

E-Commerce

Jack Lang and Stewart McTavish

Guest lectures

Anna Soilleux-Mills, CMS

Pete Stevens, Mythic Beasts

Richard Clayton, CL




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 Menlo Park, California

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I work at Andreessen Horowitz ('a16z'), a venture capital firm in Silicon Valley that invests in software companies. I try to work out what's going on and what will happen next. (Note: I don't check LinkedIn messaging: best ways to contact me are email or twitter.)



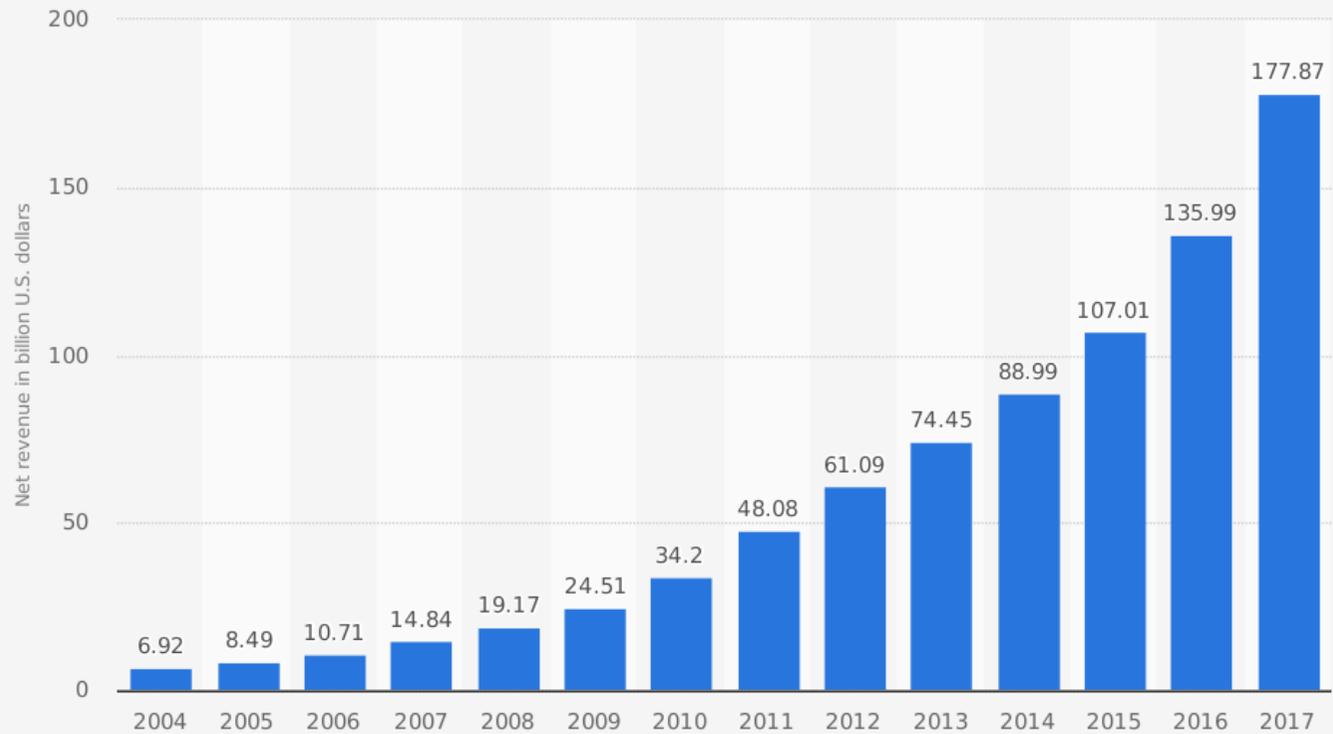
Benedict Evans ✓
 @benedictevans

Trying to work out what's going on and what happens next. Curious. Easily bored. Single parent. Expat in San Francisco. @a16z

[ben-evans.com](#)
 Joined March 2007



Net sales revenue of Amazon from 2004 to 2017 (in billion U.S. dollars)



Source
Amazon
© Statista 2018

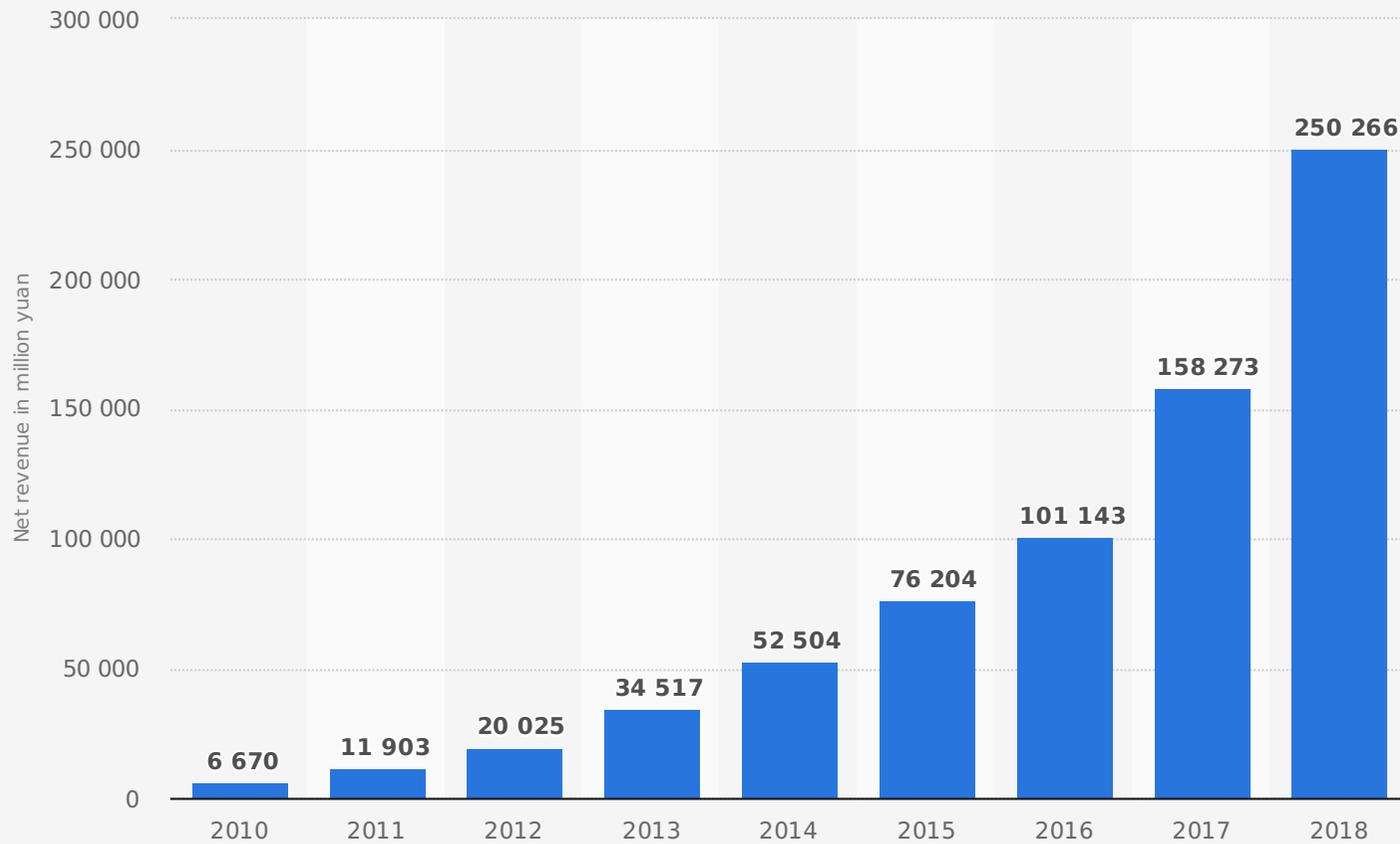
Additional Information:
Worldwide; Amazon; 2004 to 2017





阿里巴巴

Annual revenue of Alibaba Group from 2010 to 2018 (in million yuan)



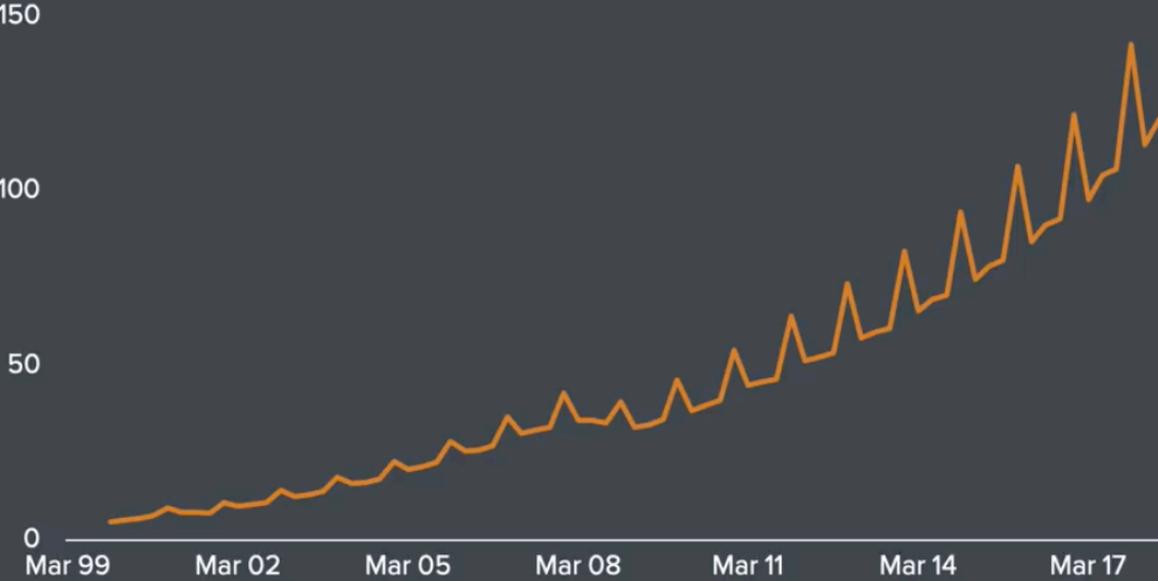
Source
Alibaba
© Statista 2019

Additional Information:
China; Alibaba; 2010 to 2018; Fiscal year ending March 31



Ecommerce is big in dollar terms

Quarterly US ecommerce revenue (\$bn)



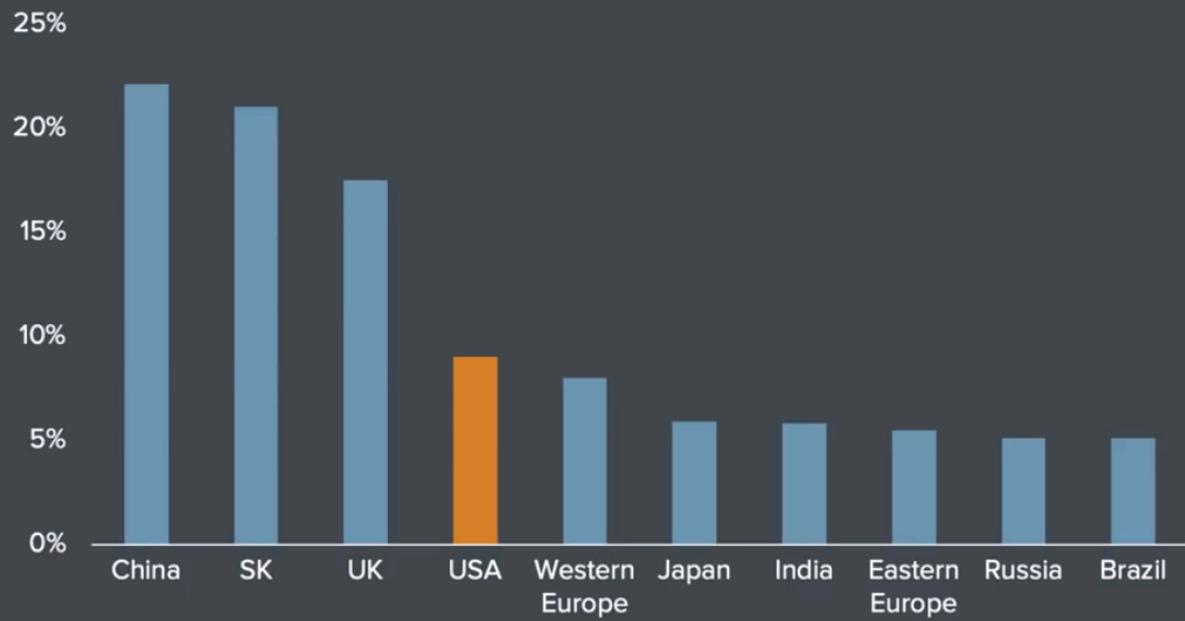
And the \$1.2tr spent on cars

US retail spending, 2017 (\$tr)



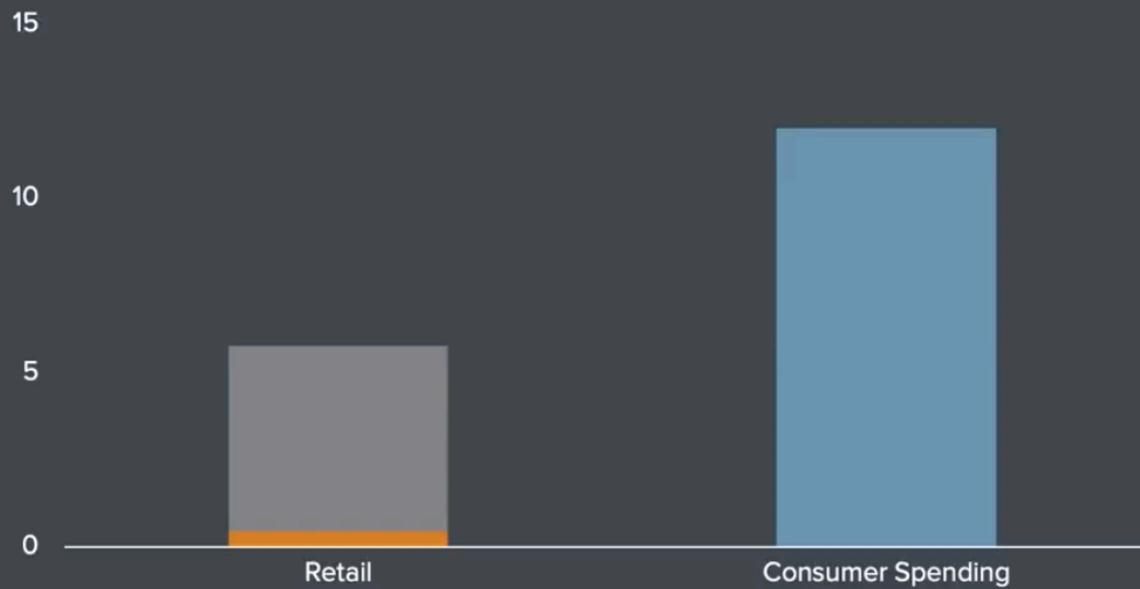
USA in the middle of the pack

Ecommerce share of retail spending, 2017

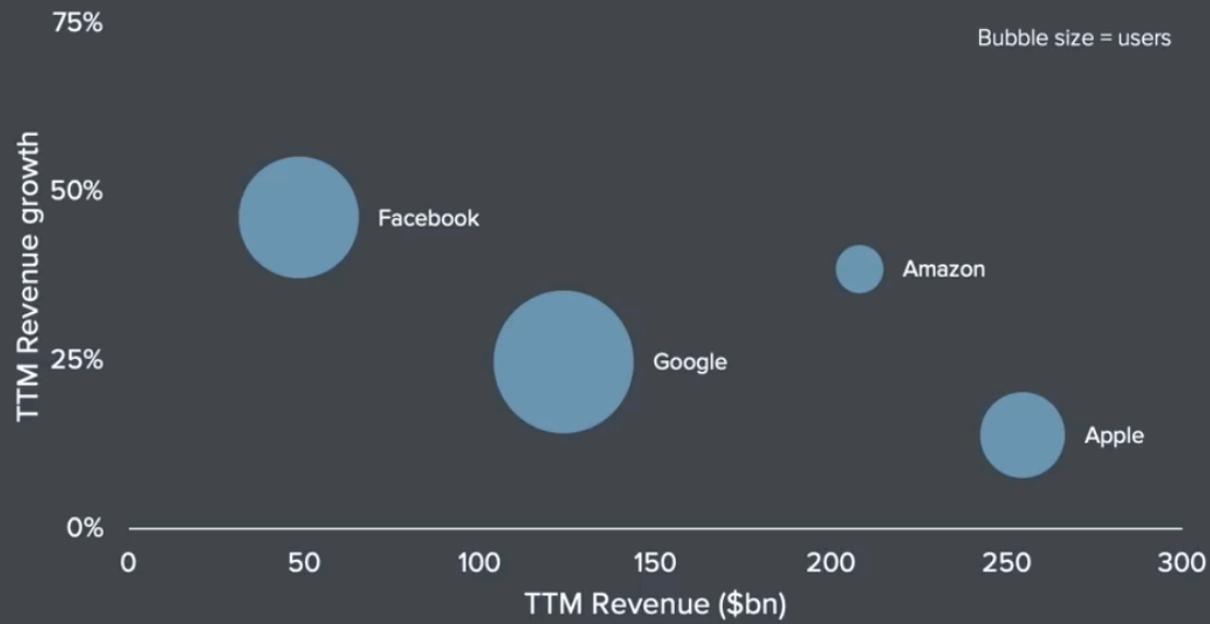


Meanwhile, there's more than just retail

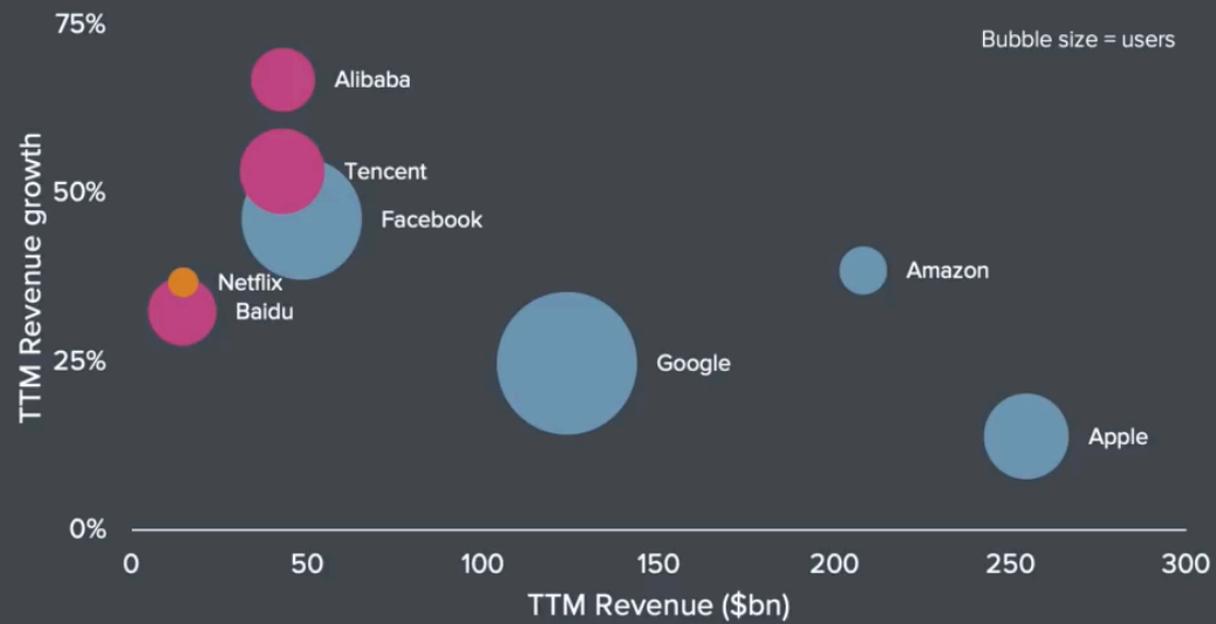
US spending, 2017 (\$tr)



Global company creation



Global company creation



New problems

\$40tr



Global consumer spending

The Business Model Canvas

Designed for:

Designed by:

Date:

Version:

<h3>Key Partners</h3>  <p>Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?</p> <p>MOTIVATIONS FOR PARTNERSHIPS Optimization and economy Reduction of risk and uncertainty Acquisition of particular resources and activities</p>	<h3>Key Activities</h3>  <p>What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue streams?</p> <p>CATEGORIES Production Problem Solving Platform/Network</p>	<h3>Value Propositions</h3>  <p>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?</p> <p>CHARACTERISTICS Newness Performance Customization "Setting the job Done" Design Brand/Status Price Cost Reduction Risk Reduction Accessibility Convenience/Usability</p>	<h3>Customer Relationships</h3>  <p>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?</p> <p>EXAMPLES Personal assistance Dedicated Personal Assistance Self Service Automated Services Communities Co-creation</p>	<h3>Customer Segments</h3>  <p>For whom are we creating value? Who are our most important customers?</p> <p>Mass Market Niche Market Segmented Diversified Multi-sided Platform</p>																								
<h3>Key Resources</h3>  <p>What Key Resources do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?</p> <p>TYPES OF RESOURCES Physical Intellectual (Brand patents, copyrights, data) Human Financial</p>	<h3>Channels</h3>  <p>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?</p> <p>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?</p>	<h3>Cost Structure</h3>  <p>What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?</p> <p>IS YOUR BUSINESS MODEL Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing) Value Driven (focused on value creation, premium value proposition)</p> <p>SAMPLE CHARACTERISTICS Fixed costs (salaries, rents, utilities) Variable costs Economies of scale Economies of scope</p>	<h3>Revenue Streams</h3>  <p>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?</p> <table border="0"> <tr> <td>TYPES</td> <td>FIXED PRICING</td> <td>DYNAMIC PRICING</td> </tr> <tr> <td>Asset sale</td> <td>List Price</td> <td>Manipulation (Bargaining)</td> </tr> <tr> <td>User fee</td> <td>Product feature dependent</td> <td>Yield Management</td> </tr> <tr> <td>Subscription Fees</td> <td>Customer segment dependent</td> <td>Real time Market</td> </tr> <tr> <td>Lending/Renting/Leasing</td> <td>Volume dependent</td> <td></td> </tr> <tr> <td>Licensing</td> <td></td> <td></td> </tr> <tr> <td>Brokerage fees</td> <td></td> <td></td> </tr> <tr> <td>Advertising</td> <td></td> <td></td> </tr> </table>	TYPES	FIXED PRICING	DYNAMIC PRICING	Asset sale	List Price	Manipulation (Bargaining)	User fee	Product feature dependent	Yield Management	Subscription Fees	Customer segment dependent	Real time Market	Lending/Renting/Leasing	Volume dependent		Licensing			Brokerage fees			Advertising			
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Brokerage fees																												
Advertising																												



DESIGNED BY: Business Model Foundry AG
The makers of Business Model Generation and Strategizer

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What is E-commerce?

