E-Commerce

Jack Lang and Stewart McTavish

Guest lectures
Pete Stevens, Mythic Beasts
Richard Clayton, CL
Alasdair Lamb, Olswang

Aims

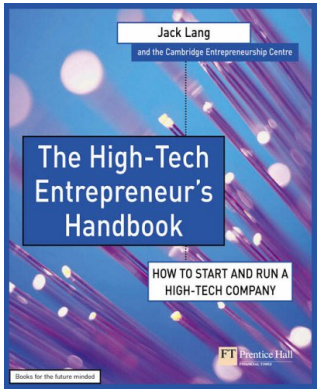
Outline

Lectures:

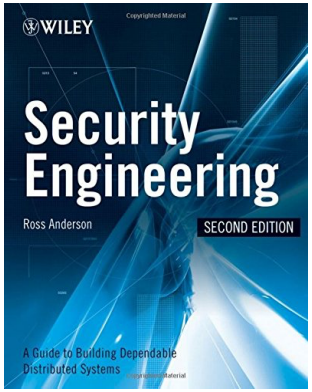
1. Running at Scale (PS)
2. Historic and Economic Background
3. Business Models and Strategy
4. Web design and implementation
5. Creating a business
6. Making E-Commerce work
7. RIP, DMCA and other legal developments (RC)
8. The Law and E-Commerce (AL)

Lecture notes for guest lectures (1,7,8) will be provided on the day of the lecture

Resources

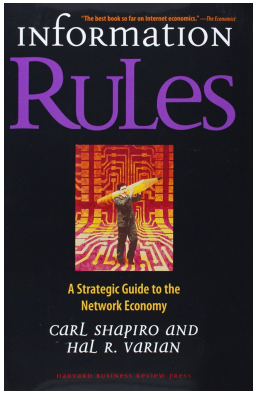


ISBN: 0273656155

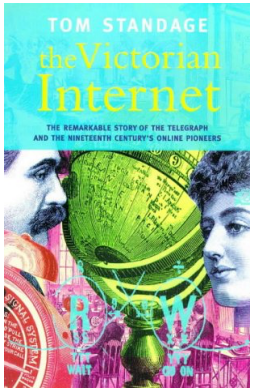


ISBN: 0470068523

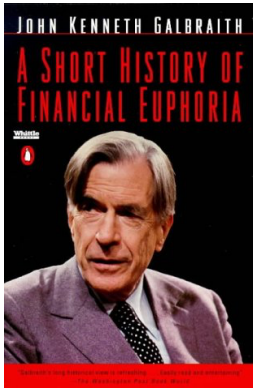
ISBN: 0393920771



ISBN: 087584863X

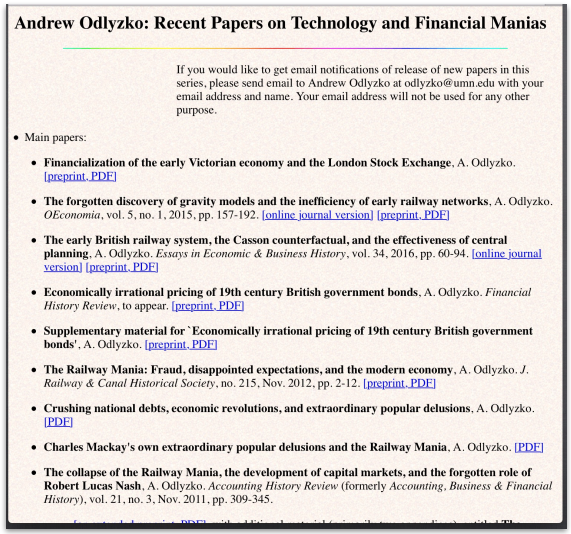


ISBN: 0753807033



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.

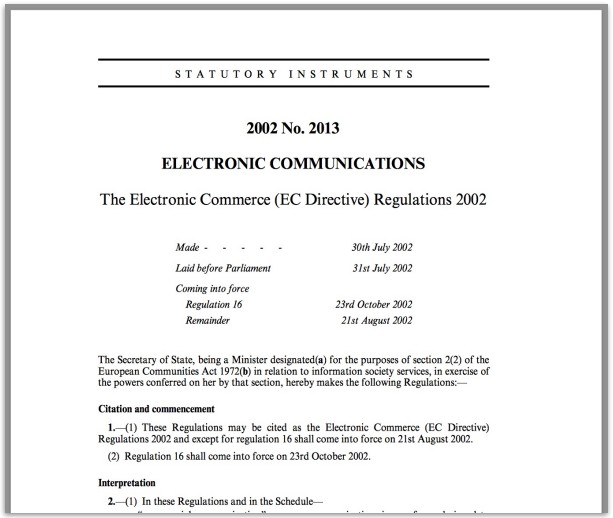
- Main papers:
  - **Financialization of the early Victorian economy and the London Stock Exchange**, A. Odlyzko. [preprint, PDF]
  - **The forgotten discovery of gravity models and the inefficiency of early railway networks**, A. Odlyzko. *OEconomia*, vol. 5, no. 1, 2015, pp. 157-192. [online journal version] [preprint, PDF]
  - **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

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

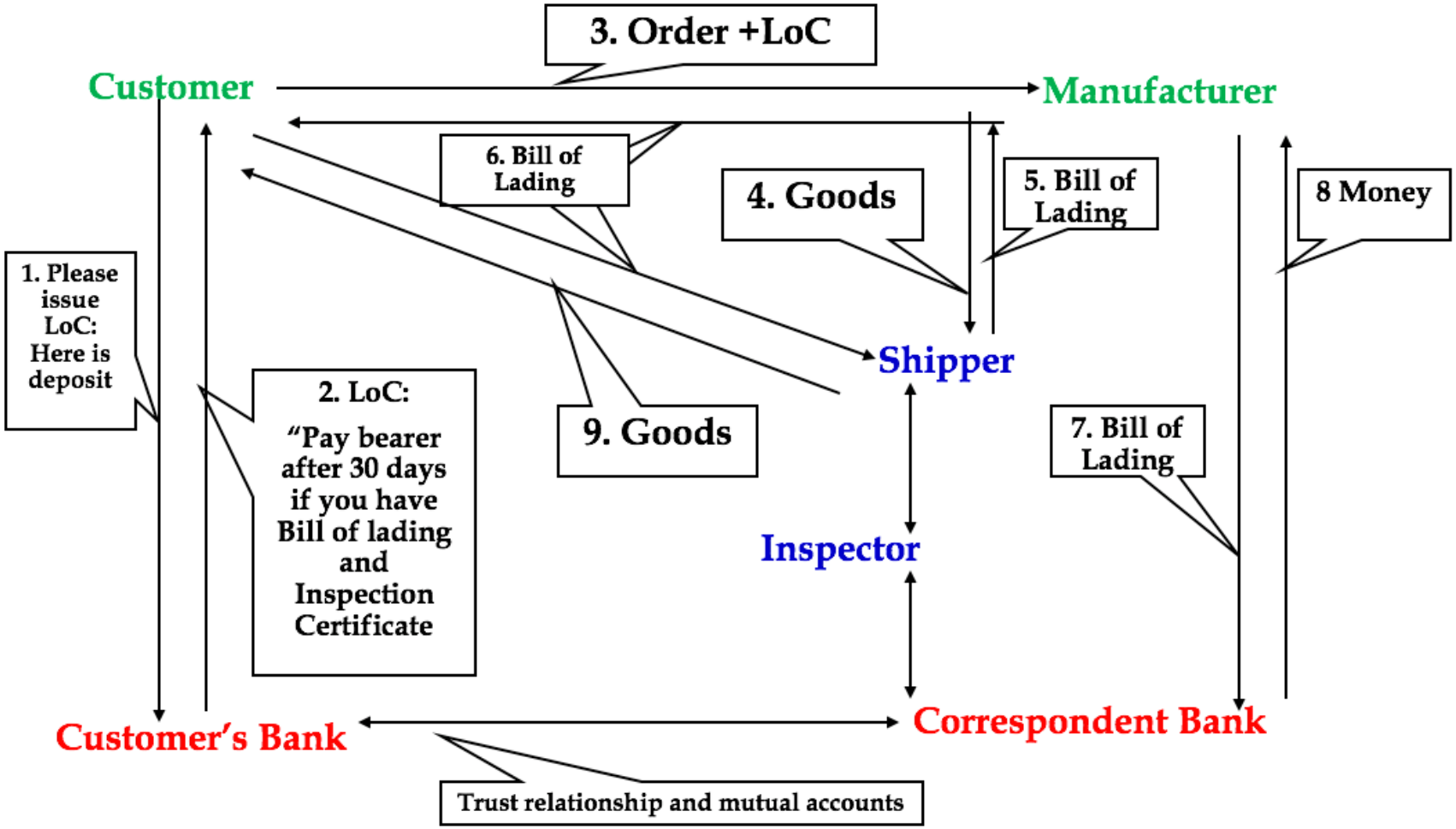
New opportunities for fraud
- The dark web

App economies

Social media

and many more

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 imilar, 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

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)

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

http://neweconomicperspectives.org/modern-monetary-theory-primer.htm

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)

Bearer certificates

Token representing value

May be anonymous (cash vr cheque)

Not easily forger (trust)

Physical handling (banks / wallets)

Coupons

Tradeable (bureau de change)

Electronic Bearer Certificates

Centralised

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

Decentralised

e.g. Bitcoin

Exchange of value	✓
Store of value	✗
Measure of value	✗

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

Hard (repudiatable) vs Soft (no recourse)

