Business Studies
L1 - so you’ve got an idea

Jack Lang and Stewart McTavish
jal1          sam56
41,890,320
The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniencies 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.
“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 economy when we have lot of human designers around? Aren’t we the gods of our own economic creation? We are accustomed to thinking of human rationality and creativity as 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 our economic but they matter as part of a larger evolutionary process.”
The High-Tech Entrepreneur’s Handbook

HOW TO START AND RUN A HIGH-TECH COMPANY

Jack Lang
and the Cambridge Entrepreneurship Centre
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 created some of the world's most exciting networks of people and companies, with an explosion of technology, life sciences and service companies that has occurred in the city since 1967.

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
3. These companies had combined turnover of £11.8bn in 2011
4. Scaling up companies generate:
   Jobs: Top 50 companies hired 991 people in the past year (UP 23.2%)
   Wealth: Top 50 companies increased their revenue by £1.3bn (UP 17.6%)
5. 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.
6. 69 of all SMEs produced 54% of jobs in the UK over the past 7 years
7. Market capitalisation generated is £50bn
8. Unemployment status is: 2.1% Cambridge, 7.8% London

Source: INDEP
www.cambridge2you.com | due Dil.com
**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 GDP Growth Slowing = Growth in 6 of Last 8 Years @ Below 20-Year Average

Global Real GDP Growth (%), 1980 – 2015

20-Year Avg = 3.8%
35-Year Avg = 3.5%

Global growth incidence curve, 1988–2008

Y-axis displays the growth rate of the poorest average incomes (in 2005 PPP USD). Weighted by population.
Growth incidence evaluated at two income groups: (e.g. bottom 2%), top quintile split into top 1% and 4% between P95 and P99.
The horizontal line shows the growth rate in the mean of 2.44% (1.1% p.a.).
## Economy of the world

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>7.095 billion (July 2013 est.)[1]</td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td>Nominal: $77.609 trillion (2014 est.)[1]</td>
</tr>
<tr>
<td></td>
<td>PPP: $106.998 trillion (2014 est.)[1]</td>
</tr>
<tr>
<td><strong>GDP growth</strong></td>
<td>3.4% (2014)[2]</td>
</tr>
<tr>
<td><strong>GDP per capita</strong></td>
<td>Nominal: $10,857</td>
</tr>
<tr>
<td></td>
<td>PPP: $15,073 (2014 est.)</td>
</tr>
<tr>
<td><strong>Millionaires</strong></td>
<td>~10 million i.e. ~0.15% (2008)</td>
</tr>
<tr>
<td><strong>(US$)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Billionaires</strong></td>
<td>1,594 (2014) [3]</td>
</tr>
<tr>
<td><strong>People earn</strong></td>
<td>~3.25 billion (~50%)</td>
</tr>
<tr>
<td><strong>below $2 per day</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Unemployment</strong></td>
<td>5.4% (Nov.2014)[4]</td>
</tr>
<tr>
<td></td>
<td>note: 30% combined unemployment and underemployment in many non-industrialized countries; developed countries typically 4%–12% unemployment (2007 est.)</td>
</tr>
</tbody>
</table>

Trailing-ten-years. Some numbers exclude certain countries for lack of information.

All values, unless otherwise stated, are in US dollars.
<table>
<thead>
<tr>
<th>Country Group</th>
<th>GDP (Nominal)</th>
<th>% of Global GDP</th>
<th>Number of Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major advanced economies (G7)</td>
<td>35,542</td>
<td>46.0%</td>
<td>7</td>
</tr>
<tr>
<td>Emerging and Developing Asia</td>
<td>14,944</td>
<td>19.3%</td>
<td>29</td>
</tr>
<tr>
<td>Other Advanced Economies (Advanced economies excluding G7)</td>
<td>11,451</td>
<td>14.8%</td>
<td>30</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>5,799</td>
<td>7.6%</td>
<td>32</td>
</tr>
<tr>
<td>Middle East, North Africa, Afghanistan, and Pakistan</td>
<td>3,458</td>
<td>4.5%</td>
<td>22</td>
</tr>
<tr>
<td>Commonwealth of Independent States and Georgia</td>
<td>2,521</td>
<td>3.3%</td>
<td>12</td>
</tr>
<tr>
<td>Emerging and developing Europe</td>
<td>1,894</td>
<td>2.5%</td>
<td>12</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>1,680</td>
<td>2.2%</td>
<td>45</td>
</tr>
<tr>
<td>World</td>
<td>77,269</td>
<td>100.0%</td>
<td>189</td>
</tr>
<tr>
<td>Economies with at least 0.50% of Global GDP</td>
<td></td>
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<tr>
<td>Canada</td>
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<td>South Korea</td>
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<td>Taiwan</td>
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<td>Argentina</td>
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<td>Saudi Arabia</td>
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<td>United Arab Emirates</td>
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<td>Russia</td>
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<td>Saudi Arabia</td>
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<tr>
<td>United Arab Emirates</td>
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<tr>
<td>Russia</td>
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<tr>
<td>Poland</td>
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<td>Turkey</td>
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<tr>
<td>Nigeria</td>
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<tr>
<td>South Africa</td>
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</tr>
<tr>
<td>World</td>
<td>113,533</td>
<td>100.0%</td>
<td>189</td>
</tr>
</tbody>
</table>

