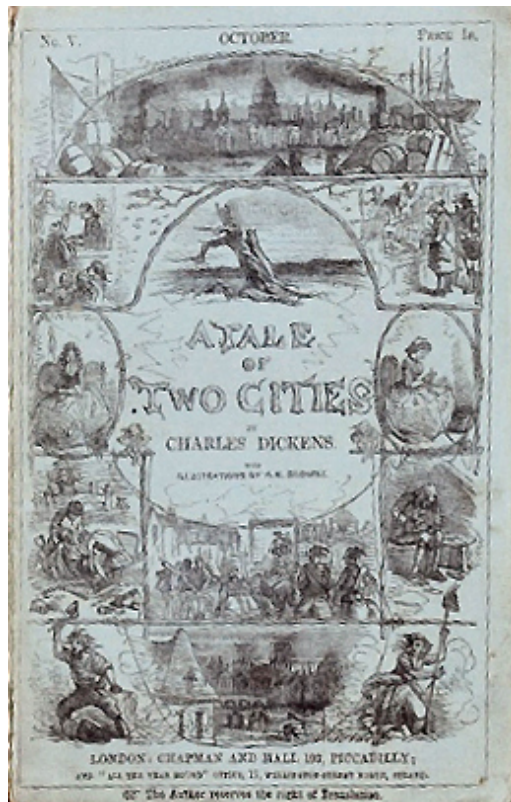reducing uncertainty in a business proposition

CAMBRIDGE COMPUTING
The First 75 Years
Haroon Ahmed
UNIVERSITY OF CAMBRIDGE
Computer Laboratory

THE UNIVERSITY OF
Cambridge
an 800th Anniversary Portrait
Editor
PETER PAGNAMENTA

CAMBRIDGE IDEAS CHANGE THE WORLD

GENOMICS

1977
Fred Sanger*
First genome sequenced

1953
Francis Crick* and James Watson*
discovered structure of DNA

1997
At a beer summit at the Panton Arms, Shankar Balasubramanian and David Klenerman devised a new approach to DNA sequencing

1998
Shankar Balasubramanian and John Berriman founded Solexa

2004
John West, new CEO of Solexa

2006
Solexa – Fast, low-cost gene sequencing. Acquired by Illumina in 2006 for $850 M

Nobel prize winners

MONOCLONAL ANTIBODIES

1975
George Köhler* and César Milstein*
monoclonal antibodies

1986
Greg Winter invented first humanised monoclonal antibody

1989
Greg Winter and David Chiswell founded Cambridge Antibody Technology (CAT)

2003
Humira launched

2006
CAT – Developed the first fully human monoclonal antibody blockbuster drug, Humira. Acquired by AstraZeneca in 2006 for $1.3 B

COMPUTING

1800s
Charles Babbage
Difference Engine

1937
Alan Turing
Theoretical computing machine

1946
Maurice Wilkes
EDSAC

1978–98
Hermann Hauser and Chris Curry
Acorn Computers

1978–86
Nigel Searle and Clive Sinclair
Sinclair Research

1990–
Robin Saxby and Warren East
ARM

2011
ARM – World's leading semiconductor IP supplier at the heart of more than 20 B digital electronic products. Market cap $12 B

SOFTWARE

1700s
Thomas Bayes**
Bayes Theorem

**Bayes matriculated at the University of Edinburgh*

1996
Mike Lynch co-founded Autonomy

Bayes Theorem in neon in Autonomy's office in Cambridge

May 2007
Autonomy floated video search company Blinkx.

2005–11
Autonomy acquisitions

Dec '05 – Verity $500M
Jul '07 – Zantaz $375M
Jan '09 – Interwoven $775M
Aug '11 – Mountain Digital $380M

2011
Autonomy – Global leader in meaning based computer technology. Acquired by HP in 2011 for $10 B

CAMBRIDGE CLUSTER
EUROPE'S MOST SUCCESSFUL TECHNOLOGY CENTRE

50 years since inception, Cambridge is the oldest and most powerful cluster in Europe. Set against the backdrop of the University of Cambridge, the cluster has evolved into one of the world's most enterprising networks of people and companies, with an explosion of technology, life sciences and service companies that has occurred in the city since 1960.

① Cambridge has over

1,525 TECH COMPANIES

② Employing more than

53,000 PEOPLE

That's enough to stretch hand-in-hand from Silicon Roundabout to Cambridge

Cambridge   London

③ These companies had combined turnover of

£11.8bn in 2011

④ Gross Valued Added per job is :

£

45k Cambridge   **35k** London

⑤ 6% of all SMEs produced 54% of jobs in the UK over the past 7 years

6%   **54%**

Source: NESTA

⑥ Market capitalisation generated is:

£50bn

⑦ Unemployment status is:

2.1% Cambridge   **7.8%** London

⑧ Scaling up companies generate:

Jobs
Top 50 companies hired 5901 people in the past year

UP 23.2%

UP 17.6%

Wealth
Top 50 companies increased their revenue by £1.3bn

⑨ 12 companies in Cambridge have achieved $1 billion valuations in the last 15 years:

Abcam, ARM, Autonomy, AVEVA, CAT, Chiroscience, CSR, Domino, Ionica, Marshall, Solexa, Virata.

DUEDIL   SILICON VALLEY COMES TO THE UK   www.cambridge2you.com | duedil.com

"Chapter I - The Period

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way--in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only."

GDP - per capita (PPP) (US$)
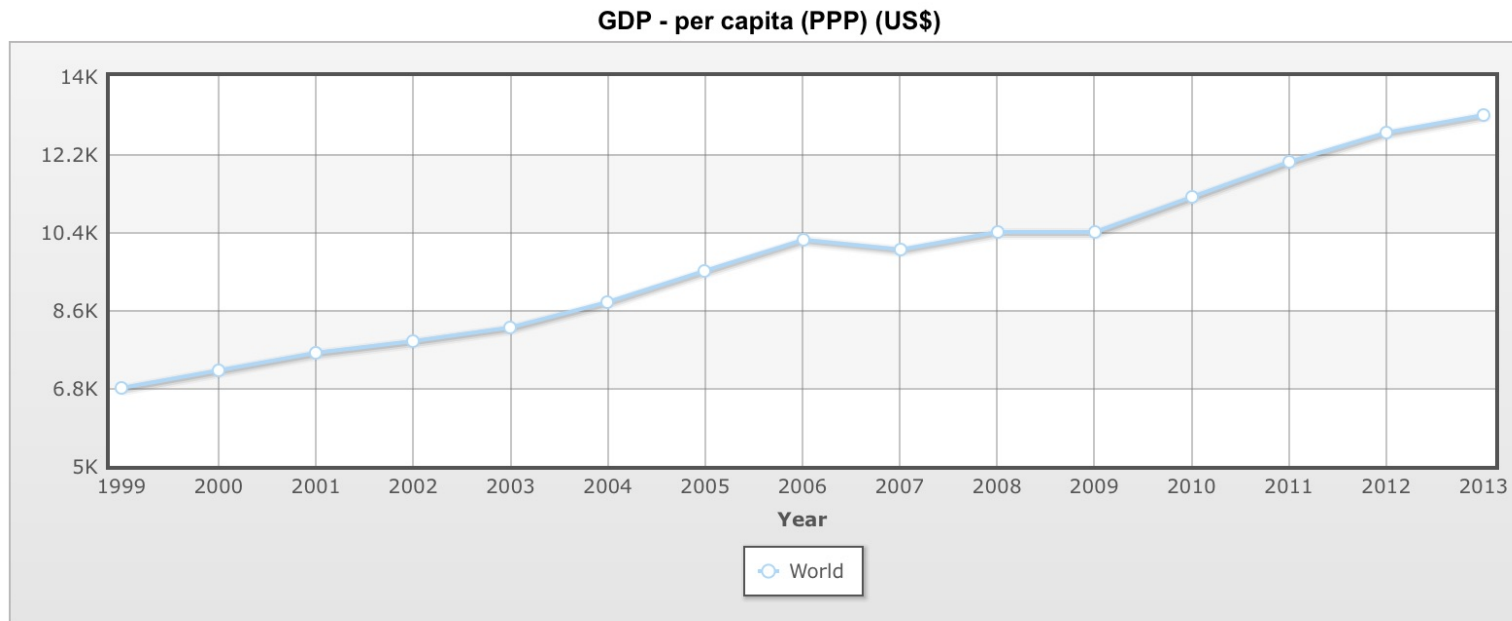
Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
World	6,800	7,200	7,600	7,900	8,200	8,800	9,500	10,200	10,000	10,400	10,400	11,200	12,000	12,700	13,100

Definition of GDP - per capita (PPP): This entry shows GDP on a purchasing power parity basis divided by population as of 1 July for the same year.

Source: CIA World Factbook - Unless otherwise noted, information in this page is accurate as of June 30, 2015

Global growth incidence curve, 1988–2008

Y–axis displays the growth rate of the fractile average income (in 2005 PPP USD). Weighted by population.
Growth incidence evaluated at ventile groups (e.g. bottom 5%); top ventile is split into top 1% and 4% between P95 and P99.
The horizontal line shows the growth rate in the mean of 24.34% (1.1% p.a.).
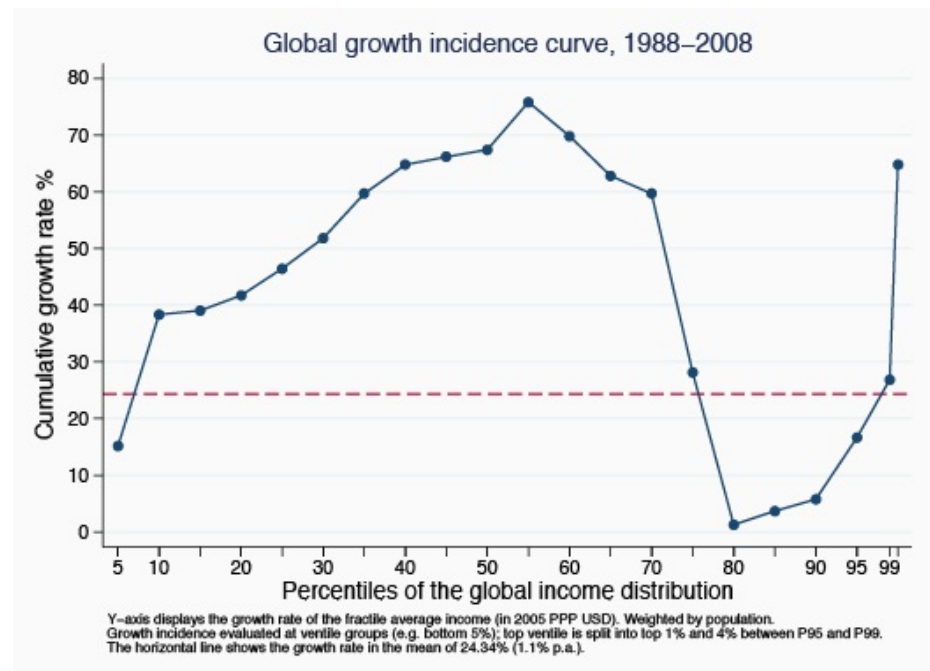
GDP growth (annual %)

World Bank national accounts data, and OECD National Accounts data files.
License: Open

Line   Bar   Map   Share   Details

https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2016&start=1961&view=chart