Crypto Currencies

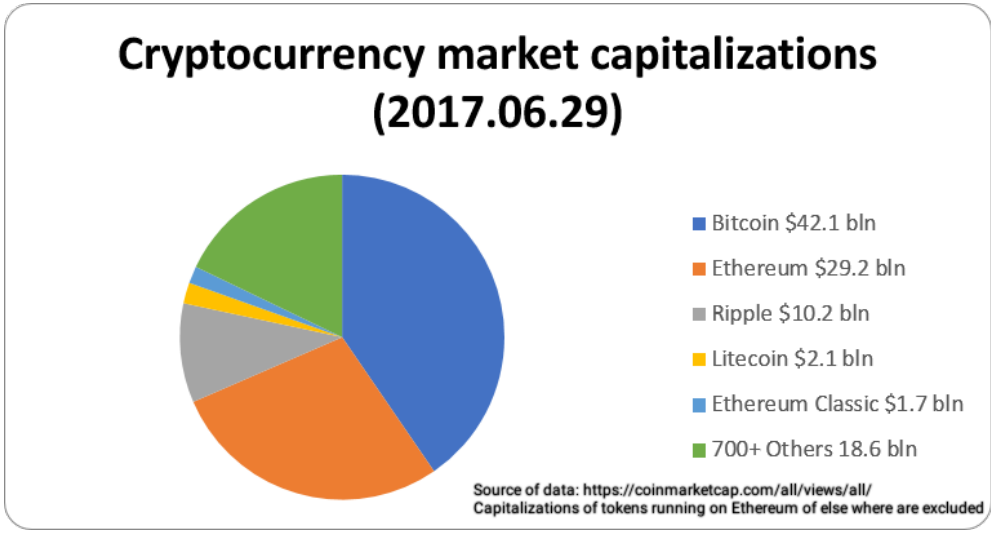
Over 1000 crypto currencies

bitcoin

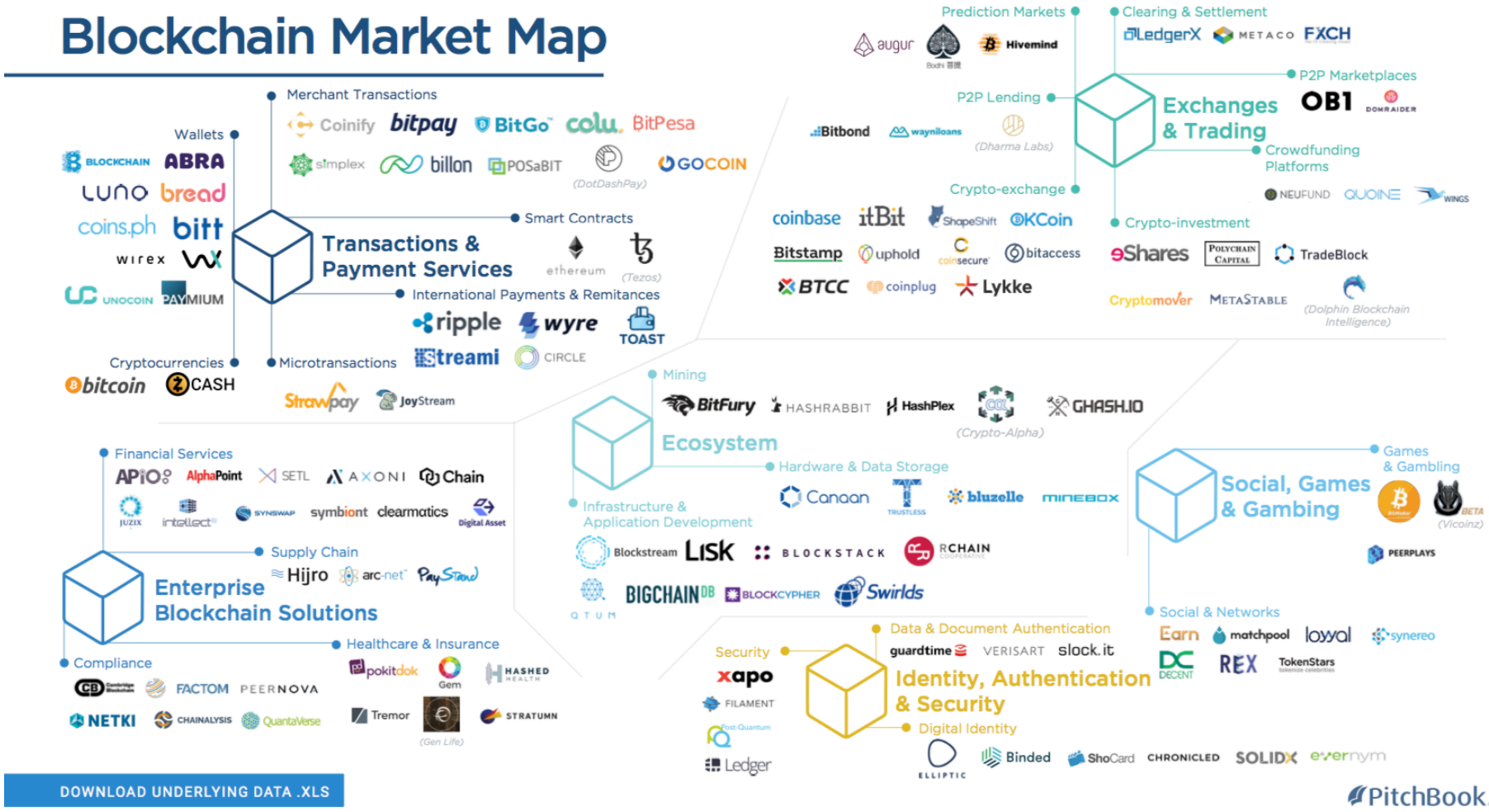
ethereum

includes smart contracts
moving to proof of value

ripple



By Nickps - Own work, CC0, https://commons.wikimedia.org/w/index.php?curid=60520004



https://files.pitchbook.com/website/files/pdf/PitchBook_4Q_2017_Blockchain_Market_Map.pdf

https://s3.amazonaws.com/cbi-research-portal-uploads/2017/08/08153016/2017.09.08-ICO-Market-Map-v2.png

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

- 6 / hour
- Uses more electricity than 150 individual countries

https://www.wired.com/story/bitcoin-mining-guzzles-energyand-its-carbon-footprint-just-keeps-growing/

Electronic money

Unforgeable token

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

ID (user's public key)
Value
Date
Serial etc

Problem: how to avoid double spending?

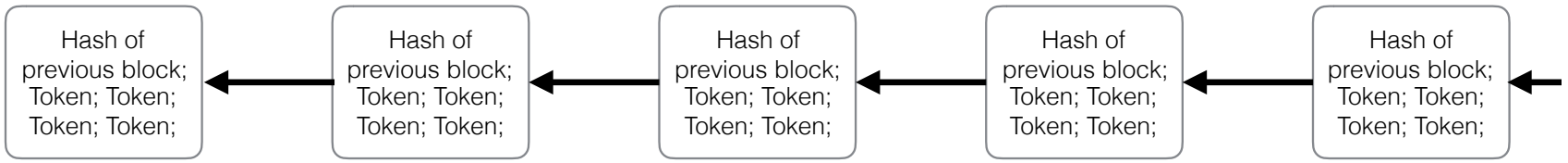
Store all spent tokens - can retire blocks of used tokens

Store all unspent tokens
Sore all transactions (~2500/block)

