E-Commerce

Jack Lang and Stewart McTavish

Guest lectures
Anna Soilleux-Mills, CMS
Pete Stevens, Mythic Beasts
Richard Clayton, CL
I work at Andreessen Horowitz (‘a16z’), a venture capital firm in Silicon Valley that invests in software companies. I try to work out what’s going on and what will happen next. (Note: I don’t check LinkedIn messaging: best ways to contact me are email or twitter.)
阿里巴巴
Ecommerce is big in dollar terms
Quarterly US ecommerce revenue ($bn)

©2018 Andreessen Horowitz. Page 6
Source: BLS
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

Source: Goldman Sachs, ONS
Meanwhile, there’s more than just retail

US spending, 2017 ($tr)
Global company creation

Bubble size = users

TTM Revenue growth

Facebook

Google

Amazon

Apple

Source: Bloomberg, companies
New problems

Global consumer spending

$40tr

Health
Clothes
Household
Entertainment
Food
Transport
Housing

Source: World Bank, UN
What is E-commerce?

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

B2B
  Replacement of paper with electronic documents
  Re-badged Electronic Document Interchange (EDI)
  Electronic Money

B2C Mail order - amazon.com
  New business models
  Disintermediation
  CRM

New opportunities for fraud
  The dark web

App economies

Social media

and many more
Aims

Outline

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

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

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


Or a web-search for other similar lists and pages

Remote transaction

1. Please issue LoC: Here is deposit

2. LoC: "Pay bearer after 30 days if you have Bill of lading and Inspection Certificate"

3. Order +LoC

4. Goods

5. Bill of Lading

6. Bill of Lading

7. Bill of Lading

8. Money

9. Goods

Customer

Manufacturer

Shipper

Inspector

Customer’s Bank

Correspondent Bank

Trust relationship and mutual accounts
Traded Paper

Typical instruments include

Warehouse receipts
Bills of Lading - “The holder is entitled to 100 amphorae of oil from the cargo of the ship Augusta”
Purchase orders and invoices
Insurance certificates
Certificates of debt
Payment instructions - Bank-to-bank or bank-customer-bank (cheques), letters of credit
Banknotes
Bearer certificates - coupons
Share Certificates

Negotiable / guaranteed - can be used for payment, security, etc.
B2B

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

Hugh boom in telegraph construction and applications

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

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

Huge expansion in banking

Banks sent about 50% of telegraph traffic

Trusted intermediaries

Others (insurers, inspection agents, shipping agents) largely harnessed via bank mechanisms
B2B - Wiring Money

Interbank message e.g.

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

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

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

First big ‘open’ EDI system

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

Adapted to CREST (UK equity clearing)

Commercial transactions similar, but more complex conditions

e.g LoC needs Bill of Lading, insurance certificate and inspection certificate
Electronic Document Interchange (EDI)

Proprietary systems build late 60s / early 70s

General Motors ordering car components (EDS)

Marks and Spencer’s clothes ordering

Big problem not security or DoS or lost systems but standards

1980s agreeing common message formats
UN, specific country / industry e.g. NHS

Being redone as XML
e.g. BOLERO (www.bolero.net)

Many players - slow progress
Business-to-business communications go back into antiquity

Believed to have driven the invention of writing and mathematics

Trust system
What is money?

Exchange of value
Store of value
Measure of value

Fiat money

Money issued by the Government, can’t go bust, can always print more
- may cause inflation, exchange rate drop etc
- “cash is trash”

“Unforgeable” bearer certificates

Anonymous, immediate

Trusted (mostly)
Magic of banking

Not everyone will want to withdraw at the same time

Banks need only fund difference between deposits and loans

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>20.5</td>
<td>15.9</td>
<td>5.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Turkey</td>
<td>58.3</td>
<td>62.7</td>
<td>30.8</td>
<td>18.0</td>
</tr>
<tr>
<td>Germany</td>
<td>19.0</td>
<td>19.3</td>
<td>17.2</td>
<td>11.9</td>
</tr>
<tr>
<td>United States</td>
<td>12.3</td>
<td>10.1</td>
<td>8.5</td>
<td>10.3</td>
</tr>
<tr>
<td>India[^34]</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>10-11</td>
</tr>
</tbody>
</table>