US Credit Market Debt

Total Credit Market Debt as a Percent of GDP

Economic Chart Dispenser   http://www.Economagic.com/

FRED 📈 — All Sectors; Debt Securities and Loans; Liability, Level

Shaded areas indicate US recessions

Source: Board of Governors of the Federal Reserve System (US)
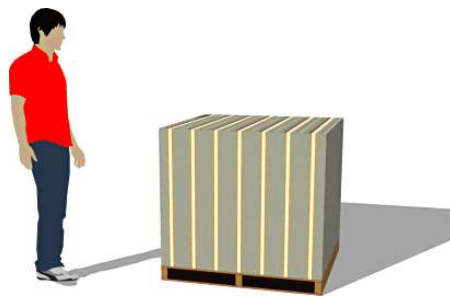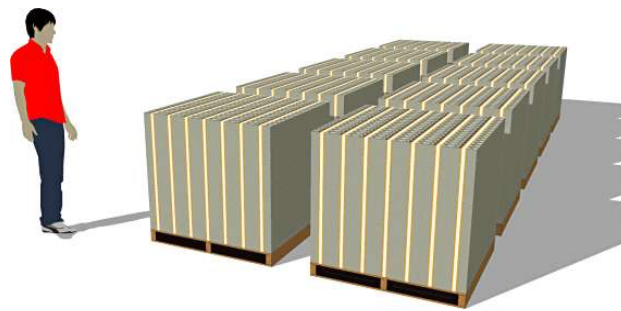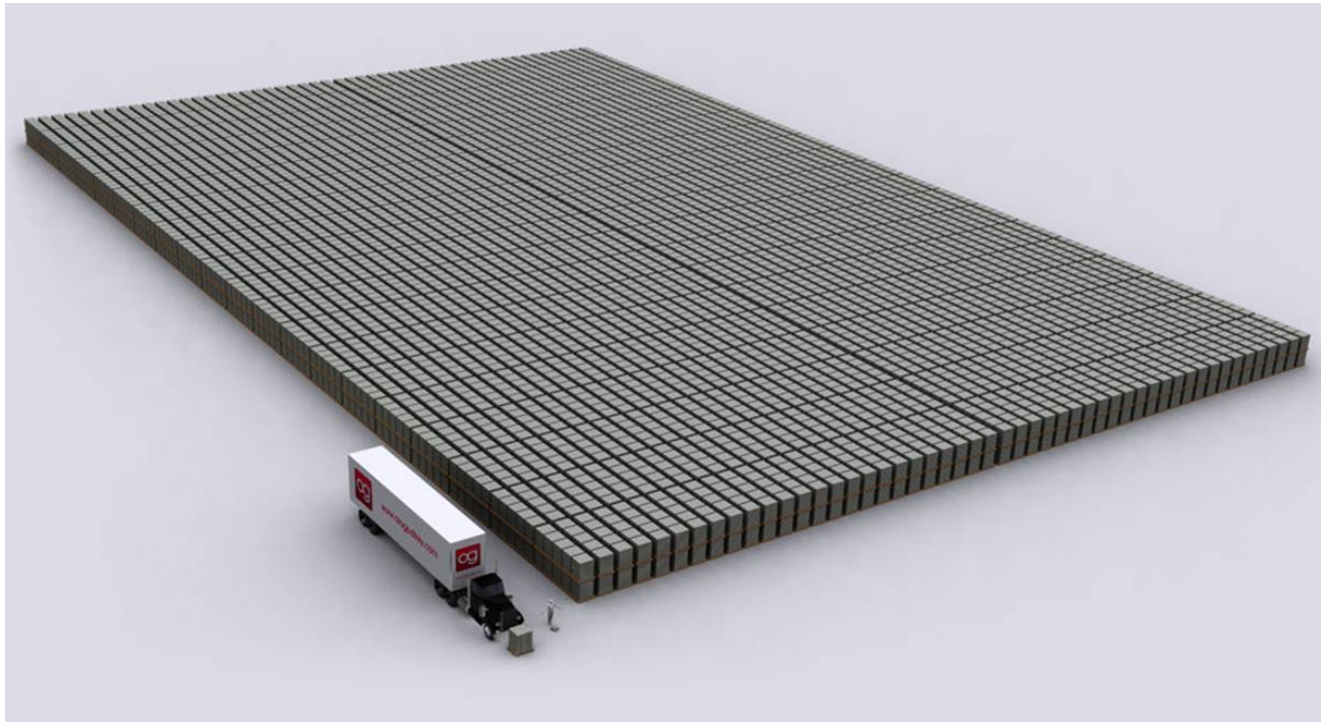
fred.stlouisfed.org

All Sectors; Debt Securities and Loans; Liability, Level

Shaded areas indicate US recessions

Source: Board of Governors of the Federal Reserve System (US)

fred.stlouisfed.org

USA = 9th Highest Public Debt / GDP Level Relative to Other Major Economies

Rank	Country	% of GDP	2015 Public Government Debt ($B)
1	Japan	248%	$10,083
2	Greece	177	347
3	Lebanon	138	68
4	Italy	133	2,342
5	Portugal	129	257
6	Jamaica	120	20
7	Cyprus	109	20
8	Belgium	106	478
9	United States	105	18,870
10	Singapore	105	302
11	Spain	99	1,124
12	France	96	2,236
13	Jordan	93	33
14	Canada	91	1,335
15	United Kingdom	89	2,458
16	Egypt	89	280
17	Croatia	87	40
18	Austria	86	302
19	Slovenia	83	30
20	Ukraine	80	37

KLEINER PERKINS

Source: IMF
Note: Ranking excludes countries with public debt less than $10B in 2015. Public debt includes federal, state and local government debt but exclude unfunded pension liabilities from government defined-benefit pension plans and debt from public enterprises and central banks.

10 Year Treasury Rate - 54 Year Historical Chart

Interactive chart showing the daily 10 year treasury yield back to 1962. The 10 year treasury is the benchmark used to decide mortgage rates across the U.S. and is the most liquid and widely traded bond in the world. The current 10 year treasury yield as of October 23, 2017 is **2.37%**.

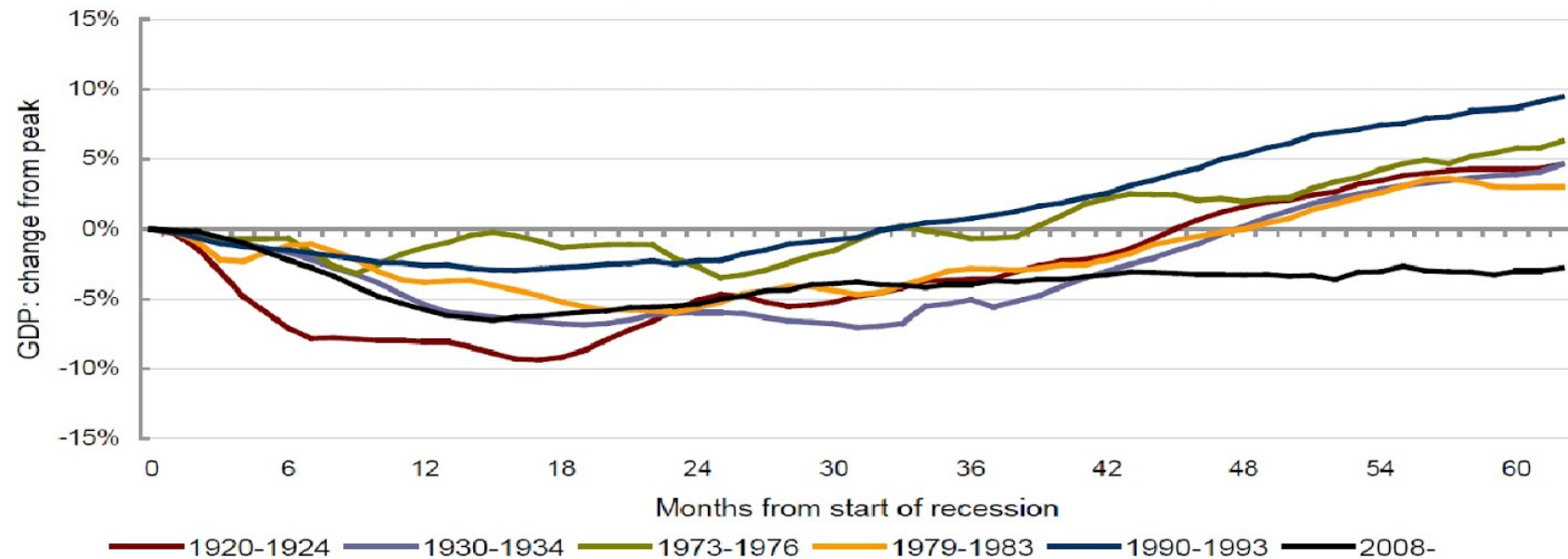# 10-Year Real Sovereign Bond Yields (%), Various Countries, 2001 – 2016YTD
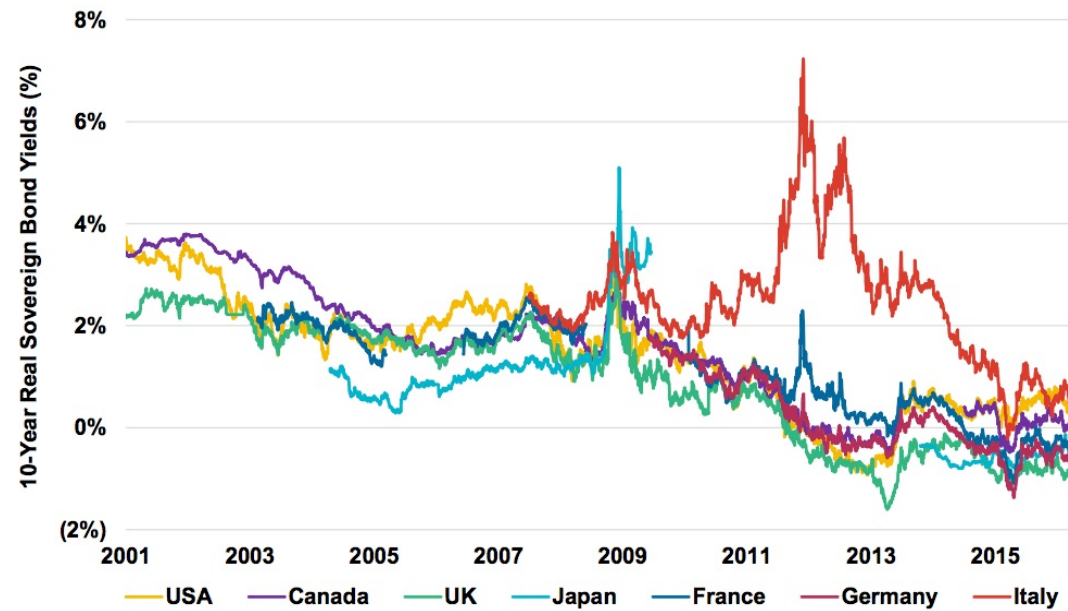
Figure 1. The profile of recession and recovery