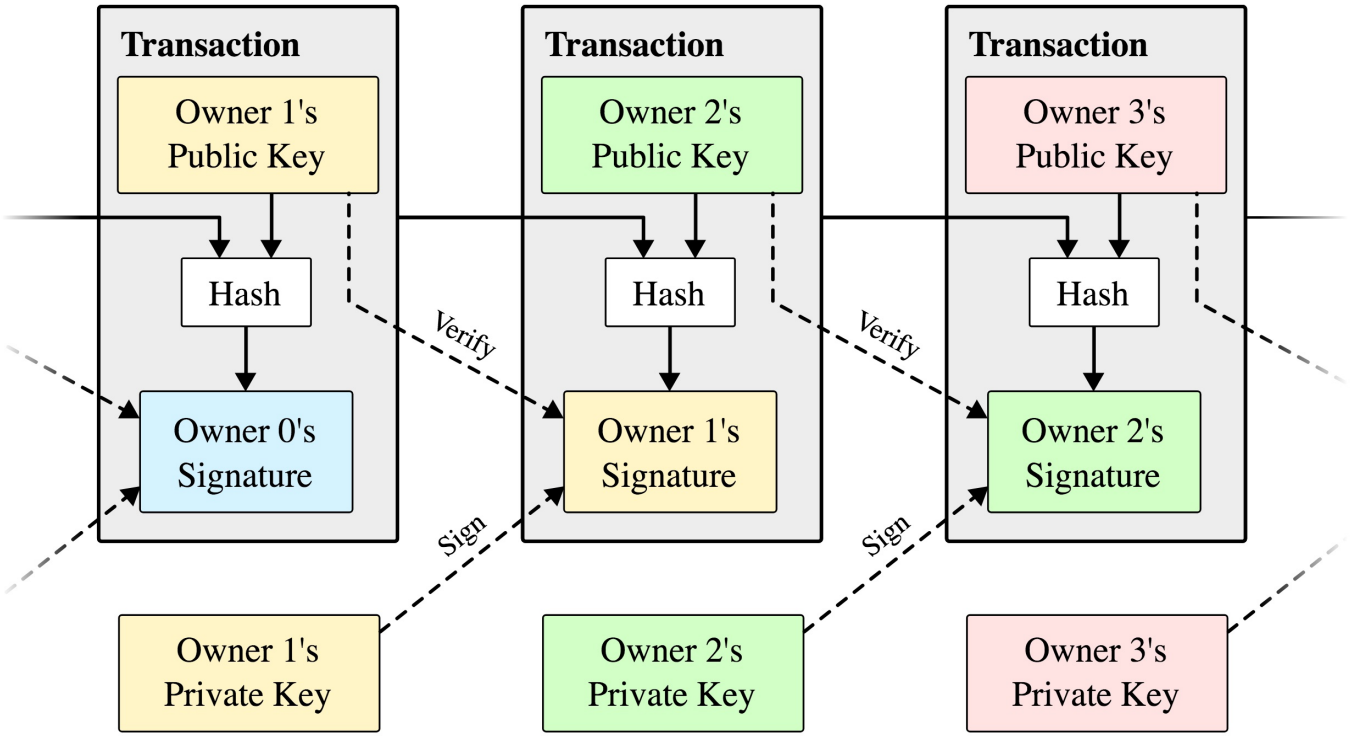
Central store

Distributed store

Block chain (>100Gb) but only updates broadcast



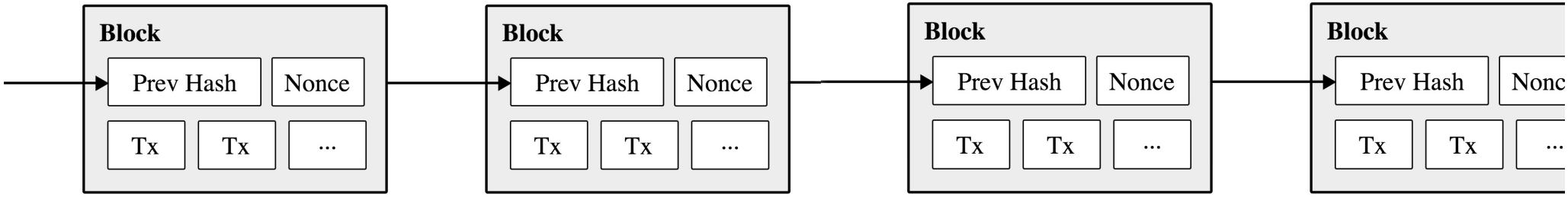
Bitcoin



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



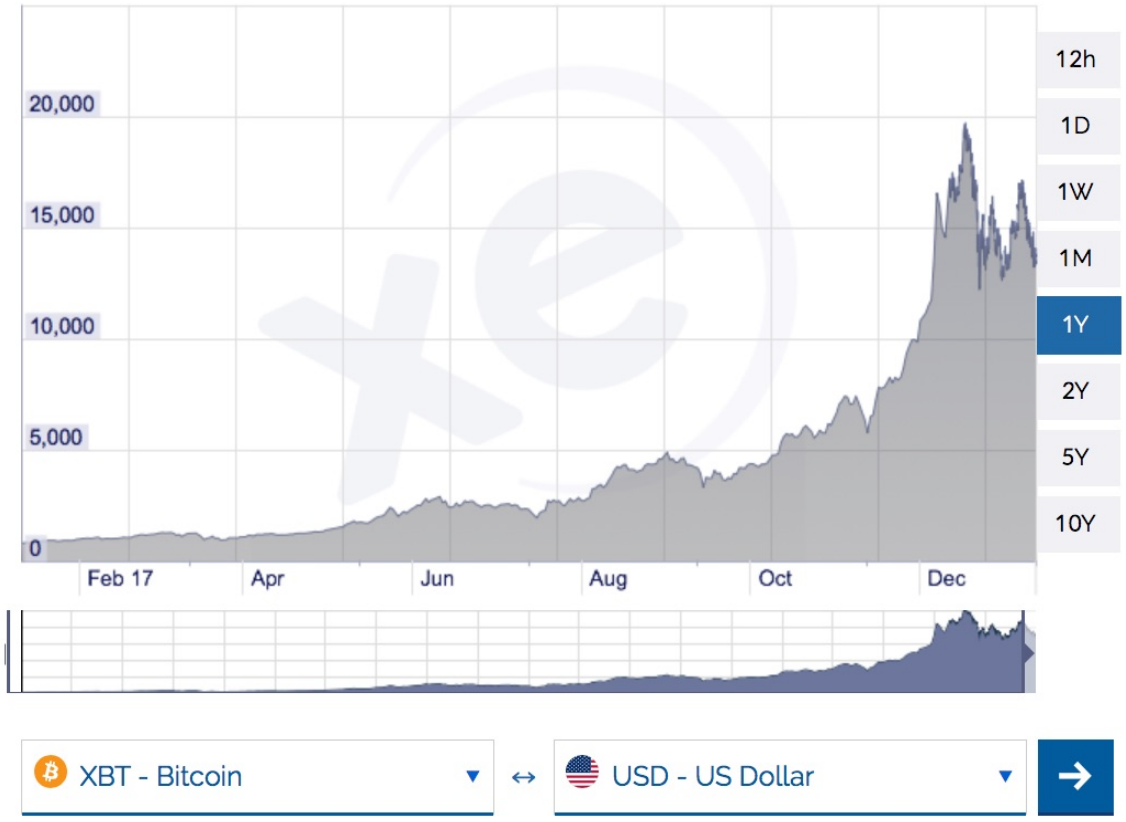
Chain of blocks of transactions

Currently 2500 per block

Currently reward of 12.5 coins per block

Rate limited by requiring a hard crypto problem solved

XBT to UsD



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

Bad News is Good News

https://www.quora.com/Did-Jamie-Dimon-just-kill-Bitcoin-Will-the-price-crash-stop

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

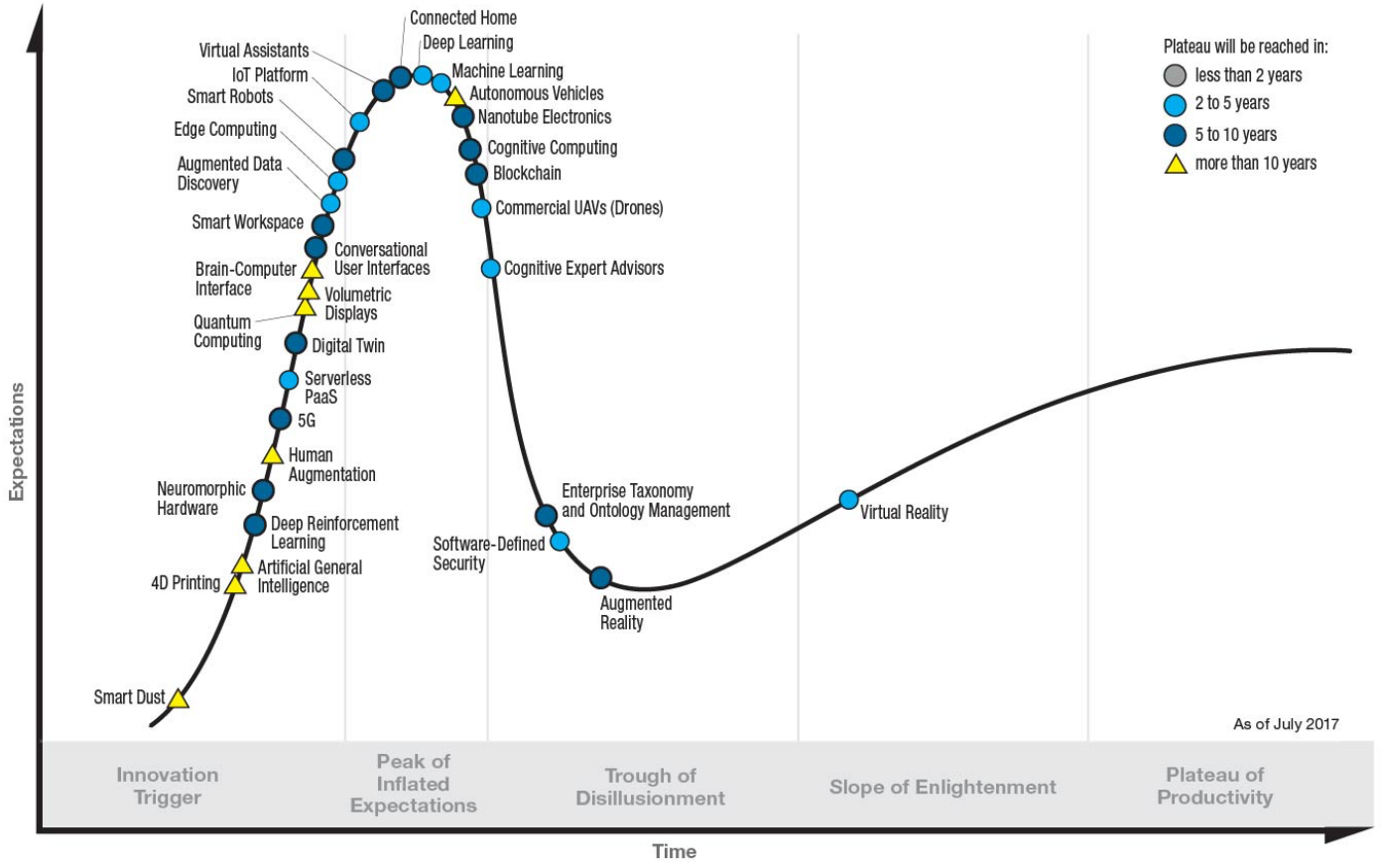
Not lightweight

Slow for certainty

Bitcoin trade price comparison

Assuming a price of bitcoin of $15,200	IG		Markets.com	Plus 500		Trading 212	
Typical observed spread	120		240	162.86		150	
	Long	Short	Long & short	Long	Short	Long	Short
Overnight funding on £1/pt (ex spread)	£11.45	-£5.21	£152.00	£76.00	£30.40	£152.24	£33.49
Total cost of round trade held **overnight**	£131.45	£114.79	£392.00	£238.86	£193.26	£302.24	£183.49
Total cost of round trade held for **1 week**	£200.16	£83.56	£1,304.00	£694.86	£375.66	£1,215.69	£384.45
Total cost of round trade held for **1 month**	£475.01	-£41.37	£4,952.00	£2,518.86	£1,105.26	£4,869.48	£1,188.26

Gartner Hype Cycle for Emerging Technologies, 2017



gartner.com/SmarterWithGartner

Source: Gartner (July 2017)

Gartner

Magic of banking

Not everyone will want to withdraw at the same time
Confindence

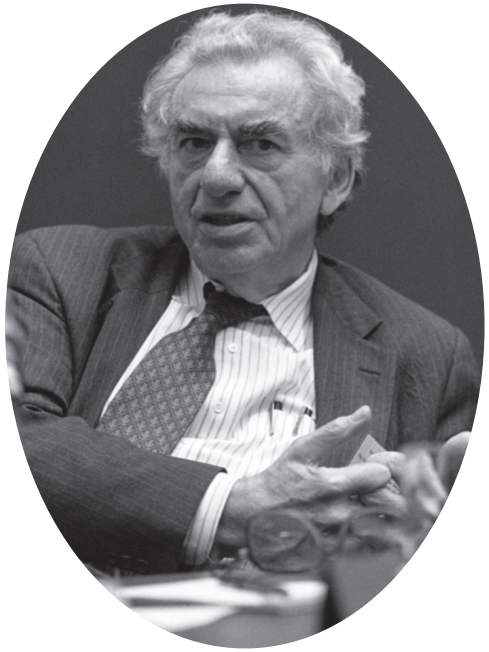
Banks need only fund difference between deposits and loans