A course thought up by the Teaching committee...
research on protocols, economics

B2B

Replacement of paper with electronic documents
Re-badged Electronic Document Interchange (EDI)
Electronic Money

B2C Mail order - amazon.com

New business models
Disintermediation
CRM

New opportunities for fraud

The dark web

App economies

Social media

and many more

Aims

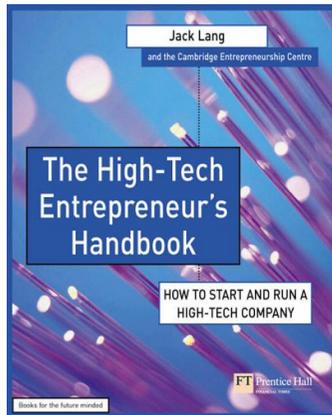
Outline

Lectures:

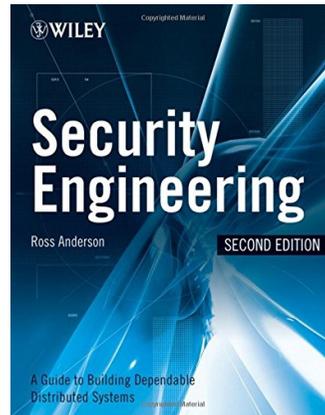
1. History and Economic Background
2. Business Models and Strategy
3. Design and implementation
4. Running at Scale (PS)
5. Creating a business
6. Making E-Commerce work
7. RIP, DMCA and other legal developments (RC)
8. The Law and E-Commerce (ASM)

Lecture notes for guest lectures (4,7,8) will be provided on the day of the lecture

Resources



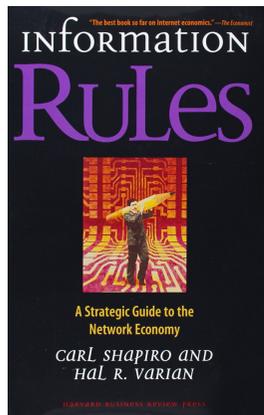
ISBN: 0273656155



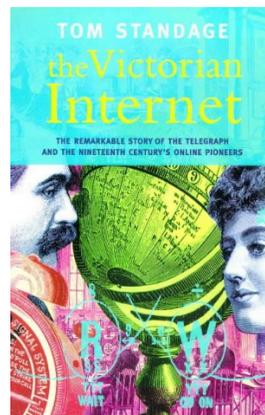
ISBN: 0470068523



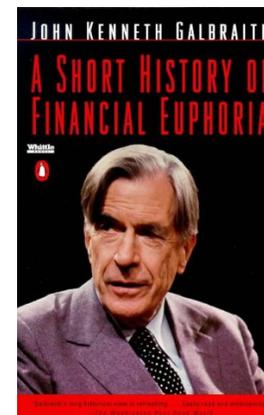
ISBN: 0393920771



ISBN: 087584863X



ISBN: 0753807033



ISBN: 0140238565

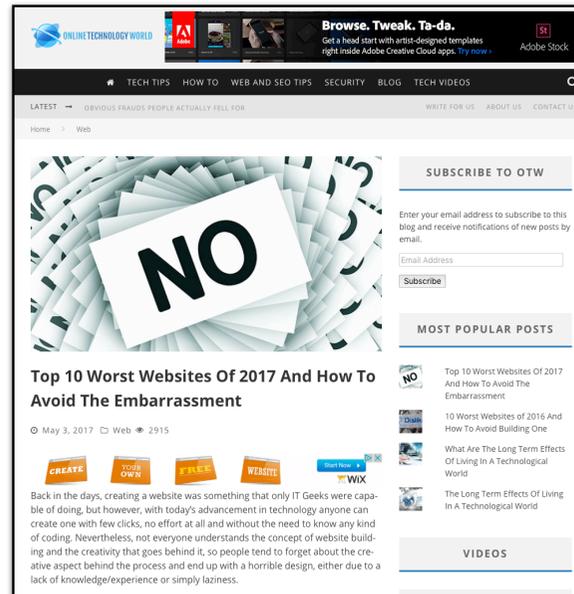
Online Resources

Andrew Odlyzko: Recent Papers on Technology and Financial Manias

If you would like to get email notifications of release of new papers in this series, please send email to Andrew Odlyzko at odlyzko@umn.edu with your email address and name. Your email address will not be used for any other purpose.

- Main papers:
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 - **The early British railway system, the Casson counterfactual, and the effectiveness of central planning.** A. Odlyzko. *Essays in Economic & Business History*, vol. 34, 2016, pp. 60-94. [\[online journal version\]](#) [\[preprint, PDF\]](#)
 - **Economically irrational pricing of 19th century British government bonds.** A. Odlyzko. *Financial History Review*, to appear. [\[preprint, PDF\]](#)
 - **Supplementary material for 'Economically irrational pricing of 19th century British government bonds'.** A. Odlyzko. [\[preprint, PDF\]](#)
 - **The Railway Mania: Fraud, disappointed expectations, and the modern economy.** A. Odlyzko. *J. Railway & Canal Historical Society*, no. 215, Nov. 2012, pp. 2-12. [\[preprint, PDF\]](#)
 - **Crushing national debts, economic revolutions, and extraordinary popular delusions.** A. Odlyzko. [\[PDF\]](#)
 - **Charles Mackay's own extraordinary popular delusions and the Railway Mania.** A. Odlyzko. [\[PDF\]](#)
 - **The collapse of the Railway Mania, the development of capital markets, and the forgotten role of Robert Lucas Nash.** A. Odlyzko. *Accounting History Review* (formerly *Accounting, Business & Financial History*), vol. 21, no. 3, Nov. 2011, pp. 309-345.

Andrew Odlyzko's papers on Technology and Financial Manias
<http://www.dtc.umn.edu/~odlyzko/doc/bubbles.html>



<http://www.onlinetechnologyworld.com/top-10-worst-websites-2017-avoid-embarrassment/>

Or a web-search for other similar lists and pages

STATUTORY INSTRUMENTS

2002 No. 2013

ELECTRONIC COMMUNICATIONS

The Electronic Commerce (EC Directive) Regulations 2002

Made	- - - -	30th July 2002
Laid before Parliament		31st July 2002
Coming into force		
Regulation 16		23rd October 2002
Remainder		21st August 2002

The Secretary of State, being a Minister designated(a) for the purposes of section 2(2) of the European Communities Act 1972(b) in relation to information society services, in exercise of the powers conferred on her by that section, hereby makes the following Regulations:—

Citation and commencement

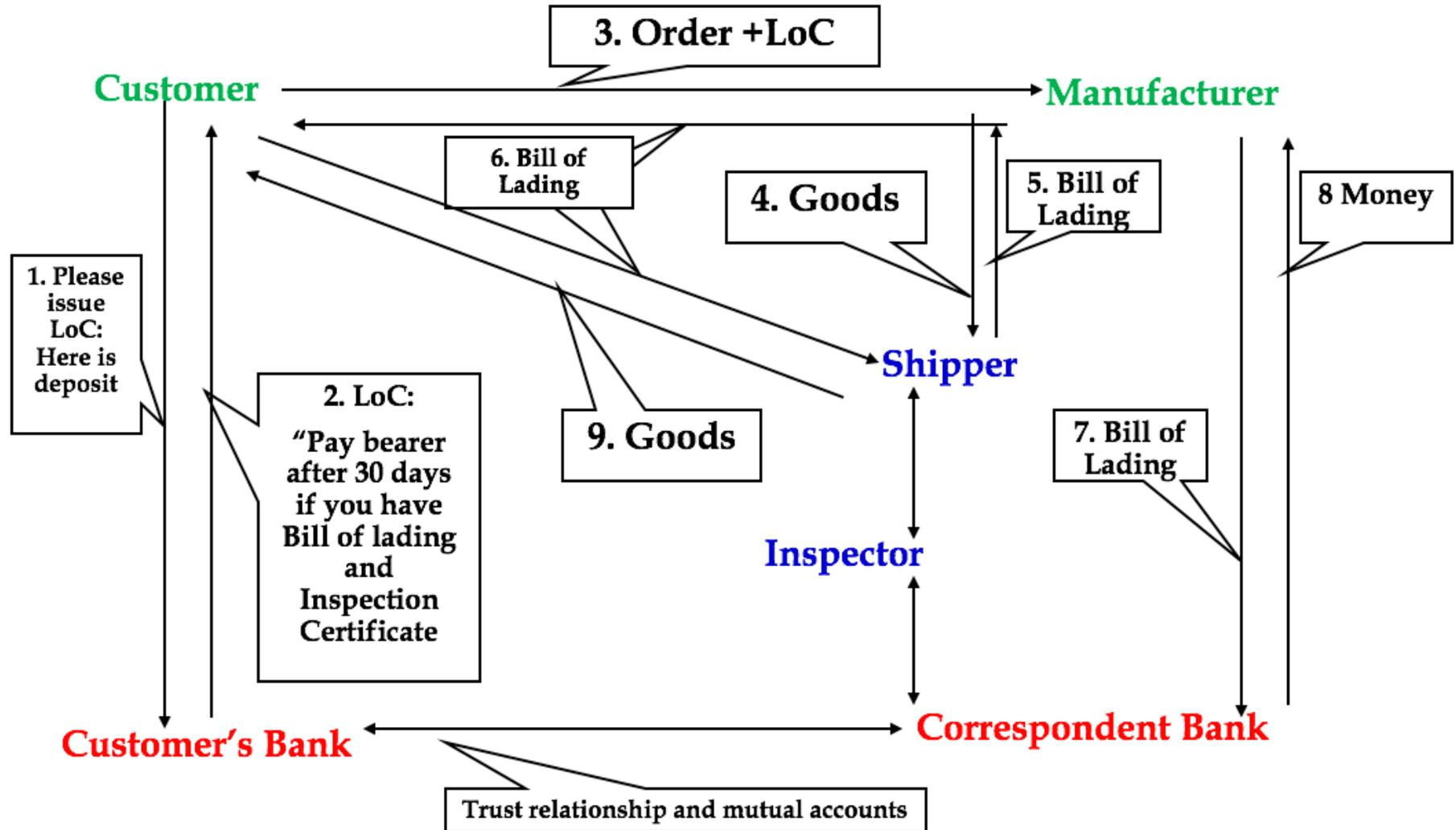
1.—(1) These Regulations may be cited as the Electronic Commerce (EC Directive) Regulations 2002 and except for regulation 16 shall come into force on 21st August 2002.
(2) Regulation 16 shall come into force on 23rd October 2002.

Interpretation

2.—(1) In these Regulations and in the Schedule—

<http://www.legislation.gov.uk/uksi/2002/2013/contents/made>

Remote transaction



Traded Paper

Typical instruments include

Warehouse receipts

Bills of Lading - "The holder is entitled to 100 amphorae of oil from the cargo of the ship Augusta"

Purchase orders and invoices

Insurance certificates

Certificates of debt

Payment instructions - Bank-to-bank or bank-customer-bank (cheques), letters of credit

Banknotes

Bearer certificates - coupons

Share Certificates

Negotiable / guaranteed - can be used for payment, security, etc.

B2B

The invention of the telegraph led to the development of business use protocols

Hugh boom in telegraph construction and applications

Indirect effects included creation of national markets - price differences drove rapid shipment + arbitrage

Direct uses included purchase orders and queries. Easy where there is an existing relationship, otherwise intermediaries needed

Huge expansion in banking

Banks sent about 50% of telegraph traffic

Trusted intermediaries

Others (insurers, inspection agents, shipping agents) largely harnessed via bank mechanisms

B2B - Wiring Money

Interbank message e.g.

“To: Lomarco Bank, Geneva. Please pay SFR 10,000 from out account to Herr Thilo Schmidt on presentation of his passport. Out test key is 254”

The 254 is a primitive MAC computed on significant data (money, date, currency, etc)

SWIFT reimplemented this using ‘email’ and proper MAC in mid 70’s

First big ‘open’ EDI system

Swift II added PKI to manage MAC keys in early 1990’s

Adapted to CREST (UK equity clearing)

Commercial transactions similar, but more complex conditions

e.g LoC needs Bill of Lading, insurance certificate and inspection certificate

Electronic Document Interchange (EDI)

Proprietary systems build late 60s / early 70s

General Motors ordering car components (EDS)

Marks and Spencer's clothes ordering

Big problem not security or DoS or lost systems but standards

1980s agreeing common message formats

UN, specific country / industry e.g. NHS

Being redone as XML

e.g. BOLERO (www.bolero.net)

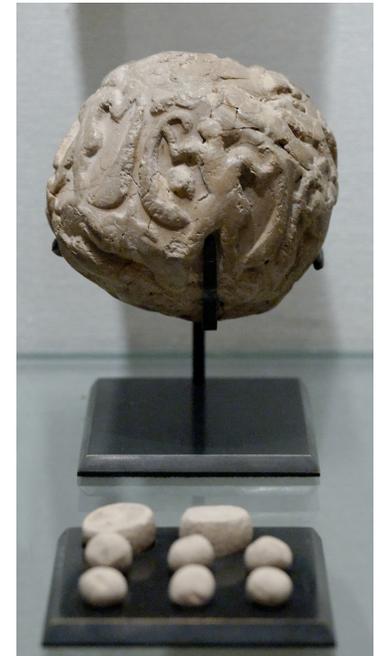
Many players - slow progress

Business-to-business communications
go back into antiquity

Believed to have driven the invention
of writing and mathematics

Trust system

Sumerian Bulla
Uruk Period
(4000 BC - 3100 BC)



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What is money?

Exchange of value
Store of value
Measure of value



Fiat money

Money issued by the Government, can't go bust, can always print more

- may cause inflation, exchange rate drop etc
- "cash is trash"

“Unforgeable” bearer certificates

Anonymous, immediate

Trusted (mostly)

Magic of banking

Not everyone will want to withdraw at the same time

Banks need only fund difference between deposits and loans

Reserve ratios vary over time, between countries and size of deposit taking institution, typical “Reserve Ratio” ~ 10%

Country ↕	1968 ↕	1978 ↕	1988 ↕	1998 ↕
United Kingdom	20.5	15.9	5.0	3.1
Turkey	58.3	62.7	30.8	18.0
Germany	19.0	19.3	17.2	11.9
United States	12.3	10.1	8.5	10.3
India ^[34]	3	6	10	10-11

https://en.wikipedia.org/wiki/Reserve_requirement

Coins

Early Coins

The first move away from the barter system may have been [the exchange of cowrie shells](#), which eventually evolved into metal nuggets and pieces. Metal money exchanges started in the form of small knives and tools in China. In the 5th century BC, [Chinese hollow spade money](#) was commonly used. While not using "coins" per se, these were some of the first exchanges of valuable, standardized metal materials. This eventually evolved into the recognizable, rounded [Chinese coins](#). In the west, the first official, minted currency was possibly the famous [Lydia coin](#), which was created in modern Turkey and featured an image of a lion. It was made of gold. These were pounded out with a hammer and were create for King Croesus. In the greater [history of money](#), this was a very important next step to opening up the Mediterranean to trade and an exchange of goods and ideas. In the next centuries, coins began to be exchanged and accepted [on a global scale](#).

Types of Coins

While [paper money started to become the dominant currency](#) in China as early as the 13th century at the behest of Emperor Kublai Khan, coins were absolutely essential to several empires, which all had their own mints. In the Persian Empire, the coin of choice was the [daric](#). In Greece, the ancient currency was the [drachma](#), which is still used in its modern form today. In Rome, on the other hand, the currency was based around the silver [denarius](#). During and after the fall of Rome, in the Byzantine Empire, the major coin was the [golden solidus](#), which was also known as the nomisma. In China, the coin design stayed by and large the same, in the form of a circle with a square hole, which was called the [ban liang](#) coin. In the Renaissance, the florin was quite common, and the [pound](#) was used in England.

Gold Standard

The gold standard is a monetary system where a country's currency or paper money has a value directly linked to gold. With the [gold standard](#), countries agreed to convert paper money into a fixed amount of gold. A country that uses the gold standard sets a fixed price for gold and buys and sells gold at that price. That fixed price is used to determine the value of the currency. For example, if the U.S. sets the [price of gold](#) at \$500 an ounce, the value of the dollar would be 1/500th of an ounce of gold.

The gold standard is not currently used by any government. Britain stopped using the gold standard in 1931 and the U.S. followed suit in 1933 and abandoned the remnants of the system in 1971. The gold standard was completely replaced by [fiat money](#), a term to describe currency that is used because of a government's order, or fiat, that the currency must be accepted as a means of payment. In the U.S., for instance the dollar is fiat money, and for Nigeria, it is the naira.

Bearer certificates

Token representing value

May be anonymous (cash vs cheque)

Not easily forged (trust)

Physical handling (banks / wallets)

Coupons

Tradeable (bureau de change)

Other ways to pay

Via phone wallets

e.g. Pingit

Electronic payment systems

Electronic bearer certificates

Bitcoin

Game currencies

Digital assets

Issues

Anonymity

Exchange rate

Regulation

etc

Electronic Bearer Certificates

Centralised

e.g. Paypal, Oyster card, M-Pesa

Decentralised

e.g. Bitcoin

Exchange of value ✓

Store of value ✗

Measure of value ✗

GBP to XBT Chart

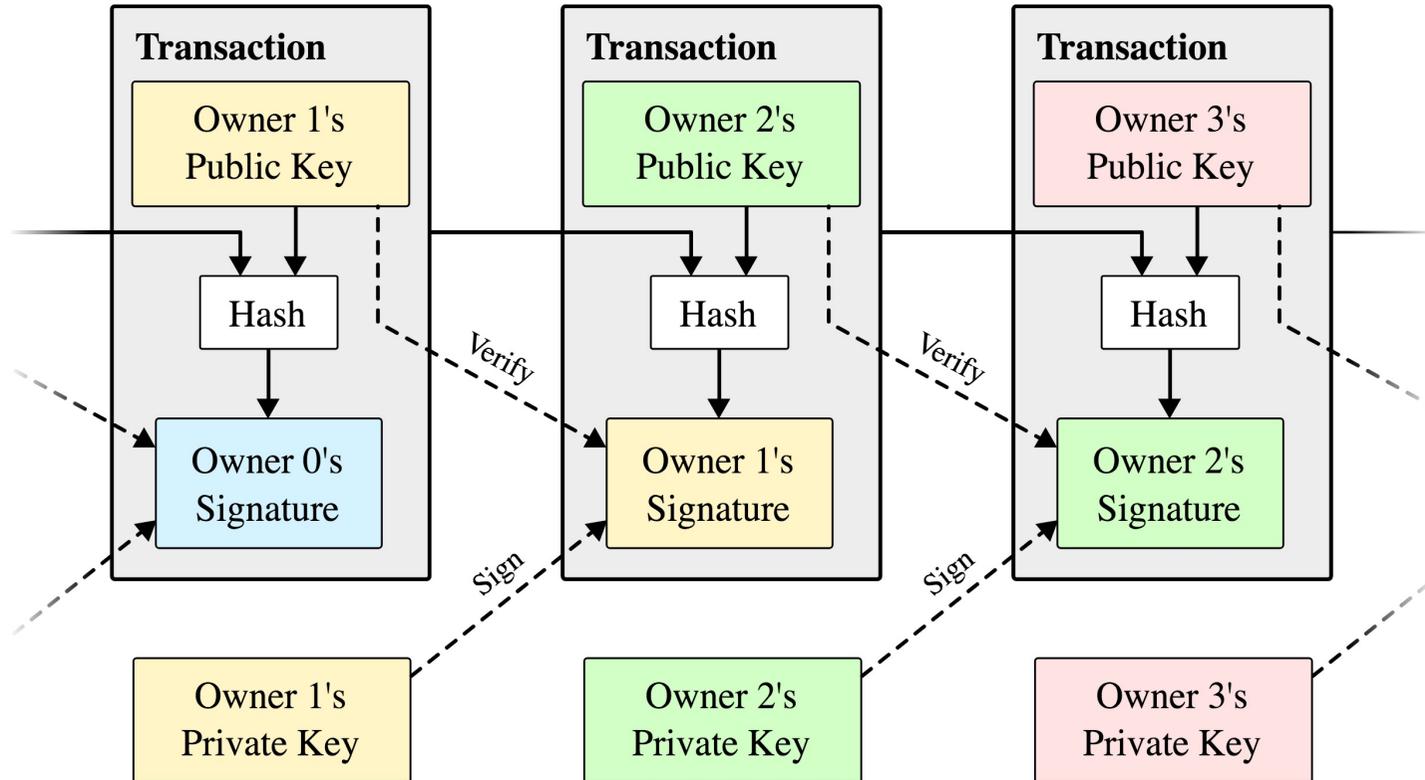
4 Jan 2017 20:45 UTC - 5 Jan 2017 20:58 UTC GBP/XBT close:0.00128 low:0.00108 high:0.00137



<http://www.xe.com/currencycharts/?from=GBP&to=XBT>

Hard (repudiatable) vs Soft (no recourse)

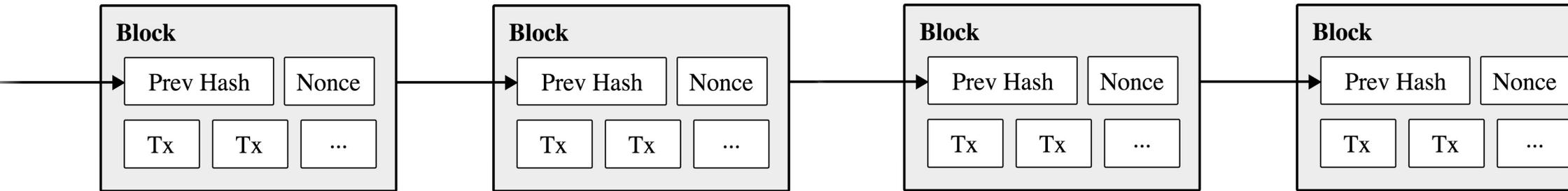
Bitcoin



We define an electronic coin as a chain of digital signatures. Each owner transfers the coin to the next by digitally signing a hash of the previous transaction and the public key of the next owner and adding these to the end of the coin. A payee can verify the signatures to verify the chain of ownership.