### List of the 25 largest economies by GDP (nominal) at their peak level of GDP in Billions

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Value (US$)</th>
<th>Peak Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>17,947</td>
<td>2015</td>
</tr>
<tr>
<td>2</td>
<td>China</td>
<td>16,220</td>
<td>2015</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>10,983</td>
<td>2015</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>4,123</td>
<td>2015</td>
</tr>
<tr>
<td>5</td>
<td>United Kingdom</td>
<td>2,849</td>
<td>2015</td>
</tr>
<tr>
<td>6</td>
<td>France</td>
<td>2,422</td>
<td>2015</td>
</tr>
<tr>
<td>7</td>
<td>India</td>
<td>2,091</td>
<td>2015</td>
</tr>
<tr>
<td>8</td>
<td>Italy</td>
<td>1,816</td>
<td>2015</td>
</tr>
<tr>
<td>9</td>
<td>Brazil</td>
<td>1,773</td>
<td>2015</td>
</tr>
<tr>
<td>10</td>
<td>Canada</td>
<td>1,552</td>
<td>2015</td>
</tr>
<tr>
<td>11</td>
<td>South Korea</td>
<td>1,377</td>
<td>2015</td>
</tr>
<tr>
<td>12</td>
<td>Russia</td>
<td>1,325</td>
<td>2015</td>
</tr>
<tr>
<td>13</td>
<td>Australia</td>
<td>1,224</td>
<td>2015</td>
</tr>
<tr>
<td>14</td>
<td>Spain</td>
<td>1,200</td>
<td>2015</td>
</tr>
<tr>
<td>15</td>
<td>Mexico</td>
<td>1,144</td>
<td>2015</td>
</tr>
<tr>
<td>16</td>
<td>Indonesia</td>
<td>859</td>
<td>2015</td>
</tr>
<tr>
<td>17</td>
<td>Netherlands</td>
<td>738</td>
<td>2015</td>
</tr>
<tr>
<td>18</td>
<td>Turkey</td>
<td>734</td>
<td>2015</td>
</tr>
<tr>
<td>19</td>
<td>Iran</td>
<td>665</td>
<td>2013</td>
</tr>
<tr>
<td>20</td>
<td>Saudi Arabia</td>
<td>653</td>
<td>2015</td>
</tr>
</tbody>
</table>

### List of the 25 largest economies by GDP (PPP) at their peak level of GDP in Billions

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Value (US$)</th>
<th>Peak Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>19,510</td>
<td>2015</td>
</tr>
<tr>
<td>2</td>
<td>European Union</td>
<td>19,176</td>
<td>2015</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>17,968</td>
<td>2015</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>8,027</td>
<td>2015</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>4,842</td>
<td>2015</td>
</tr>
<tr>
<td>6</td>
<td>Germany</td>
<td>3,842</td>
<td>2015</td>
</tr>
<tr>
<td>7</td>
<td>Russia</td>
<td>3,745</td>
<td>2014</td>
</tr>
<tr>
<td>8</td>
<td>Brazil</td>
<td>3,276</td>
<td>2014</td>
</tr>
<tr>
<td>9</td>
<td>Indonesia</td>
<td>2,839</td>
<td>2015</td>
</tr>
<tr>
<td>10</td>
<td>United Kingdom</td>
<td>2,660</td>
<td>2015</td>
</tr>
<tr>
<td>11</td>
<td>France</td>
<td>2,647</td>
<td>2015</td>
</tr>
<tr>
<td>12</td>
<td>Mexico</td>
<td>2,220</td>
<td>2016</td>
</tr>
<tr>
<td>13</td>
<td>Italy</td>
<td>2,174</td>
<td>2015</td>
</tr>
<tr>
<td>14</td>
<td>South Korea</td>
<td>1,849</td>
<td>2015</td>
</tr>
<tr>
<td>15</td>
<td>Saudi Arabia</td>
<td>1,881</td>
<td>2015</td>
</tr>
<tr>
<td>16</td>
<td>Spain</td>
<td>1,636</td>
<td>2015</td>
</tr>
<tr>
<td>17</td>
<td>Canada</td>
<td>1,628</td>
<td>2015</td>
</tr>
<tr>
<td>18</td>
<td>Turkey</td>
<td>1,576</td>
<td>2015</td>
</tr>
<tr>
<td>19</td>
<td>Iran</td>
<td>1,382</td>
<td>2015</td>
</tr>
<tr>
<td>20</td>
<td>Australia</td>
<td>1,137</td>
<td>2015</td>
</tr>
<tr>
<td>21</td>
<td>Taiwan</td>
<td>1,114</td>
<td>2015</td>
</tr>
</tbody>
</table>