Notes: Calculated from centred three-month moving averages of monthly GDP, the effect of the miners' strike in 1921 is excluded from the 1920-1924 profile (the strike started on 31st March 1921 and ended on 28th June 1921).
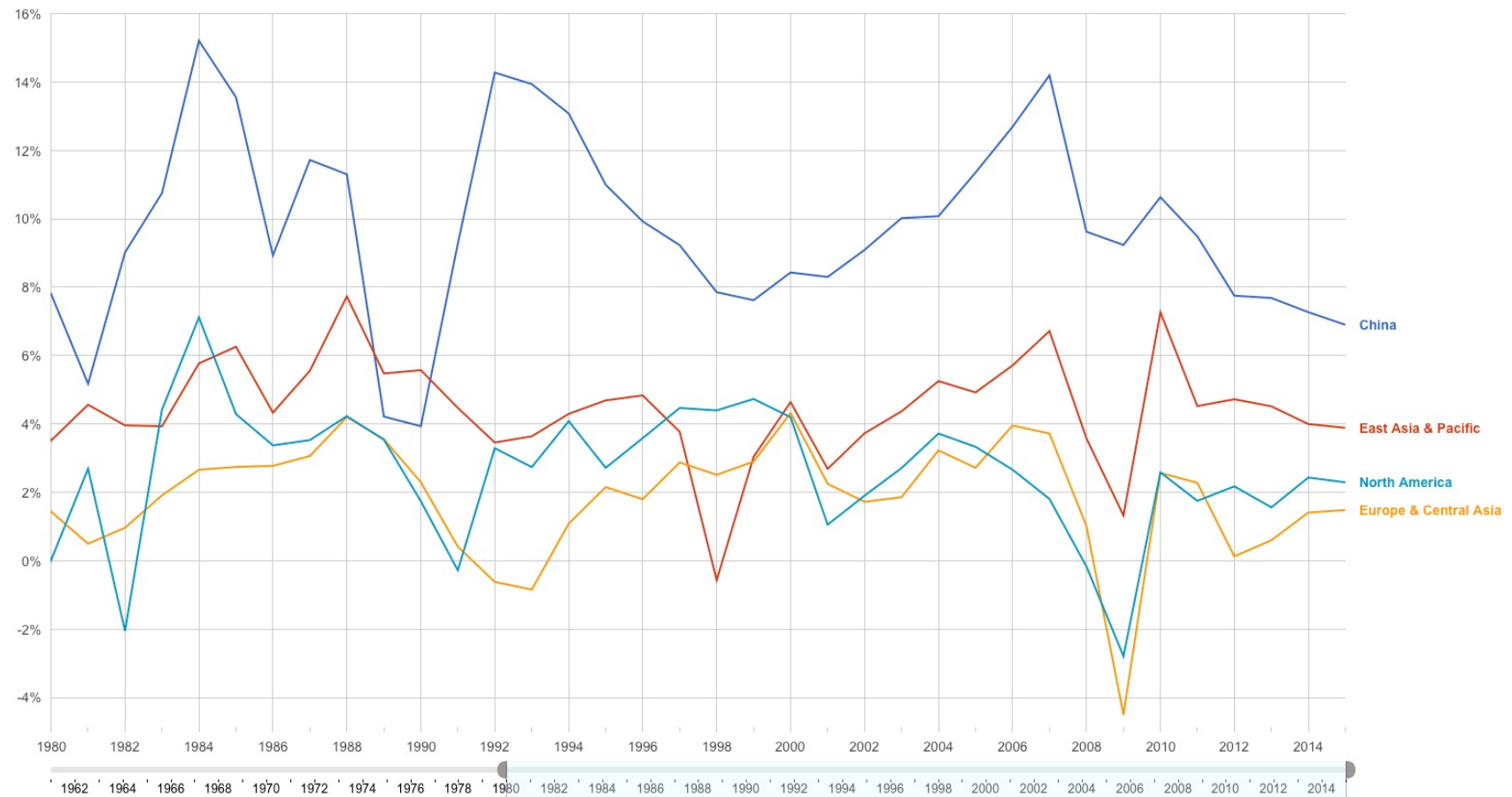
http://www.niesr.ac.uk/blog/recessions-and-recoveries-historical-perspective-updated-april-9-2013#.WAyckqOZNhE
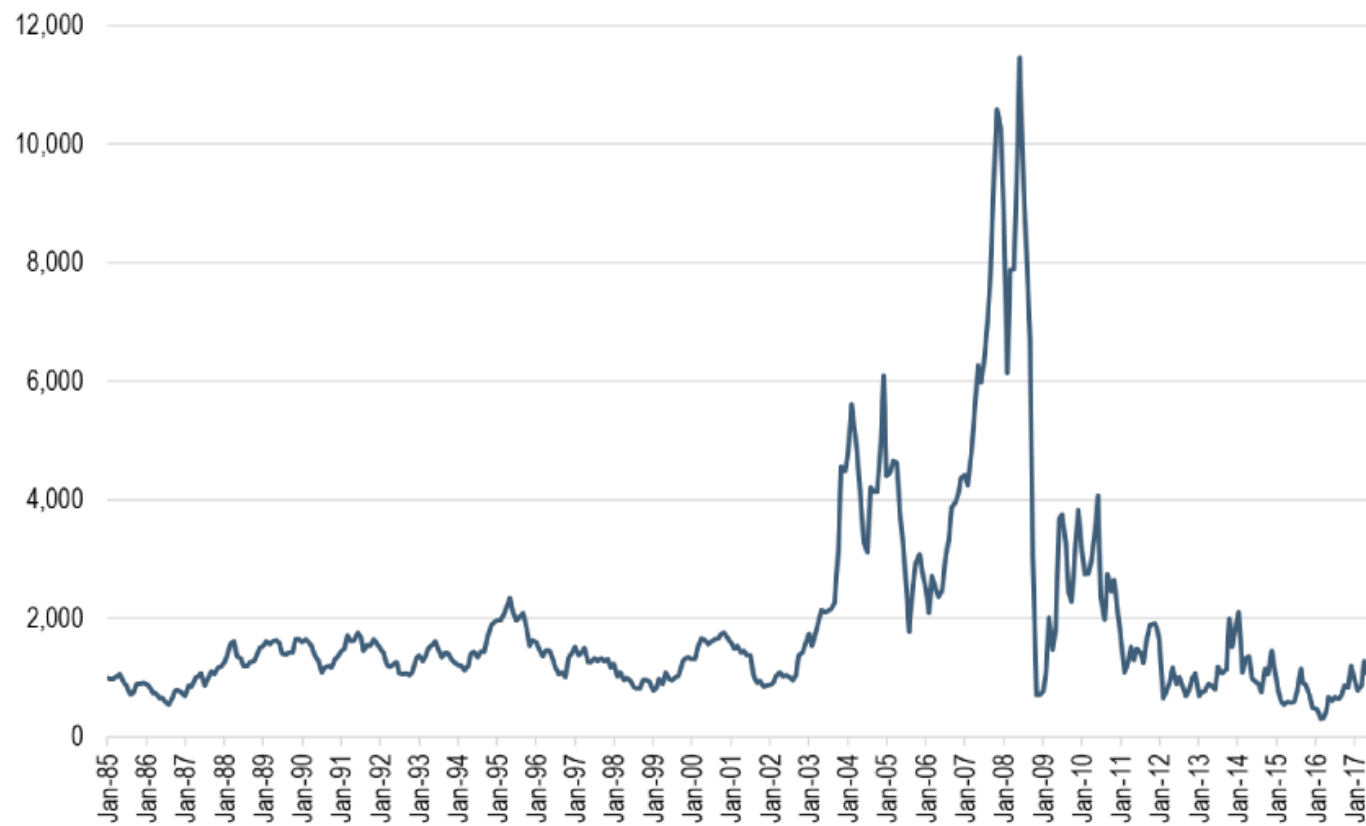
GBP to USD Chart

27 Oct 2007 00:00 UTC - 23 Oct 2017 17:32 UTC   **GBP/USD** close:**1.32063** low:**1.20230** high:**2.11018**

The Baltic Dry Index, 1985-2017

https://people.hofstra.edu/geotrans/eng/ch7en/conc7en/bdi.html

Gold Prices - 100 Year Historical Chart

Interactive chart of historical data for real (inflation-adjusted) gold prices per ounce back to 1915. The series is deflated using the headline Consumer Price Index (CPI) with the most recent month as the base. The current month is updated on an hourly basis with today's latest value. The current price of gold as of October 23, 2017 is **$1,276.20** per ounce.

Global Technology Merger & Acquisition Volume = Robust Relative to History

Global Technology M&A Deals, 2010-2016
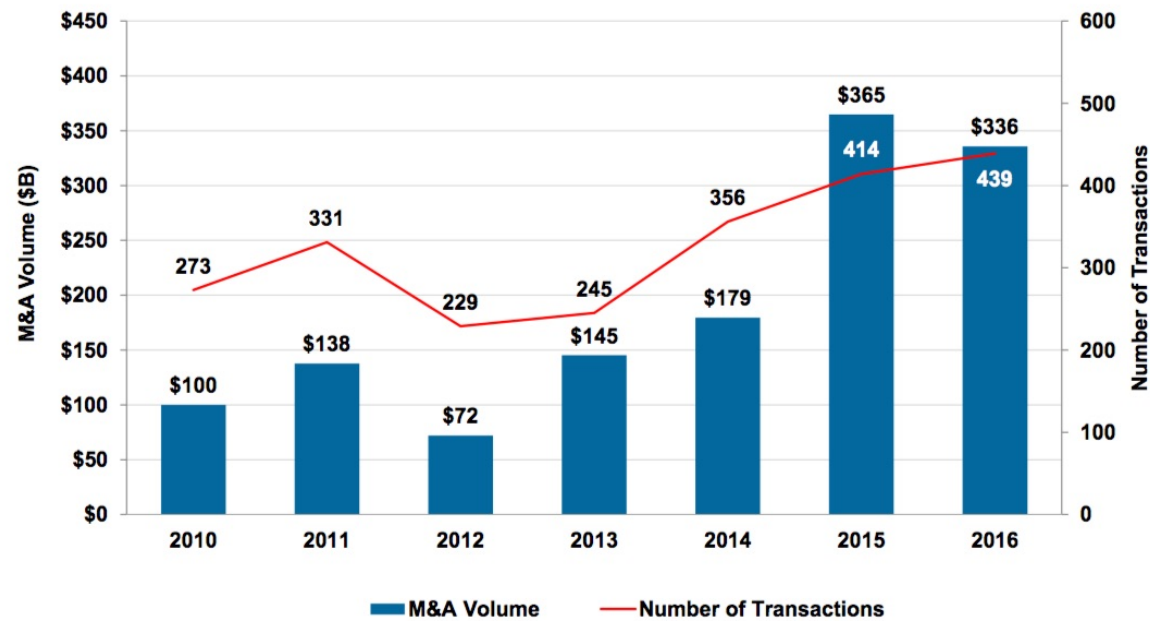
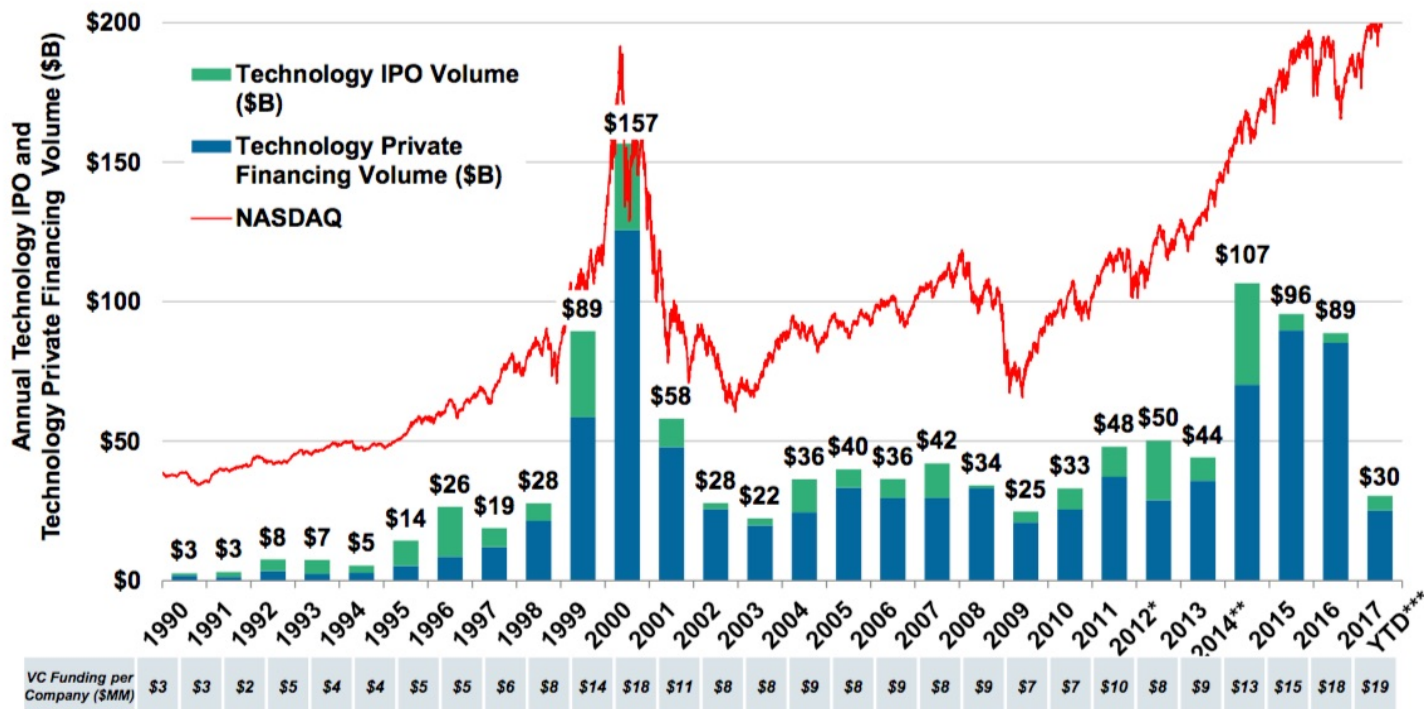Source: Morgan Stanley, Thomson Research

Global Technology Financings = Strong Relative to History Slowing @ Margin

Global USA-Listed Technology IPO Issuance & Global Technology Venture Capital Financing, 1990 – 2017YTD

Source: Morgan Stanley Equity Capital Markets, 2017YTD as of 5/12/17, Thomson ONE 2017YTD as of 5/12/17. All global U.S.-listed technology IPOs over $30MM, data per Dealogic, Bloomberg, & Capital IQ. VC Funding per Company ($MM) calculated as total venture financing per year divided by number of companies receiving venture financing.
*Facebook ($16B IPO) = 75% of 2012 IPO $ value. **Alibaba ($25B IPO) = 69% of 2014 IPO $ value. ***Snap ($4B IPO) = 74% of 2017 YTD $ value.