<http://nakamotoinstitute.org/bitcoin/#selection-57.4-57.311>

Block chain



Chain of blocks of transactions

Currently 2500 per block

Currently reward of 12.5 coins per block

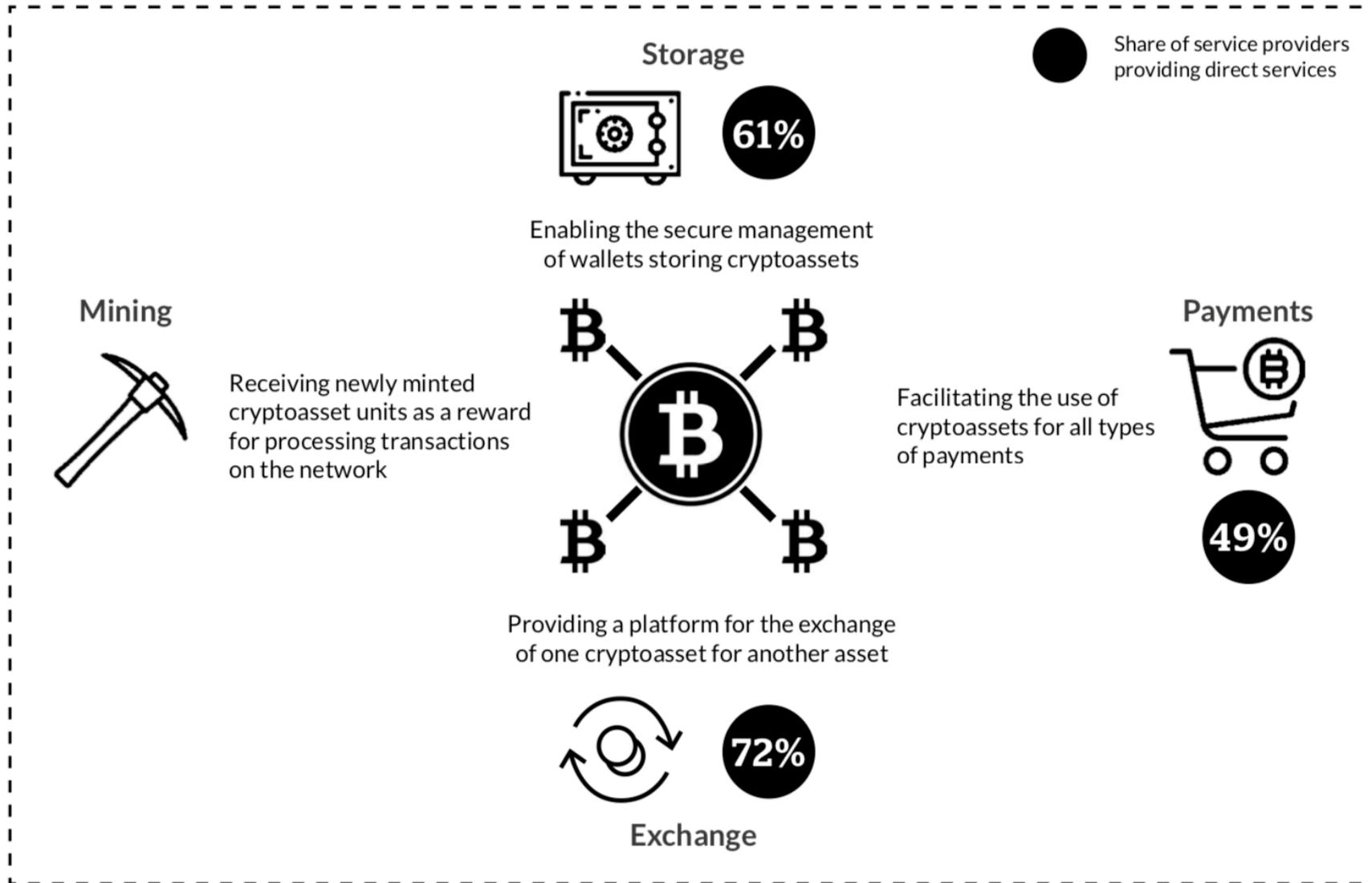
Rate limited by requiring a hard crypto problem solved

Crypto market capitalisation



Downloaded 14 Feb 2019, <https://coinmarketcap.com/charts/>

Key Cryptoasset Industry Segments



Mining

Miners generate income by verifying transactions and adding blocks of transactions to the block chain

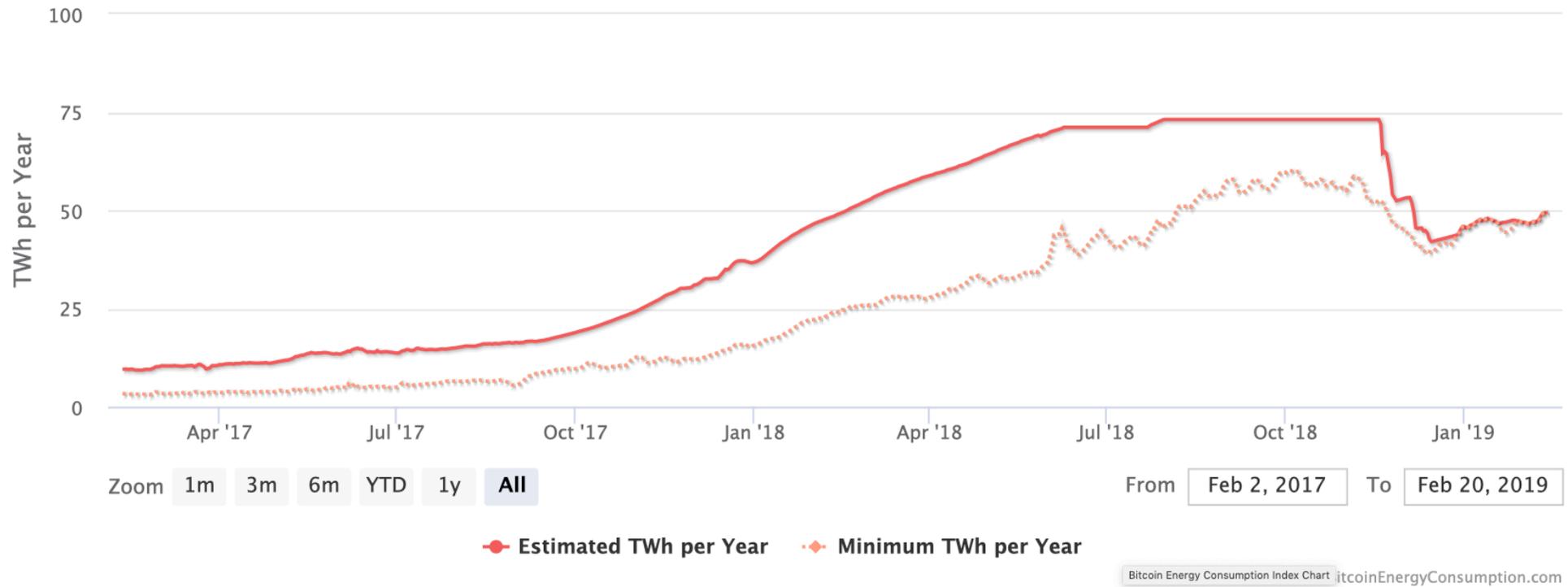
Rate limited by needing to solve hard cryptographic problems to generate a valid block

This uses a lot of energy

Bitcoin Energy Consumption Index

Bitcoin Energy Consumption Index Chart

Click and drag in the plot area to zoom in



Downloaded Feb 14 2019, <https://digiconomist.net/bitcoin-energy-consumption>

Key Network Statistics

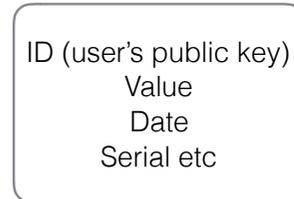
Description	Value
Bitcoin's current estimated annual electricity consumption* (TWh)	49.5
Bitcoin's current minimum annual electricity consumption** (TWh)	49.5
Annualized global mining revenues	\$2,424,932,755
Annualized estimated global mining costs	\$2,309,011,812
Current cost percentage	95.22%
Country closest to Bitcoin in terms of electricity consumption	Singapore
Estimated electricity used over the previous day (KWh)	135,604,584
Implied Watts per GH/s	0.115
Total Network Hashrate in PH/s (1,000,000 GH/s)	49,100
Electricity consumed per transaction (KWh)	411
Number of U.S. households that could be powered by Bitcoin	4,582,933
Number of U.S. households powered for 1 day by the electricity consumed for a single transaction	13.91
Bitcoin's electricity consumption as a percentage of the world's electricity consumption	0.22%
Annual carbon footprint (kt of CO2)	24,253
Carbon footprint per transaction (kg of CO2)	201.63

Downloaded Feb 14 2019, <https://digiconomist.net/bitcoin-energy-consumption>

Electronic money

Unforgeable token

e.g. (value, serial number, id) signed by the issuer's private key



Problem: how to avoid double spending?

Store all spent tokens - can retire blocks of used tokens

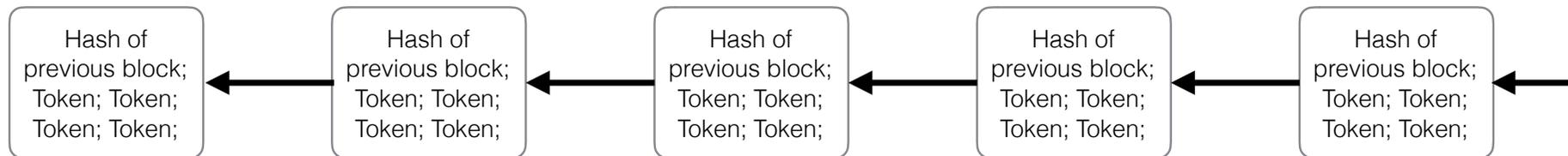
Store all unspent tokens

Store all transactions (~2500/block)

Central store

Distributed store

Block chain (>100Gb) but only updates broadcast



Electronic money - 2

Trusted

Value?

Volatility?

Anonymous or pseudo-anonymous or open?

Currency?

Fiat, or other asset backed

Blockchain pro and con

Advantages

Public record

Pseudo anonymous

Mutually distrustful entities

Disadvantages

Not lightweight

Slow for certainty

XBT to UsD

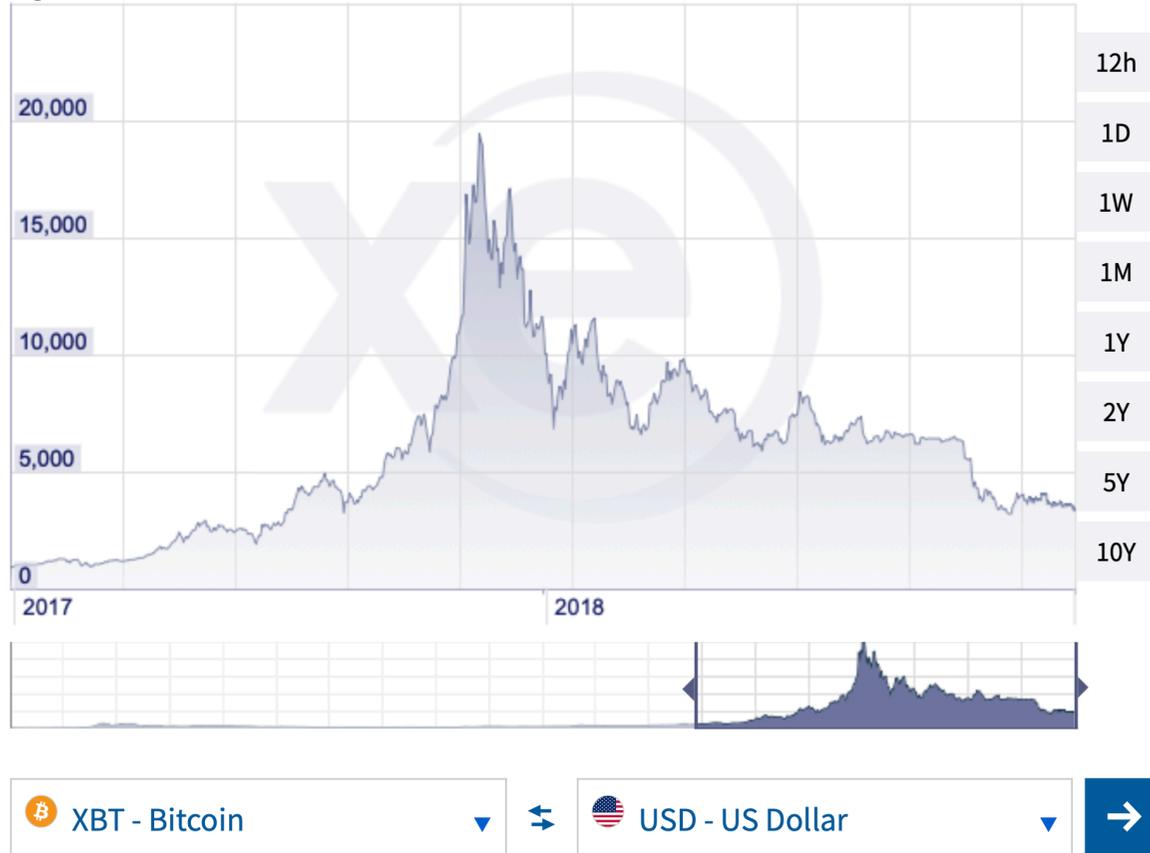
29 Jan 2017 00:00 UTC - 16 Jan 2018 00:00 UTC XBT/USD close:13647.27525 low:913.83880 high:19447.68573



<http://www.xe.com/currencycharts/?from=XBT&to=USD&view=1Y>

XBT to UsD

29 Jan 2017 00:00 UTC - 29 Jan 2019 13:24 UTC **XBT/USD** close:**3397.36460** low:**913.83880**
high:**19447.68573**



<http://www.xe.com/currencycharts/?from=XBT&to=USD&view=1Y>

Blockchain: considering the risks to consumers and competition

Speech by Mary Starks, Director of Competition, FCA, at Authority for Consumers & Markets Conference Panel, Netherlands.



Speaker: Mary Starks, Director of Competition
Event: Authority for Consumers & Markets Conference Panel, Netherlands
Delivered: 26 April 2018
Note: this is the speech as drafted and may differ from the delivered version

Highlights

- Blockchain technology has numerous useful applications but there are potential risks to consumers and competition to be considered.
- Cryptoassets are a well-known application of Blockchain which has demonstrated some risks, and may require further monitoring going forward.
- Distributed Ledger Technology shows potential promise for improving the financial services market but these benefits need to be balanced against the risks to competition which may emerge.
- Understanding more about Blockchain is crucial to ensuring we encourage the promise of the technology while remaining mindful of the potential pitfalls.

As you can imagine, blockchain is something that frequently comes up for us a financial markets regulator. And the panel session title 'Promises and Perils' sums it up neatly: the potential applications for blockchain technology are far-reaching; but there are risks.

As a financial regulator, my thoughts on blockchain fall roughly into 2 groups. The first group of thoughts is about Bitcoin and other cryptocurrencies – and those are slightly anxious thoughts. The second group is about other applications of distributed ledger technology in financial services – and those thoughts are more optimistic.

Evaluating cryptocurrencies

Let's start with cryptocurrencies. Also known as cryptoassets – for reasons I'll come onto in a minute.

Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around \$325 billion. How much is \$325 billion? Big, but not that big. Some of the world's largest pension funds are valued at around \$1 trillion, for example.

For thousands of years, currencies have been developed (and backed) by sovereign states – and we think of currencies primarily in that context. Not exclusively – I live in south London, where we have the 'Brixton pound'. But the Brixton pound is not worth \$325 billion – the cryptocurrency phenomenon is clearly something new. What does it mean for regulators?

Without getting too deep into the UK financial regulation system, it's worth briefly touching on the FCA's remit. The FCA exists to make financial markets work well, and has 3 objectives within that: consumer protection, market integrity and promoting competition. We also support the Bank of England when it comes to financial stability.

The UK Government determines what activities come within our remit. Currently, that remit does not include cryptocurrencies. That said, we do regulate derivative products based on these assets, and we also regulate initial coin offerings (I understand this is the case here in the Netherlands as well).

Faced with a thorny public policy question, it can be helpful to go back to basics. If you take any economic textbook definition of money, it will tell you it fulfils 3 core functions:

- a unit of exchange, (ie to pay someone)
- a store of value, which you can save
- a unit of account, which can be used for bookkeeping

In the early days, the primary purpose for many cryptocurrencies was to be a means of payment. Bitcoin's 'developer', Satoshi Nakamoto defined Bitcoin as a 'peer-to-peer electronic cash system'. And indeed there are pubs across the UK where you can buy a pint of beer with Bitcoin.

More notoriously, one of the early uses for Bitcoin was for purchasing items on the dark web. Various platforms used Bitcoin because of its quasi-anonymous characteristics and faster settlement. These factors can also make cryptocurrencies appealing for money laundering or terrorist finance, which is obviously of concern to us a regulator. That is because such payments can bypass regulated financial institutions like banks, which play an important role in identifying financial crime. However, the fifth anti-money laundering directive will oblige cryptocurrency exchanges and wallet providers to comply with anti-money laundering requirements.

More positively, we see firms using cryptocurrency for international money remittance, lowering the cost and time of sending money overseas. So there are legitimate and economically significant use cases.

All that said, most people now view Bitcoin and other such coins as an asset class rather than a means of payment – hence 'cryptoassets'. Which is probably both cause and effect of swings in the value. In 2017, the price of Bitcoin appreciated from around 850 euro to over 14,000 euro (that's 1600%). Why would I use Bitcoin to buy a pint of beer, when tomorrow it could be worth 20% more? Of course since then we have seen prices go the other way, down about 50% in the first quarter of 2018.

So do these price movements reflect rational expectations, or 'animal spirits'? History offers us many examples of excessive market exuberance, and subsequent crashes – in assets ranging from financial to floral.

Speculation tends to be obvious in hindsight, but hard to call with precision at the time. Financial regulators are not generally in the business of judging when specific assets are overvalued, especially niche assets which (even at \$325 billion) do not appear to pose a systemic risk. However, given our consumer protection objective, we do want to understand who is investing and how much, and we want to guard against people losing more than they can afford to. We have issued investor warnings in relation to initial coin offerings [3], for example.

There's an eye-catching statistic about Bitcoin holdings from a Canadian study. While only 7% of Ontarians owned Bitcoin in November 2017, the proportion was nearly 30% for men aged between 18 and 34. This is striking, particularly as this age group tends to hold fewer assets in other classes (such as stocks or bonds) so may be more rather than less financially exposed to cryptoasset volatility than other demographic groups.

There was also some eye-catching research by analysts at Barclays, who used techniques for infectious disease to model the spread of 'Bitcoin fever'. The idea being that as people hear about friends or colleagues making money they are 'infected' and want to get involved, but once they hear of significant losses or lose money themselves, they become 'immune'. According to Barclays, this modelling suggests Bitcoin fever may have reached its peak. Though perhaps like any good virus, Bitcoin and other cryptocurrencies will evolve to ensure they remain appealing even to those who were once immune.

So let me turn to the final textbook use for money – as a unit of account, for bookkeeping. And this is where my thoughts begin to shift from peril to promise, away from cryptoassets to other uses of blockchain or digital ledger technology.

But before I do that, let me wrap up this first group. To summarise, there has been a shift from cryptocurrencies as a medium for exchange to being seen primarily as an asset class. This has a range of public policy implications. The UK Government recently announced the creation of a cryptocurrency taskforce, which FCA is part of, to assess whether further regulatory action is required and to monitor international developments.