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

Financial Instability Hypothesis



Hyman Minsky (1919-1996)

Accumulation of debt causes instability

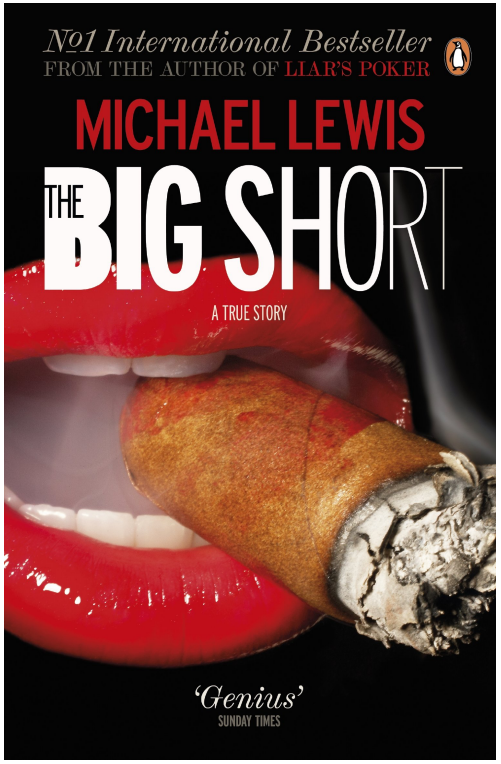
Three stages

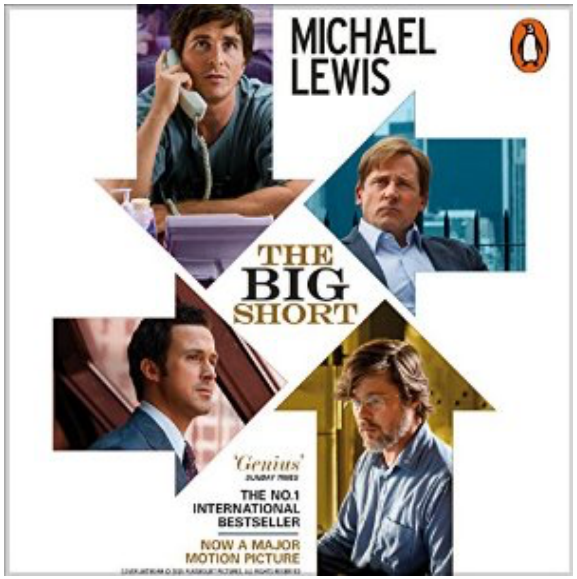
Hedge borrower - can repay interest and capital
Speculative borrower - can only repay interest = hopes asset will go up
Ponzi borrower - hopes appreciation of asset will pay both interest and capital

Good times don't last

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

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


№1 International Bestseller
FROM THE AUTHOR OF LIAR'S POKER
MICHAEL LEWIS
THE BIG SHORT
A TRUE STORY
'Genius'
SUNDAY TIMES


MICHAEL LEWIS
THE BIG SHORT
'Genius'
SUNDAY TIMES
THE NO.1 INTERNATIONAL BESTSELLER
NOW A MAJOR MOTION PICTURE


5 OSCAR® NOMINATIONS INCLUDING BEST PICTURE
AN ADAM McKAY FILM
THE BIG SHORT
THIS IS A TRUE STORY
CHRISTIAN BALE
STEVE CARELL
RYAN GOSLING
BRAD PITT
"YOU NEED TO SEE THIS"
Claudia Winkleman, FILM 2016
15
15

Game money

Monetisation for F2P apps

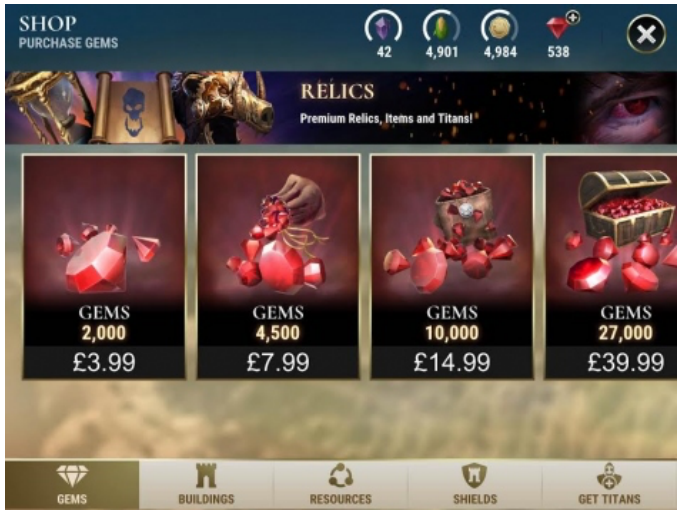
Multiple currencies gives easier control

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

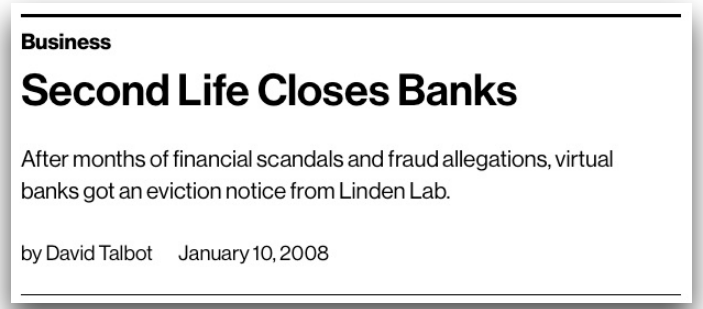
Economic Stability

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/

B2C Mail Order

Book printers in C15th

Aldus Manutius of Venice 1498. His mail-order offerings included 15 texts he had published

(UK) William Lucas, Gardener, 1667

Amy and Navy Stores supplied British Forces and other in India ~1871

(US) Tiffany of Fifth Ave 1845

Montgomery Ward 1872

Sears, Roebuck made it possible to settle the West 1886

US Postal services subsidised shipping by halving flat rates nationwide

Need guarantees to provide customer confidence

Brand (e.g Sears, Amazon)

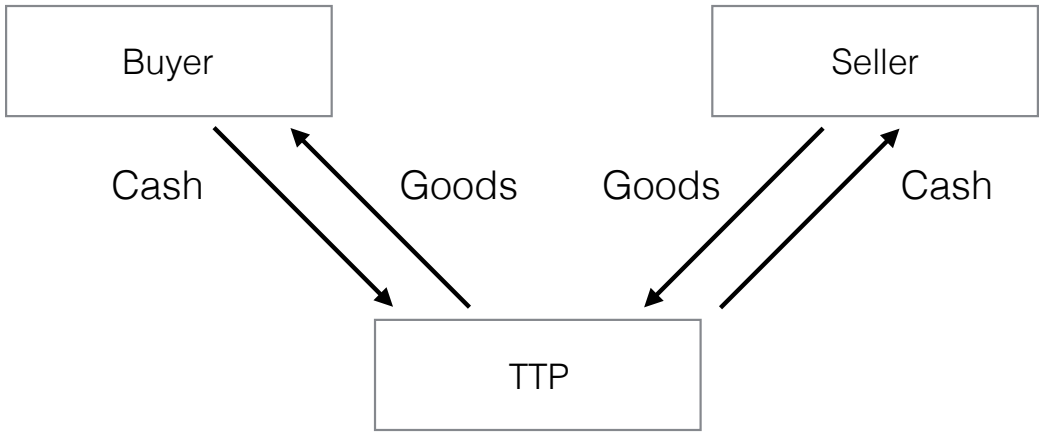
Sears unique innovation: “Satisfaction guaranteed or your money back”

Zappos: free shipping on returns

Industry (ABTA, MOPS)

Intermediary (VISA, Access Paypal, etc)

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

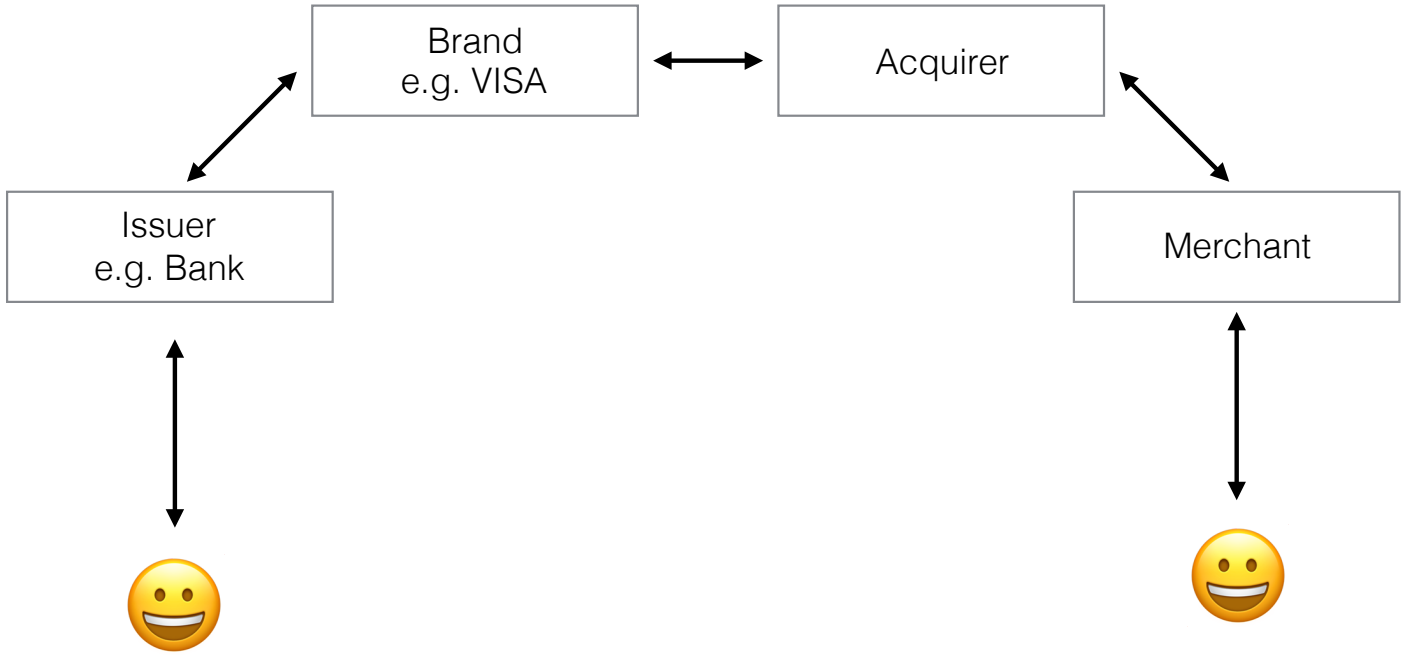
Barclaycard offered as incentive to high-value Barclay customers in late 60s;
Access started as rival