KP INTERNET TRENDS 2017 | PAGE 329

Exits slowing faster than deals
US VC investment-to-exit ratio
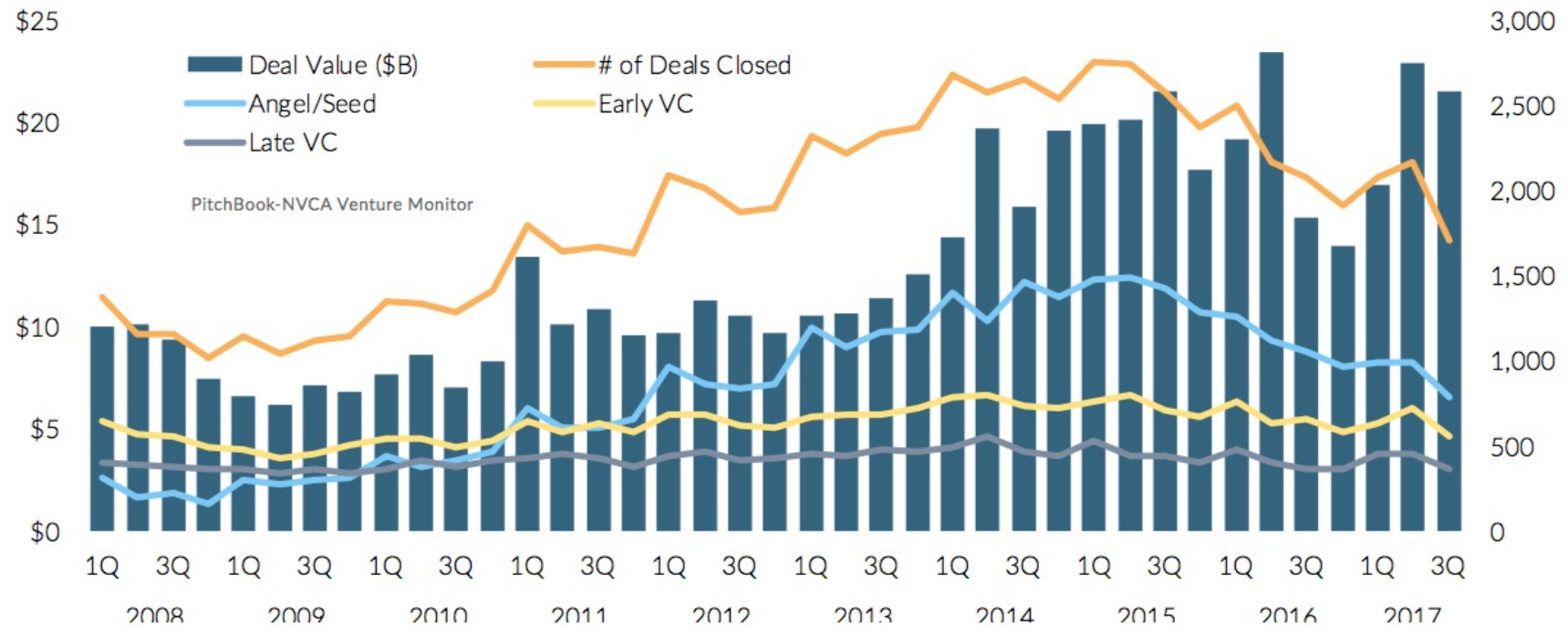
*As of 9/30/2017
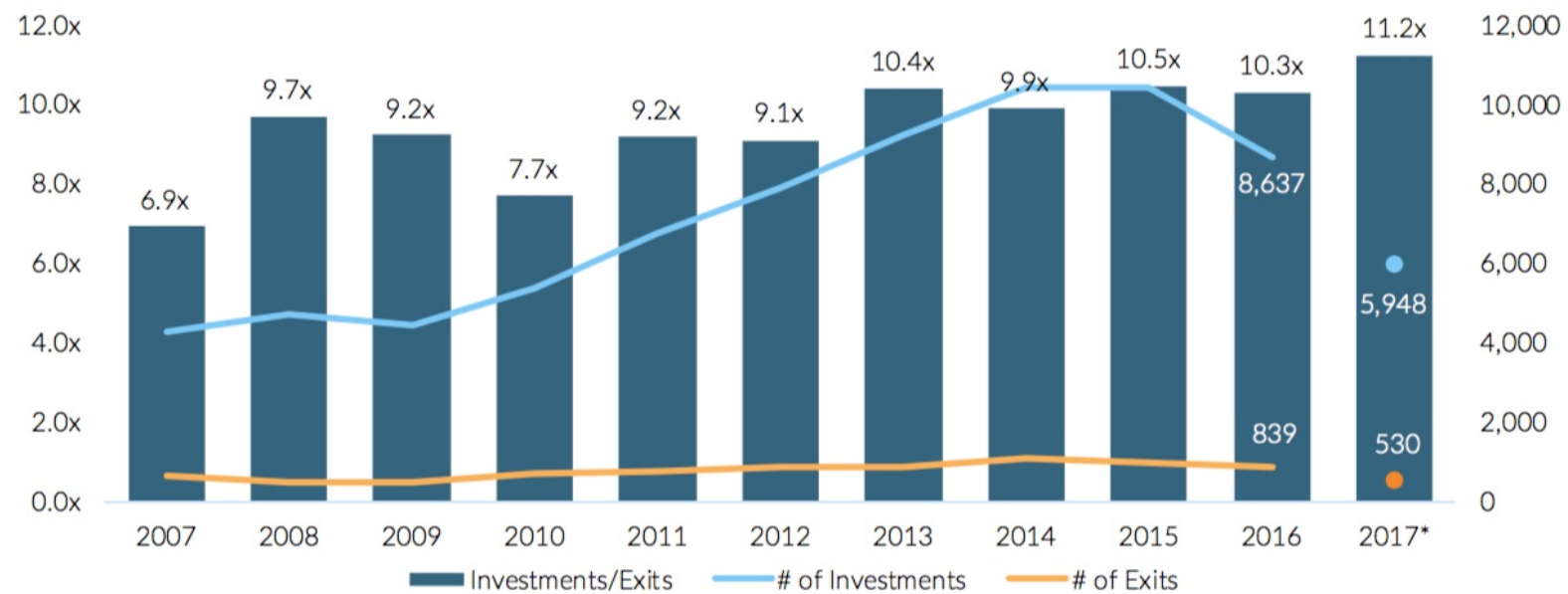
PitchBook-NVCA Venture Monitor
*As of 9/30/2017

More than $20B invested in each of past two quarters

US VC activity

PitchBook-NVCA Venture Monitor

Legend: Deal Value ($B) | # of Deals Closed | Angel/Seed | Early VC | Late VC

Unicorn deals driving growth of aggregate value

Unicorn round deal value versus non-unicorn round deal value ($B)

Crunchbase Unicorn Leaderboards

Today's Unicorns | Exited Unicorns | Emerging Unicorns

Last updated September 25, 2017

This curated leaderboard of private companies with post-money valuations of $1 billion or more is based on Crunchbase data. New companies are added to the list as they reach the $1 billion valuation mark. Data for companies already on the leaderboard is updated when there is a new funding or valuation. Valuations credibly reported but not officially confirmed are marked with an asterisk.

Please reach out to feedback@crunchbase.com if a company is missing or if data needs updating.

Unicorn Statistics

| 267 Companies | $920.8B Total Valuation | $176B Total Amount Raised |

Unicorn Interactive Visualizations

Timeline | Investor x Company | Investor x Lead | Investor x Round | Founded On

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Today's Unicorns | Exited Unicorns | Emerging Unicorns

Last updated September 25, 2017

The leaderboards below list companies that reached a valuation of $1B or more as private companies and subsequently exited by acquisition or IPO. The list is based on a curated Crunchbase dataset and market data. Valuations credibly reported but not officially confirmed are marked with an asterisk.

Unicorn Statistics

| 59 Companies | $241B Total Valuation | $35.3B Total Amount Raised |

Today's Unicorns | Exited Unicorns | Emerging Unicorns

Last updated September 25, 2017

This curated leaderboard of private companies with a valuation of between $500M and $1B is based on Crunchbase data. The list is updated whenever a new company reaches that valuation range or there is a change in valuation for a company already on the leaderboard. Valuations that have been widely reported but not officially confirmed are marked

Unicorn Statistics

| 95 Companies | $63.7B Total Valuation | $16.3B Total Amount Raised |

TechCrunch Unicorn top 20 - 25th Sep 2017

Company	Post Money ($ Bn)	Date	Funding ($ Bn)	Country	Market
Uber	62.5	Sep 17	8.6	USA	Transportation
ANT Financial	60	Feb 17	1.5	CHN	Financial Services
Didi Chuxing	50	Apr 17	13	CHN	Consumer Internet
Xiaomi	45	Jul 17	1.1	CHN	Hardware
Airbnb	31	Mar 17	3.4	USA	Consumer Internet
Space-X	21	Jul 17	1.5	USA	Aerospace
Palantir Technologies	20.33	Nov 16	2	USA	Software
Toutiao	20	Aug 17	3.1	CHN	Consumer Internet
WeWork	20	Aug 17	5.45	USA	Real Estate
Lufax	18.2	Jan 16	1.7	CHN	Financial Services
Meituan-Dianping	18	Jul 16	4.34	CHN	Consumer Internet
Pinterest	12.3	Jun 17	1.47	USA	Consumer Internet
Flipkart	11.6	Sep 17	6.12	IND	E-Commerce
Dropbox	10.35	Mar 17	0.6	USA	Software
Infor	10	Nov 16	2.5	USA	Software
Stripe	9.2	Nov 16	0.44	USA	Financial Services
Spotify	8.53	Mar 16	1.06	SWE	Consumer Internet
ZhongAn	8	Jun 15	0.934	CHN	Financial Services
DJI	8	May 15	0.105	CHN	Hardware
Koubei	8	Jan 17	1.1	CHN	Local Business