Other applications for distributed ledger technology

In our recent [discussion paper on distributed ledger technology \(DLT\)](#) [4] we defined it as a set of technological solutions that enables a single, sequenced, standardised and cryptographically secured record of activity to be safely distributed to, and acted on, by different participants. This rather lengthy definition reflects the view that DLT has a huge range of applications involving records, including records of contracts, transactions, asset holdings and proof of identity.

Already through our sandbox we are starting to see some of the exciting applications of DLT to solve problems or inefficiencies in the existing system. Many of you may have heard of the FCA's sandbox [5], but those of you who are less familiar with it, let me give you a brief overview. The sandbox is a 'safe space' where businesses can test innovative products, services, business models and delivery mechanisms in the real market, with real consumers.

Blockchain: considering the risks to consumers and competition

Speech by Mary Starks, Director of Consumer Protection, FCA, at the Netherlands.



Speaker: Mary Starks, Director of Consumer Protection, FCA
Event: Authority for Consumers & Markets
Delivered: 26 April 2018
Note: this is the speech as drafted.

Highlights

- Blockchain technology has many benefits.
- Cryptoassets are a well-known risk.
- Distributed Ledger Technology (DLT) offers the risks to competition which are being addressed.
- Understanding more about Bitcoin's pitfalls.

As you can imagine, blockchain is 'Perils' sums it up neatly: the potential for disruption is high. As a financial regulator, my thoughts and those of my colleagues are slightly anxious thoughts. The second group is about other applications of distributed ledger technology in financial services – and those thoughts are more optimistic.

Evaluating cryptocurrencies

Let's start with cryptocurrencies. Also known as cryptoassets – for reasons I'll come onto in a minute. Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around \$325 billion. How much is \$325 billion? Big, but not that big. Some of the world's largest pension funds are valued at around \$1 trillion, for example. For thousands of years, currencies have been developed (and backed) by sovereign states – and we think of currencies primarily in that context. Not exclusively – I live in south London, where we have the 'Brixton pound'. But the Brixton pound is not worth \$325 billion – the cryptocurrency phenomenon is clearly something new. What does it mean for regulators?

Without getting too deep into the UK financial regulation system, it's worth briefly touching on the FCA's remit. The FCA exists to make financial markets work well, and has 3 objectives within that: consumer protection, market integrity and promoting competition. We also support the Bank of England when it comes to financial stability.

The UK Government determines what activities come within our remit. Currently, that remit does not include cryptocurrencies. That said, we do regulate derivative products based on these assets, and we also regulate initial coin offerings (I understand this is the case here in the Netherlands as well).

Faced with a thorny public policy question, it can be helpful to go back to basics. If you take any economic textbook definition of money, it will tell you it fulfils 3 core functions:

- a unit of exchange, (ie to pay someone)
- a store of value, which you can save
- a unit of account, which can be used for bookkeeping

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ing money overseas. So there are a number of ways in which

exchanges and wallet providers

to comply with anti-money laundering requirements.



5 THINGS YOU NEED TO KNOW ABOUT ICOs

[-] ICOs can be securities offerings.

ICOs, based on specific facts, may be securities offerings, and fall under the SEC's jurisdiction of enforcing federal securities laws.

[-] They may need to be registered.

ICOs that are securities most likely need to be registered with the SEC or fall under an exemption to registration.

[-] Tokens sold in ICOs can be called many things.

ICOs, or more specifically tokens, can be called a variety of names, but merely calling a token a "utility" token or structuring it to provide some utility does not prevent the token from being a security.

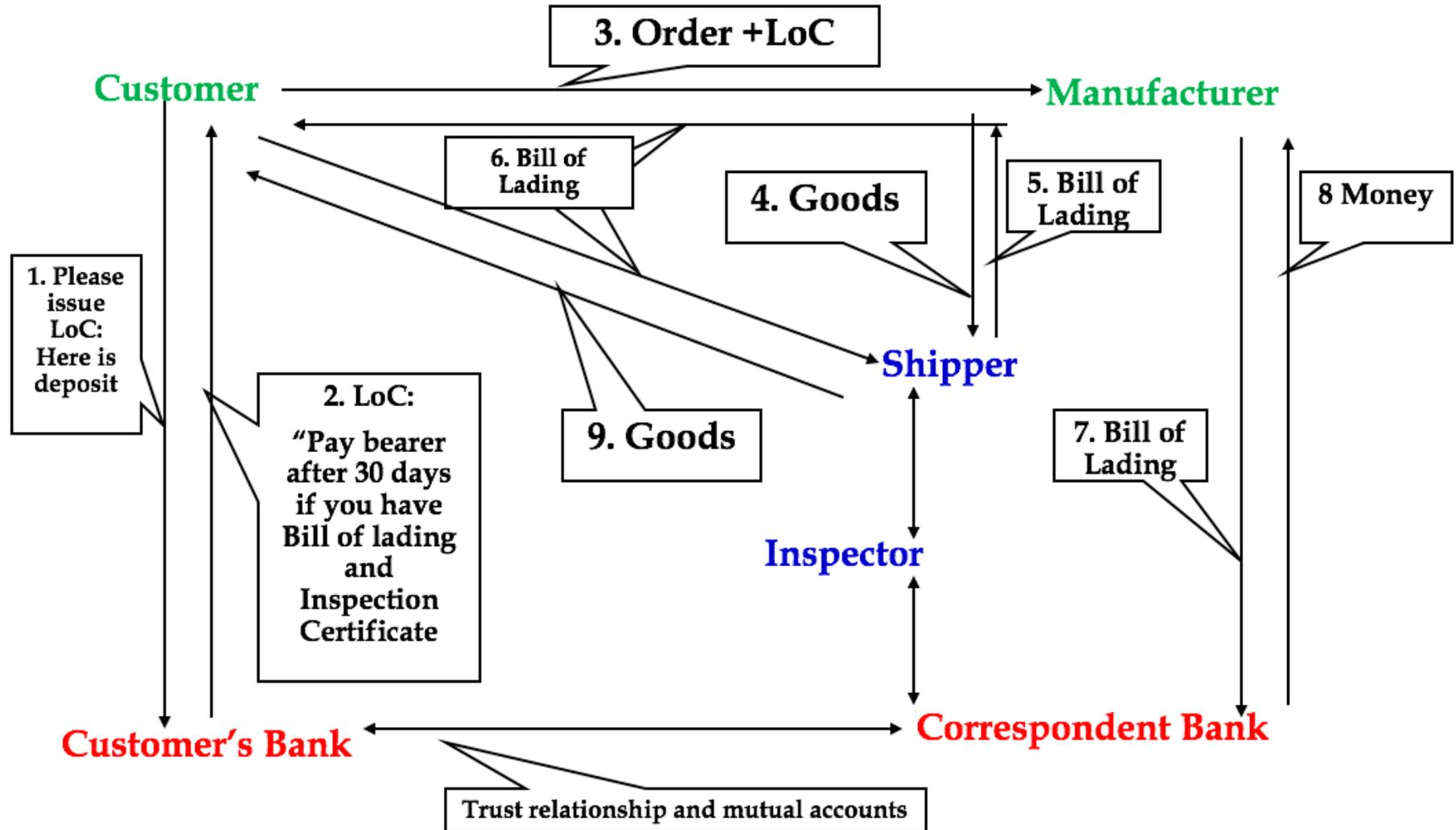
[-] ICOs may pose substantial risks.

While some ICOs may be attempts at honest investment opportunities, many may be frauds, separating you from your hard-earned money with promises of guaranteed returns and future fortunes. They may also present substantial risks for loss or manipulation, including through hacking, with little recourse for victims after-the-fact.

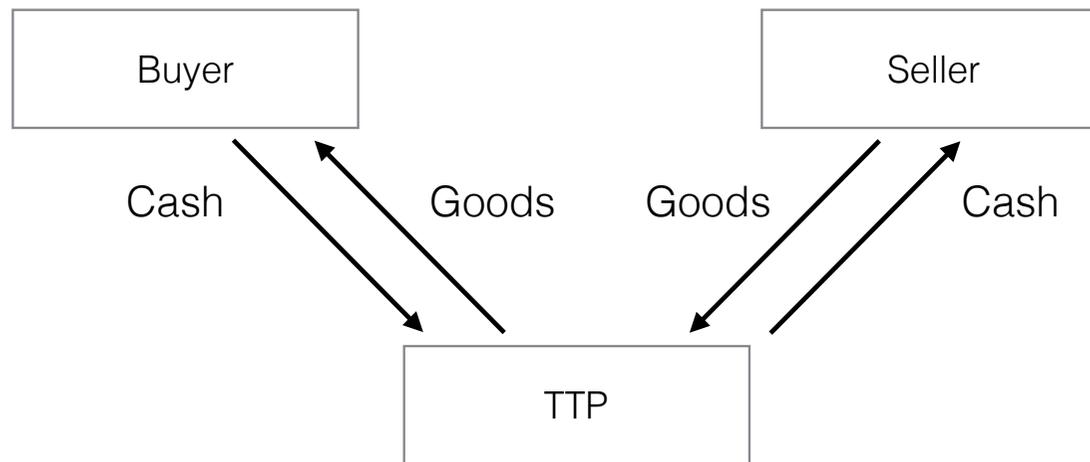
[-] Ask questions before investing.

If you choose to invest in these products, please ask questions and demand clear answers.

Remote transaction



Trusted Third Party



Lawyers e.g. property
Brokers e.g. shares
Credit cards B2C
Auction houses

Credit Cards

Consumer credit goes back to C18th - “The Tallyman”

Some US stores offer “shopper’s plate” from 1920s

Diners Club offered first credit card

NY 1951: 27 Restaurants, 200 customers

Barclaycard offered as incentive to high-value Barclay customers in late 60s;
Access started as rival

Classic “Network effect”

Need enough shops to attract customers and vice versa

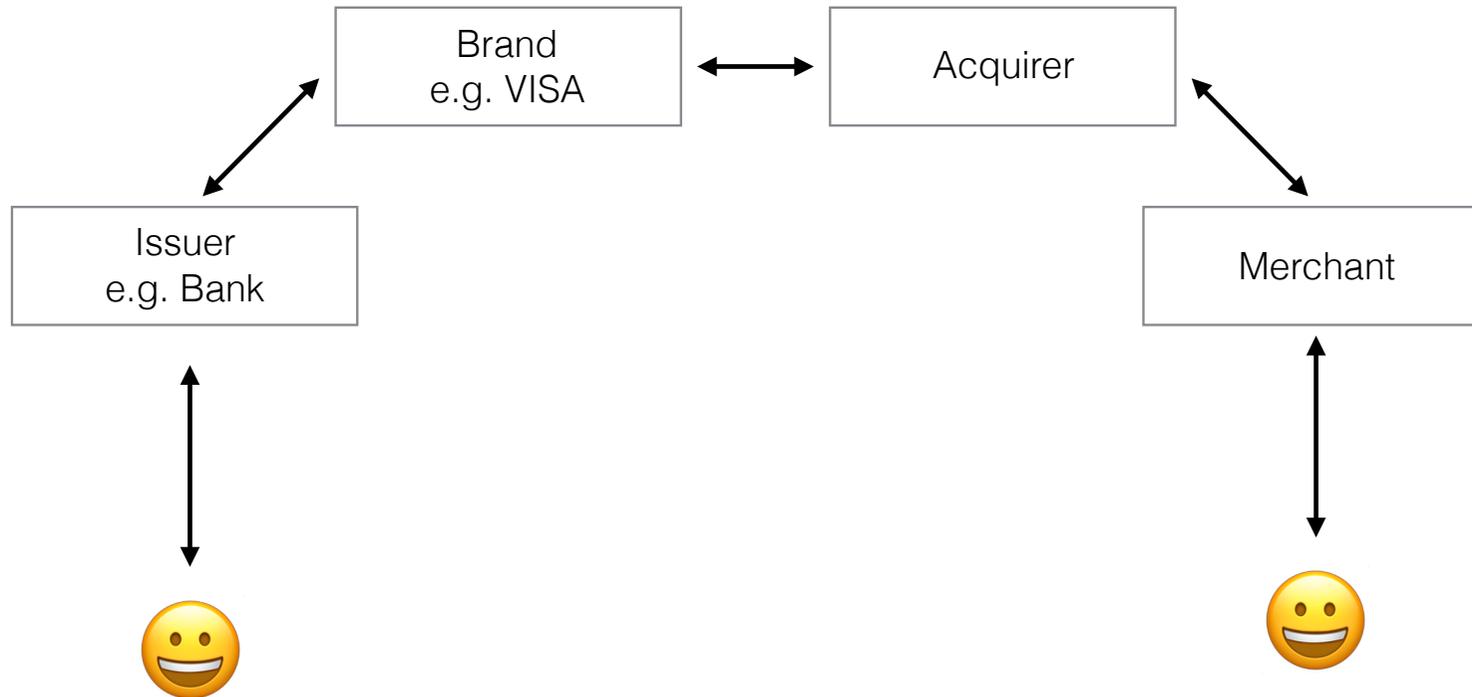
Took off in early 1980s suddenly turning from loss leader to main profit centre.

Some countries (e.g. Germany, Japan) only just taking off

Earnings from online trades starting to be significant

PayPal, Apple Pay

Credit Cards - 2



Credit Cards - 3

Merchant is paid for goods by acquiring bank
less merchant discount (typically 2%-10%, often 4%-5%)

Transactions over floor limit checked with acquirer
hot card list or credit check with issuer

Brand takes a cut;
acquirer makes money from merchant discount;
issuer from selling revolving credit - expensive money, often over 20% APR

Credit Cards - 4

Overall cost of fraud varies

1 – Comparative Overview in 2013

	EU	France	Netherlands	UK	Canada	USA
Population (m)	508.1	65.7	16.8	64.1	35.1	313.9
Number of cards (m)	759.7	85.5	30.4	157.3	105.0	827.4
Card payments value (€bn)	2,204.4	438.4	100.3	653.6	417.2	3,438.4
ATM withdrawals value (€bn)	1,418.3	135.6	51.5	242.5	na	534.7
EMV Implementation	cards: 81.6%	complete	complete	complete	debit cards: 95%	—
Total of card fraud losses (€m)	1,330.0	405.8	41.9	530.3	361.5	4,148.5
Card fraud loss ratio	0.038%	0.071%	0.028%	0.059%	0.087%	0.104%

Sources: ECB, ECB, OSCP, ECB, Betaal Vereniging, ECB, FFA UK, BIS, CBA, Interac, BIS, Federal Reserve

Notes: 1. Number of cards covers both debit and credit and e-purses. Card fraud losses cover both domestic and international transactions. 2. EU card fraud figures and all USA figures are from 2012. Canadian and USA card fraud ratios are calculated in order to comply with European figures. 3. France: Statistics cover 68.4 million CB* bank cards and Moneo e-purses and 17.1 million French "private" cards issued by third parties. 4. Netherlands: Number of cards comprises 24.5 million debit cards and 5.9 million credit/delayed debit cards. 5. UK: Number of cards includes 0.19 million ATM only, 95.7 million debit cards and 57.6 million credit/delayed debit cards. 6. Canada: Number of cards includes 23.9 million debit cards and 81.1 million credit/delayed debit cards. 7. USA: Number of cards includes 290.8 million debit cards and 905.6 million credit/delayed debit cards.

Sources: European Central Bank (ECB), Bank of International Settlement (BIS), for other sources see above.

Motivation - who gets the reward?

- huge hype of hacking the system
- no case of fraud from interception
- real problem is old fashioned card theft

7 – Card Fraud Losses by Method of Compromise – France vs UK vs Canada

	France		UK			Canada (credit cards only)		
	(€m)	%	(£m)	(€m)	%	(CADm)	(€m)	%
Card lost or stolen	81.7	34.2%	58.9	69.4	13.1%	25.2	18.4	5.4%
Card not received	0.9	0.4%	10.4	12.2	2.3%	5.0	3.6	1.1%
Card altered / counterfeit	0.5	0.2%	43.4	51.1	9.6%	111.5	81.5	24.0%
Theft of Card Details	154.0	64.5%	301.1	354.5	66.9%	299.4	218.8	64.4%
– of which e-commerce	125.0	52.4%	163.2	192.2	36.2%	na	na	na
Account takeover, others	1.5	0.6%	36.7	43.2	8.1%	24.0	17.6	5.2%
Total (€m)	238.6	100.0%	450.4	530.3	100.0%	465.1	339.9	100.0%

Notes: 1. Figures cover both domestic and international transactions on French and UK-issued cards respectively. 2. France Data covers both interbank ("CB") cards and private cards. "Other" covers, particularly for three-party cards, fraud resulting from the fraudulent opening of accounts with a false identity. 3. UK: "Others" covers third party application fraud. 4. Canada: Data covers Canadian credit cards only. Additionally, card fraud losses on debit cards were CAD 29.5 million.

Sources: Observatoire de la sécurité des cartes de paiement, Financial Fraud Action UK, Canadian Bankers Association.

Overall pattern - cyclical : best defences not always high-tech

http://www.paymentscardsandmobile.com/wp-content/uploads/2015/03/PCM_Alaric_Fraud-Report_2015.pdf

Credit Cards - 5

Bigger problem: disputes

Porn sites
Paypal etc

Incompetence, fraudulent denial by customers, outright fraud by merchants

Control mechanisms poor and slow

e.g. acquirer call centre can only check country, not cardholder address

Technology?

SET failed
Other formats, e.g. stored value cards, cell-phones

Game money

Monetisation for F2P apps

Multiple currencies gives easier control

Hard/soft currencies

“Buy this sword for £9.99 or 10,000 gems”

Multiple traceable game objects

Wood, good, gems, credits, etc

Internal market

External market



<http://www.pocketgamer.biz/the-iap-inspector/64609/how-does-dawn-of-titans-monetise/>

Game money - 2

Fungible or purchase / winnable only?

- + prevention of “Mudflation”, 3rd party exchanges
- money laundering regulation, VAT, gambling etc

Economic Stability

Sources and sinks

Central banker(s)

Other financial products

Pseudo anonymous?

Business

Second Life Closes Banks

After months of financial scandals and fraud allegations, virtual banks got an eviction notice from Linden Lab.

by David Talbot January 10, 2008

<https://www.technologyreview.com/s/409373/second-life-closes-banks/>

Digital assets / customisation



Fortnite has hit over \$1 billion in revenue with in-app purchases

Michael Potuck



Fortnite has become an insanely popular game and we heard last month that the title's debut on iOS generated \$100 million in revenue in just three months. Now, a new report says that the battle royale blockbuster has hit over \$1 billion in sales across all platforms.

Detailed in a new analysis by [Super Data](#) (via [IGN](#)), the popularity of the game continues to increase as the developer, Epic Games hit the billion dollar milestone for in-app purchases in less than a year.

While the majority of players are likely on a desktop version, iOS certainly helped to boost the awareness and revenue of the game. There's also some pent-up demand as [Android users eagerly await a release this summer](#).

The report also notes that the popularity of the game really took off thanks to wall-

Fair Market

Group of willing buyers and sellers

“Fair price”

Not under compulsion

Price discovery

Equality of information

“Reasonable knowledge of relevant facts”

Anonymity

Pre transaction e.g. Stock market

Pseudo anonymity e.g. Ebay (reputation)

Post transaction

Settlement mechanisms

Shared regulatory framework

Hot Topics

Anonymity

Dark web

Who controls your identity?

Government, Bank, or Apple / Google

Identity cards, MS. Net

Lots of issues?

liability

control

civil liberties

protocol attacks

etc

Privacy

who owns your information?

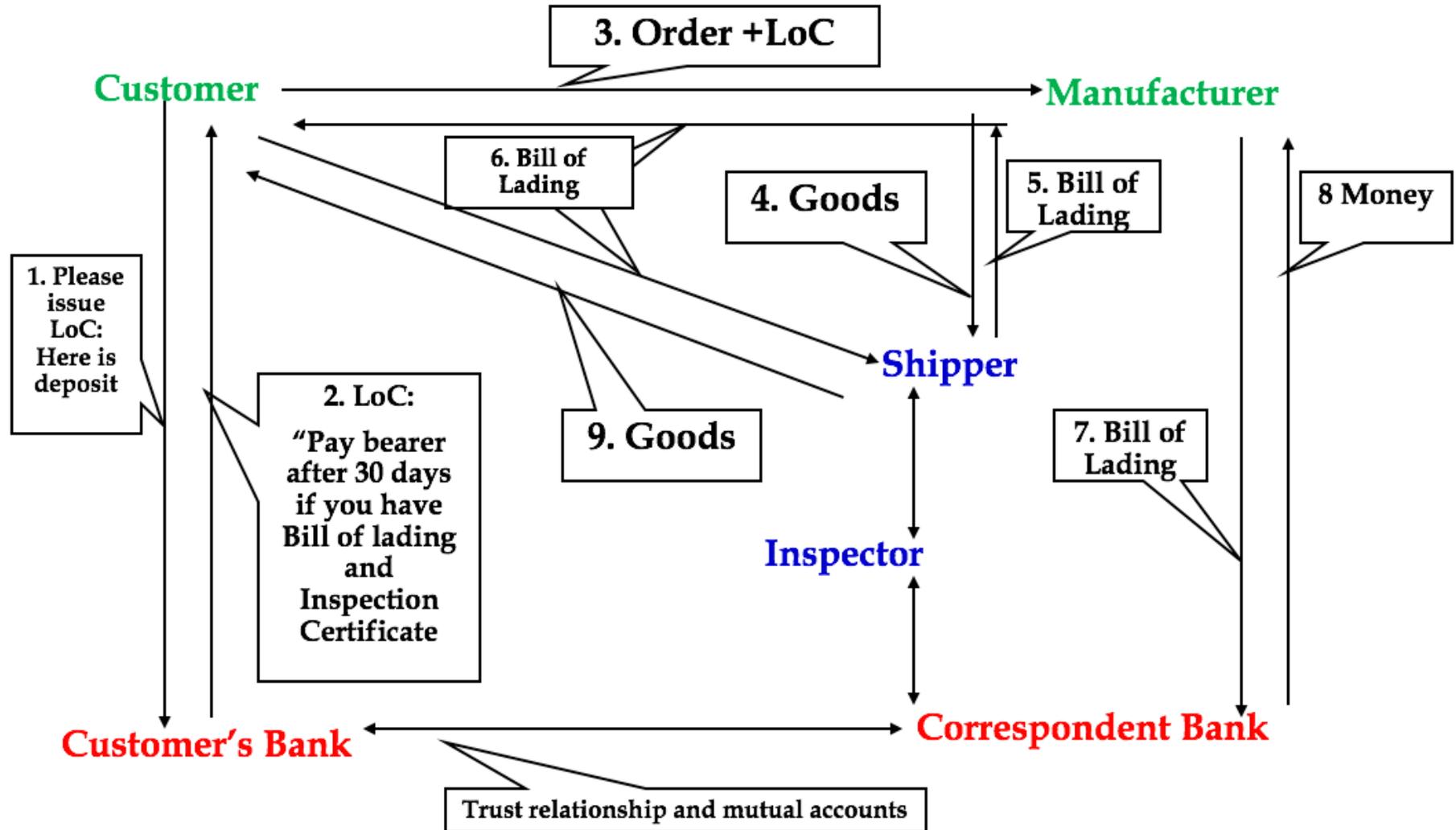
what is it worth?

power and monopolies

E-Commerce - 2

Business Models and Strategy

Remote transaction



What is money?