### List of the 10 largest economies by contribution to global economic growth by GDP (nominal) over 2014-15

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>51.3</td>
</tr>
<tr>
<td>2</td>
<td>United States</td>
<td>30.9</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>6.6</td>
</tr>
<tr>
<td>4</td>
<td>Egypt</td>
<td>1.9</td>
</tr>
<tr>
<td>5</td>
<td>Argentina</td>
<td>1.8</td>
</tr>
<tr>
<td>6</td>
<td>Pakistan</td>
<td>1.2</td>
</tr>
<tr>
<td>7</td>
<td>Bangladesh</td>
<td>0.9</td>
</tr>
<tr>
<td>8</td>
<td>Hong Kong</td>
<td>0.8</td>
</tr>
<tr>
<td>9</td>
<td>Philippines</td>
<td>0.7</td>
</tr>
<tr>
<td>10</td>
<td>Vietnam</td>
<td>0.6</td>
</tr>
<tr>
<td>11</td>
<td>Remaining Countries</td>
<td>3.2</td>
</tr>
</tbody>
</table>

United States Debt as a Percentage of GDP (1940 - 2012 Est)

Measuring U.S. debt in numbers that haven't been adjusted for inflation produces an alarming and somewhat misleading result. Measuring U.S. debt as a percentage of GDP gives us a much better idea of who our biggest borrowers have been.

Budget Surpluses & Deficits as a Percentage of GDP

Some presidents are better at balancing budgets than others. Despite labels such as fiscal conservative or big government liberal, the data shows that the ability or inability to balance budgets is truly bi-partisan.

How the Ratio of US Debt Compares to Other Countries.

The range is enormous due to emerging third world markets and wild swings created by the economic collapse. (Public Debt/GDP)
US Total Credit Market Debt % GDP

Source: Board of Governors of the Federal Reserve System

http://trueeconomics.blogspot.co.uk/2016/05/11516-us-economy-three-charts-debt-one.html
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Source: Board of Governors of the Federal Reserve System

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HOW THE RATIO OF US DEBT COMPARES TO OTHER COUNTRIES.

The range is enormous due to emerging third world markets and wild swings created by the economic collapse. (Public Debt/GDP)

1,307% Ireland, 413% UK, 95.4% USA, 92.6% EU, 18.4% Russia, 14.3% Brazil, 5.8% India, 4% China.
USA 10-Year Treasury Yield = Low by Historical Standards

USA 10-Year Treasury Yields, Nominal and Real, 1962 – 2016YTD

Nominal Yield (%)  Real Yield (%)


(5%) 0% 5% 10% 15% 20%

Note: Real Yield is based on U.S. ISF CPI Index on Bloomberg, which measures yield to maturity plus inflation of Generic 10-Year USA government inflation-indexed bonds.
European government debt

At the end of the second quarter of 2012, the government debt to GDP ratio in the euro area stood at 90 percent, compared with 88.2 percent at the end of the first quarter of 2012. In the EU27, the ratio increased from 83.5 percent to 84.9 percent.

GOVERNMENT DEBT TO GDP RATIO — IN PERCENT

- Greece: 150.3
- Italy: 126.1
- Portugal: 117.5
- Ireland: 111.5
- Belgium: 102.5
- France: 91
- U.K.: 86
- Cyprus: 83.3
- Germany: 82.8
- Hungary: 78.3
- Malta: 76.3
- Spain: 76
- Austria: 75.1
- Netherlands: 68.2
- Poland: 57
- Finland: 51.7
- Slovakia: 50.1
- Slovenia: 48.1
- Denmark: 46.7
- Czech Rep.: 43.6
- Latvia: 43
- Lithuania: 40.4
- Sweden: 37.3
- Romania: 35.6
- Luxembourg: 20.9
- Bulgaria: 16.5
- Estonia: 7.3