TechCrunch Public Exit Unicorn top 20- 25th Sep 2017

Company	Last Private Valuation ($ Bn)	Date of Last Private Valuation	IPO Value ($ Bn)	Date of IPO	Market Capitalisation ($ Bn)	Change Since IPO	Total Pre-IPO Equity Raised ($ Bn)
Facebook	50	Jan 11	104	May 12	502.75	+383%	2.43
Alibaba	42	Jun 16	238	Sep 14	441.09	+85%	4.81
Snap Inc	19.3	May 16	33	Mar 17	18.38	-44%	2.65
Zynga	9.1	Feb 11	7	Dec 11	3.37	-52%	0.867
Twitter	8	Dec 11	14.2	Nov 13	12.98	-9%	0.800
Square	6	Oct 14	3.6	Nov 15	12.54	+248%	0.591
Groupon	4.75	Apr 16	13	Nov 11	2.62	-80%	1.1
UCAR	4.4	Jun 17	5.5	Jul 16			1.37
Cloudera	4.1	Dec 16	1.9	Apr 17	2.12	+12%	1.04
Zalando	4.03	Nov 13	6.7	Oct 14			0.243
Lending Club	3.8	Apr 17	8.5	Dec 14	2.42	-71%	0.342
Atlassian	3.3	Apr 14	4.4	Dec 15	11.07	+152%	0.462
Delivery Hero	3.11	May 17	5.1	Jun 17			1.81
Pure Storage	3	Aug 14	3.1	Oct 15	3.35	+8%	0.470
Box	2.4	Jul 14	1.67	Jan 15	2.84	+70%	0.559
GoPro	2.25	Aug 17	2.96	Jun 14	1.36	-54%	0.288
Blue Apron	2.14	Dec 14	1.9	Jun 17	0.960	-49%	0.193
Meitu	2	Mar 14	4.6	Dec 16			0.360
Wayfair	2	Sep 16	2.4	Oct 14	5.76	+140%	0.351
Nutanix	2	Oct 11	2.2	Sep 16	4.22	+92%	0.312

TechCrunch Unicorn Acquisition Exit top 20 by LPV - 25th Sep 2017

Company	Last Private Valuation ($ Bn)	Date	Acquisition ($ Bn)	Date	Value Change	Acquired By	Total Equity Raised ($ Bn)
Uber China	9	Jan 16	7	Aug 16	-22%	Didi Chuxing	2
Stem CentTx	5	Sep 15	5.8	Apr 16	+16%	AbbVie	0.474
Legendary Entertainment	3	Oct 14	3.5	Jan 16	+17%	Wanda Group	1.08
AppDynamics	1.9	Dec 16	3.7	Jan 17	+95%	Cisco	0.315
avito.ru	1.82	Feb 14	0	Oct 15		Naspers	0.142
Skyscanner	1.6	Jan 16	1.4	Nov 16	-13%	Ctrip	0.197
Better Place	1.6	Nov 12	0.012	Jul 13	-99%	Sunrise Group	0.925
Living Social	1.51	Feb 13	0	Oct 16		Groupon	0.930
WhatsApp	1.5	Jul 13	19	Feb 14	+1200%	Facebook	0.060
HomeAway	1.4	Oct 10	3.9	Nov 16	+54%	Expedia	0.505
Jasper	1.35	Apr 14	1.4	Feb 16	+4%	Cisco	0.102
Jet	1.35	Nov 15	3	Aug 16	+122%	Walmart	0.565
Ten-X	1.2	Mar 14	0	Aug 17		Thomas H. Lee Partners	0.142
Good Technology	1.2	Sep 14	0.425	Sep 15	-65%	Blackberry	0.291
Gilt Groupe	1.15	Feb 15	0.250	Jan 16	-78%	Hudson Bay Company	0.286
Fab	1.15	Aug 13	0.015	Mar 15	-99%	PCH International	0.336
zulily	1.09	May 15	2.4	Oct 15	+121%	Liberty Interactive Coporation	0.138
SimpliVity	1.03	Mar 15	0.650	Jan 17	-37%	Hewlett Packard Enterprise	0.275
Kabam	1.02	Dec 14	0	Dec 16		Netmarble	0.245
Airwatch	1	May 13	1.54	Jan 14	+54%	VMware	0.225

TechCrunch Unicorn Acquisition Exit top 20 by Acquisition Price - 25th Sep 2017

Company	Last Private Valuation ($ Bn)	Date	Acquisition ($ Bn)	Date	Value Change	Acquired By	Total Equity Raised ($ Bn)
WhatsApp	1.5	Jul 13	19	Feb 14	+1200%	Facebook	0.060
Uber China	9	Jan 16	7	Aug 16	-22%	Didi Chuxing	2
Stem CentTx	5	Sep 15	5.8	Apr 16	+16%	AbbVie	0.474
Homeway	1.4	Oct 10	3.9	Nov 16	+54%	Expedia	0.505
AppDynamics	1.9	Dec 16	3.7	Jan 17	+95%	Cisco	0.315
Legendary Entertainment	3	Oct 14	3.5	Jan 16	+17%	Wanda Group	1.08
Jet	1.35	Nov 15	3	Aug 16	+122%	Walmart	0.565
zulily	1.09	May 15	2.4	Oct 15	+121%	Liberty Interactive Coporation	0.138
Airwatch	1	May 13	1.54	Jan 14	+54%	VMware	0.225
lynda.com	1	Jan 15	1.5	Ap 15	+50%	LinkedIn	0.289
Skyscanner	1.6	Jan 16	1.4	Nov 16	-13%	Ctrip	0.197
Jasper	1.35	Apr 14	1.4	Feb 16	+4%	Cisco	0.102
Renaissance Learning	1	Feb 14	1.1	Mar 14	+10%	Hellman & Friedman	0.04
SimpliVity	1.03	Mar 15	0.650	Jan 17	-37%	Hewlett Packard Enterprise	0.275
Souq	1	Feb 16	0.650	Mar 17	-35%	Amazon	0.390
Good Technology	1.2	Sep 14	0.425	Sep 15	-65%	Blackberry	0.291
Gilt Groupe	1.15	Feb 15	0.250	Jan 16	-78%	Hudson Bay Company	0.286
Wandoujia	1	Jan 14	0.200	Jul 16	-80%	Alibaba	0.128
Fab	1.15	Aug 13	0.015	Mar 15	-99%	PCH International	0.336
Better Place	1.6	Nov 12	0.012	Jul 13	-99%	Sunrise Group	0.925

"Winter is Coming" message received by portfolio companies

https://www.slideshare.net/msuster/upfront-vc-analysis-2016/17-17Winter_isComingmessagereceived_byportfoliocompanies

Stats

$3,348,214,786

total dollars pledged to Kickstarter projects

133,305

Successfully funded projects

13,743,881

Total backers

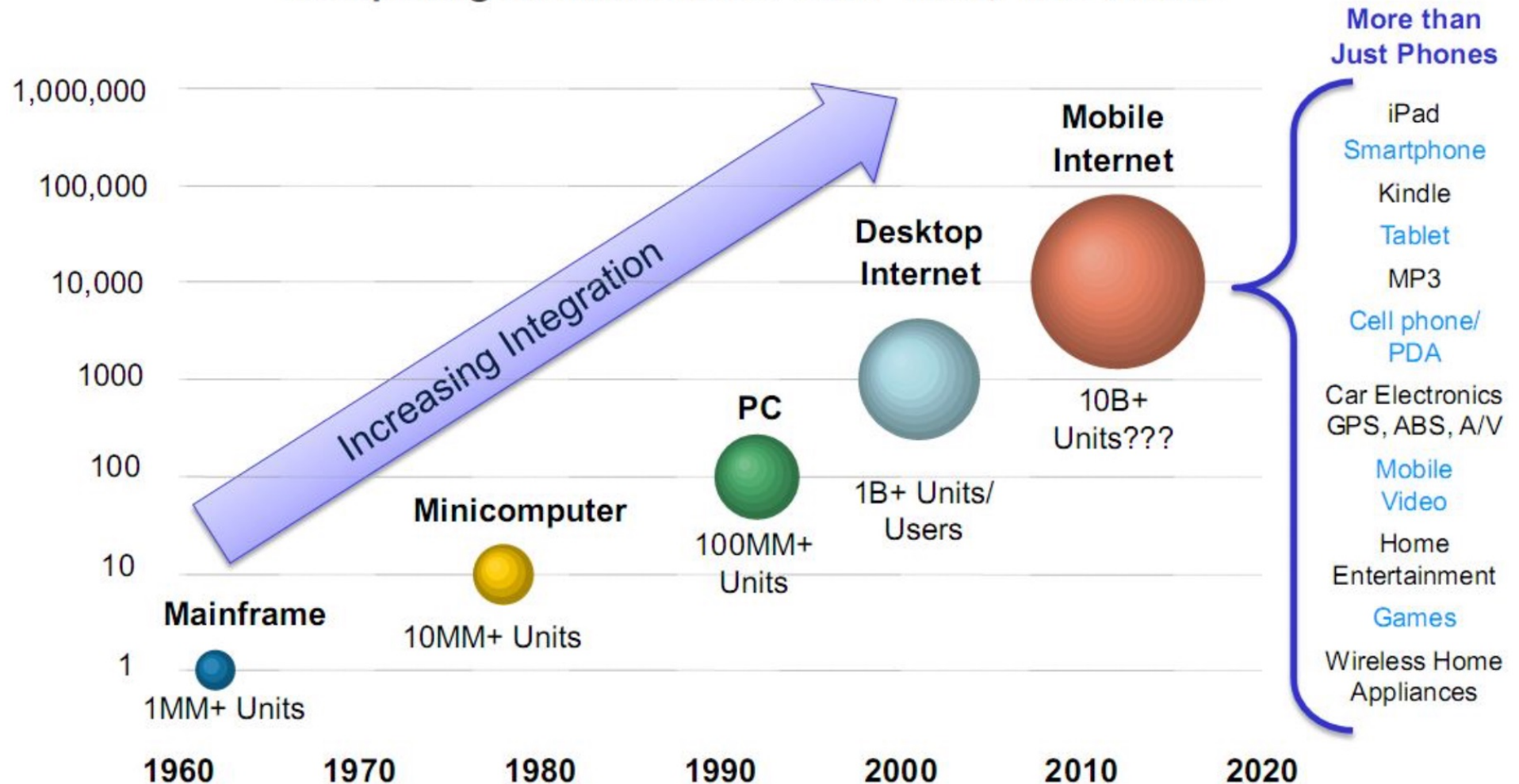**4,433,328**

Repeat backers

41,579,158

Total pledges

retrieved 23 Oct 2017

Projects and Dollars

Category	Launched Projects		Total Dollars	Successful Dollars	Unsuccessful Dollars	Live Dollars	Live Projects	Success Rate
All	**376,276**		**$3.35 B**	**$2.94 B**	**$365 M**	**$42 M**	**4,503**	**35.86%**
Games	34,324		$724.02 M	$654.70 M	$59.86 M	$9.46 M	608	35.38%
Design	29,309		$697.88 M	$623.82 M	$63.82 M	$10.24 M	565	34.84%
Technology	31,885		$674.05 M	$577.99 M	$83.82 M	$12.23 M	539	19.80%
Film & Video	64,272		$389.18 M	$327.35 M	$60.39 M	$1.44 M	455	37.13%
Music	53,704		$203.43 M	$185.43 M	$16.91 M	$1.09 M	404	49.49%
Fashion	22,149		$129.55 M	$111.60 M	$15.61 M	$2.34 M	375	24.50%
Publishing	39,474		$129.41 M	$111.55 M	$16.40 M	$1.46 M	471	30.66%
Food	24,260		$123.05 M	$102.47 M	$19.18 M	$1.41 M	264	24.90%
Art	27,699		$88.28 M	$77.64 M	$9.92 M	$722.89 K	279	40.77%
Comics	10,562		$70.17 M	$64.62 M	$4.72 M	$827.25 K	209	53.75%
Theater	10,858		$43.08 M	$38.51 M	$4.44 M	$133.87 K	57	60.11%
Photography	10,723		$37.39 M	$32.36 M	$4.74 M	$292.52 K	87	30.52%
Crafts	8,592		$13.74 M	$11.19 M	$2.20 M	$348.64 K	125	23.88%
Dance	3,736		$12.87 M	$11.98 M	$848.45 K	$44,480	24	62.12%
Journalism	4,729		$12.11 M	$10.22 M	$1.86 M	$33,483	41	21.48%

retrieved 23 Oct 2017

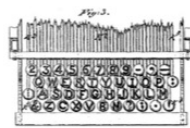**Computing Growth Drivers Over Time, 1960-2020E**

Increasing Integration

1,000,000
100,000
10,000
1000
100
10
1

Mobile Internet
10B+ Units???