Exchange of value
Store of value
Measure of value



Fiat money

Money issued by the Government, can't go bust, can always print more

- may cause inflation, exchange rate drop etc
- "cash is trash"

“Unforgeable” bearer certificates

Anonymous, immediate

Trusted (mostly)

Fair Market

Group of willing buyers and sellers

“Fair price”

Not under compulsion

Price discovery

Equality of information

“Reasonable knowledge of relevant facts”

Anonymity

Pre transaction e.g. Stock market

Pseudo anonymity e.g. Ebay (reputation)

Post transaction

Settlement mechanisms

Shared regulatory framework

Macro economics: Modern Monetary Theory

Domestic Government Balance + Domestic Private Balance + Foreign Balance = 0

$$(T-G) + (S - I) - NX = 0$$

Where

G is government spending

T is taxes

S is savings

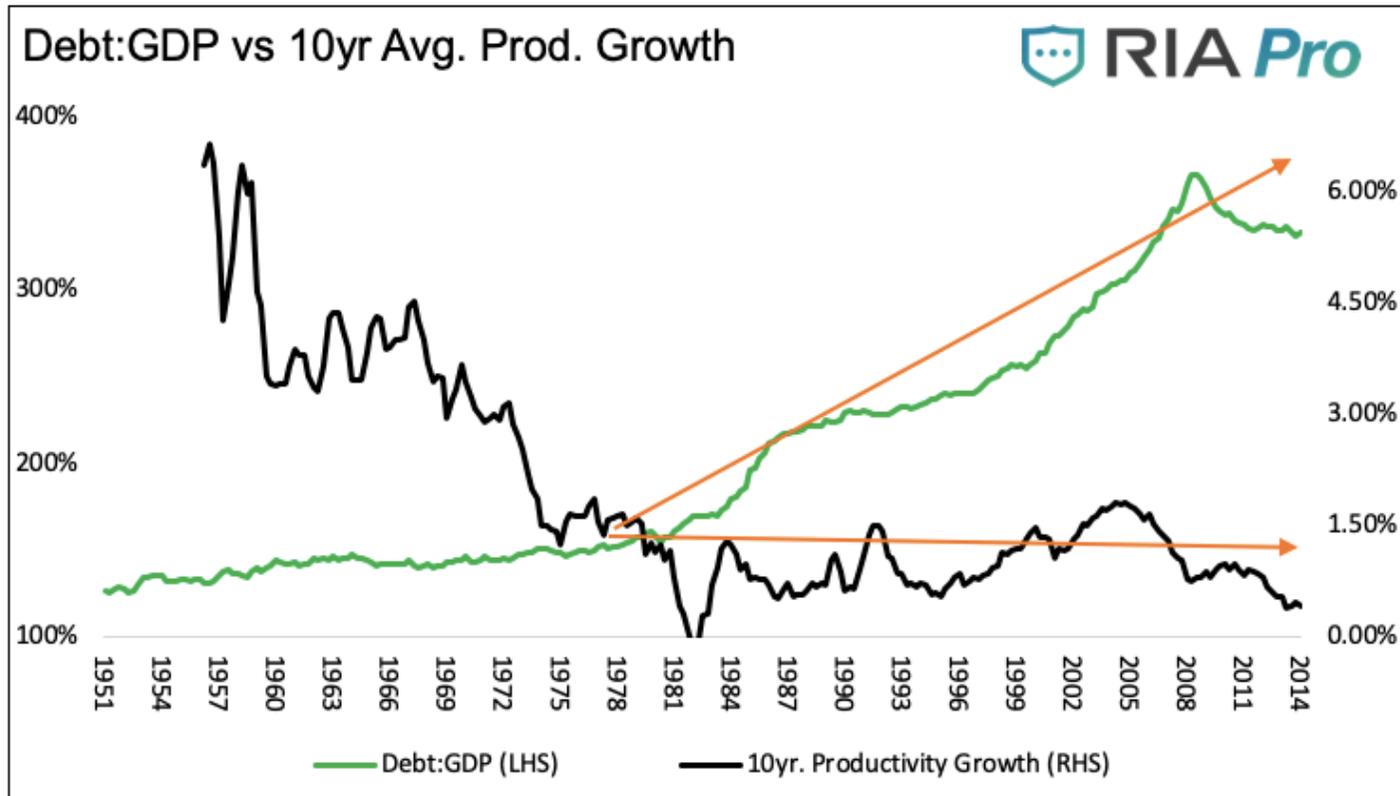
I is investment

NX is net exports

or

$$S-I = G-T + NX$$

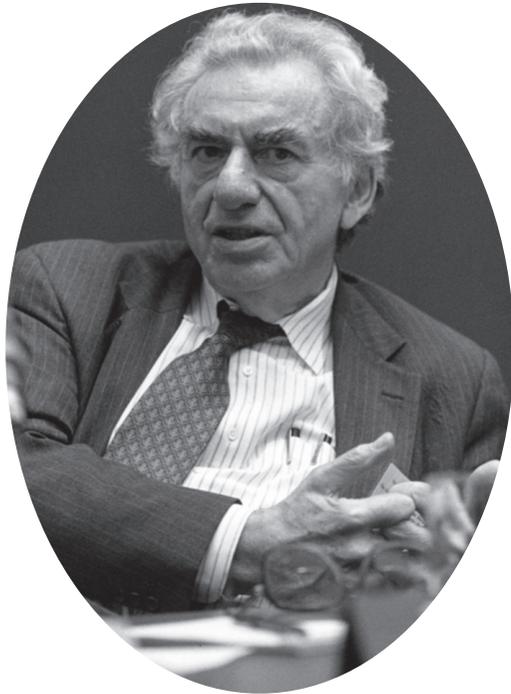
=> Private Wealth ~ Government deficit or trade surplus



Data Courtesy: Bloomberg, St. Louis and San Francisco Federal Reserve

<https://www.seeitmarket.com/u-s-productivity-why-key-understanding-todays-economy-18863/>

Financial Instability Hypothesis



Hyman Minsky (1919-1996)

Accumulation of debt causes instability

Three stages

Hedge borrower - can repay interest and capital

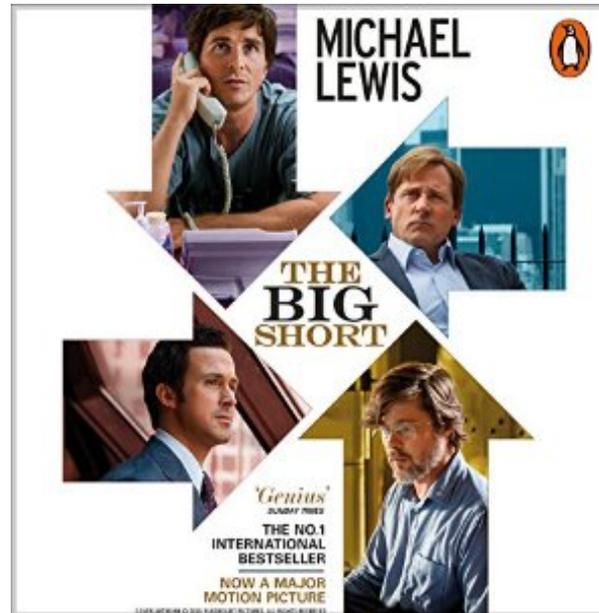
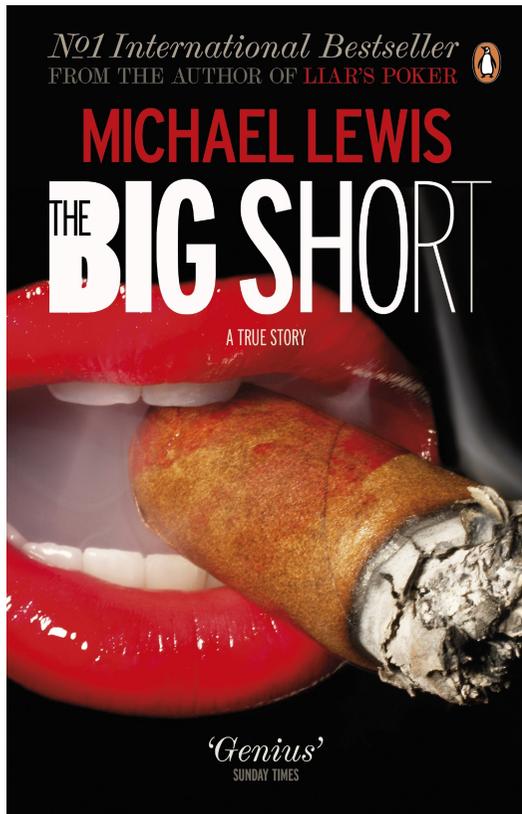
Speculative borrower - can only repay interest = hopes asset will go up

Ponzi borrower - hopes appreciation of asset will pay both interest and capital

Good times don't last

https://en.wikipedia.org/wiki/Hyman_Minsky

<https://kpfa.org/wp-content/uploads/2016/06/HymanMinsky2.png>



Network Externalities

The more people, the more valuable the network

Examples

Telephone late 19th century

Credit card 1980s

Fax 1985-8

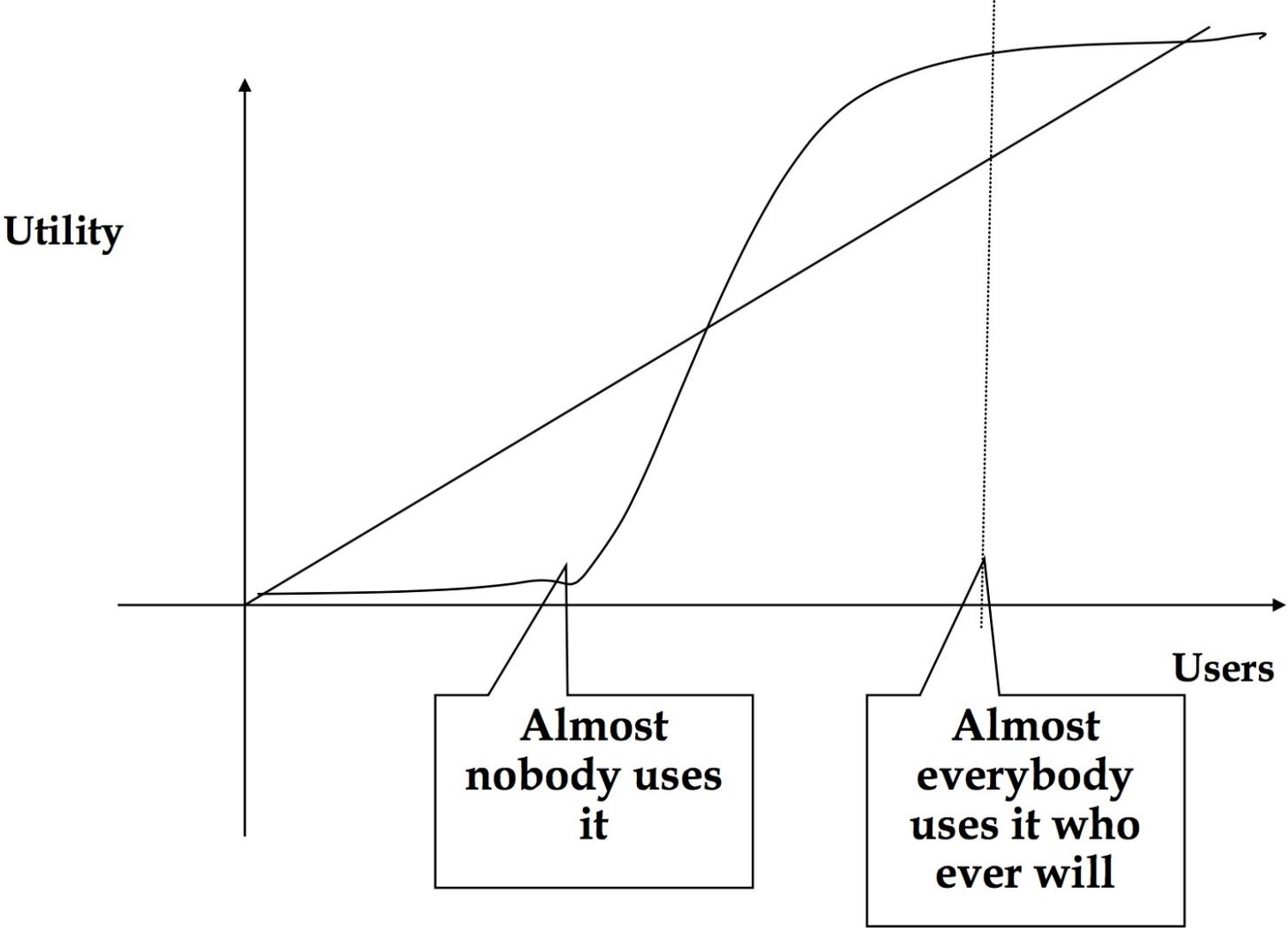
Email 1995-9

Metcalfe's law

The value of a network is proportional to the square of the number of users

Not completely accurate, as the value to each user is non-linear

Network Externalities



Networks

The increase in value of a network is an example of what economists call an “externality”

an external factor other than price

Network means that my purchase benefits all other users as well as myself

Once a network passes a critical size it grows rapidly

Success disaster

Network allows opportunity to extract value even when marginal costs are near zero

price controls

lock-in: value is switching costs

Combination of high fixed / low marginal costs, high switching costs and network externalities lead to a dominant firm model

One sentence summary of information economics

Network Effects

Dominant firm markets -> huge amount to play for (crazy valuations)

Control of key de-facto standards

Hugh first-mover advantages

Can be displaced by larger entity

MS: "Embrace and Extend" - spreadsheets and wordprocessors

Need to create bandwagon effect with makers of complimentary products

need to court developers rather than users (e.g. MS)

Price to value

but still need to make a profit

Liquidity

Liquidity is the ease with which an asset can be traded without creating a substantial change in price or value

