E-Commerce
Jack Lang and Stewart McTavish

Guest lectures
Fiona Vickerstaff, CMS
Pete Stevens, Mythic Beasts
Richard Clayton, CL

Commerce ?
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)
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 potential topics

Aims

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

Examples classes
2\textsuperscript{nd} March LT2 12:05-12:55, Q7P82012, Q7P82013, Q7P82014
11\textsuperscript{th} March LT2 12:05-12:55, Q5P82015, Q7P82016, Q7P82017

Lecture notes for guest lectures (3,5,7) 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’s papers on Technology and Financial Manias
http://www.dtc.umn.edu/~odlyzko/doc/bubbles.html


Consider how a normal trade occurs. A customer (you) wants to purchase some goods for example a container full of computers from a remote manufacturer, for example in China. There is mutual distrust: you don’t trust them to deliver, and they don’t trust you to pay. How does this get resolved?

This is has been a common problem since humans started trading, and over centuries a common set of protocols have emerged for Business to Business trades, from which E-commerce systems have evolved. It goes like this:

1. You the customer go to your bank and request a Letter of Credit. This is like a bankers cheque, but one that can only be cashed if certain conditions are fulfilled. Here the conditions might include:
   - A Bill of Lading (showing that the goods have been shipped)
   - An inspection certificate (showing that they are what you expect, and not just rocks)
   - An insurance certificate

2. Your bank supplies the Letter of Credit, for which it requires deposit of the amount, plus a fee.
3. You send your order plus the LoC to the manufacturer.
4. The manufacturer manufactures the goods and delivers them to the shipper.
5. The shipper provides a Bill of Landing. (or Air Way Bill etc) plus insurance certificate and inspection certificate.
6. The Bill of Lading is sent by fast means to the customer (eg electronically, or by fast horse).
7. The manufacturer presents the Letter of Credit and other supporting documentation (Bill of Lading, Inspection and Insurance certificates to their bank,
8. The bank pays the manufacturer, and claims the money via the banking network from the customer’s bank.
9. The shipper transports the goods.

The above is a simplified view of a typical transaction. In practice there may be customs and taxes to pay, border inspections and controls, shipping fees, and the like, and many special cases, such as medicines and other time critical or regulated goods.

Note that in this example the banking network is used as the trusted third party, giving guarantees to the customer that they will get the goods (or a refund) and to the manufacturer that they will get paid.

For B2B transactions the payment/credit provider, such as a credit card company, or Paypal often plays this role.
Business-to-business communications go back into antiquity

Believed to have driven the invention of writing and mathematics

Trust system

Sumerian Bulla an “Unforgeable” warehouse receipt. Clay models representing sacks of grain pressed into a wet clay ball with the warehouse owner’s thumbprint or design and then dried in the sun.

Could be used as money for a trade – a lot easier than carrying the actual goods.

Superseded by stylus marks on a clay tablet.

Thought to have contributed to the development of writing and of Mathematics (and accountancy, and taxes).
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-spatula 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, round Liaoning Chinese coins. In the west, the first official, minted currency was possibly the famous Lydian 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 created 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 Kubla 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 (tang) coin. In the Renaissance, the form was quite common, and the pound was used in England.

Bearer certificates

Token representing value

May be anonymous (cash vs cheque)

Not easily forged (trust)

Physical handling (banks / wallets)

May have Coupons attached - tear off to claim interest

Tradeable
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.

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The Victorian Internet

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

- Banks became trusted intermediaries

- Others (insurers, inspection agents, shipping agents) largely harnessed via bank mechanisms
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
What is money?

- Exchange of value for example making a purchase
- Store of value for example savings
- Measure of value for example pricing

Fiat money

Money issued by the Government, and can be used to pay taxes
- Governments can’t go bust, as they can always print more: “Quantitive Easing”
- However devaluing the currency may cause inflation, exchange rate drop and other bad effects
- “cash is trash”

IMF bailout, EU bailout (Greece)

“Unforgeable” bearer certificates

Anonymous, immediate

Trusted (mostly)

Magic of banking

Banks issue Money

Not everyone will want to withdraw at the same time, so Banks (if Trusted) need only fund difference between deposits and withdrawals

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

If trust in the bank fails, everybody wants to withdraw their money at the same time…

<table>
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<tr>
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<td>20.5</td>
<td>15.9</td>
<td>5.0</td>
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<td>68.3</td>
<td>62.7</td>
<td>30.8</td>
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<td>19.0</td>
<td>19.3</td>
<td>17.2</td>
<td>11.9</td>
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<tr>
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<td>India[54]</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>10-11</td>
</tr>
</tbody>
</table>

Cyber space – it's where your bank keeps your money
(William Gibson, Neuromancer 1984)