Desktop Internet
1B+ Units/ Users

PC
100MM+ Units

Minicomputer
10MM+ Units

Mainframe
1MM+ Units

1960 1970 1980 1990 2000 2010 2020

More than Just Phones

iPad
Smartphone
Kindle
Tablet
MP3
Cell phone/ PDA
Car Electronics GPS, ABS, A/V
Mobile Video
Home Entertainment
Games
Wireless Home Appliances

Note: PC installed base reached 100MM in 1993, cellphone/Internet users reached 1B in 2002/2005 respectively; Source: ITU, Mark Lipacis, Morgan Stanley Research.

Human-Computer Interaction (1830s – 2015), USA =
Touch 1.0 → Touch 2.0 → Touch 3.0 → Voice

but what's next

Outline Synopsis

1. So you've got an idea…
2. Money and Tools for it's management
3. Legal aspects, contracts and copyright
4. People: How to organise a team
5. Project planning and management
6. Quality, maintenance and documentation
7. Marketing and Selling
8. Growth and Exit routes

Next term e-commerce, apps, electronic money, block chain, etc
and 6 seminars in Easter term

Reading list

The High-tech Entrepreneur's Handbook
[Jack Lang](#)

Paperback - 224 pages (2 November, 2001) FT.COM; ISBN: 0273656155
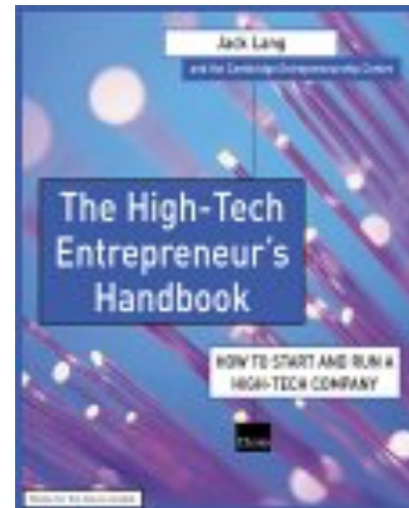
Students will be expected to able to use Microsoft Excel and Microsoft Project

Reading list

- *Lecture 1: From idea to Business Plan*

- Cambridge Enterprise *Starting a Technology Company*: A guide for University staff and students
Also online at http://www.enterprise.cam.ac.uk/building/starting.html

- Carter, M. (2004). *It's all cobblers! The one book to read before starting a business*. Cirencester: Management Books 2000.

- Rogers, E.M. (2003). *Diffusion of innovations.* London: Free Press.

- Segal Quince Wicksteed (1985). *The Cambridge phenomenon: the growth of high technology industry in a university town*. Cambridge: Segal Quince Wicksteed.

Reading list 2

- *Lecture 2: Money and tools for its management: raising the cash*

- Dyson, J.R. (2004). *Accounting for non-accounting students.* 6th ed. Harlow: Financial Times/Prentice Hall (or any basic accounting book)

- Varian, H.R. (2003). *Intermediate microeconomics: a modern approach.* 6th ed. New York: W.W. Norton.

- Shapiro, C. and Varian, H.R. (1998). *Information rules: a strategic guide to the network economy.* Boston, Mass.: Harvard Business School Press.

- Useful websites:
  http://www.bvca.co.uk
  http://www.etrade.co.uk
  http://www.londonstockexchange.com/en-gb/

Reading List 3

- ## *Lecture 3: Setting up and legal aspects*

- Manser, P. and Walker, S. (2002). *Tolley's start-ups: law and business handbook.* Croydon: Butterworths Tolley.

- Institute of Directors (1985). *Guidelines for directors*. 3rd ed. London: Director Publications.

- Useful websites:
  http://www.delphion.com/ (was the IBM patent search site)
  http://www.patent.gov.uk/ (UK Patent office)
  http://www.jordans.co.uk/ (company formation agents)

- http://www.solicitor.net/powers_and_duties.asp (there is a lot of good stuff on that site)
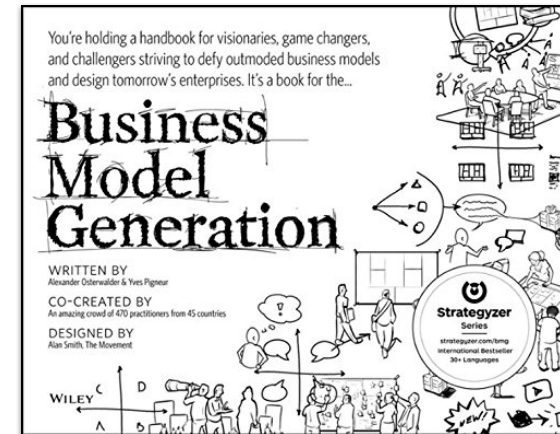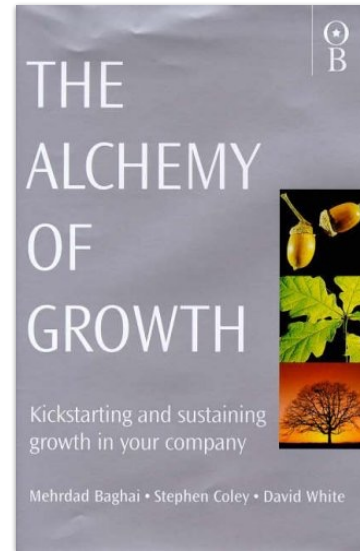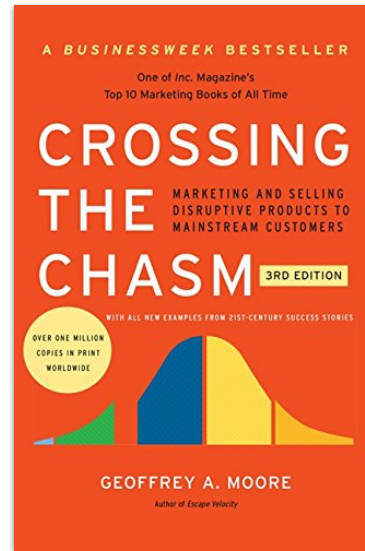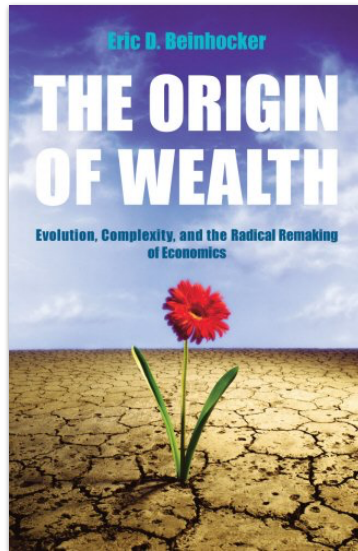
Reading List 4

- *Lecture 4: Project Planning and Management*

- Townsend, R. (1971). *Up the organisation: how to stop the corporation from stifling people and strangling profits*. New York: Knopf.

- Brooks, F. (1995). *The mythical man-month.* Boston, Mass.: Addison-Wesley Pub. Co.

- Useful software: Microsoft Project.

Reading List 5

- *Lecture 5: Prototype to Product*
  - Moore, G.A. (1998). *Crossing the chasm*. Oxford: Capstone.
  - Moore, G.A. (1998). *Inside the tornado.* Oxford: Capstone.
- *Lecture 6: Standards, Quality, Documentation and Maintenance*
  - British Standards Institute (2000). *Quality management systems: fundamentals and vocabulary*. ISO 9000:2000 London: British Standards Institute.
  - British Standards Institute (2002). *Information security management: specification with guidance for use.* BS 7799-2:2002 London: British Standards Institute.
  - http://standards.ieee.org/

How To Start A Startup (Stanford Course: CS183B)

Michael Babich • 20 videos • 97,620 views • Last updated on 9 Jun 2015

Sam Altman and the folks from Y Combinator offer up an amazing course in "How To Start A Startup" at Stanford. Course includes lectures from: Sam Altman, Dustin Moskovitz, Paul Graham, Adora Cheung, Peter Thiel, Alex Schultz, Kevin Hale,... more

▶ Play all   ≪ Share   ➕ Save

1	WATCHED	**Lecture 1 - How to Start a Startup (Sam Altman, Dustin Moskovitz)** by How to Start a Startup	43:53
2	WATCHED	**Lecture 2 - Team and Execution (Sam Altman)** by How to Start a Startup	46:19
3	WATCHED	**Lecture 3 - Before the Startup (Paul Graham)** by How to Start a Startup	48:08
4	WATCHED	**Lecture 4 - Building Product, Talking to Users, and Growing (Adora Cheung)** by How to Start a Startup	52:22
5	WATCHED	**Lecture 5 - Competition is for Losers (Peter Thiel)** by How to Start a Startup	50:17
6	WATCHED	**Lecture 6 - Growth (Alex Schultz)** by How to Start a Startup	47:28
7	WATCHED	**Lecture 7 - How to Build Products Users Love (Kevin Hale)** by How to Start a Startup	48:02
8	WATCHED	**Lecture 8 - How to Get Started, Doing Things that Don't Scale, Press** by How to Start a Startup	52:14
9	WATCHED	**Lecture 9 - How to Raise Money (Marc Andreessen, Ron Conway, Parker Conrad)** by How to Start a Startup	50:11
10	WATCHED	**Lecture 10 - Culture (Brian Chesky, Alfred Lin)** by How to Start a Startup	50:26

Technology-enabled Blitzscaling

Greylock Partners • 20 videos • 49,744 views • Last updated on 7 Dec 2015

Class recordings from Stanford CS183C: Technology-enabled Blitzscaling.

▶ Play all   ⟨ Share   ＋ Save

|		
1	**Blitzscaling 01: Overview of the Five Stages of Blitzscaling** by Greylock Partners	1:12:51
2	**Blitzscaling 02: Sam Altman on Y Combinator and What Makes The Best Founders** by Greylock Partners	1:12:26
3	**Blitzscaling 03: Michael Dearing on Capitalism, Creativity, and Creative Destruction** by Greylock Partners	1:19:36
4	**Blitzscaling 04: Ann Miura-Ko on FLOODGATE's Thunder Lizard Theory and Achieving Product Market Fit** by Greylock Partners	1:12:37
5	**Blitzscaling 05: John Lilly on Leveraging Community to Scale Mozilla** by Greylock Partners	1:14:36
6	**Blitzscaling 06: Jennifer Pahlka on Founding Code For America and Starting the US Digital Service** by Greylock Partners	1:02:18
7	**Blitzscaling 07: Mariam Naficy on Lessons From The Dot Com Days and Knowing When To Blitzscale** by Greylock Partners	1:12:43
8	**Blitzscaling 08: Eric Schmidt on Structuring Teams and Scaling Google** by Greylock Partners	1:22:39
9	**Blitzscaling 09: Reid Hoffman and Allen Blue on Why and How They Scaled LinkedIn** by Greylock Partners	1:20:13
10	**Blitzscaling 10: Selina Tobaccowala on Building a Global Business at SurveyMonkey** by Greylock Partners	1:21:53
	Blitzscaling 11: Patrick Collison on Hiring at Stripe and the Role of a Product-Focused CEO	1:19:12

1. So you've got an idea...

Introduction

Why are you doing it?

What is it? defining the product or service; types of company

Who needs it? an introduction to market analysis

How? Writing the business plan

Futures: some emerging areas for new computer businesses

One of you will become a Billionaire

- **Most will be millionaires**
  - And need to be
    - Pension issue
      - Say household income of £50K @ 4% -> £1.25M
      - Inflation for 40 year @ 3% -> x 3 -> £3.75M
      - House, etc say £250K -> 750K

      - Total   £4.5M

- **You won't save £4.5M from a salary**
  - Trading
  - Starting an Enterprise

Why?

Why now?
- Because I can: available time and resource
- Just graduated, or made redundant and nothing else to do
- Brilliant idea or market opportunity

Why me?
- Barriers to market entry
  - What have you got to make it through?
    - Expertise, resource, relationships
- Barriers to competition
  - What stops others doing the same thing
    - IPR, network effect, niche
- Unique advantages

Know yourself
- Know your motivation so you can motivate others
  - What counts as success?