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 Vereiniging	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. Aditionally, 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-conten
uploads/2015/03/PCM_Alaric_Fraud-Report_2015.pd

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

Fair Market

Willing buyer and seller

- “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

Other ways to pay

Via phone wallets
- e.g. Pingit

Electronic cash
- Chaum
- Bitcoins
- Game currencies

Issues
- Anonymity
- Exchange rate
- Regulation
- etc

Hot Topics

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?

E-Commerce - 3

Business Models and Strategy

Network Externalities

The more people, the more valuable the network

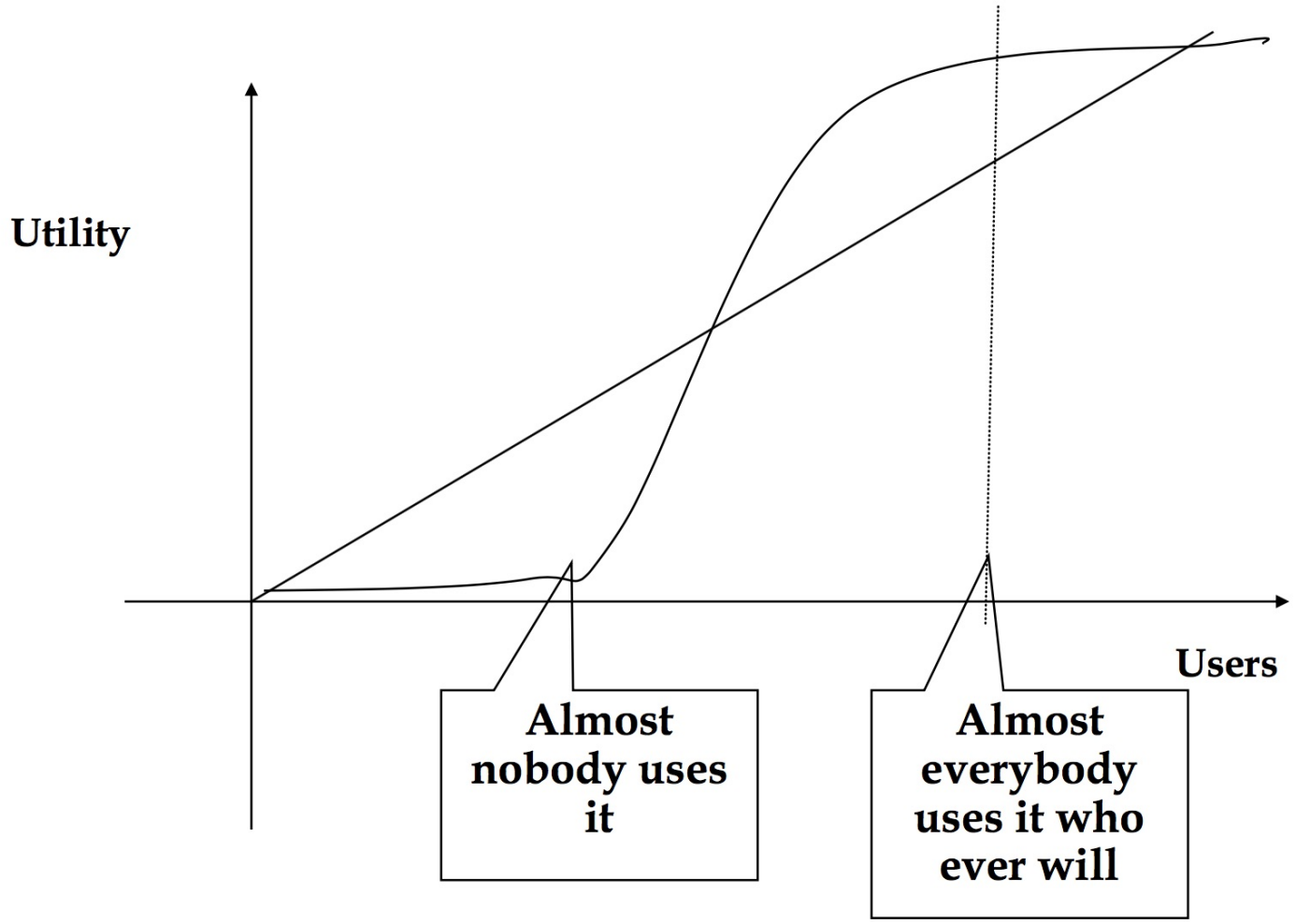
- Examples
  - Telephone late 19th century
  - Credit card 1980s
  - Fax 1985-8
  - Email 1995-9

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 economist 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 Extent” - 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

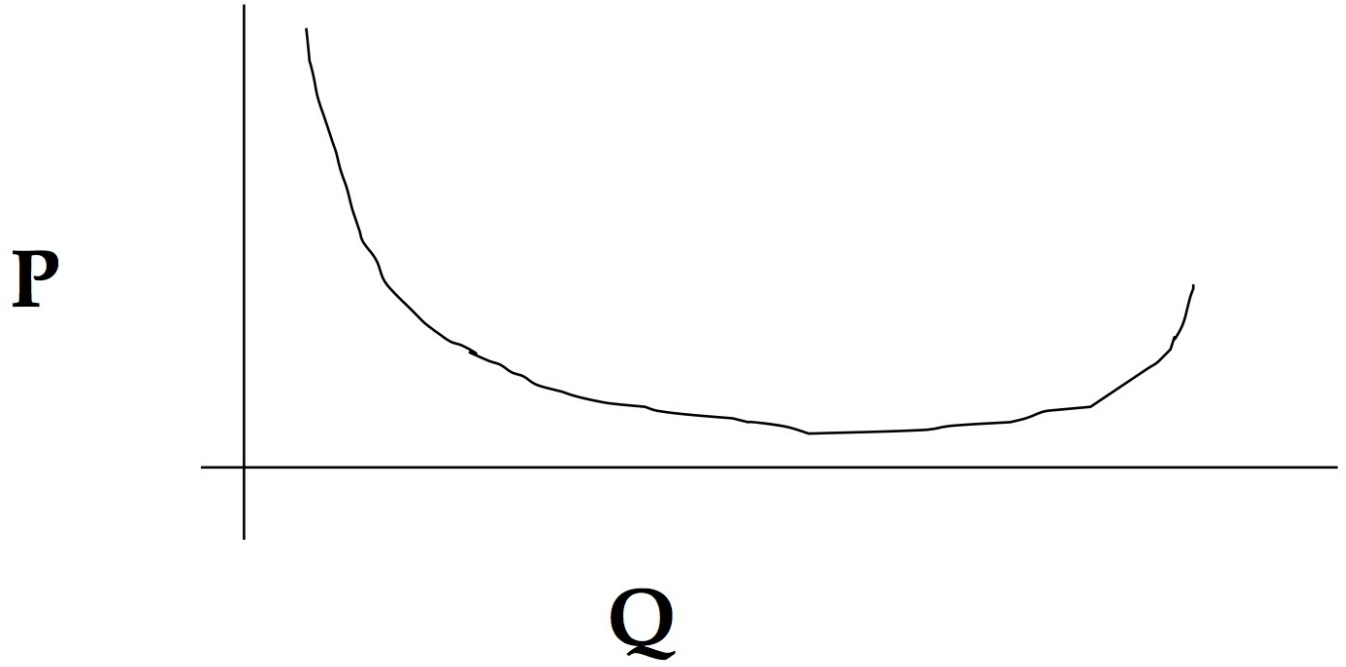
Liquidity is a Network Externality

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

Examples

- Ebay vs Yahoo Auctions
- Stock exchanges

Manufacturing Cost



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”

JINAL! SINAL! WANL!!