Journals and Ledger systems:
- Journal: List of transactions as they happen
  - A pays B £100
  - B pays C £50
- Ledger: View of Journal organised into Accounts
  - Double entry: Credit (+) Debit (-)
    - Debit A £100; Credit B £100
    - Debit A £50; Credit C £50
- A bank maintains a journal (and hence ledger) for each account

<table>
<thead>
<tr>
<th></th>
<th>Debit</th>
<th>Credit</th>
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<tbody>
<tr>
<td>B's Account</td>
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<td></td>
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<td>Debit</td>
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<tr>
<td>Totals</td>
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<td></td>
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<tr>
<td>50</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

<= Must balance

Electronic money tokens

- Token representing value

- Unforgeable Transaction record
  - eg (value, serial number, id) signed by the issuer's private key

- Problem: Bits can be easily copied.
  - How to avoid double spending?
    - Store all spent Tokens
    - Can retire blocks of used Transactions
    - Store all unspent Tokens
    - Store all transactions (~2500/block)
    - Central store (bank)
    - Distributed store
      - Block chain (>250Gb) but only updates broadcast
      - Everyone has a copy and can check
    - No good lightweight electronic equivalent of cash

ID (user's public key)
Value
Date
Serial etc
Nonce
Crypto Currencies
“Distributed Ledger Technology”

- Over 1000 crypto currencies
  - Bitcoin
  - Ethereum
    - Includes smart contracts
    - Moving to proof of value
    - Many others

Top 130 Blockchain companies by finance raised
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

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
Crypto market capitalisation

https://www.jbs.cam.ac.uk/faculty-%20research/centres/alternative-finance/publications/2nd-global-cryptoasset-benchmarking-%20study/
Mining

- Miners generate income by verifying transactions and adding blocks of transactions to the global block chain for a small fee

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

  - 6/hour

- This uses a lot of energy
### Key Network Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Bitcoin's current estimated annual electricity consumption* (TWh)</td>
<td>49.5</td>
</tr>
<tr>
<td>Bitcoin's current minimum annual electricity consumption** (TWh)</td>
<td>49.5</td>
</tr>
<tr>
<td>Annualized global mining revenues</td>
<td>$2,424,932,755</td>
</tr>
<tr>
<td>Annualized estimated global mining costs</td>
<td>$2,309,011,812</td>
</tr>
<tr>
<td>Current cost percentage</td>
<td>95.22%</td>
</tr>
<tr>
<td>Country closest to Bitcoin in terms of electricity consumption</td>
<td>Singapore</td>
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<tr>
<td>Estimated electricity used over the previous day (kWh)</td>
<td>135,604,584</td>
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<tr>
<td>Implied Watts per GH/s</td>
<td>0.115</td>
</tr>
<tr>
<td>Total Network Hashrate in PH/s (1,000,000 GH/s)</td>
<td>49,100</td>
</tr>
<tr>
<td>Electricity consumed per transaction (kWh)</td>
<td>41</td>
</tr>
<tr>
<td>Number of U.S. households that could be powered by Bitcoin</td>
<td>4,582,933</td>
</tr>
<tr>
<td>Number of U.S. households powered for 1 day by the electricity consumed for a single transaction</td>
<td>13.91</td>
</tr>
<tr>
<td>Bitcoin's electricity consumption as a percentage of the world's electricity consumption</td>
<td>0.22%</td>
</tr>
<tr>
<td>Annual carbon footprint (kt of CO2)</td>
<td>24,253</td>
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<tr>
<td>Carbon footprint per transaction (kg of CO2)</td>
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<td>7</td>
<td>Canada</td>
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<tr>
<td>8</td>
<td>Brazil</td>
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<td>Korea, South</td>
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<td>France</td>
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<td>11</td>
<td>United Kingdom</td>
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<tr>
<td>12</td>
<td>Italy</td>
</tr>
<tr>
<td>13</td>
<td>Saudi Arabia</td>
</tr>
</tbody>
</table>

DLT pro and con

- Advantages
  - Public record
    - Pseudo anonymous
  - Mutually distrustful entities
  - Mechanisms for consensus

- Disadvantages
  - Not lightweight  Blockchain size >250GB, Etherium>1TB,
  - Updates ~300Gb/day
  - Slow for certainty –days to weeks
Bitcoin Redux


• See also https://www.lightbluetouchpaper.org/2018/06/01/bitcoin-redux-crypto-crime-and-how-to-tackle-it/

BIS Annual report, June 17th 2018

“Cryptocurrencies promise to replace trusted institutions with distributed ledger technology. Yet, looking beyond the hype, it is hard to identify a specific economic problem which they currently solve. Transactions are slow and costly, prone to congestion, and cannot scale with demand. The decentralised consensus behind the technology is also fragile and consumes vast amounts of energy. Still, distributed ledger technology could have promise in other applications. Policy responses need to prevent abuses while allowing further experimentation.”