Never a better time to start than NOW

- Money
  - Cambridge Angels, Cambridge Capital….
- Support
  - St Johns, Cambridge Enterprise….
- Infrastructure
  - Banks, lawyers, accountants
  - Office space
- People
  - Cambridge Network, mentors…
- Government
  - EIS Tax relief, TSB Awards, SFLGS/ Enterprise Finance Guarantee….
  - Princes Trust
- Society attitude
  - OK to lose,
    - "Better to have loved and lost than never loved at all"

- "Dare to Begin" (Horace)
  - Nothing will be attempted if all possible objections must be overcome (Samuel Johnson)

Why are you doing it?

- **Wealth generation**
  - You need £5M by the time you retire, for a modest lifestyle
- **Better toys**
- **Make a difference**
  - Social consequences
    - Generation of employment
    - Death of the nation state
- **Fun or profit?**
  - Lifestyle or high growth?
    - Funding
    - Eventual size?

An Entrepreneur is…

- ## Someone who starts a project without having the full resources or knowledge
    - Estimate, guess and gut feel
    - Risk taking
        - Market risk
        - Technology risk
        - Financial risk

- ## Value accrues as risk lessens
    - Guesses replaced by justified facts
    - As development progresses and market established
    - Transition from intangible hopes to reality and cash-flow
    - Risk lessens, hence value increases

Example

- (Almost) Risk Free return, eg Bank:
  - say 5% or P/E 20
  - after 1 year 100 ->105

- Invest in companies, say 30% chance of failure:
  - After 1 year average return is $0.7*(100+x)$ where x is the IRR
  - For equivalent return $0.7(100+x) = 105$
  - x=50%

Your job as an entrepreneur is to
discover and build a business
(& sell it)

Customer Value Proposition (CVP)
- **Target customer**
- **Job to be done** to solve an important problem or fulfill an important need for the target customer
- **Offering,** which satisfies the problem or fulfills the need. This is defined not only by what is sold but also by how it's sold.

PROFIT FORMULA
- **Revenue model** How much money can be made: price x volume. Volume can be thought of in terms of market size, purchase frequency, ancillary sales, etc.
- **Cost structure** How costs are allocated: includes cost of key assets, direct costs, indirect costs, economies of scale.
- **Margin model** How much each transaction should net to achieve desired profit levels.
- **Resource velocity** How quickly resources need to be used to support target volume. Includes lead times, throughput, inventory turns, asset utilization, and so on.

KEY RESOURCES
needed to deliver the customer value proposition profitably. Might include:
- **People**
- **Technology, products**
- **Equipment**
- **Information**
- **Channels**
- **Partnerships, alliances**
- **Brand**

KEY PROCESSES, as well as rules, metrics, and norms, that make the profitable delivery of the customer value proposition repeatable and scalable. Might include:
- **Processes:** design, product development, sourcing, manufacturing, marketing, hiring and training, IT
- **Rules and metrics:** margin requirements for investment, credit terms, lead times, supplier terms
- **Norms:** opportunity size needed for investment, approach to customers and channels

Christensen et al., Harvard Business Review Dec 2008

The Business Model Canvas

Designed for:

Designed by:

Date:

Version:

Key Partners

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Key Resources

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES
1. Awareness
   How do we raise awareness about our company's products and services?
2. Evaluation
   How do we help customers evaluate our organization's Value Proposition?
3. Purchase
   How do we allow customers to purchase specific products and services?
4. Delivery
   How do we deliver a Value Proposition to customers?
5. After sales
   How do we provide post-purchase customer support?

Customer Segments

For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams

For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
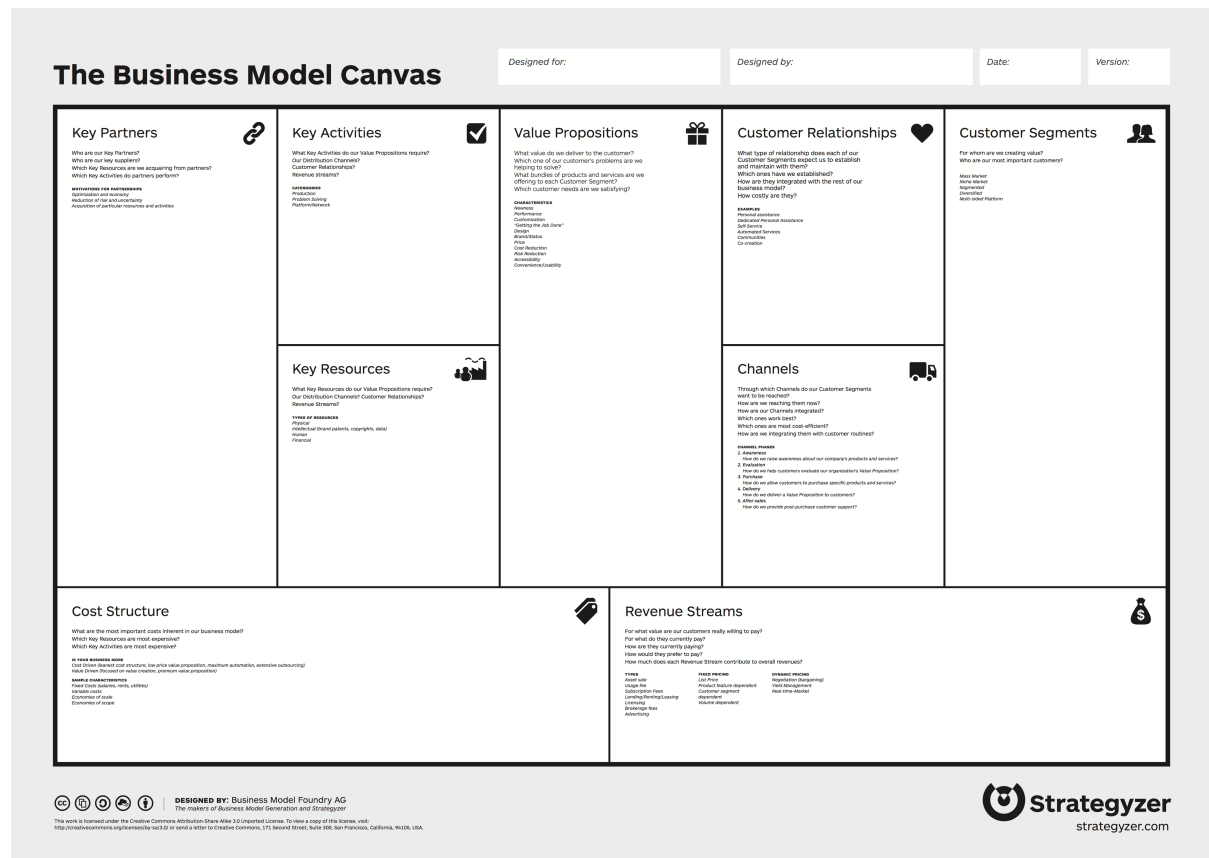How much does each Revenue Stream contribute to overall revenues?

TYPES
Asset sale
Usage fee
Subscription Fees
Lending/Renting/Leasing
Licensing
Brokerage fees
Advertising

FIXED PRICING
List Price
Product feature dependent
Customer segment dependent
Volume dependent

DYNAMIC PRICING
Negotiation (bargaining)
Yield Management
Real-time-Market

Learn → Build → Measure (Build-Measure-Learn loop)

Minimize the total time through the loop

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Product feature dependent
Customer segment dependent
Volume dependent

DYNAMIC PRICING
Negotiation (bargaining)
Yield Management
Real-time-Market

Strategyzer
strategyzer.com

High Profit vs High Growth

- High Profit
- Lifestyle
  - Restaurant/shop
- P&L
- Organic Growth
  - 20 years

- Debt finance

- High Growth
- Sell the Company
  - Chain of Restaurants/shops
- Balance Sheet
- Investment
  - Exit route
  - 5 years
- Equity
- BUT
  - Fairy Godmothers now extinct
  - Raise enough cash to get to get to profitability and survive

Investor Criteria for a business

Market   Global sustainable under-served market need

Technical   Defensible technological advantage

People   Strong team

Financial   Believable plans, 60% IRR

Major Risks   Framework to understand and manage.
            What do you know?
            What do you know you don't know?
            How will you discover the things you don't know you don't know?

Market Need

- Largest risk factor: everything else is process or resource
- Who needs it?
    - Why?
    Why do they need yours??
        - What are they doing now?
        - How much is it worth to them?
    - How is it sold, or advertised?
        - Routes to market
        - Alliances
        - Branding
    - Under served need
        - Competition
        - What other solutions?
    - Sustainable or one-shot wonder?
    - Growing market
        - Global potential

Global

Sustainable

Under-Served

Market Need

Job
to be
Done

Why do people hire your product?

People hire *your product* to do the job of _____ every _____ when _____. The other applicants for this job are _____, _____, and _____, but *your product* will always get the job because of _____

https://blog.intercom.com/when-personas-fail-you/

Market - who loves ya?

it's FAB because

Feature - techie speak
this chip uses a double super helical fooglefarg

Advantages - the translation step
it uses less power, gives you more speed

Benefits - customer speak
it is cheaper, smaller, works better in marginal conditions, batteries last longer

because *your friends will be envious*
why people really buy it

Defensible advantage

Exclude competition

Outcompete

Intellectual Property
Asset monopoly
Network effect
Scale faster
Company culture

Defensible technological advantage

- IPR
  - Patent
  - Copyright
  - Trademark

- Defensible technological leadership
  - against well-funded competition
  - Niche Market share

Senior Team

US	UK	
Chair	Chair	Senior figure; Old wise head Experience and contacts; Major dispute resolution; part-time
CEO	Managing Director	Finding money; Investor relations; Style setting; Keeping the peace
CFO	Finance Director	Accounts etc. Office management; Administration, Legals, Quality control
CTO	Technical Director	Inventing new things; development
COO	Production Director	Running the factory and distribution
VP Marketing	Marketing Director	Deciding what and how to sell; pricing Marcoms; Market information
VP Sales	Sales Director	Selling; CRM;

Strong management team

- **You can't do it all by yourself**
  - "Small" project >10 person-year
  - Team building
  - 1:3:10 rule

- **Alliances**

- **Recruit experience**
  - Financial Director
  - Sales & Marketing

- **Training & experience**
  - Merchant bank/Management Consultancy
  - MBA

where do you want to fit in?

The Business Model Canvas

Designed for:	Designed by:	Date:	Version:

Key Partners 🔗

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities ✓

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Key Resources 🏭

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions 🎁

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships ❤

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels 🚚

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES
1. *Awareness*
   How do we raise awareness about our company's products and services?
2. *Evaluation*
   How do we help customers evaluate our organization's Value Proposition?
3. *Purchase*
   How do we allow customers to purchase specific products and services?
4. *Delivery*
   How do we deliver a Value Proposition to customers?
5. *After sales*
   How do we provide post-purchase customer support?

Customer Segments 👥

For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure 🏷

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams 💰

For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

TYPES
Asset sale
Usage fee
Subscription Fees
Lending/Renting/Leasing
Licensing
Brokerage fees
Advertising

FIXED PRICING
List Price
Product feature dependent
Customer segment dependent
Volume dependent

DYNAMIC PRICING
Negotiation (bargaining)
Yield Management
Real-time-Market

PROBLEM

List your top 1-3 problems.

SOLUTION

Outline a possible solution for each problem.

UNIQUE VALUE PROPOSITION

Single, clear, compelling message that states why you are different and worth paying attention.

UNFAIR ADVANTAGE

Something that cannot easily be bought or copied.

CUSTOMER SEGMENTS

List your target customers and users.

KEY METRICS

List the key numbers that tell you how your business is doing.

CHANNELS

List your path to customers (inbound or outbound).

EXISTING ALTERNATIVES

List how these problems are solved today.

HIGH-LEVEL CONCEPT

List your X for Y analogy e.g. YouTube = Flickr for videos.

EARLY ADOPTERS

List the characteristics of your ideal customers.

COST STRUCTURE

List your fixed and variable costs.