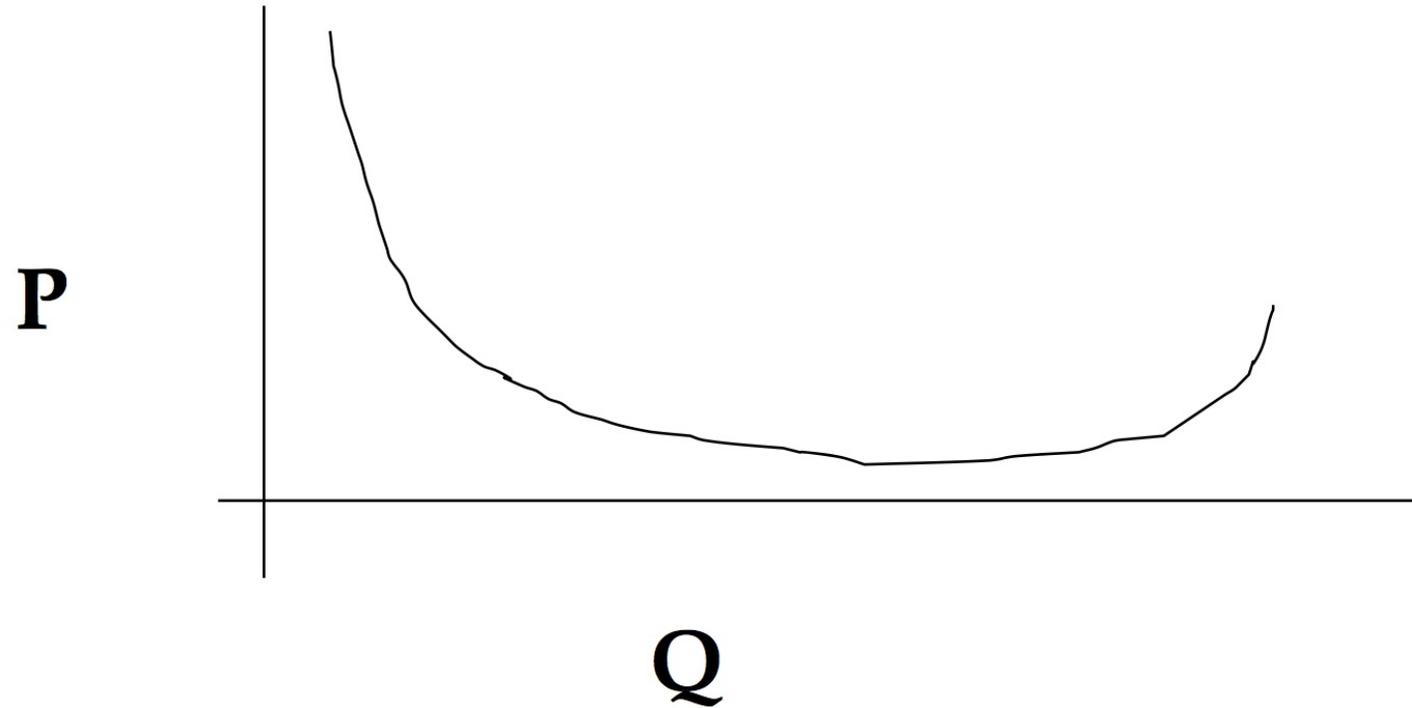
Liquidity is a Network Externality

a single marketplace tends to dominate for any single class of goods
reputation

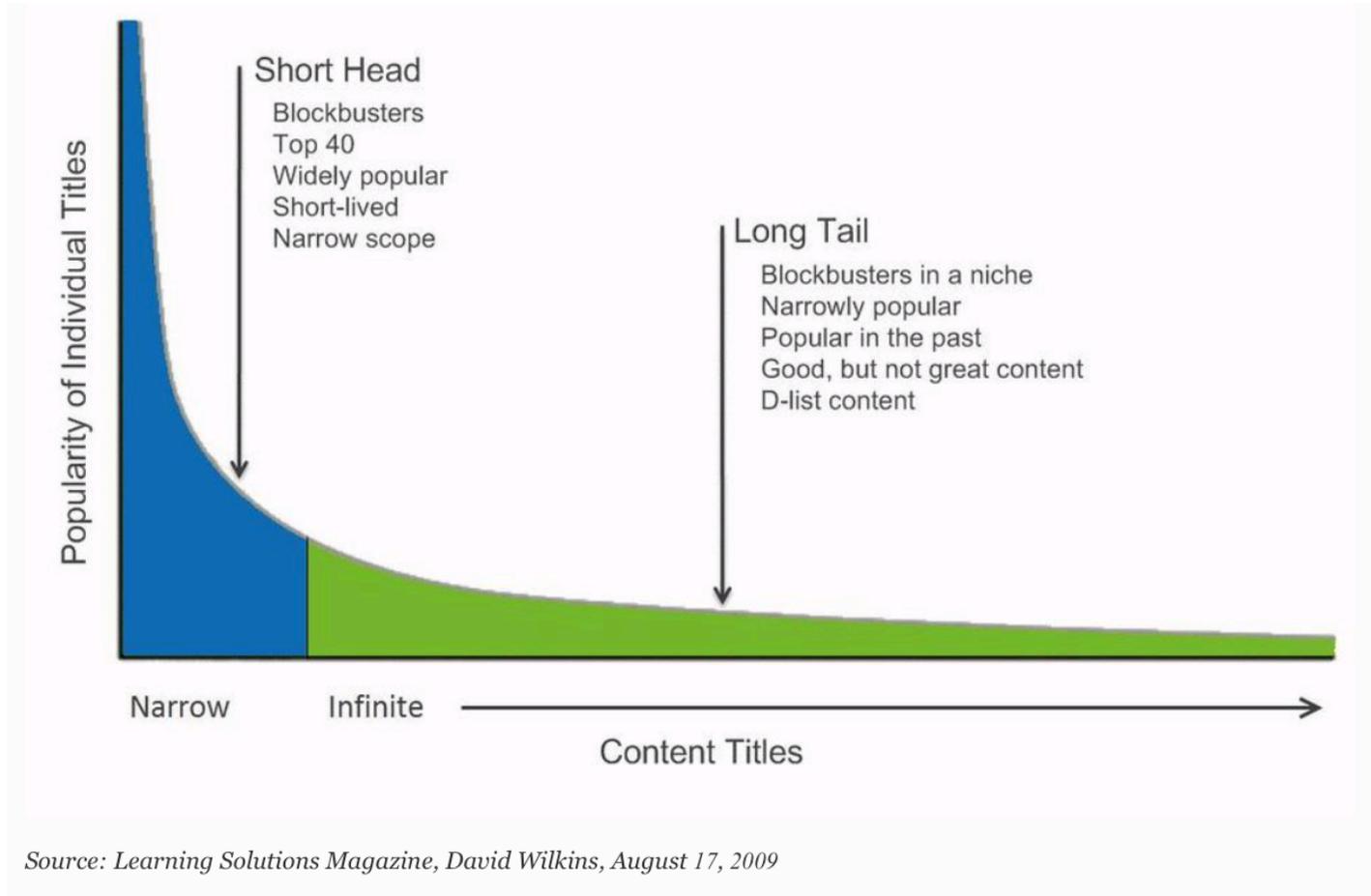
Examples

Ebay vs Yahoo Auctions
Stock exchanges

Manufacturing Cost

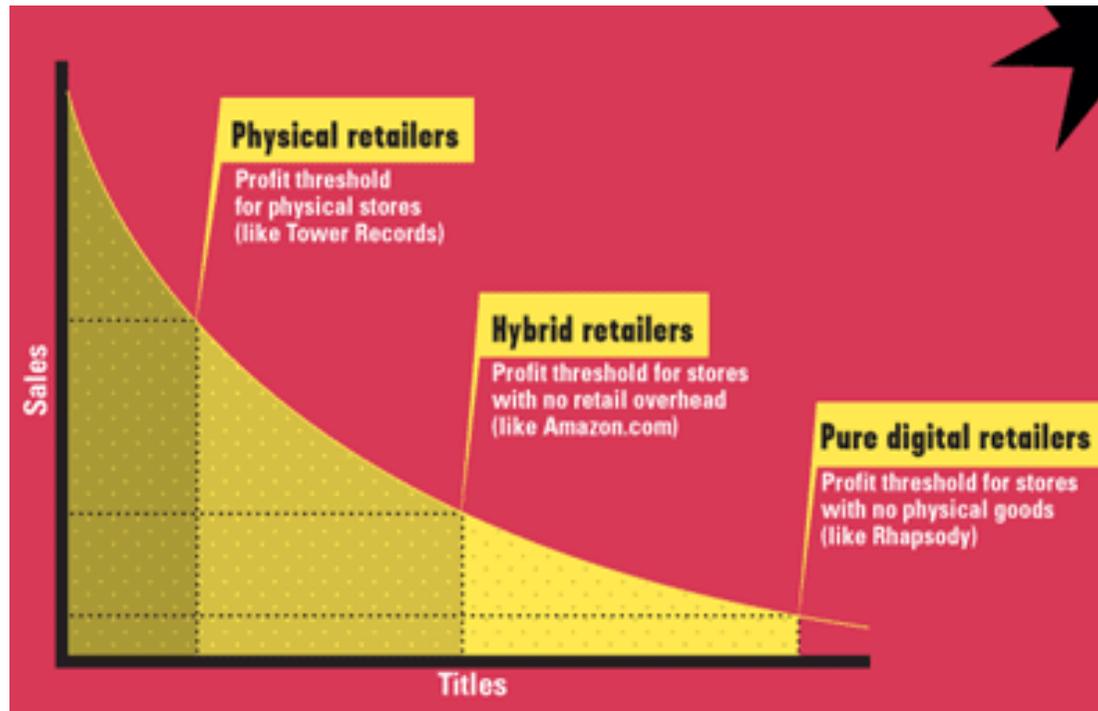


Long tail economics



<https://www.forbes.com/sites/schifrin/2014/05/08/why-alibabas-long-tail-makes-amazons-look-like-a-bobcats/#22097ca97a20>

Long tail economics



http://www.aurorawdc.com/ci/long_tail.gif

JINAL! SINAL! WANL!!

Regulations

The Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013

Electronic Commerce (EC Directive) Regulations 2002

Privacy and Electronic Communications Regulations (EC Directive) 2003
update 2012/13

EU Consumer Rights Directive 2011

Consumer Rights Act 2015 - included "Digital content"

Consumer Contracts - 1

Your identity including sufficient detail for the consumer to be able to identify the business they are dealing with. **This means real name**

A description of the main characteristics of the goods or services you are offering

The price of the goods or services you are offering, including all taxes

Details of any delivery costs

Details of how payments can be made

If payment is required in advance, you must supply your full **geographic address**

Consumer Contracts - 2

The arrangements for delivery or performance of the service, for example when consumers can expect delivery of the goods or the service to start. The contract should be performed within 30 days unless the parties agree to a different period. **Not this affects pre-orders.**

Information about your consumers' right to cancel, where applicable.

If consumers have to use a premium-rate phone number, you must specify the cost of the call (including taxes) before any charges are incurred for the phone call.

For how long the price of the offer remains valid.

The minimum duration of the contract where good or services are to be provided permanently or recurrently and that you will pay the cost of your consumers returning any product that you supply as substitutes because the goods or services originally ordered are not available

Consumer Contracts - 3

After buying information that must be supplied in a durable form (**meaning paper or email**)

The information above

When and how to exercise their rights to cancel including
for goods - whether you require goods to be returned by the consumer and if so who will pay for their return

for services - the consequence of agreeing to a service starting before the end of the usual seven working day cancellation period

Details of any guarantees or after-sales services (**but see warranties**)

The geographic address of the business to which the consumer may direct any complaints. This excludes PO Box addresses

If a contract lasts more than a year or is open ended, the contractual conditions for terminating it.

ECR

Electronic Commerce (EC Directive) Regulations 2002

The full name of your business

The geographic address at which your business is established

Your contact details, including e-mail address

Details of any publicly accessible trade or similar register with which you are registered

If your service is subject of an authorisation scheme or if you are a member of a professional body, details of the relevant supervisory authority or body

Your VAT registration number

ECR 2

where you refer to prices, a clear and unambiguous indication of those prices and whether the price include taxes and delivery costs (but Consumer Contracts also require you to quote prices inclusive of all taxes if the sale is covered by those regulations).

Anti-spam provisions

commercial communications must be clearly identified as such,
provide your identify as the person making the communication,
clearly identify any promotional offer or promotional competition or game and ensure that the terms and conditions for participation are presented clearly

Requirements relating to the storing of the contract and for access to this by the consumer

Provision to enable the consumer to correct input errors prior to placing an order

Consumers should receive acknowledgement of the receipt of the order electronically without delay.

Warranties

EU law does not mandate a 2 year warranty

But does mandate a 2 year period for return of goods delivered faulty

Cancellations by consumer

14 working days after delivery of goods or required information

30 days plus seven working days if no information is delivered

VAT etc

UK customers

EU customers UNLESS they are registered for VAT and you have their VAT number

Special cases

Local sales taxes

Revenue duty on import converse of above

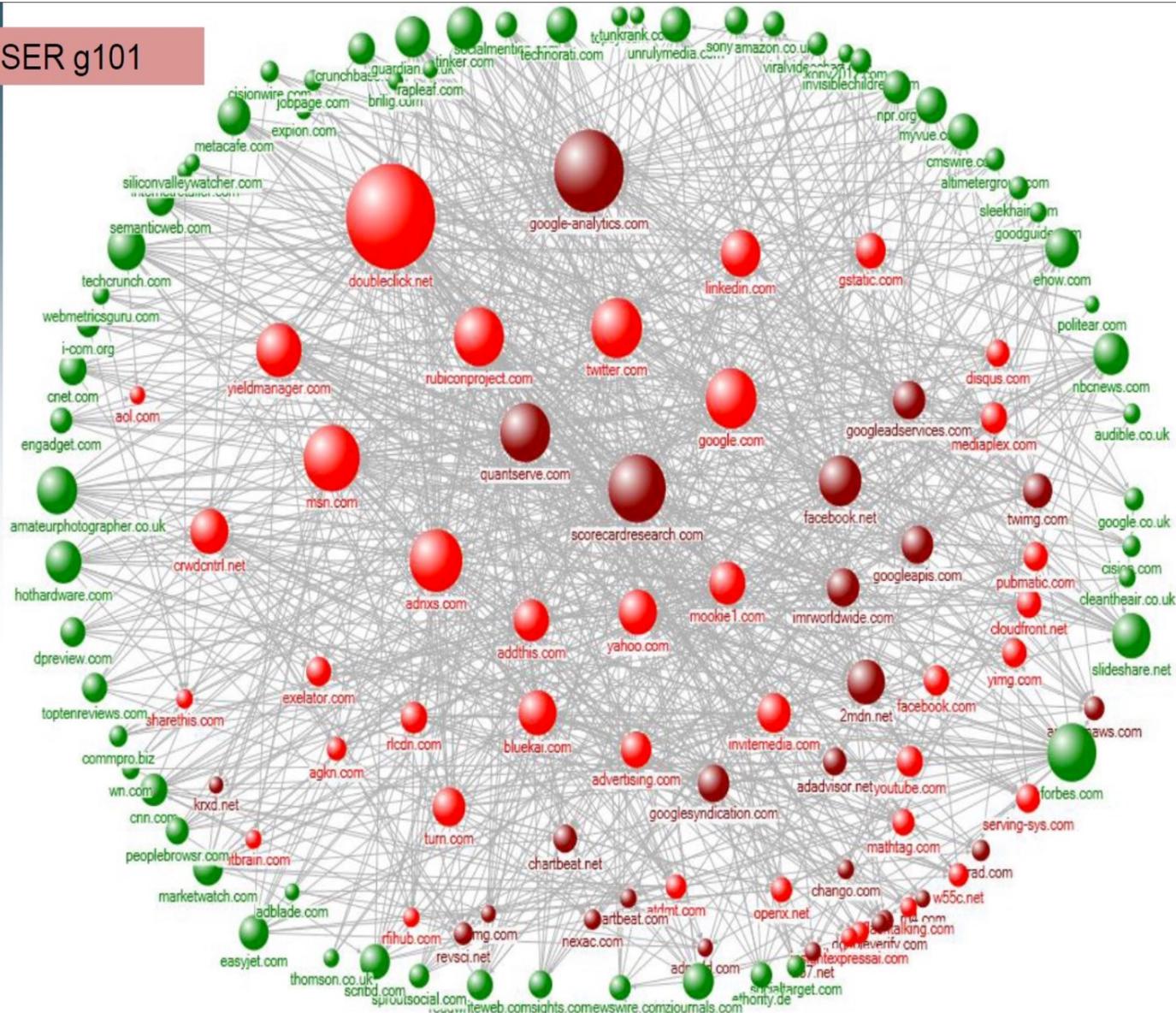
Excise duties complex e.g. TV components

Cookies

Must declare use

Must obtain explicit assent for third party cookies each time

USER g101



Created with NodeXL (<http://nodexl.codeplex.com>)

General Data Protection Regulation

Seven key principles - personal data shall be

(a) processed lawfully, fairly and in a transparent manner in relation to individuals ('lawfulness, fairness and transparency');

(b) collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall not be considered to be incompatible with the initial purposes ('purpose limitation');

(c) adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed ('data minimisation');

(d) accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay ('accuracy');

(e) kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes subject to implementation of the appropriate technical and organisational measures required by the GDPR in order to safeguard the rights and freedoms of individuals ('storage limitation');

(f) processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures ('integrity and confidentiality').

And the controller shall be responsible for, and be able to demonstrate compliance with the above ('accountability')."

<https://gdpr-info.eu>

The European Union Directive on Copyright in the Digital Single Market

Article 11

Protection of press publications concerning digital uses

1. Member States shall provide publishers of press publications with the rights provided for in Article 2 and Article 3(2) of Directive 2001/29/EC for the digital use of their press publications.
2. The rights referred to in paragraph 1 shall leave intact and shall in no way affect any rights provided for in Union law to authors and other rightholders, in respect of the works and other subject-matter incorporated in a press publication. Such rights may not be invoked against those authors and other rightholders and, in particular, may not deprive them of their right to exploit their works and other subject-matter independently from the press publication in which they are incorporated.
3. Articles 5 to 8 of Directive 2001/29/EC and Directive 2012/28/EU shall apply mutatis mutandis in respect of the rights referred to in paragraph 1.
4. The rights referred to in paragraph 1 shall expire 20 years after the publication of the press publication. This term shall be calculated from the first day of January of the year following the date of publication.

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0593>

<https://www.wired.co.uk/article/what-is-article-13-article-11-european-directive-on-copyright-explained-meme-ban>

The European Union Directive on Copyright in the Digital Single Market

Article 11

Protection of press publications concerning digital uses

1. Member States shall provide publishers of press publications with the rights provided for in Article 2 and Article 3(2) of Directive 2001/29/EC for the digital use of their press publications.
2. The rights referred to in paragraph 1 shall leave intact and shall in no way affect any rights provided for in Union law to authors and other rightholders, in respect of the works and other subject-matter incorporated in a press publication. Such rights may not be invoked against those authors and other rightholders and, in particular, may not deprive them of their right to exploit their works and other subject-matter independently from the press publication in which they are incorporated.
3. Articles 5 to 8 of Directive 2001/29/EC and Directive 2012/28/EU shall apply mutatis mutandis in respect of the rights referred to in paragraph 1.
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“link tax”

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0593>

<https://www.wired.co.uk/article/what-is-article-13-article-11-european-directive-on-copyright-explained-meme-ban>

The European Union Directive on Copyright in the Digital Single Market

Article 13

Use of protected content by information society service providers storing and giving access to large amounts of works and other subject-matter uploaded by their users

1. Information society service providers that store and provide to the public access to large amounts of works or other subject-matter uploaded by their users shall, in cooperation with rightholders, take measures to ensure the functioning of agreements concluded with rightholders for the use of their works or other subject-matter or to prevent the availability on their services of works or other subject-matter identified by rightholders through the cooperation with the service providers. Those measures, such as the use of effective content recognition technologies, shall be appropriate and proportionate. The service providers shall provide rightholders with adequate information on the functioning and the deployment of the measures, as well as, when relevant, adequate reporting on the recognition and use of the works and other subject-matter.
2. Member States shall ensure that the service providers referred to in paragraph 1 put in place complaints and redress mechanisms that are available to users in case of disputes over the application of the measures referred to in paragraph 1.
3. Member States shall facilitate, where appropriate, the cooperation between the information society service providers and rightholders through stakeholder dialogues to define best practices, such as appropriate and proportionate content recognition technologies, taking into account, among others, the nature of the services, the availability of the technologies and their effectiveness in light of technological developments.

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0593>

<https://www.wired.co.uk/article/what-is-article-13-article-11-european-directive-on-copyright-explained-meme-ban>

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“meme ban”

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0593>

<https://www.wired.co.uk/article/what-is-article-13-article-11-european-directive-on-copyright-explained-meme-ban>

When in doubt ask a lawyer

Capturing / Extracting Value

Business models (Where's the money?)

Landgrab

Merchant

PPV, Subscription, Freemium, Shareware, etc

Market

Advertising hoarding

Lotteries and scams

Land grab

Maximise market share now; worry about profitability later

Since there are not yet profits, stock market values the company (for a while) on number of customers

Typical of new “Bubble” companies: cable TV, airlines, radio, Railways in 19th C, colonial exploration in 18th C

Now discredited: later never comes
At least, not until the next bubble

Merchant

Sells goods or services for more than they cost

Basic to most businesses

Internet technologies add maybe 20% efficiency

- Disintermediation

- Lower cost market comms

- Lower cost order taking

- Lower cost distribution, especially for informational goods

- 'Just in Time' gives lower cost for stock and inventory

- Better modelling and control

 - Mexican cement plant example

BUT still must be a sound business!! !

- Established players may be asleep, but are not dead

PPV or Subscription

Pay per View (use)
e.g. phone rates

Subscriptions

Actuarial calculations

All you can eat models

Administration issues - charging model never stays simple!

Matrix of services and products

Freebies, promotions, etc

Copying issues

Provide service

Street Performer Protocol

Market

Commission on other people's trades

No stock cost

Low barriers to entry

Place for buyers and sellers to meet

eBay, B2B auctions, lastminute.com, bookfinder.com

Liquidity, liquidity, liquidity

Network effects

Settlement issue

Paypal, CrestCo, Bolero, Amazon pay, Apple pay, Google wallet

Novel pricing models (e.g. auctioning demand / surge pricing)

Agent technology

Death of the portal (and maybe rebirth)

Better ways to trade - Platforms

Network effects

- Single marketplace for each class of goods

- Markets illiquid for large trades, inefficient for small trades

- What is a 'fair market'?

Clearance and settlement

- Issues for very large and very small trades

- Warranties provided by CC & banks

 - Dispute resolution

- Bearer certificates?

- Tax and jurisdiction?

- Privacy vs money laundering

Advertising

Typical rate £10 pct (thousand impressions)

More for personalisation and target adverts

Advertising industry, and advertisers are very conservative

Monitoring

High traffic sites

ISP home pages

Need to drive traffic to the site

Need to refresh site often / build community to keep users returning

Agency sales

Google, Facebook

Market saturating

Rates dropping

Different formats

Flash inserts; streaming media

Email, digital TV, etc

Lotteries and Scams

Lotteries: tax on the ignorant

Poor estimate of low probability events

Premium rate telephone scams

TV quiz shows and auctions

Phone this number to win...

Straight frauds

Ponzi schemes (Pyramid sells)

Credit card and other personal details

Telecom scams

Boiler room operations

Lightweight startups

Virtual office and presence

Licence don't manufacture

Cloud based resources (e.g. Amazon S3)

Low hanging fruit

Crowd source - Kickstarter

Establish market

Pre-sell product

Test assumptions not just predict miracles

E-Commerce - 3

Design and implementation

Web design

It's another form of publishing

Your website is your shop window. People will judge your company on it
Web publishing is no different from other types of publishing
Spelling, grammar, point size, broken links, incorrect captions
Social networking sites and CMSs make this available to all

Get the domain name right

Inventive: business.com vs PlentyOfFish (dating site)

Design is important

Good design is look and feel that enhances functionality
Integrate good design with backend databases

Health warning!

www.dokimos.org/ajff/
www.zombo.com

Web design mistakes

Ego: Believing people care about you and your website

Why are they looking at your site?

What are they trying to do?

Do you help them achieve THEIR goals?

Can't figure out what your website is about in less than four seconds

www.genicap.com

Mystery Meat

Navigation you have to roll over

Zero intelligible

www.bluebell.com

www.zombo.com

Too much stuff

www.arngren.net

Contrast, Contrast, Contrast, Contrast, Contrast, Contrast, Contrast

Horrid examples

<http://www.dokimos.org/ajff/>

warning flashing lights

<http://Lingscars.com>

<http://www.patimex.com>

more common mistakes

Huge images

Distracting colour schemes

Flash gifs, scrolling test

Autoplay music or video

Unclear navigation

Unreadable

Cluttered

Useless Title

Zero intelligible content

Refuses to work with IE

Only works with IE

Requires Flash

Assumes screen size

Assumes font size

Contains errors

Modes considered harmful

www.webpagethatsuck.com

Navigation

Navigation is important

- Make the navigation clear

- Three clicks maximum to get anywhere

- Hard when Sainsbury's have >25,000 line items

Consistent position / action

- Logo top left and takes you home

Search

- On site and landing page optimisation

Text

www.mrbottles.com

Consistent font

One family

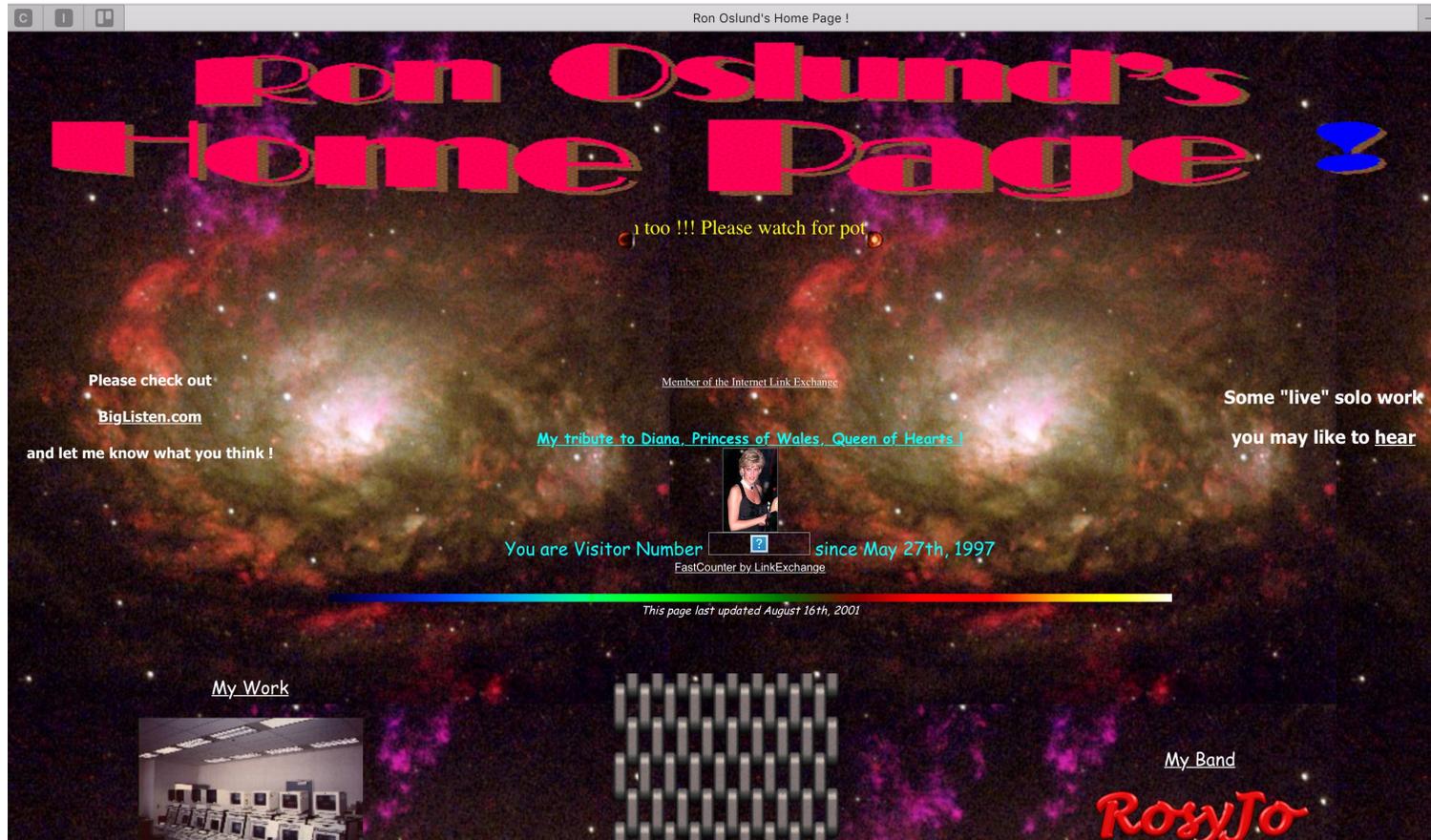
Care on colour / size

Fonts carry a subtle simplicity message

Serif or San Sarif?