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 you service is subject of an authorisation scheme or if you are a member of a professional body, details of the relevant superviseory 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

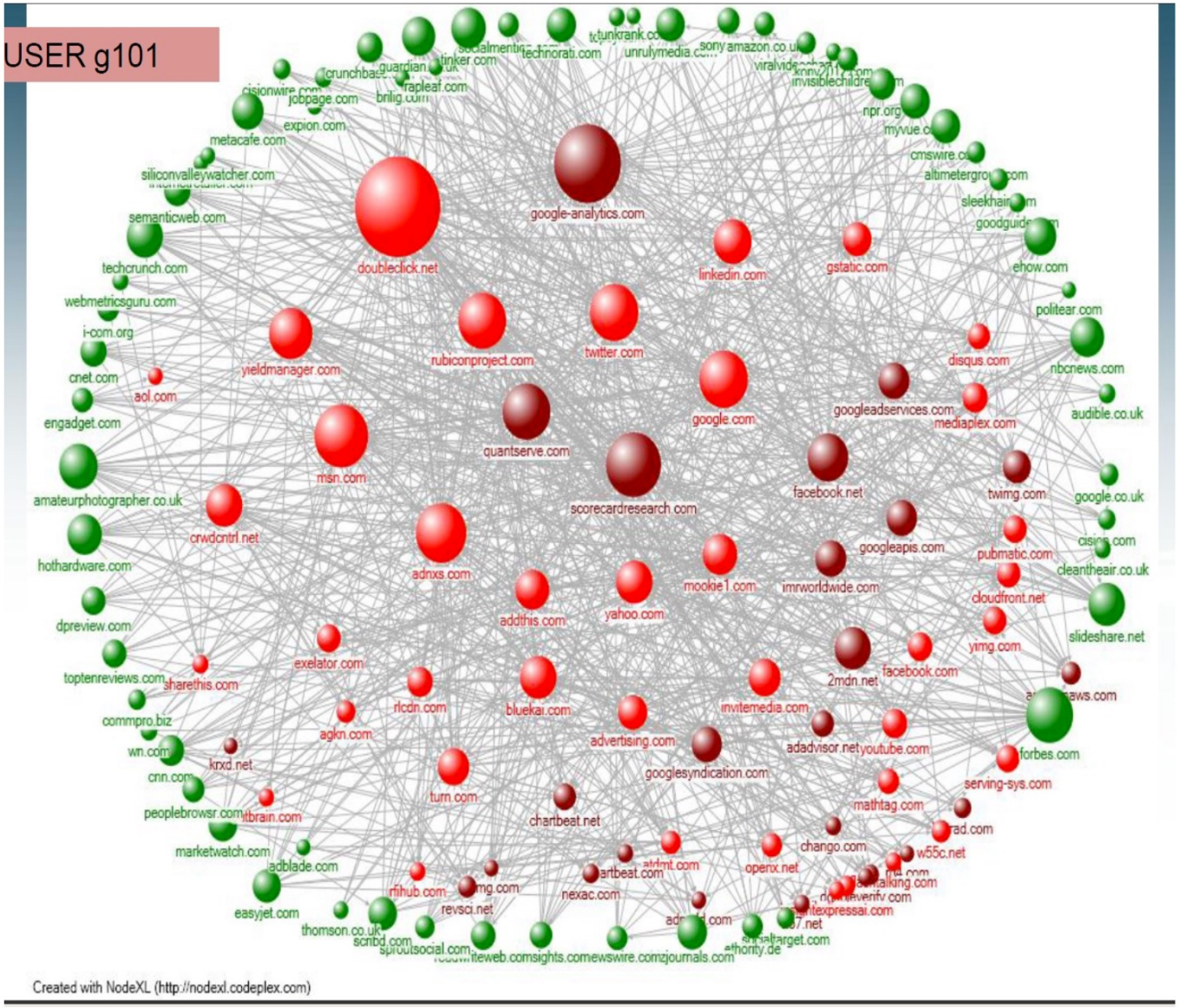
EU customers UNLESS they are registered for VAT and you have their VAT number

Special cases

Local sales taxes

Revenue duty on import converse of above

Excise duties complex e.g. TV components


USER g101
google-analytics.com
doubleclick.net
linkedin.com
gstatic.com
semanticweb.com
techcrunch.com
webmetricsguru.com
i-com.org
cnet.com
aol.com
engadget.com
yieldmanager.com
rubiconproject.com
twitter.com
disqus.com
nbcnews.com
audible.co.uk
google.com
googleadservices.com
mediaplex.com
quantserve.com
msn.com
scorecardresearch.com
facebook.net
twimg.com
google.co.uk
amateurphotographer.co.uk
crwdcntrl.net
hothardware.com
adnxs.com
addthis.com
yahoo.com
mookie1.com
imrworldwide.com
googleapis.com
pubmatic.com
cloudfront.net
cleantheair.co.uk
slideshare.net
dpreview.com
toptenreviews.com
sharethis.com
exelator.com
rlcdn.com
bluekai.com
invitemedia.com
2mdn.net
facebook.com
ytmg.com
commpro.biz
agkn.com
advertising.com
adadvisor.net
youtube.com
forbes.com
wn.com
krxd.net
cnn.com
googlesyndication.com
serving-sys.com
peoplebrowsr.com
turn.com
chartbeat.net
mathtag.com
itbrain.com
marketwatch.com
adblade.com
chango.com
w55c.net
openx.net
easyjet.com
mfhub.com
revsci.net
nexac.com
thomson.co.uk
scmbd.com
sproutsocial.com
Created with NodeXL (http://nodexl.codeplex.com)

Cookies

Must declare use

Must obtain explicit assent for third party cookies each time

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 distributino, 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

Cloud based resources (e.g. Amazon S3)

Low hanging fruit

Crowd source - Kickstarter
- Establish market
- Pre-sell product

Test assumptions not just product miracles

E-Commerce - 4

Web 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, Constrast, Contrast, Constrast, 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.webpagesthatsuck.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

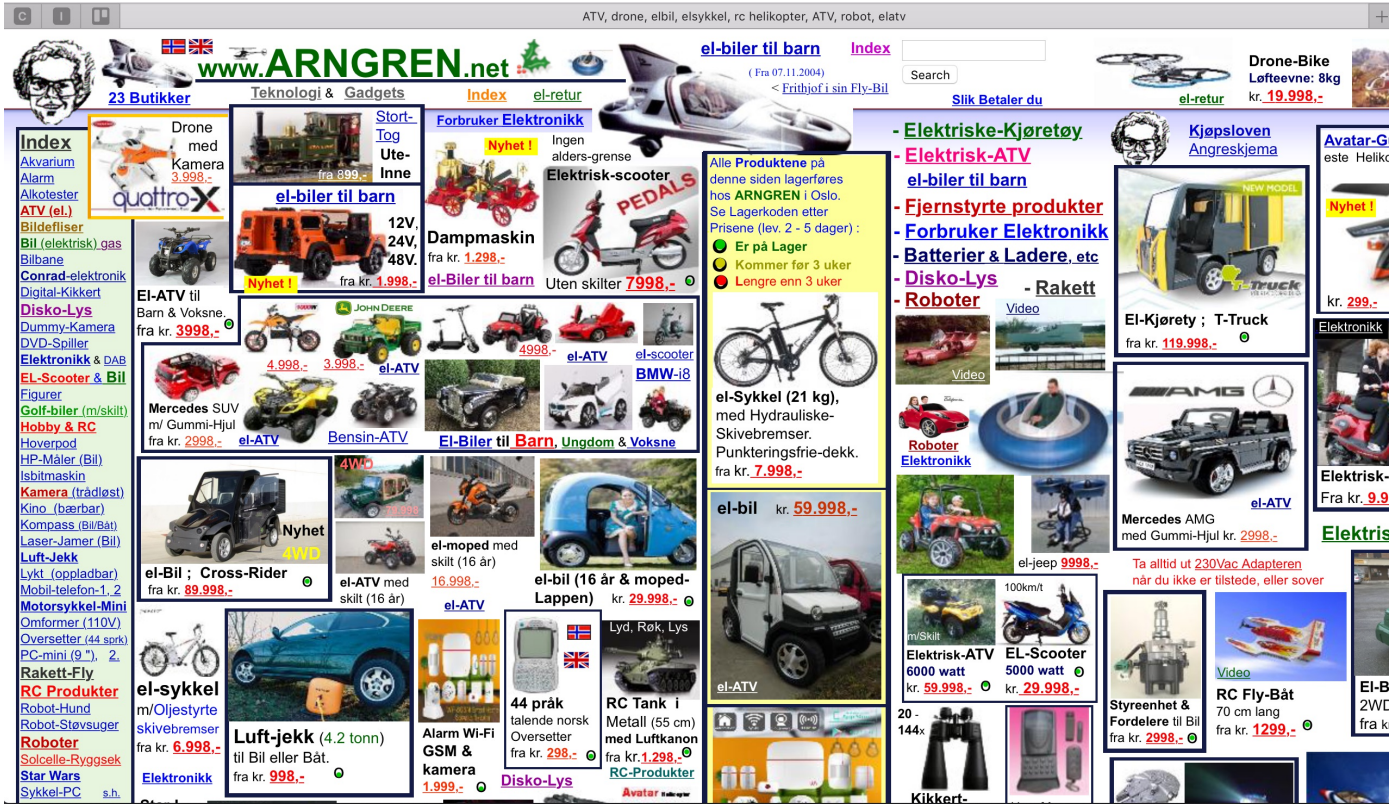
- One family
- Care on colour / size
- Fonts carry a subtle simplicity message
  - Serif or San Sarif?
  - **Loud** *Soft* **STRANGE** Respectable Old fashioned