Source: Eurostat
Profile of recession and recovery

Calculated from three-month moving averages of monthly GDP

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
10-Year Real Sovereign Bond Yields (%), Various Countries, 2001 – 2016YTD

Source: Morgan Stanley, Hulbert
Note: Real rates based on yield to maturity on 10-year inflation-indexed treasury security for each country.
Figure B5. 10-year sovereign bond yields

Source: Datastream.
World GDP

Contribution to growth, percentage points, from:

- China
- United States
- India
- all other countries

Total, % increase on a year earlier

Sources: Haver Analytics; IMF; The Economist

*Estimates based on 48 economies representing 86% of world GDP. Weighted GDP at purchasing-power parity

Economist.com
Shanghai grows up in a hurry, going from a big but sleepy city to a thriving metropolis in 20 years

http://www.compasscapital.co/a-closer-look-at-china/
Paris is one of the world’s most vibrant cities, bustling with hundreds of thousands of people. At least, the one in France is. The meticulously built replica city in China – not so much. Tianducheng, in China’s Zhejiang district, was modeled after the real Paris, complete with a 354-foot replica of the Eiffel Tower as well as other landmarks. Intended to be a luxurious gated community that could house 100,000 and draw rural families into a centralized urban location, the city has been a ghost town since its construction in 2007. Only about 2,000 people moved there, and that small number seems to be dwindling by the day. But work is still in progress, and officials are hoping to get more people there before the whole complex is totally complete in 2015.

http://weburbanist.com/2013/12/18/ghost-cities-of-china-7-eerie-abandoned-wonders/
GBP to USD Chart

27 Oct 2006 00:00 UTC - 23 Oct 2016 11:33 UTC

GBP/USD close: 1.22370 low: 1.21145 high: 2.11018

http://www.xe.com/currencycharts/?from=GBP&to=USD&view=10Y
GBP to USD Chart

23 Sep 2016 11:00 UTC - 23 Oct 2016 11:34 UTC  
GBP/USD close: 1.22370 low: 1.21145 high: 1.30498

http://www.xe.com/currencycharts/?from=GBP&to=USD&view=1M
Hanjin Shipping bankruptcy causes turmoil in global sea freight

Some vessels seized by authorities and creditors, with others refused entry to ports unload after South Korean company loses the support of banks

The bankruptcy of the Hanjin shipping line has thrown ports and retailers around

**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
<table>
<thead>
<tr>
<th>Average annual growth rate</th>
<th>Per capita world output</th>
<th>Europe</th>
<th>America</th>
<th>Africa</th>
<th>Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1700</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>1700-2012</td>
<td>0.8%</td>
<td>1.0%</td>
<td>1.1%</td>
<td>0.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>incl.: 1700-1820</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>0.9%</td>
</tr>
<tr>
<td>1820-1913</td>
<td>0.9%</td>
<td>1.0%</td>
<td>1.5%</td>
<td>0.4%</td>
<td>0.2%</td>
</tr>
<tr>
<td>1913-2012</td>
<td>1.8%</td>
<td>1.9%</td>
<td>1.5%</td>
<td>1.1%</td>
<td>2.0%</td>
</tr>
<tr>
<td>1913-1950</td>
<td>0.9%</td>
<td>0.9%</td>
<td>1.4%</td>
<td>0.9%</td>
<td>0.2%</td>
</tr>
<tr>
<td>1950-1970</td>
<td>2.8%</td>
<td>3.8%</td>
<td>1.0%</td>
<td>2.1%</td>
<td>3.5%</td>
</tr>
<tr>
<td>1970-1990</td>
<td>1.3%</td>
<td>1.5%</td>
<td>1.8%</td>
<td>0.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>1990-2012</td>
<td>2.1%</td>
<td>1.9%</td>
<td>1.5%</td>
<td>1.4%</td>
<td>3.6%</td>
</tr>
<tr>
<td>1950-1980</td>
<td>2.5%</td>
<td>3.4%</td>
<td>2.0%</td>
<td>1.8%</td>
<td>3.2%</td>
</tr>
<tr>
<td>1980-2012</td>
<td>1.7%</td>
<td>1.6%</td>
<td>1.3%</td>
<td>0.8%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

Between 1810 and 2012, the growth rate of per capita output was 1.7% per year on average at the world level, including 1.9% in Europe, 1.6% in America, etc.