Loud *Soft* **STRANGE** Respectable Old fashioned

Poor design examples



Poor design examples

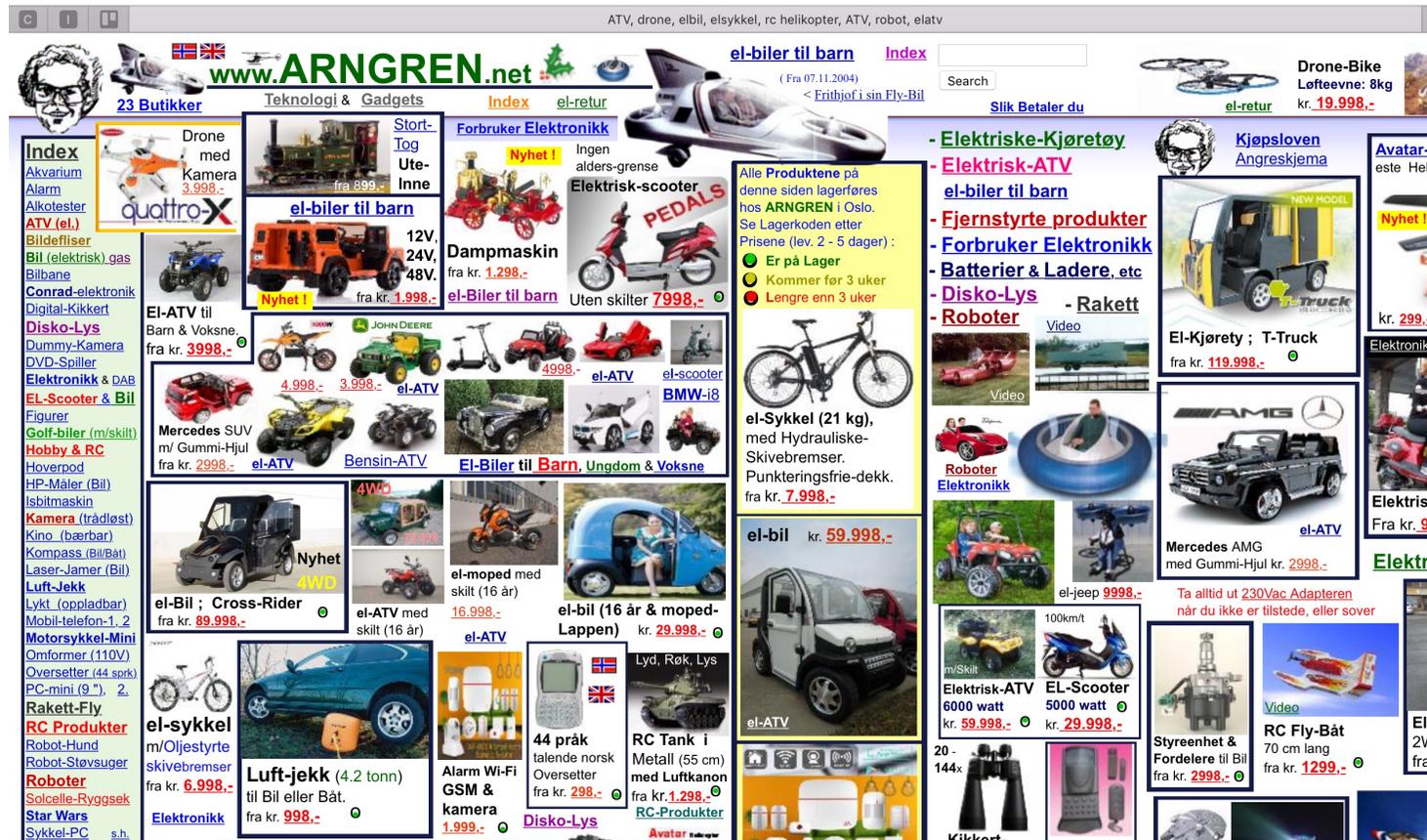
Title confused with keywords

Mixes fonts

Far too much material

Navigational mess

Needs more than 1024x768



Good design example

consistent navigation

clear call to action

quick links

consistent navigation

The screenshot shows the Cisco Live! website homepage. At the top, there is a navigation bar with the Cisco logo on the left and links for 'Products & Services', 'Support', 'How to Buy', 'Training & Events', and 'Partners' in the center. On the right side of the navigation bar, there are links for 'UK & Ireland [change]', 'Log In', 'Account', 'Register', 'About Cisco', and 'Local Offices', along with a search icon. Below the navigation bar is a large hero section with a blue and orange abstract background. The text in the hero section reads: 'Cisco live!', 'Attend the best technology event of the year', 'Only Cisco Live delivers the training, education and connections you need to thrive in the world of digital business.', and 'Join us in Barcelona!'. A 'Register now' button is centered below the text. Below the hero section is a dark blue bar with six icons and their corresponding labels: 'Design Guides', 'Learning', 'Career Certifications', 'Software Downloads', 'Support Community', and 'Tech Support Cases'. Below this bar is a light gray section with four columns of quick links. The first column lists 'Solutions for' (Executives, Small Business, Midsize Business, Service Provider, Public Sector), 'Industries', and 'Initiatives' (Financing Options, Cisco Powered). The second column lists 'News & Alerts' (The Network, Blogs, RSS feeds, Social Web), 'Local Training & Events', 'Technology Trends' (Cloud, Internet of Things (IoT), Mobility, Software Defined Networking (SDN)). The third column lists 'Communities' (Downloads, Documentation, Communities, Collaboration, Developer Network, Learning Network, Support (NetPro)). The fourth column lists 'About Cisco' (Investor Relations, Corporate Social Responsibility, Environmental Sustainability, Supply Chain Transparency, Career Opportunities, Investing in Digital Skills, Case Studies, Innovation, 'There's never been a better time'), 'Contacts' (Local Offices, Find a Reseller). At the bottom of the page is a dark gray footer with links for 'Contacts', 'Feedback', 'Help', 'Site Map', 'Terms & Conditions', 'Privacy Statement', 'Cookie Policy', and 'Trademarks'.

Protected and encrypted pages

Most web sites are open to all

Protected pages for

Subscribers, suppliers, customers, staff

Protected by username / pw; IP address; domain name of browser; or combination thereof

Most traffic to and from websites is in the clear

Potential eavesdropping possible

Secure Socket Layer (SSL) encrypts data

Widely used whenever privacy is important

Payment

Secure communication (spooks, terrorists, medical)

Static and Dynamic pages

HTML forms

- Fill in fields
- Press button to submit data
- Validate locally using javascript
- Remember use input when redrawing form

HTML with extra tags pre-processed

- Java Server Pages (JSP)
- Active Server Pages (ASP)
- PHP

Complete content management systems

- Signiant, Vignette, Joomla, Drupal, Wordpress, etc
- Content and style kept distinct - can adapt for target audience
- Dynamic pages added as extensions, many already in libraries
- Complex javascript frameworks (Jquery, MooTools, Prototype)

Improving the experience

Asynchronous Javascript and XML (AJAX)

- XMLHttpRequest calls as data entered
- No need to refresh entire web page
- Immediate field verification
- Google suggestions and Instant

Web apps that compete with local ones

- Sproutcore for iPhone apps
- HTML5 includes geolocation, local storage
- Google Web Toolkit
 - Java compiler produces Javascript
 - works with all browsers
 - that can be tested using standard Java IDE
- www.gwtproject.org

Search Engine Optimisation

Links from other domains

Page titles - each page different

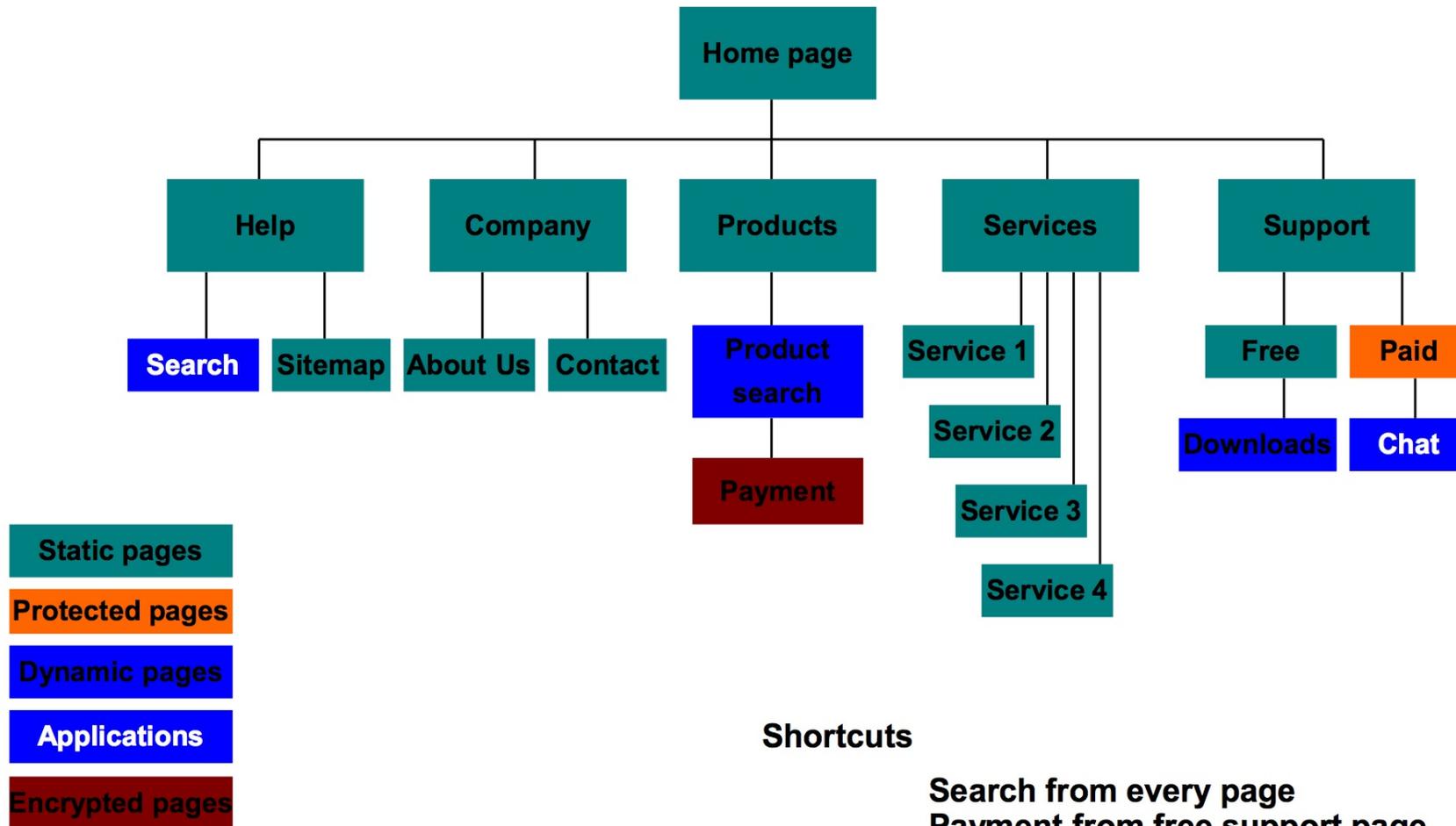
Meta tags

Anchor and alt text

Robots.txt

www.google.com/webmasters/

Page transition diagram



Online decisions

User logon required? When

Remember credit card details?

Same price for everyone?

Special offers (free delivery if over £100 spent)

Backend integration

Helpdesk support?

Online credit checking?

Order picking?

Online stock shown?

Delivery extra - options - reliability

Consumer Generated Content / Media

General model funded by adverts

Layout generated by owners, content by users

Facebook, MySpace, YouTube, Twitter, Blogs

Instant feedback to ideas and huge audience

Seen as important tool in elections

Modern version of 'on the stump' heckling

Companies see need to participate

over 50% of shoppers who use social media follow / friend brands
but it can bite them back

Consumer review sites e.g. tripadvisor, lateroom

Some ad income, other income from hotels listed

offers analytics, right of reply

Unclear in some cases whether people had actually visited

Wikis

Widely used as informal knowledge sharing tool

Outline Physical Design



Sizing

Scalability

How many people?
At the same time?

Number of products

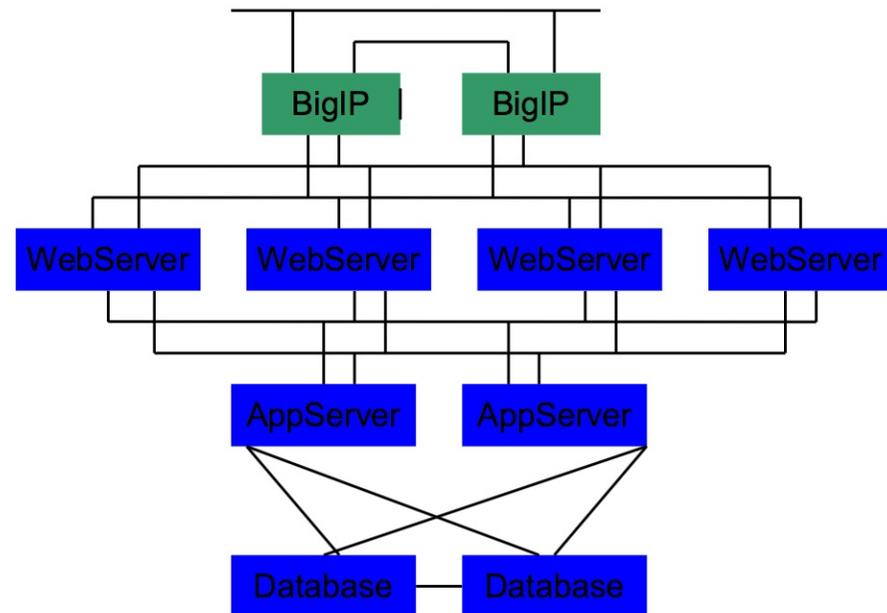
Size of downloads

Music 4M
Software 200M
Movie 2G

Reliability

Responsiveness

Lastminute.com system design



E-Commerce - 5

Creating a business

Merchant System

Requirements

- User logon required?
- Remember credit card details?
- Same price for everyone?
- Special offers (free delivery if over \$100 spent)
- Backend integration?
- Help desk support?
- Online credit checking?
- Order picking?
- Online stock shown?

Examples

- Microsoft Biztalk, OpenMarket, Intershop
- Stripe, Square, PayPal, Sage
- Amazon payment, Amazon fulfillment

Pricing

More complex than it seems
confusion pricing

Service levels
matrix

Special cases
government, students, ...

Special offers
time limited

Service	Blue	Silver	Gold
Basic	✓		
Advanced		✓	✓
Fancy case			✓

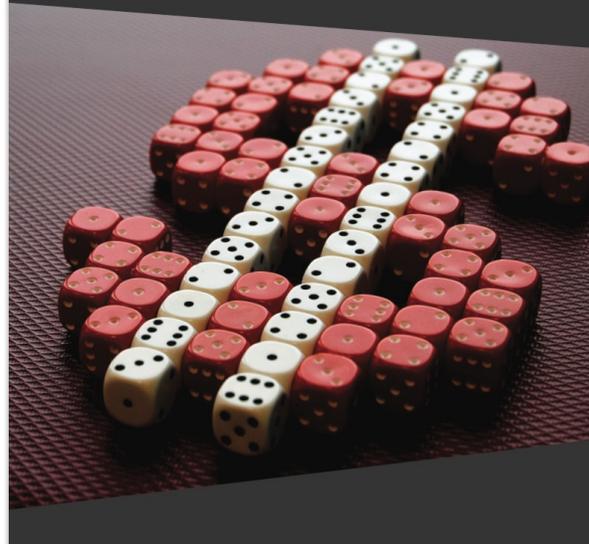
The Business of Software



Don't Just Roll the Dice

A usefully short guide to software pricing

Neil Davidson



http://download.red-gate.com/ebooks/DJRTD_eBook.pdf

Legacy Integration

Nightmare

stock, picking, billing, customer care, marcom...

Legacy-based to realtime

Sainsbury's mainframe is busy 6-10pm every day

Attempt to run shopping system off this

Incompatible nomenclature

COBOL connecting to JAVA

Batch

Online credit card systems

Customer care issues

XML helps

Payment

Credit card horror stories

has your card been compromised?

Not everyone has one

Italians prefer post offices

Services such as WorldPay, PayPal

Fraud 40%

but the merchant pays (at least in the UK)

Only deliver to card address

Irrelevant: eTickets, Telegraph Crossword, downloads

Tax horror stories

Customer Relationship Management

CRM must be good

Empowering the Customer Service Representative

“I’m sorry our terminals are down this morning”

Call centre hell

Sainsbury’s have 80 call centres

Good Morning Dr King, please tell me your dog’s name

If you know my mother’s maiden name then so does the whole world

Continuity of customer experience

Sly TV suggests turning box on and off to cure database fault

Personalisation

Make site more interesting, and hence sticky

User database

Address / postcode -> socio economic indicator

Gender

Age

Register with Information Commissioner's Office

Profile typical users

Disposable income

Disposable leisure time

Customer and User profiles

Pen portraits of typical user

Hot buttons

Influencers (media)

Disposable budget / time

70 Profile 'bins'

2 Gender +LBGT

5-8 Social-economic class

income / postcode

www.neighbourhood.statistics.gov.uk/dissemination/

www.acorn.caci.co.uk

7 ages

kids

teens

dinky

married with kids

empty nesters

retired

seniors

The National Statistics Socio-economic Classification (NS-SEC)

8 classes

1. High managerial and professional occupations
2. Lower managerial and professional occupations
3. Intermediate occupations
4. Small employers and own account workers
5. Lower supervisory and technical occupations
6. Semi-routine occupations
7. Routine occupations
8. Never worked and long-term unemployed

5 classes

1. Managerial and professional occupations
2. Intermediate occupations
3. Small employers and own account workers
4. Lower supervisory and technical occupations
5. Semi-routine and routine occupations

Never worked and long-term unemployed

3 classes

1. Managerial and professional occupations
 2. Intermediate occupations
 3. Routine and manual occupations
- Never worked and long-term unemployed

Internationalisation

Not as simple as you may think

e.g. German nouns, Yen

Fulfilment

Taxes

Legalist e.g. Gambling, porn, alcohol, guns

Payment mechanisms

Credit cards unusual in Italy, for example

Different liability rules re bad debt

Free to use business models

For the Fun of it

Donation funded (wikipedia)

Land grab to gain early users

Funded by adverts

That you can pay to turn off (spotify)

That you can pay for the premium service (downloads)

Funded by selling information about users

Funded by sellers (eBay)

Part of the wider service (BBC, cars)

Free software, pay if you like it (guiltware)

Free software, pay for maintenance (Linux, AVG)

Paid for use Business Models

Try before you buy

Poor quality short clips

Free trial - but licence key cracks are common

Pay per use

Software as a service

Genealogy sites

Betting

Licence / subscription

Digital Rights Management (everlasting vs annual)

Per item

Amazon, eBay

Value your business

Cost per Acquisition (CPA) - how much to get a user

Customer Lifetime Value (LTV) - how much they spent

Average Revenue Per Customer (ARPU)

Freemium Model

Free taster

Subset, or time limited or adverts
'try before you buy'
Cf ACCTO

Premium content

Payment or subscription
Register of users
Unlock key
May be hacked

Street performer protocol

patreon.com

Brand awareness

Single most important piece of data

Hard to gain and easy to lose

People buy from a known name

Sense of trust

Marks and Spence

Perceived value

Cheap reliable airline => cheap reliable mobile

Peer pressure

Nike, Rolex, Dolce and Gabanna, Ferrari

Brand can expand

Virgin

Active, Atlantic, Books, Bridges, Broadband, Cosmetics, Credit cards

Drinks, Galactic, Games, Holidays, Megastore, Mobile, Trains, Wine, and more

Apple

computers, iPods, iPhones

Advertising

Google AdWords

Ads are matched to keywords purchased

Buy your brand name

Coke

Careers

Corporate Responsibility

The Coca-Cola company

Buy your supplier's brand name

Nike

JDSports

Buy your competitor's brand name

Ford

Advert for Toyota dealer

Buy your target

Nike (Boycott Nike)

Coke (KillerCoke)

Google AdWords

Select keywords and Ad Content

Content Network and Search Network
Each has a maximum Cost Per Click (CPC)

Actions when keyword(s) match search term

Maximum CPC determines position (if at all)
Actual CPC depends on auction results
Daily budget stops runaway

Optimise via Click Through Rate (CTR)

Less than 1% CTR may mean your keyword is removed

Make the ad match the keyword

e.g. Ad says "Cheap electronics" searching "Digital Camera"

Users add value

Network externality

The effect a user has on the value of a site to other users

A site / service is more attractive if your mates use it

MySpace / Facebook; Yahoo / Google / Bing

Snapchat, slack, instagram

Produce content targeted at your users

You produce it (Newspapers, slate)

Let them produce it (Facebook, YouTube)

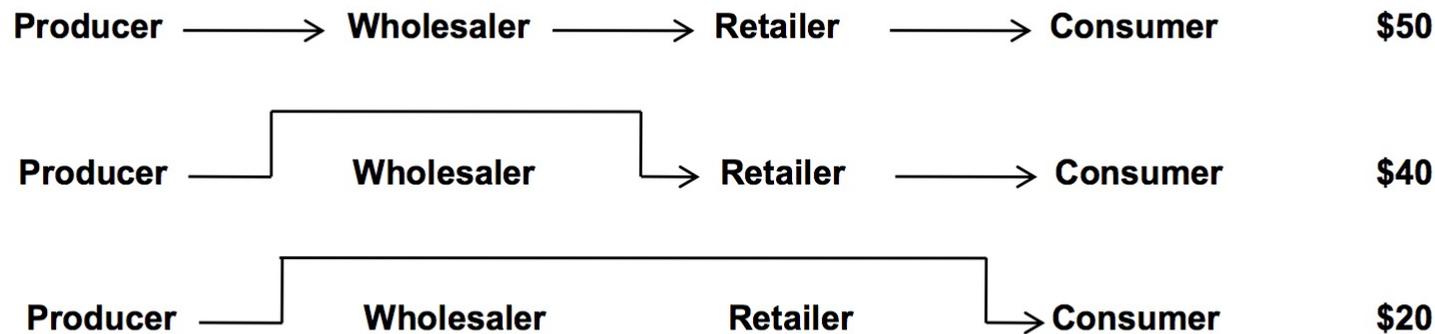
Chicken and egg problem

How to get the site started?