Poor design examples

Poor design examples

Title confused with keywords

Mixes fonts



Far too much material

Navigational mess

Needs more then 1024x768

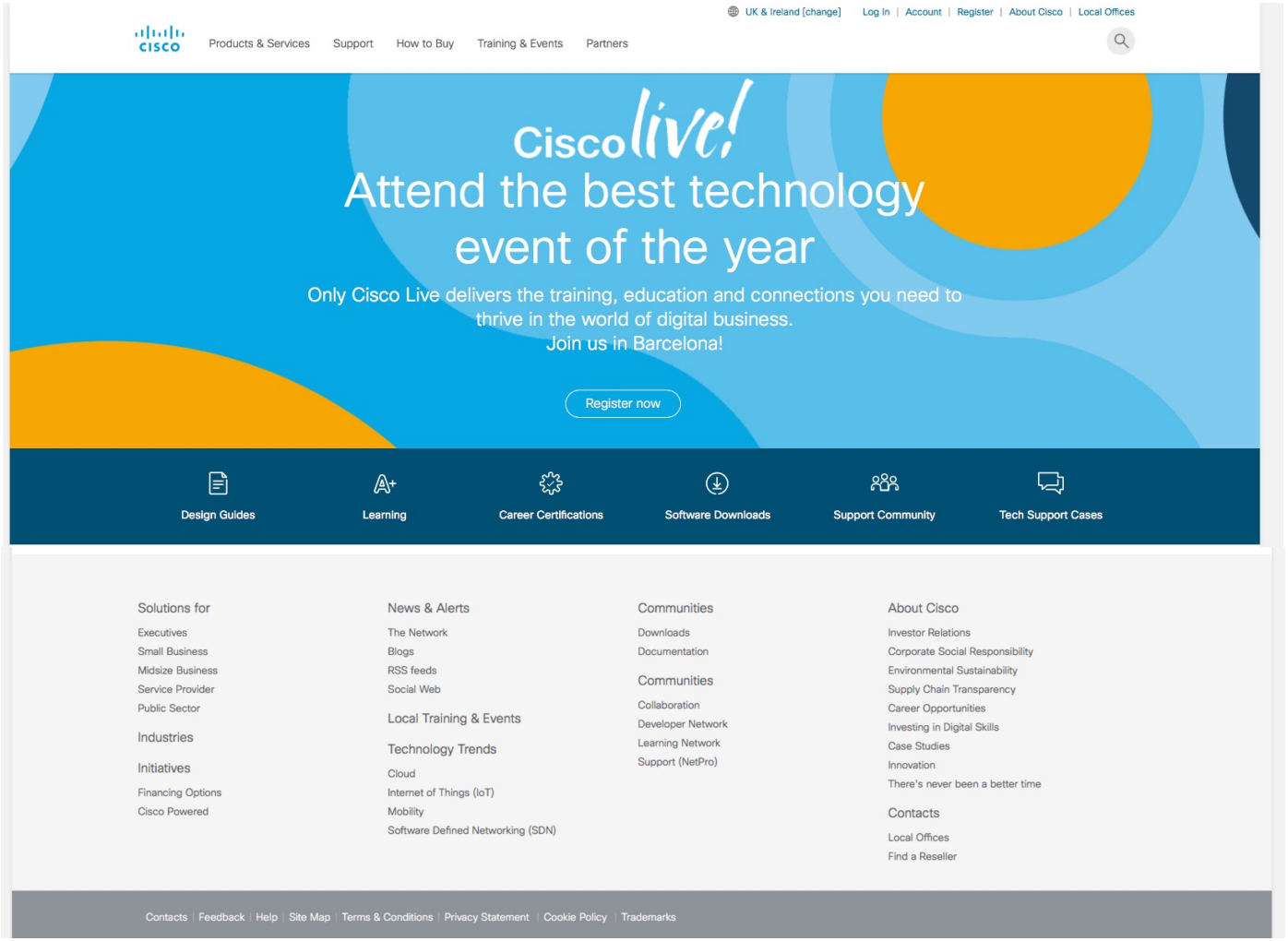
Good design example

consistent navigation

clear call to action

quick links

consistent navigation



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)

- XMLRequest 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

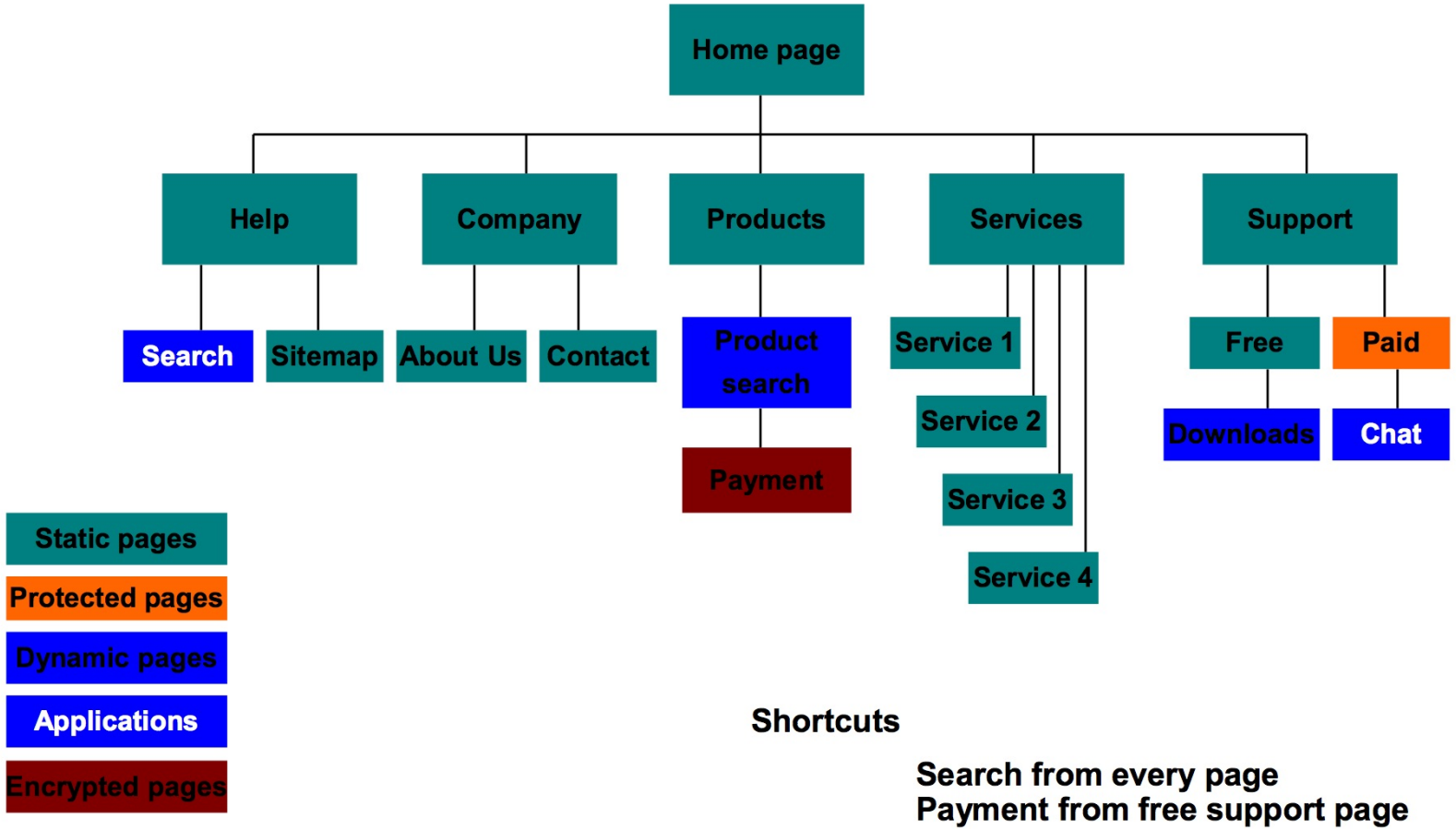
Meta tags

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

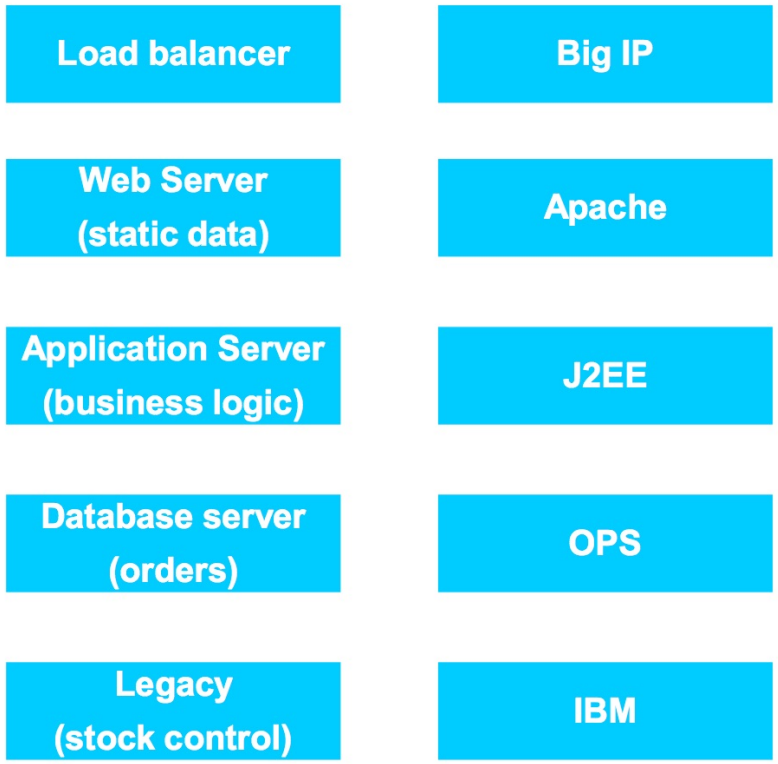
Consumer Generated Content / Media

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

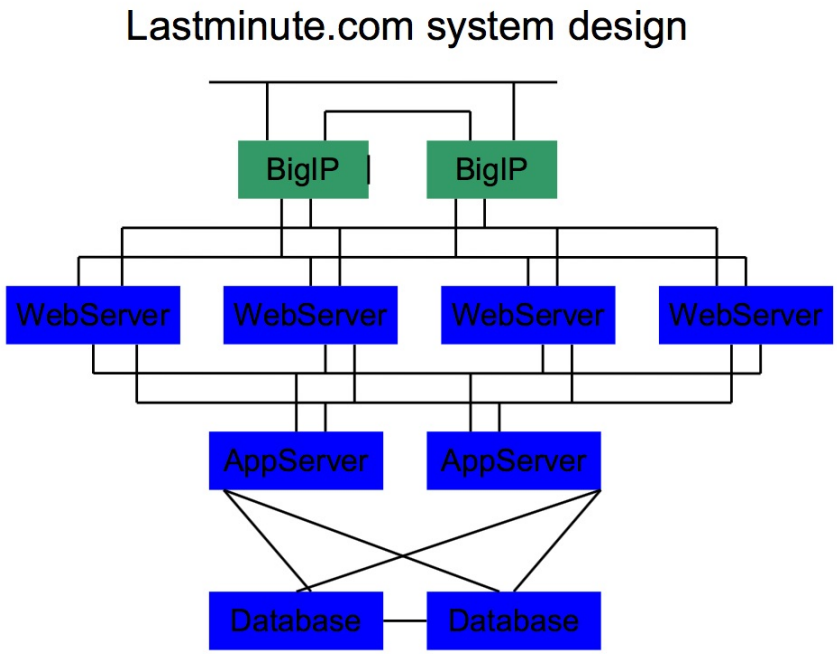
Scalability
- How many people?
- At the same time?