Sources: see piketty.pse.ens.fr/capital2tc
Global growth incidence curve, 1988–2008

Y-axis displays the growth rate of the four tails average income (in 2005 PPP USD). Weighted by population.
Growth incidence evaluated at quintile groups (e.g. bottom 20%), top quintile is split into top 1% and 9% between P95 and P99.
The horizontal line shows the growth rate in the mean of 2.16% (1.1% p.a.).
Figure I.1. Income inequality in the United States, 1910-2010

The top decile share in U.S. national income dropped from 45-50% in the 1910s-1920s to less than 35% in the 1950s (this is the fall documented by Kuznets); it then rose from less than 35% in the 1970s to 45-50% in the 2000s-2010s. Sources and series: see piketty.pse.ens.fr/capital21c.
Figure 1.3. Global inequality 1700-2012: divergence then convergence?

Per capita GDP in Asia-Africa went from 37% of world average in 1950 to 61% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.
Figure 2.5. The growth rate of world output from Antiquity until 2100

The growth rate of world output surpassed 4% from 1950 to 1990. If the convergence process goes on it will drop below 2% by 2050. Sources and series: see piketty.pse.ens.fr/capital21c.
Figure 2.4. The growth rate of world per capita output since Antiquity until 2100

The growth rate of per capita output surpassed 2% from 1950 to 2012. If the convergence process goes on, it will surpass 2.5% from 2012 to 2050, and then will drop below 1.5%.

Sources and series: see piketty.pse.ens.fr/capital21c.
LP contributions to the VC industry are back to pre-recession levels and anecdotally 2016 seems likely to increase further.

Source: Dow Jones VentureSource, Upfront analysis.
With more money (and new non VC entrants) venture financings have obviously increased. 2015 was an enormous year (2x pre recession)

US VC financing activity

Welcome To The Unicorn Club: Learning From Billion-Dollar Startups

Posted Nov 2, 2013 by Aileen Lee (@aileenlee), Contributor
Learnings to date about the “Unicorn Club”:

1. We found **39 companies** belong to what we call the “Unicorn Club” (by our definition, U.S.-based software companies started since 2003 and valued at over $1 billion by public or private market investors). That’s about **.07 percent** of venture-backed consumer and enterprise software startups.

2. On average, **four unicorns were born per year** in the past decade, with Facebook being the breakout “super-unicorn” (worth >$100 billion). In each recent decade, 1-3 super unicorns have been born.

3. **Consumer-oriented unicorns have been more plentiful** and created more value in aggregate, even excluding Facebook.

4. But **enterprise-oriented unicorns have become worth more on average**, and raised much less private capital, delivering a **higher return on private investment**.

5. Companies fall somewhat evenly into **four major business models**: consumer e-commerce, consumer audience, software-as-a-service, and enterprise software.

6. It has taken **seven-plus years on average** before a “liquidity event” for companies, not including the **third of our list that is still private**. It’s a long journey beyond vesting periods.

7. Inexperienced, **twentysomething founders were an outlier**. Companies with **well-educated, thirtysomething co-founders who have history together** have built the most successes

8. The “**big pivot**” after starting with a different initial product is an outlier.

9. **San Francisco** (not the Valley) now reigns as the home of unicorns.

10. There is very **little diversity among founders** in the Unicorn Club.
Summary Of Our Updated Analysis

1) We found 84 U.S.-based companies belong to what we call the “unicorn club,” a jaw-dropping 115% increase from our last post. The increase is driven largely by *paper unicorns* - private companies that have not yet had a “liquidity event.” But, these companies are still a super-rarity; our list is just 0.14% of venture-backed consumer and enterprise tech startups.

2) On average, eight unicorns were born per year in the past decade (versus four in the 2003-2013 era). There’s not yet a super-unicorn ($100 billion-plus in value) born from the 2005-2015 decade, but there are now nine “decacorns” ($10 billion-plus in value), 3x our last post.

3) Consumer-oriented companies drive the majority of value in our set: more companies and higher average value per company. They raise a lot of private capital.

4) Enterprise-oriented companies are fewer and raise less private capital; and increased enterprise fundraising has reduced their return on private dollars raised.

5) In terms of business models, e-commerce companies drive the majority of value in our set, but have the lowest “capital efficiency.” Enterprise and audience companies have decreased in market share of our set, while SaaS companies have grown in market share significantly. We’ve also added a new category: Internet of Things/consumer electronics.

6) It’s a long journey, beyond vesting periods: it has taken 7 years on average before a “liquidity event” for the 39% who have “exited” – not including the 61% of our list that is still private. The capital efficiency of these “private unicorns” is surprisingly low, which will likely impact future returns for founders, investors and employees.

7) Take heart. “Old people” of Silicon Valley: Companies with educated, tech-savvy, experienced 30-something, co-founding teams with history together have built the most successes. Twenty-something founders and successful pivots are the minority; dedicated CEOs who are able to scale their companies for the long haul are not.