Vienna, October 2018
Who do you trust?

- Distributed ledger technology does not remove risk but changes the trusted entity:
  - Exchange: changes real assets into electronic tokens
  - Wallet providers: stores tokens on behalf or users
  - Many examples of fraud
    - Mt Gox, 850,000 Bitcoins lost or stolen (about $500M) from wallets
    - One Coin (about $4 billion worldwide) (MLM scam?)

Combination of Crypto currency, MLM (multi-level marketing) and Ponzi Fraud defrauded billions in the OneCoin scam

Must listen to

Https://www.bbc.co.uk/programmes/p07nkd84/episodes/player
How can you own an asset?

• Self-hosting: keep your gold coins under the bed, or keep your private key on your laptop
  
  • If you lose your laptop you lose your money
  
  • Gold merchant: you buy a gold bar for £30,000 and the merchant keeps it in their vault but with your name on it. If they go bust, it’s still yours

• Bank: you deposit it and the bank records in its ledger that it now owes you £30,000. If the bank goes bust, you stand in line

Vienna, October 2018

The real bitcoin ecosystem in 2018

• The exchanges suggest they’re gold merchants but analysis of the blockchain suggests they’re banks

• Huge growth in ‘off-chain’ transactions over the past 2 years; payments fast and cheap
  
  • You might think you are buying electronic coins, but are just making a ledger entry in the Exchange’s private ledger system

• Now most people in US, UK use Coinbase, most Chinese use Binance etc

• They are acting as e-money providers but without the licences required by EU law

• The E-Money Directive is not being enforced

Vienna, October 2018
How regulation is failing

- EU: new definition of hosted wallet (a service holding keys) is two years out of date
- Germany is similar; closed OneCoin as it was transferring funds by adjusting Euro balances, but ignores off-chain bitcoin transactions
- UK: Financial Conduct Authority won’t see payment as significant: bitcoin a ‘crypto asset’
- So it won’t give the Payment Service Regulator authority over cryptocurrency payments

Vienna, October 2018

Liquidity and solvency

- Coinbase UK’s company accounts show only about 1% of expected assets
- Most is in the virtual currency company, not the fiat e-money business (£23m vs £1m)
- Are even the former assets the company’s own bitcoins, or customer deposits?
- So: what’s to be done? Basel III?
- Yesterday: G4S announces cryptocurrency custodian service

Vienna, October 2018
MLM (briefly)

- MLM – Multi-level Marketing

- Sell something, such as cosmetics, via Agents and sub-agents Multi-level market (MLM) or network marketing is an American institution. Companies like Amway, Tupperware, Herbalife, Avon, Mary Kay and The Pampered Chef support huge networks of distributors and recruits

- Agents purchase wholesale and earn a commission on sales they make

- Agents recruit sub agents, and earn a proportion of their commission (“down line”) and in turn pay some of their commission to their contact “up line”

Pyramid selling

- Example: each new recruit must recruit 6 others to break even

- Early adopters win by taking money from later recruits

- Chain letters are another example

- “Buy these crypto coins”
Ponzi scheme

- The scheme is named after Charles Ponzi, who became notorious for using the technique in the 1920s defrauding the Boston Fire Brigade.

- Like Pyramid selling but the emphasis is on new recruits who pay to join in the expectation of later rewards. Inevitably run out of recruits.

- Scheme uses money from later investors to pay early investors.

Fictitious Example

Health warning: do not try this at home.

I have a great new company, JacknStewCoin.

It is so good that for an investment of a mere £4000 I will pay you £400 interest per month after the first month providing you recruit two more investors on the same terms in that time, and I will pay you 10% of their investment as a management fee, and the same for any they recruit (your downline).

<table>
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<th>Income Tier 2</th>
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<th>Profit/Loss per person</th>
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<td>12800</td>
<td>16400</td>
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<td>-51200 - 3413.33</td>
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</tbody>
</table>
XBT to UsD

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

- Via phone wallets
  - e.g. Pingit, M-Pesa
- Electronic cash
  - Credit and Debit cards
  - Bank transfers
  - Game currencies
  - Gift vouchers
  - Many Issues

Trusted Third Party

Buyer
  - Cash
  - Goods
Seller
  - Goods
  - Cash

TTP

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

Issuer
e.g. Bank

Brand
e.g. VISA

Acquirer

Merchant

😊😊
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

Overall cost of fraud varies

Motivation - who gets the reward?
huge hype of hacking the system
no case of fraud from interception
real problem is old fashioned card theft

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

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?