Number of products

Size of downloads
- Music 4M
- Software 200M
- Movie 2G

Reliability

Responsiveness



E-Commerce - 5

Creating a business

Merchant System

Requirements

- User logon required?
- Remember credit card details?
- Same price for everone?
- 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

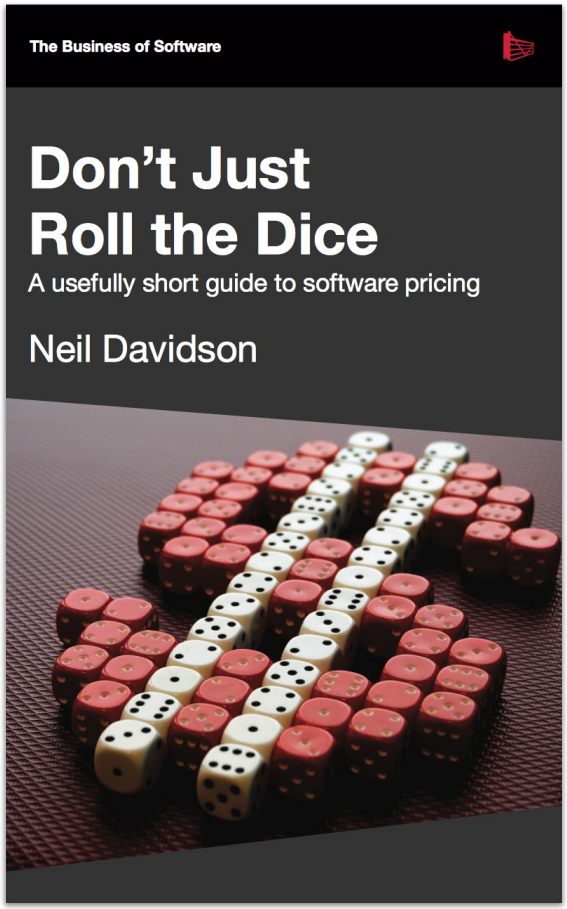
More complex than it seems
- confusion pricing

Service levels
- matrix

Special cases
- government, students, …

Special offers
- time limited

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



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

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

Payment mechanisms
- Credit cards unusual in Italy, for example
- Different liability rules re bad debt

Free 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 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, eBuyer

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 exapand
  - 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 us it
- MySpace / Facebook; Yahoo / Google / Bing
- Snapchat, slack, instagram

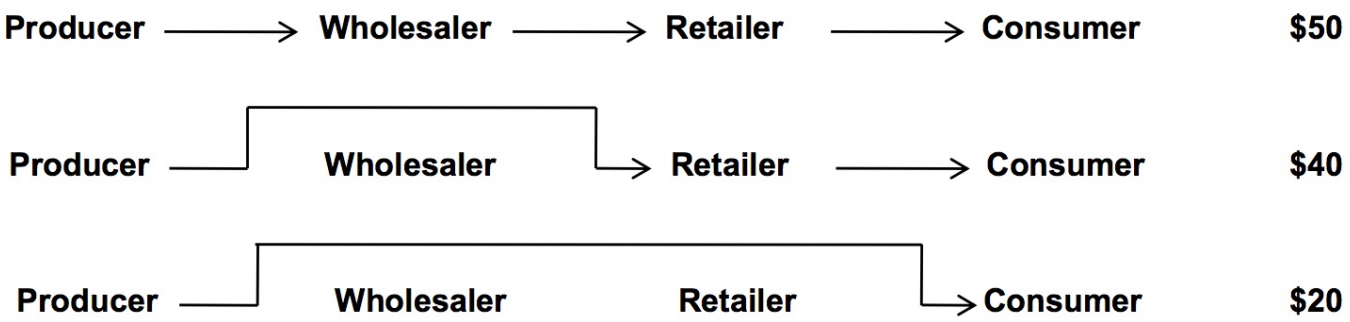
Produce content targeted at your users

- 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 Plant 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 AdSence 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

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

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

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 than1% 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

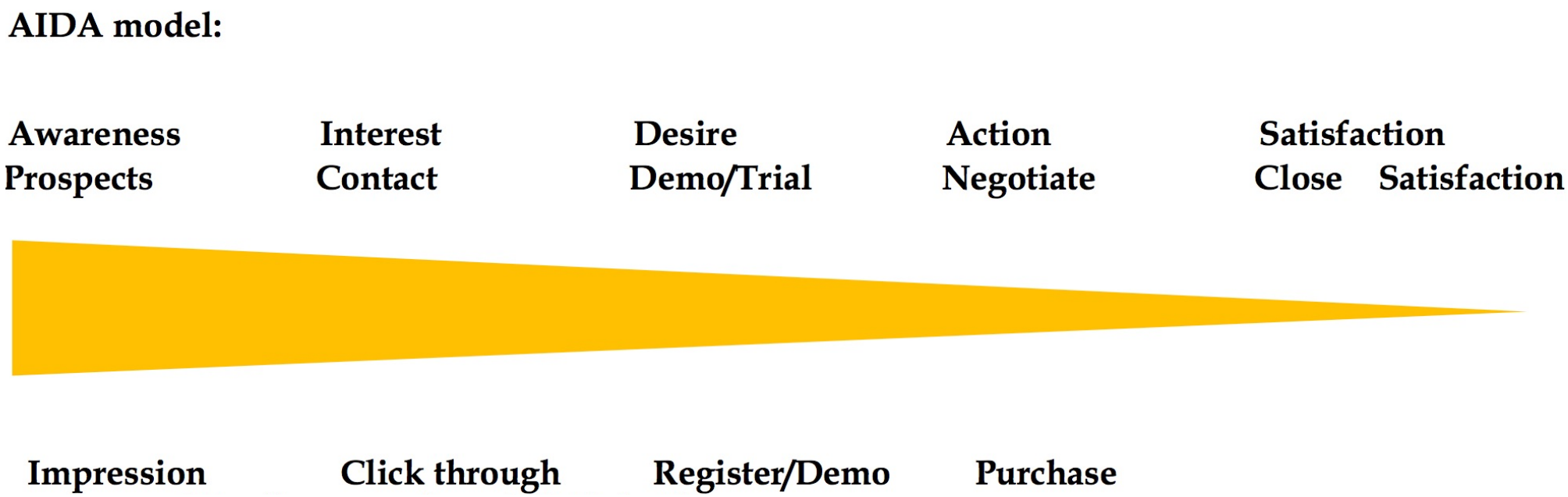
www.google.com/onlinechallenge

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:



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

Apps

Proliferation of devices
- iPhone, iPad, Andriod, Fire
  - appinventor.mit.edu/explore/
- Facebook games, messaging games, etc

Controlled by vendor
- Limites revenue

Fashion (mostly)
- Top 10 list important

Social Media

Keep in touch

- Human face
- Consistent voice
- Community
- Feedback

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’

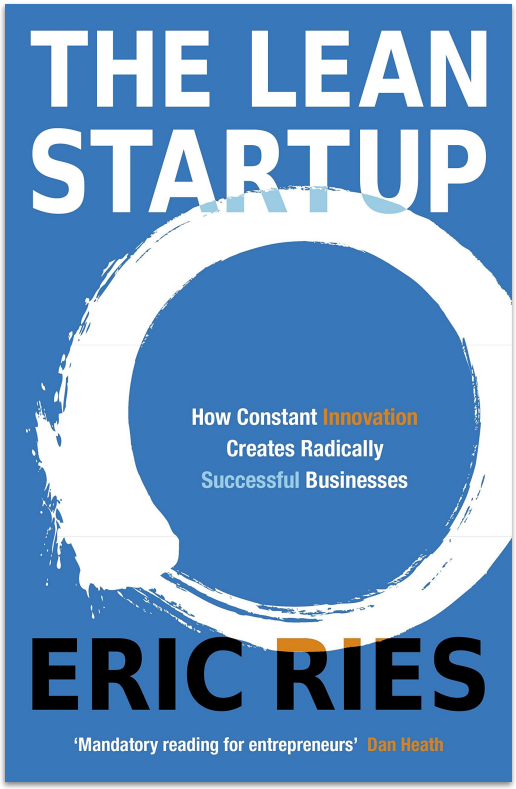
Analytics

- 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


CAN YOU GIVE ME SOME COMMENTS ON MY BUSINESS PLAN?
SURE.
www.dilbert.com scottadams@aol.com
YOUR PLAN IS A HODGE-PODGE OF UNWARRANTED OPTIMISM ENCASED IN AN IMPENETRABLE FORTRESS OF BUZZ-WORDS.
10-25-08 ©2008 Scott Adams, Inc./Dist. by UFS, Inc.
WOULD YOU LIKE TO READ IT?
THERE'S THAT UN-WARRANTED OPTIMISM AGAIN.

Valuation

Estimate of future yield - risk assessment

- Market
- Assets
- Ratio on current revenue
- Ration 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
- Portals
- Get-rich-quick sites
- Smartcards, VOIP, interactive TV

Zuckerberg's letter to investors

Five core values for how we run Facebook:

Focus on Impact

If we want to have the biggest impact, the best way to do this is to make sure we always focus on solving the most important problems. It sounds simple, but we think most companies do this poorly and waste a lot of time. We expect everyone at Facebook to be good at finding the biggest problems to work on.

Move Fast

Moving fast enables us to build more things and learn faster. However, as most companies grow, they slow down too much because they're more afraid of making mistakes than they are of losing opportunities by moving too slowly. We have a saying: "Move fast and break things." The idea is that if you never break anything, you're probably not moving fast enough.

Be Bold

Building great things means taking risks. This can be scary and prevents most companies from doing the bold things they should. However, in a world that's changing so quickly, you're guaranteed to fail if you don't take any risks. We have another saying: "The riskiest thing is to take no risks." We encourage everyone to make bold decisions, even if that means being wrong some of the time.

Be Open

We believe that a more open world is a better world because people with more information can make better decisions and have a greater impact. That goes for running our company as well. We work hard to make sure everyone at Facebook has access to as much information as possible about every part of the company so they can make the best decisions and have the greatest impact.

Build Social Value

Once again, Facebook exists to make the world more open and connected, and not just to build a company. We expect everyone at Facebook to focus every day on how to build real value for the world in everything they do.

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, toliets
  - “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