Twitter used two large monitors at SXSW

Provide superset of competitor

Disintermediation



Supermarkets - dominant species

Consumer buys through local supermarket, even if chosen online. Producer must negotiate with supermarket to stock items who will only accept products via distribution chain.

Travel Agents - an endangered species

Airlines, holidays, hotels all sell direct. Customers can decide best time and prices.
Personal advice because they have been there - trip advisor, Lonely Planet far better
No commission paid to travel agent so far cheaper for consumer and larger margin for suppliers

Relationship with the customer is now sometimes with the producer

Analytics

Where do visitors from from and why

From another web site, via a search engine or direct
Google Analytics

Profile typical users when they visit a website

Time and path to make purchase decision
Read ad, click ad, browse site, choose item, checkout, pay
Purchase history
Amount of research done

Profile users through loyalty cards in the real world

Nectar know everything you have ever bought

Different landing sites for different campaigns

Successful business models

Google

- Acquiring DoubleClick gives it over 80% of web advertising
- Acquiring YouTube gives it millions more viewers
- Providing a simple way to advertise gets it plenty of customers
- Has Microsoft Office firmly in its sights
- Mobile and Android and voice and ...

PlentyOfFish

- For a long time run by a single guy from his apartment paid over \$5m per year by google from AdSense adverts
- Free dating site
- In the global top 40 websites
- Bought by Match.com for \$575m in 2015

E-Commerce - 6

Making E-Commerce Work

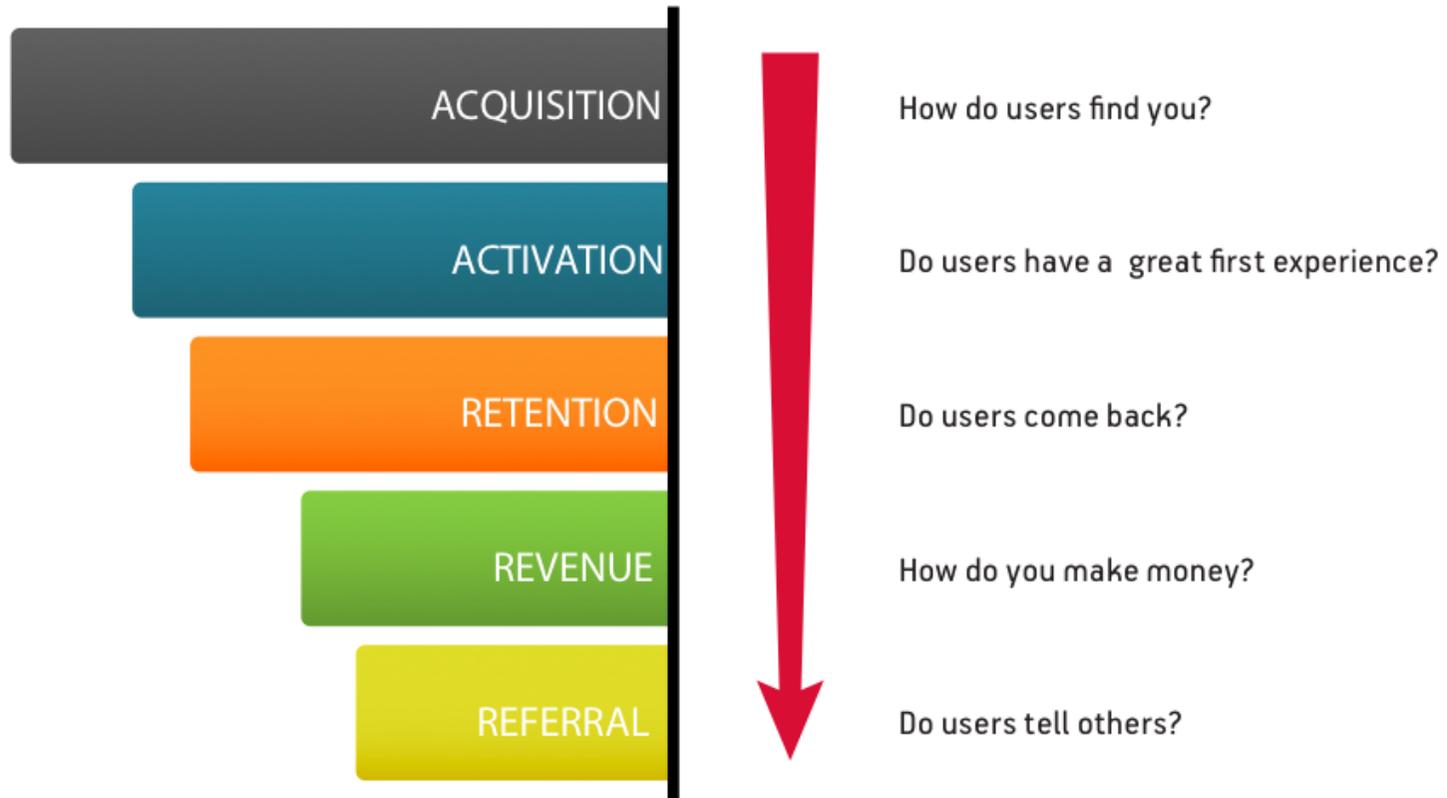


The PIRATES!

In an Adventure
with SCIENTISTS!

Computer Scientists





Driving traffic

Special targets

UK Online - Parents and kids

WorldPOP - 12 to 16 year old females

actually paid by music industry

Adverts

Click to win a car

Known URL

www.microsoft.com

Freshness (even if just a date)

Nothing sadder than 'last altered June 1999'

Social networks

Facebook, Twitter, etc

Search Engines

Easily the most important marketing item

Complicated by highly personalised search results

Google

Try “Computer Science” in google.co.uk

Try “Computer Science” - in google.com

Try “Computer Laboratory” - the lab comes top

poor nomenclature in the marketplace

Try “Last minute holidays”

Algorithm

Page ranking (peer review)

Which led to scams (checks IP now)

Meta text, URL, page title, headings more important

Massively parallel retrieval, rank and search

Google AdWord campaigns

Logs and Audit

Who bought what and when

I bought this from you and it's faulty
Why have I been charged for this?

ISPs must keep records for RIP

Regulation of Investigatory Powers

BCCi: The country's most popular destination

How do they know?

Ad costs

Separate landing pages

Per impression

AdWords

Effectiveness

Words mean what I want them to

Hit: Primitive object served by the server

Or proxy request (not quite the same)

Multiple object to the page

Impression: Banner ad served - measured by counter

Page view: Pages or frames served

Click: deliberate action by the user

Not refresh or script generated

But timeout refreshes are interesting

Visit: multiple pages on site

trajectory

Unique user / day

Exit popups

Answers depend on the questions

Audit

- Advertising returns and effectiveness
- Confirmation of transaction

Traffic analysis

- 80% of the site is wasted

Confirming user behaviour

- Still need focus groups to find out why

Trend analysis

Data mining

Lots of data

100 bytes / hit -> gigabytes / week

Multiple sources: e.g. helpdesk, servers, proxy, telephone logs, radius logs, etc

Hits, clicks, page views ,visits, trajectories, etc

Answers depend o the the questions

Personalisation and localisation

Models of the user

Bins and profiles

Collaborative filtering

X liked these so you'll like them too

Affinity marketing

Special offers from our carefully selected partners

Real-world matching

Sainsbury's data mountain

Communities

Chat

Bulletin boards

Social networking e.g. Facebook, etc

BBC

Amazon

Feedback and people feel good about it

But beware false shoppers who are actually competitors

Typical behaviour

40% chat

Maybe overstated because of frequent refreshes

10% mail, newsgroups, mail lists (75%)

5% help, admin, accounts, home page

3% search

2% favourite

Less than 1% purchase (same as mail order)

Remainder fandom surfing

40% "specialist content"

30% shopping

Model (still) as 'sad lonely geek' BUT

Fastest growing demographic is women over 60

Genealogy

Typical behaviour - 2

100,000 impressions

1% - 1000 clicks / new visitors

about the same as mail shot

CPC costs maybe \$0.5 - \$5

5% 50 register / trial

depends how hard registration is

2% - 1 purchase

www.google.com/onlinechallenge

Typical funnel

Stat	Actual	% funnel	% conversions	
unique visitors	84867			
new unique visitors	82170	96.82%	96.8%	% Unique Visitors = New
unique download page visitors	15141	17.84%	18.4%	% New Visitors = Download
new registrations	4318	5.09%	28.5%	% Download = Registered
new trial users	3192	3.76%	73.9%	% Registration = Trial
new paying user	95	0.11%	3.0%	% Trial = Paying user
cancelled subscriptions	17	0.02%	2.8%	% Total subscriptions

Sales funnel

AIDA model:

**Awareness
Prospects**

**Interest
Contact**

**Desire
Demo/Trial**

**Action
Negotiate**

**Satisfaction
Close Satisfaction**



Impression

Click through

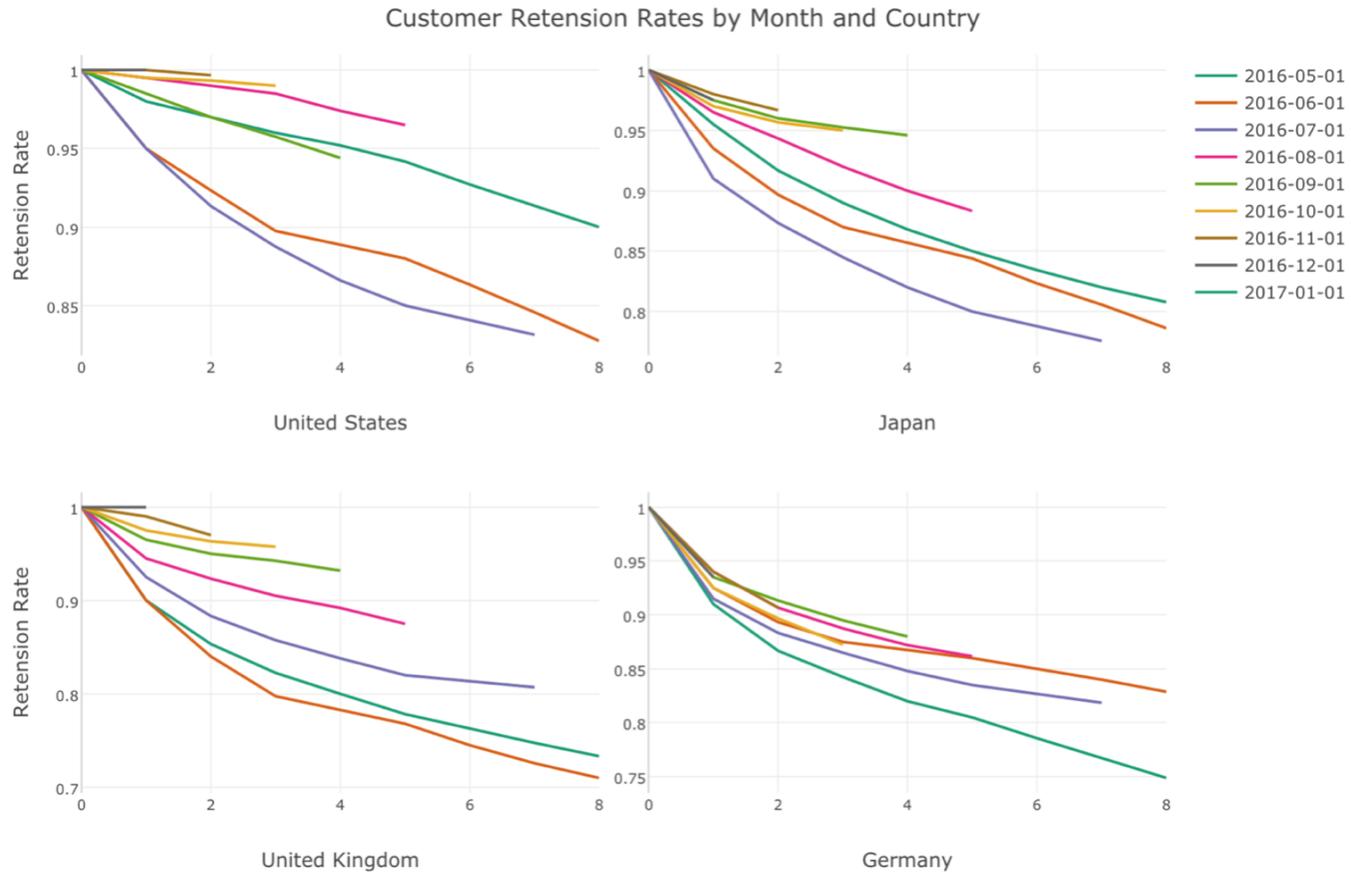
Register/Demo

Purchase

Alphabet soup

CPC	Cost Per Click (what Google charges)
CPA	Cost Per Acquisition aka COCA
ARPU	Average Return per User (in period)
CLV	Customer Lifetime Value

User numbers vrs User retention



Apps

Proliferation of devices

iPhone, iPad, Android, Fire

appinventor.mit.edu/explore/

Facebook games, messaging games, etc

Controlled by vendor

Limits revenue

Fashion (mostly)

Top 10 list important

Social Media

Keep in touch

Human face

Consistent voice

Community

Feedback

Platforms

Messaging

Social Network

OS

Browser

Future

Mobile

TV

Clicks and mortar

Multiple devices

Adverts are annoying and don't work - pop up hell

Content will no longer be free

Pay for E-mail

Conclusions

Invent your future

Go out there and build something

Sell it

Bonus material

Financing e commerce

Raising money

Valuation

Winners and losers

Futures

Lean startup

Book 'the lean startup' by Eric Reis

Minimum viable product

feedback

Early and frequent customer contact

build the case that there is a viable market

low hanging fruit

'the best is enemy of the good'

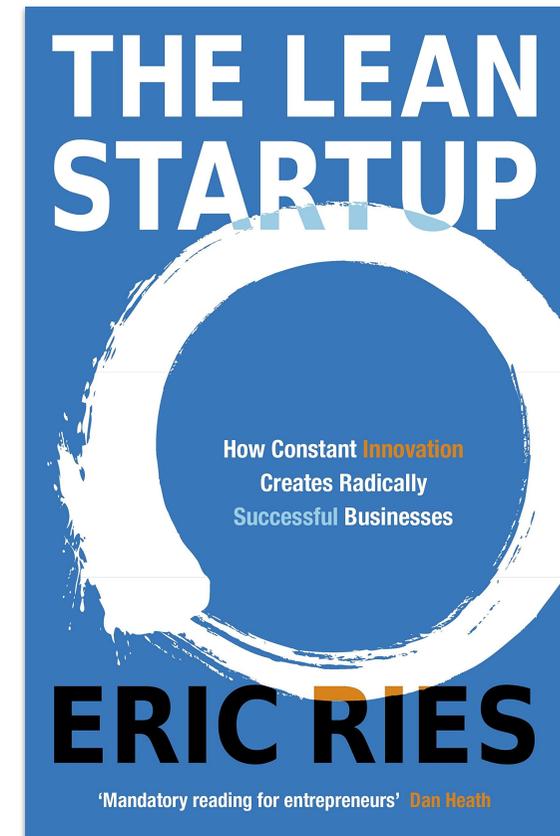
Analytics

understand the value to the customer

Virtual company

fail early and cheaply

Agile engineering



the web makes this possible easier, hackathons, crowdfunding

Sources of finance

Family and friends	£50k
Banks (need security)	£100k
Angels	£250k - £500k
Venture capital	£2m - £25m
IPO	£50m - 250m

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?

Writing the plan

1. Executive summary and funding requirement
2. Concept
3. 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 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 Industry and quality standards
- 7. Financials

Writing the plan - 3

Appendices:

Financial model

Key staff

Letters of support

Correspondance re IPR

Full development plan

Full marketing and sales plan

Examples and brochures



www.dilbert.com scottadams@aol.com

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Valuation

Estimate of future yield - risk assessment

Market

Assets

Ratio on current revenue

Ratio on current profitability

Discounted Cash Flow (DCF)

NPV of profitability

Probability based methods

What goes wrong

Actual experience: not usually fraud

angry customer phones up demanding to talk to someone korean at 3am

Bugs, blunders and incompetence

free US flight for every hoover bought

Other places, other customs

different laws; equities, porn, drugs, alcohol, fireworks, cigars

product liability

Traditional business risks still apply

Still need traditional controls

Double entry book-keeping

Stock and accounting control

Take up staff references

Market analysis

Winners and losers

Winners

- Communication and communities

- Branded goods

- Bricks and clicks

- Specialty goods

Losers

- Content is NOT king or is it?

- Portals

- Get-rich-quick sites

- Smartcards, VOIP, interactive TV

Futurology

Integration of the Infosphere

Thesis / antithesis / synthesis

Better ways to trade

End of Moore's Law

Integration of the infosphere

.NET (www.microsoft.com/net)

Moving functionality into the network (Saas)

Disintermediating ISPs and Telcos

SOAP & RPC

Google competes heavily

discovery of intent

7 Big functions

Identity

Payment

Diary

Message delivery

Address book

Storage

Search / DRM / content management / favourites / history

Integration of the infosphere

New services and devices

Smart consumer

- Dynamic bid for bandwidth

- Toasters bid for electricity

ipV6

Smart TV, white goods, cars, toaster, toilets

- “do you really want to have your third cup of coffee today?”

Home nets / LTE (4g)

P2P stuff - death of copyright

Privacy issues

Infrastructure capacity issues

Thesis / antithesis / synthesis

Thesis

Unlimited communications and publications

Antithesis

Entropy (99% of everything is crud - Theodore Sturgeon)

Synthesis

No good solutions at present

search engines

personal agents

University connectivity

Pandora's box?

Virtual reality?

Better ways to trade

Perfect information <> Perfect market

Effective monopolises (amazon, eBay)

Market and auction structure

New models

kickstarter

time and demand sensitive

Global

Security

New currencies / bearer certificates

Cell phone banking, market prices in Africa

Death of Moore's Law

Geometry reduction nearing limits

Leakage, quantum effects

Massive parallelism only works for somethings

Bandwidth demand growing faster

Return to local data

Text -> Pictures -> video -> HD -> UHD -> UHD VR

Universal connectivity

Privacy pendulum

Conflict between local and central control

Phase	Main frame	Mini computer	Desktop	Laptop	Mobile
network	stand alone	stand alone	low speed network 10Mb/s	high speed network 100Mb/s	Wifi / 4g 100Mb/s
	central datastore	department	individual	Company database Private Network	Cloud Data centre