8) San Francisco maintains dominance as the new epicenter of the Bay Area’s most valuable tech companies; cities like NYC and L.A. are growing in importance.
- **We identified 84 companies for our set** (by our definition, U.S.-based, VC-backed software and Internet-oriented companies founded since 2005 and valued at over $1 billion by public or private market investors). **That’s a staggering 115% increase since our last analysis** just a year-and-a-half ago.

- The total **value of these companies is $327 Billion – 2.4x our last analysis** (excluding Facebook, which was almost half the value of our last list).

- **It’s the number of companies**, not their individual valuations, **driving the dramatic increase** in total value. The average company value on our list is worth $3.9 billion, just an ~8% increase from last time.

- **And it’s the number of “paper unicorns”** that has dramatically increased the total value. Private companies are now 61% (vs 36%) of our list, worth $188 billion in total and $3.7 billion on average.

- **Why so many more ‘unicorn’ companies now versus 2013?** Some thoughts:
## Funding Rounds (7) - $590.5M

<table>
<thead>
<tr>
<th>Date</th>
<th>Amount / Round</th>
<th>Valuation</th>
<th>Lead Investor</th>
<th>Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct, 2014</td>
<td>$150M / Series E</td>
<td>$6B</td>
<td>GIC</td>
<td>5</td>
</tr>
<tr>
<td>Apr, 2014</td>
<td>$100M / Debt Financing</td>
<td></td>
<td>—</td>
<td>5</td>
</tr>
<tr>
<td>Sep, 2012</td>
<td>$200M / Series D</td>
<td>$3.25B</td>
<td>—</td>
<td>4</td>
</tr>
<tr>
<td>Dec, 2011</td>
<td>$3M / Series C</td>
<td>—</td>
<td>Richard Branson</td>
<td>2</td>
</tr>
<tr>
<td>Jun, 2011</td>
<td>$100M / Series C</td>
<td>—</td>
<td>Kleiner Perkins Caufield &amp; Byers</td>
<td>2</td>
</tr>
<tr>
<td>Jan, 2011</td>
<td>$27.5M / Series B</td>
<td>—</td>
<td>Sequoia Capital</td>
<td>3</td>
</tr>
<tr>
<td>Nov, 2009</td>
<td>$10M / Series A</td>
<td>—</td>
<td>Khosla Ventures</td>
<td>20</td>
</tr>
</tbody>
</table>

**Investors (38)**
Square’s $9-a-Share Price Deals Blow to IPO Market

Offering is seen as an important test for battered market for new tech stocks

Jack Dorsey is CEO of both Square and Twitter. PHOTO: JUSTIN TALLIS/AGENCE FRANCE-PRESSE/GETTY IMAGES
Square is one of more than 120 private tech startups sporting valuations above $1 billion, according to Dow Jones VentureSource, and is one of the most valuable ones focused on financial technology.

"This deal is representative of companies that are falling out of favor with investors," said Jeremy Abelson, portfolio manager at Irving Investors. "These are companies that are spending a lot to grow their top line but still have a tough path to profitability."

The price gives the company a market value of about $3 billion, which doesn’t include any future shares issued to employees. The shares are set to begin trading Thursday morning on the New York Stock Exchange. Square declined to comment.
Square Inc
NYSE: SQ - Oct 14, 7:45 PM EDT

11.12 USD  ↓0.07 (0.63%)
After-hours: 11.19  ↑0.63%

1 day  5 day  1 month  3 months  1 year  5 years  max

12 14 16

Open  11.24
High  11.35
Low  11.07

Mkt cap  3.77B
P/E ratio  -
Div yield  -
Initial Public Misses

Several tech IPOs have come under pressure since they started trading earlier this year. The latest to price are Square and Match.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>IPO PRICE</th>
<th>RANGE</th>
<th>PERFORMANCE SINCE IPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td>$9</td>
<td>$11-13</td>
<td>$16.88</td>
</tr>
<tr>
<td>Nov. 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Match</td>
<td>$12</td>
<td>$12-14</td>
<td>$16</td>
</tr>
<tr>
<td>Nov. 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Data</td>
<td>$16</td>
<td>$18-20</td>
<td>$16.88</td>
</tr>
<tr>
<td>Oct. 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitbit</td>
<td>$17</td>
<td>$19-20</td>
<td>$28.67</td>
</tr>
<tr>
<td>June 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etsy</td>
<td>$14</td>
<td>$15-16</td>
<td>$8.72</td>
</tr>
<tr>
<td>April 15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: company filings; people familiar with the deals (Square, Match); FactSet (share price)
M&A pace hasn’t matched the increases in funding pace so VC mark-ups have been good but cash distributions less so.