REVENUE STREAMS

List your sources of revenue.

1	4	3	9	2
	8		5	
	7		6	
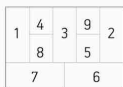
CANVAS FILL ORDER

RISK ITERATION PATH

● PRODUCT RISK
■ CUSTOMER RISK
● MARKET RISK

Lean Canvas

Created by Spark59 // Online version available at www.leancanvas.com

The Value Proposition Canvas

Value Proposition

Customer Segment
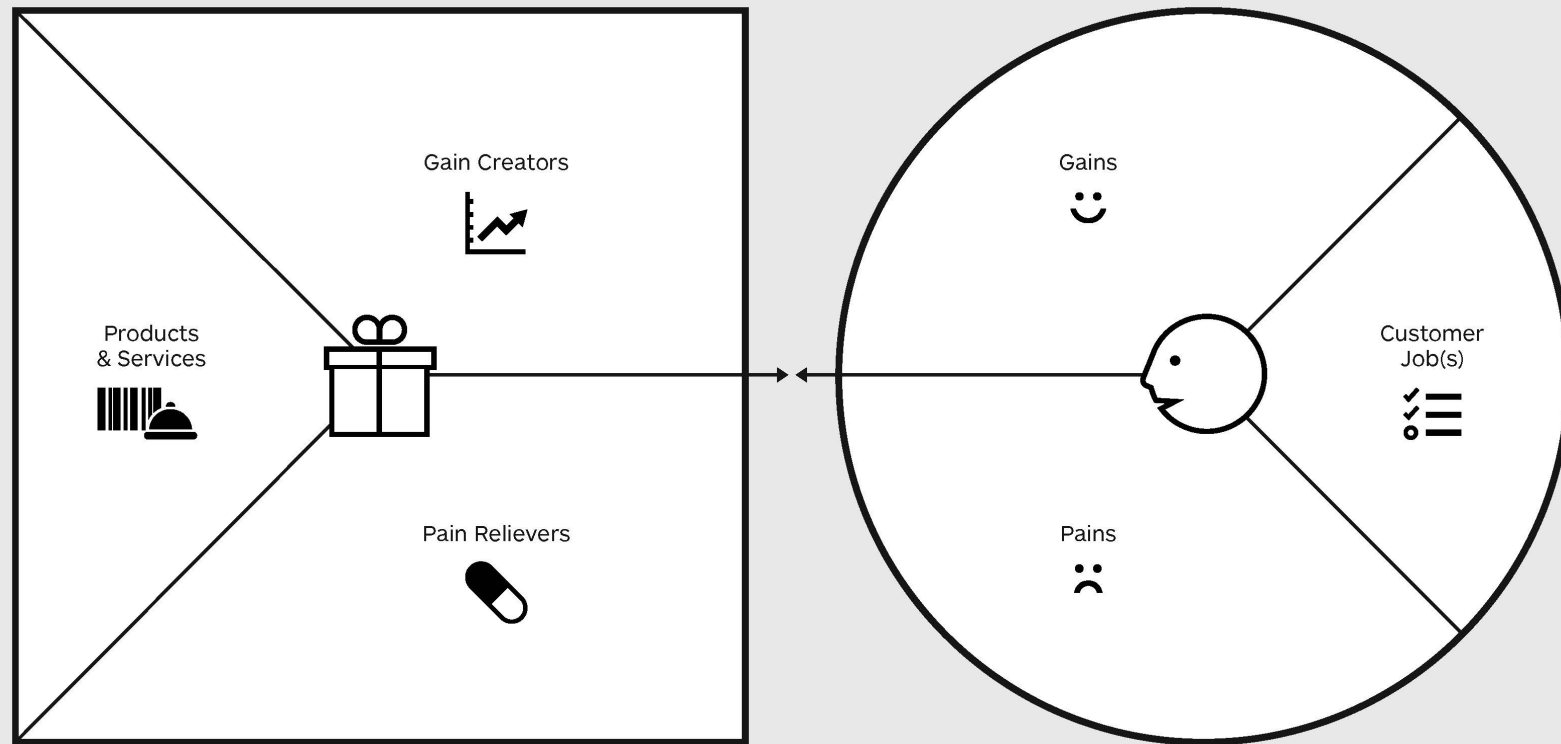
Gain Creators

Gains

Products & Services

Customer Job(s)

Pain Relievers

Pains

Ⓢ Strategyzer

strategyzer.com

CUSTOMER FORCES CANVAS

1. TRIGGERING EVENT
List the conditions that created a desire for change.

4. CONSIDERATION SET
What alternative solutions were considerd?

5. NEW SOLUTION
What solution was selected?

2. DESIRED OUTCOME
How was success first defined?

8. ACTUAL OUTCOME
Was the job done?

3. OLD SOLUTION
What existing solution (if any) was already in place?

9. NEXT SUMMIT
What are they going to do next?

6. INERTIA
What habits and anxieties held them back at the time of switching to their chosen solution?
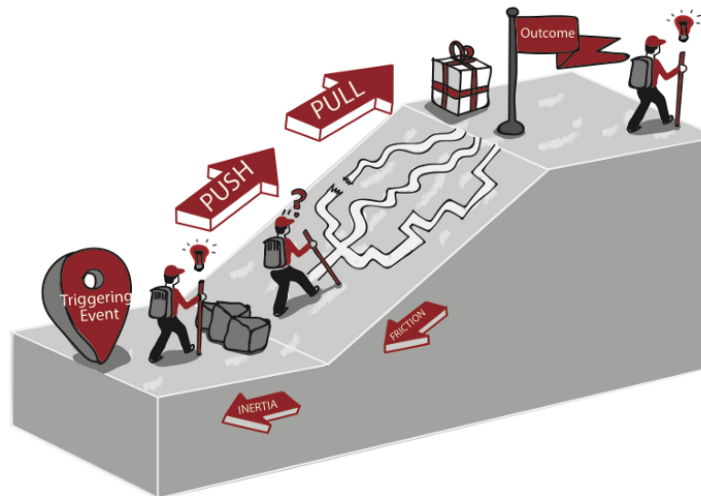
7. FRICTION
What habits and anxieties got in the way during usage of their chosen solution?

PULL

PUSH

Outcome

Triggering
Event

FRICTION

INERTIA

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Believable Plans

- Business Plan
- Development Plan
- Marketing plan
  - Adverts, mail shots, web-sites
- Sales Plans
  - Distribution, Direct Sales
- Quality Plans
- Financial Projections
  - Budget
    - 60% IRR
      - Pay back financing in third year
  - Cash flow

Writing the Business Plan

Executive Summary and funding requirement
1. Concept
2. The Market
    3.1 Global market size and need
    3.2 Sustainability
    3.3 Competition
    3.4 Marketing plans
4. The Team
    4.1 CEO
    4.2 CTO
    4.3 CFO
    4.4 VP Sales and Marketing

Writing the Plan - 2

5. The technology and its IPR

6. Summary of plans

    6.1 Development plans

        6.1.1   Methodology

        6.1.2   Milestones

    6.2 Marketing

    6.3 Sales and distribution

    6.4 Quality and industry standards

7. Financials

Writing the Plan - 3

Appendices:

Financial model

Key staff

Letters of support

Correspondence re IPR

Full development plan

Full marketing and sales plan

Examples and brochures

CUE Competitions

£2k

"Choose a category, complete a business canvas and present to our judges "

The business canvas will force you to answer key questions like: 'Where is your revenue from?', 'Who is on your team and why?' and 'What metrics will you use?'.

In the slide deck you will need to: clearly identify your market niche, make rigorous, quantitative comments and display a self-critical attitude.

A demo or evidence of existing traction will give you a big advantage.

Opens: 24th November 2017

Deadline: 2nd January 2018, 11:59pm

Presentation to judges: 20th-22nd Feb 2018

Winners announced: 1st March 2018

No. prizes: 6

£10k

"Do everything from the £2k, create a demo poster and start the company!"

Depending on the category, the demo poster should be a concise summary of either: a working prototype, commercialisation-ready research or substantial customer engagement.

At the CUE Grand Finale, three winners will present their businesses to potential investors and every entrant will have the opportunity to showcase at the event's poster session.

Opens: 1st March 2018

Deadline: 6th April 2018, 11.59pm

Presentation to judges: 1st-3rd May 2018

Winners announced: 9th May 2018

No. prizes: 3

cue.org.uk

Advanced Systems Topics
Part I of III

Steven Hand
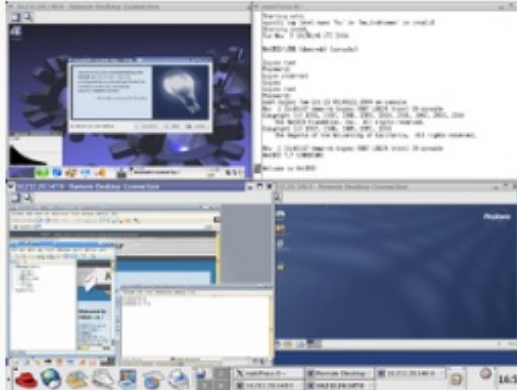
Lent Term 2003

- Part I: Advanced Operating Systems [SMH, 6L]
  - Local & Distributed Virtual Memory
  - Capability Systems and Microkernels
  - Virtual Machine Monitors
  - Extensibile Operating Systems
  - Filesystem & Database Storage

Xen

Xen Project running NetBSD and three Linux distributions

Original author(s)	Keir Fraser, Steven Hand, Ian Pratt, University of Cambridge Computer Laboratory
Developer(s)	Linux Foundation
Initial release	2003
Stable release	4.7[1] / June 23, 2016; 3 months ago
Preview release	4.6.1[2] / February 15, 2016; 8 months ago
Type	Hypervisor
License	GNU GPL version 2
Website	www.xenproject.org

Citrix to buy virtualization company XenSource for $500 million

Open-source software company XenSource will be added to Citrix's server management software.

Tech Culture

15 August 2007
7:47 pm BST

by *Martin LaMonica*
🐦 @mlamonica

One day after the spectacular public offering of virtualization company VMware, Citrix Systems on Wednesday said that it intends to acquire open-source virtualization company XenSource for about $500 million.

Citrix makes so-called thin client software that delivers business applications from servers to desktop computers.

By acquiring XenSource, the company intends to move into the adjacent server and desktop virtualization market.

The acquisition will be financed through a combination of stock and cash and includes the assumption of $107 million in a vested stock options.

The company's open-source "hypervisor" software, called Xen, lets a single computer run n

https://www.cnet.com/uk/news/citrix-to-buy-virtualization-company-xensource-for-500-million/

Fantasy sports site FanDuel is now worth over $1 billion

Photograph by Jim Rogash — Getty Images

FanDuel announced a $275 million funding round that values the daily fantasy sports site at $1.3 billion.

Daily fantasy sports sites are rapidly gaining popularity and investors are lining up to back the few industry leaders.

FanDuel is the latest platform to cash in, announcing Tuesday it closed a $275 million Series E financing round. The funding is led by private equity firm KKR (KKR +0.08%) along with Google's (GOOG +0.06%) growth equity arm as well as

Oxbridge graduates 'earn double £200,000 Russell Group premium'

Graduates of the Universities of Oxford and Cambridge earn £400,000 more over a lifetime than students from non-Russell Group universities

Oxbridge grads earn £400,000 more during their lifetime than peers elsewhere   Photo: Alamy

By Josie Gurney-Read, Online Education Editor
12:01AM BST 09 Oct 2015
Follow   3,104 followers

Graduates from the **Universities of Oxford** and **Cambridge** can expect to earn over £400,000 more during their lifetime than peers in other higher education institutions - double the £200,000 earning premium afforded to other members of the elite Russell Group.

The figures suggest that students at the two ancient institutions will earn an average £1.8 million over a lifetime, compared with £1.39 million earned by those with a non-Russell Group degree.

http://www.telegraph.co.uk/education/universityeducation/11918904/Oxbridge-graduates-earn-double-200000-Russell-Group-premium.html

http://www.enterprisenetwork.group.cam.ac.uk