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Digital assets / customisation

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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 18, 2008


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

Michael Pachter

Fortnite has become an instant popular game and we heard last month that the title’s debut on iOS generated $90 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 SuperData (via ESPN), 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 post-up demand as Android users eagerly await a release this summer.
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

Macro economics: Modern Monetary Theory

Government debt considered good

\[
\text{Domestic Government Balance} + \text{Domestic Private Balance} + \text{Foreign Balance} = 0
\]

\[
(T-G) + (S-I) - NX = 0
\]

Where
\[
\begin{align*}
G & \text{ is government spending} \\
T & \text{ is taxes} \\
S & \text{ is savings} \\
I & \text{ is investment} \\
NX & \text{ is net exports}
\end{align*}
\]

or
\[
S-I = G-T + NX
\]

\[=> \text{Private Wealth} \sim \text{Government deficit or trade surplus}\]

http://neweconomicperspectives.org/modern-monetary-theory-primer.html
Trouble Ahead: High US debt does not increase USA productivity  
Who will pay?

[Graph: Debt:GDP vs 10yr Avg. Prod. Growth]

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

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

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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

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 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

Source: Learning Solutions Magazine, David Wilkins, August 17, 2009

Long tail economics

http://www.aurorawdc.com/ci/long_tail.gif
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. **Note 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
Cookies

Must declare use

Must obtain explicit assent for third party cookies each time
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

General Data Protection Regulation

Six lawful purposes that data may be processed for

(a) If the data subject has given consent to the processing of his or her personal data;

(b) To fulfil contractual obligations with a data subject, or for tasks at the request of a data subject who is in the process of entering into a contract;

(c) To comply with a data controller’s legal obligations;

(d) To protect the vital interests of a data subject or another individual;

(e) To perform a task in the public interest or in official authority;

(f) For the legitimate interests of a data controller or a third party, unless these interests are overridden by interests of the data subject or her or his rights according to the Charter of Fundamental Rights

https://gdpr-info.eu
General Data Protection Regulation

Four rights of the data subject

(a) Transparency and modalities: data controllers are required to information to the 'data subject in a concise, transparent, intelligible and easily accessible form, using clear and plain language, in particular for any information addressed specifically to a child.'

(b) Information and Access: data subjects have the right to access their personal data and information about how this personal data is processed. A data controller must provide, upon request, an overview of the categories of data that are being processed and well as the actual data. The data controller has to inform the data subject on details about the processing, such as the. Purpose, with whom the data is shared and how it acquired the data.

(c) Rectification and erasure: the data subject has the right to request erasure of personal data related to them on any one of a number of grounds within 30 days, including noncompliance with Article 6(1) (lawfulness) that includes a case if the legitimate interests of the controller are overridden by the interests or fundamental rights and freedoms of the data subject, which require protection of personal data.

(d) Right to object to automated decisions: The data subject has the right to object to their data being used for marketing, sales or non-service related purposes and for such use to stop unless there is an existing lawful purpose.

https://gdpr-info.eu

The European Union Directive on Copyright in the Digital Single Market

Article 11
Protection of press publications concerning digital use

1. Member States shall provide publishers of press publications with the rights provided for in Article 2 and Article 3 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.


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://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://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: Maximise market share now; worry about profitability later

Merchant: Buy and sell goods and services
   Special cases: PPV, Subscription, Freemium, Shareware, etc

Market: meeting place for others to buy and sell

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
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

Auctions, a brief introduction

Price discovery
Settlement and Clearance

Auction types:
   Ascending bid aka Open, English
   Descending bid aka Dutch
   First price sealed bid
   Second price sealed bid aka Vickery Auction

Timing and certainty
Markemakers and liquidity
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.zombo.com

Too much stuff
www.arngren.net

Contrast, Contrast, Contrast, Constrast, Contrast, Constrast,
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.webpagesthatssuck.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

Consistent font
One family
Care on colour / size
Fonts carry a subtle simplicity message
Serif or San Serif?

Loud Soft Strange Respectable Old fashioned
Poor design examples

1. Title confused with keywords
2. Far too much material
3. Mixes fonts
4. Navigational mess
5. Needs more than 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)
- 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

Load balancer
Big IP

Web Server (static data)
Apache

Application Server (business logic)
J2EE

Database server (orders)
OPS

Legacy (stock control)
IBM

Sizing

Scalability
How many people?
At the same time?

Number of products

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

Reliability

Responsiveness
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

<table>
<thead>
<tr>
<th>Service</th>
<th>Blue</th>
<th>Silver</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Fancy case</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

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

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 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, 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 expand
Virgin
   Active, Atlantic, Books, 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
      JD Sports

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 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 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
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 on 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

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

### Sales funnel

**AIDA model:**

- Awareness
- Interest
- Prospect
- 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

Sell the company

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
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

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

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