US VC-backed M&A activity

Amount Paid ($B)  Number of M&As

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount Paid</th>
<th>Number of M&amp;As</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$47</td>
<td>542</td>
</tr>
<tr>
<td>2012</td>
<td>$43</td>
<td>462</td>
</tr>
<tr>
<td>2013</td>
<td>$42</td>
<td>470</td>
</tr>
<tr>
<td>2014</td>
<td>$81</td>
<td>510</td>
</tr>
<tr>
<td>2015</td>
<td>$54</td>
<td>473</td>
</tr>
</tbody>
</table>

Source: Dow Jones VentureSource Venture Capital Report 4Q’15; Upfront analysis.
IPO exits are down 32% in volume and 38% in value

US VC-backed IPO activity

- Raised ($B) through IPO
- Number of IPOs

Source: Dow Jones VentureSource Venture Capital Report 4Q'15; Upfront analysis.
Private market valuations had risen beyond what some believe are sustainable (up 3x in 2 years). Q4 saw massive correction (we asked VCs if they thought it was an anomaly or a trend).

Source: Dow Jones VentureSource Venture Capital Report 4Q’15; Upfront analysis.
Global Birth Rates =
Down 39% Since 1960 (1% Annual Average Decline)

Birth Rates per 1,000 People per Year, By Region, 1960 – 2014

- World
- USA
- India
- China
- Middle East / North Africa
- Europe / Central Asia
- East Asia / Pacific
- Sub-Saharan Africa

Source: World Bank World Development Indicators
Note: Represented by births per 1,000 people per year.
Global Life Expectancy @ 72 Years = Up 36% Since 1960 (0.6% Annual Average Increase)
Adjusting to Slower Growth + Higher Debt + Aging Population Creates Rising Risks...

Creates Opportunities for Businesses that Innovate / Increase Efficiency / Lower Prices / Create Jobs – Internet Can Be @ Core of This...
“Winter is Coming” message received by portfolio companies
R.I.P.
GOOD TIMES
OUR TAKE

MANAGE WHAT YOU CAN CONTROL
SPENDING
GROWTH ASSUMPTIONS
EARNINGS ASSUMPTIONS

FOCUS ON QUALITY

LOWER RISK

REDUCE DEBT
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dollars pledged to Kickstarter projects</td>
<td>$2,663,332,677</td>
</tr>
<tr>
<td>Successfully funded projects</td>
<td>113,517</td>
</tr>
<tr>
<td>Total backers</td>
<td>11,777,436</td>
</tr>
<tr>
<td>Repeat backers</td>
<td>3,719,919</td>
</tr>
<tr>
<td>Total pledges</td>
<td>33,574,411</td>
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<tr>
<td>Category</td>
<td>Successfully Funded Projects</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>All</td>
<td>113,517</td>
</tr>
<tr>
<td>Music</td>
<td>24,019</td>
</tr>
<tr>
<td>Film &amp; Video</td>
<td>21,438</td>
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<tr>
<td>Publishing</td>
<td>9,983</td>
</tr>
<tr>
<td>Art</td>
<td>9,539</td>
</tr>
<tr>
<td>Games</td>
<td>8,985</td>
</tr>
<tr>
<td>Design</td>
<td>7,586</td>
</tr>
<tr>
<td>Theater</td>
<td>5,952</td>
</tr>
<tr>
<td>Food</td>
<td>5,165</td>
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<tr>
<td>Technology</td>
<td>4,874</td>
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<tr>
<td>Comics</td>
<td>4,340</td>
</tr>
<tr>
<td>Fashion</td>
<td>4,154</td>
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<tr>
<td>Photography</td>
<td>2,856</td>
</tr>
<tr>
<td>Dance</td>
<td>2,080</td>
</tr>
<tr>
<td>Crafts</td>
<td>1,622</td>
</tr>
<tr>
<td>Journalism</td>
<td>864</td>
</tr>
</tbody>
</table>
Computing Growth Drivers Over Time, 1960-2020E

- Mainframe: 1MM+ Units
- Minicomputer: 10MM+ Units
- PC: 100MM+ Units
- Desktop Internet: 1B+ Units/Users
- Mobile Internet: 10B+ Units

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

- Punch Cards for Informatics 1832
- QWERTY Keyboard 1872
- Electromechanical Computer (Z3) 1941
- Electronic Computer (ENIAC) 1943
- Paper Tape Reader (Harvard Mark I) 1944
- Mainframe Computers (IBM SSEC) 1948
- Trackball 1952
- Joystick 1967
- Microcomputers (IBM Mark-8) 1974
- Portable Computer (IBM 5100) 1975
- Commercial Use of Window-Based GUI (Xerox Star) 1961
- Commercial Use of Mouse (Apple Lisa) 1983
- Commercial Use of Mobile Computing (PalmPilot) 1996
- Touch + Camera - based Mobile Computing (iPhone 2G) 2007
- Voice on Mobile (Siri) 2011
- Voice on Connected / Ambient Devices (Amazon Echo) 2014

Source: University of California, “History of Computer Interfaces” (Bauk Simonberg)
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)

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](http://www.enterprise.cam.ac.uk/building/starting.html)


Reading list 2

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

• 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**
  - Useful websites:
    - [http://www.delphion.com/](http://www.delphion.com/) (was the IBM patent search site)
    - [http://www.jordans.co.uk/](http://www.jordans.co.uk/) (company formation agents)
  - [http://www.solicitor.net/powers_and_duties.asp](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


• Useful software: Microsoft Project.
Reading List 5

• **Lecture 5: Prototype to Product**

• **Lecture 6: Standards, Quality, Documentation and Maintenance**
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
- that is risk and uncertainty in a business
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 \(0.7 \times (100+x)\) 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)
invention
individual experience
insight

discover and develop a business model

founder

build and scale an organisation

startup CEO
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**: Unique value created to provide a solution to the problem or fulfill the need.

**PROFIT FORMULA**

- **Revenue model**: How much money is made from sales volume. Includes market size, price, and volume. Volume can be thought of in terms of market size, purchase frequency, and sales volume, etc.
- **Cost structure**: How costs are allocated. Includes cost of key assets, direct costs, indirect costs, economies of scale, etc.
- **Margin model**: How much of each transaction should be allocated 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**

- People
- Technology, products
- Equipment
- Information
- Channels
- Partnerships, alliances
- Brand

**KEY PROCESSES**

- Rules, metrics, and norms that make the profitable delivery of the customer value proposition repeatable and scalable. They 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

Minimize the total time through the loop

Learn

Build

Measure
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 ______________.
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
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
# Senior Team

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

Business plan describes what you want to do
BVCA Handbook
KISS
Write for the target audience

Business Plan Competitions
Cambridge £100, £1k and £5k
Cambridge University Entrepreneurs (CUE)
www.cue.org.uk
Can you give me some comments on my business plan?

Sure.

Your plan is a hodge-podge of unwarranted optimism encased in an impenetrable fortress of buzzwords.

Would you like to read it?

There's that unwarranted optimism again.
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
\[
\text{product}^{\text{value}} > \text{product}^{\text{price}} > \text{product}^{\text{cost}}
\]

\[
\text{customer}^{\text{ltv}} > \text{customer}^{\text{ac}} + \text{customer}^{\text{rc}}
\]
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
  – Extensible Operating Systems
  – Filesystem & Database Storage
### Xen

Xen Project running NetBSD and three Linux distributions

<table>
<thead>
<tr>
<th>Original author(s)</th>
<th>Keir Fraser, Steven Hand, Ian Pratt, University of Cambridge Computer Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer(s)</td>
<td>Linux Foundation</td>
</tr>
<tr>
<td>Initial release</td>
<td>2003</td>
</tr>
<tr>
<td>Stable release</td>
<td>4.7&lt;sup&gt;[1]&lt;/sup&gt; / June 23, 2016; 3 months ago</td>
</tr>
<tr>
<td>Preview release</td>
<td>4.6.1&lt;sup&gt;[2]&lt;/sup&gt; / February 15, 2016; 8 months ago</td>
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<tr>
<td>Type</td>
<td>Hypervisor</td>
</tr>
<tr>
<td>License</td>
<td>GNU GPL version 2</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.xenproject.org">www.xenproject.org</a></td>
</tr>
</tbody>
</table>

Citrix to buy virtualization company XenSource for $500 million

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

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
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.

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

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.
The University Enterprise Network

About
This website is for students and staff at the University of Cambridge who are interested in enterprise and innovation. It provides links to the different ways you can get involved in a range of activities at Cambridge, such as learning new skills, attending networking events, getting a job or internship a start-up, starting your own business, or getting the results of your research applied in industry.

This website is managed in partnership with ideaspaces, St John’s Innovation Centre and the Institute for Manufacturing.

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Amazon gives the outside world a first look at its secret delivery drone lab in Cambridge
https://twitter.com/irelandh/status/881245779760756480

http://www.enterprisenetwork.group.cam.ac.uk
The Grand Launch marks the official **start of the £100 for 100 words competition**. Make sure to submit your competition entries by **November 6, 2016** for your chance to win some cash (Guidelines and more information are available on our [website](http://www.cue.org.uk)).