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

Early Coins

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

Types of Coins

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

Gold Standard

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

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

Token representing value

May be anonymous (cash vr cheque)

Not easily forge (trust)

Physical handling (banks / wallets)

Coupons

Tradeable (bureau de change)
Other ways to pay

Via phone wallets
  e.g. Pingit

Electronic payment systems
  Electronic bearer certificates
  Bitcoin
  Game currencies
  Digital assets

Issues
  Anonymity
  Exchange rate
  Regulation
  etc
Electronic Bearer Certificates

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

Decentralised  
e.g. Bitcoin
   - Exchange of value ✔
   - Store of value ✗
   - Measure of value ✗

Hard (repudiatable) vs Soft (no recourse)

http://www.xe.com/currencycharts/?from=GBP&to=XBT
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
Chain of blocks of transactions

Currently 2500 per block

Currently reward of 12.5 coins per block

Rate limited by requiring a hard crypto problem solved
Crypto market capitalisation

Key Cryptoasset Industry Segments

- **Storage**: 61%
  - Enabling the secure management of wallets storing cryptoassets
  - Share of service providers providing direct services

- **Mining**: Receiving newly minted cryptoasset units as a reward for processing transactions on the network

- **Payments**: 49%
  - Facilitating the use of cryptoassets for all types of payments

- **Exchange**: 72%
  - Providing a platform for the exchange of one cryptoasset for another asset

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 block chain.

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

This uses a lot of energy.
Bitcoin Energy Consumption Index

Click and drag in the plot area to zoom in

From Feb 2, 2017 To Feb 20, 2019

Downloaded Feb 14 2019, https://digiconomist.net/bitcoin-energy-consumption
## Key Network Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>Estimated electricity used over the previous day (KWh)</td>
<td>135,604,584</td>
</tr>
<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>411</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>
</tr>
<tr>
<td>Carbon footprint per transaction (kg of CO2)</td>
<td>201.63</td>
</tr>
</tbody>
</table>
Electronic money

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

Problem: how to avoid double spending?
Store all spent tokens - can retire blocks of used tokens
Store all unspent tokens
Store all transactions (~2500/block)
Central store
Distributed store
Block chain (>100Gb) but only updates broadcast
Electronic money - 2

Trusted

Value?

Volatility?

Anonymous or pseudo-anonymous or open?

Currency?
  Fiat, or other asset backed
Blockchain pro and con

Advantages
- Public record
- Pseudo anonymous
- Mutually distrustful entities

Disadvantages
- Not lightweight
- Slow for certainty
XBT to UsD

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

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

29 Jan 2017 00:00 UTC - 29 Jan 2019 13:24 UTC

XBT/USD close: 3397.36460 low: 913.83880
high: 19447.68573

http://www.xe.com/currencycharts/?from=XBT&to=USD&view=1Y
Blockchain: considering the risks to consumers and competition

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

As you can imagine, blockchain is something that frequently comes up for us in a financial markets context. And the panel session title: Promises and Perils’ seems to really, the potential applications for blockchain technology are far-reaching, but there are risks.

As a financial regulator, we thought on blockchain fall roughly into two groups. The first group of Promises of trust: Bitcoin and other cryptocurrencies; and those are slightly easier thoughts. The second group is about other applications of distributed ledger technology in financial services – and these thoughts are more ambiguous.

Evaluating cryptocurrencies

Let’s start with cryptocurrencies. Also known as cryptocurrencies – for reasons I’ll come into in a minute.

Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around $250 billion. How much is $250 billion? 8 kg, but not 8 kg.

Some of the world’s largest pension funds are invested at around $1 million, for example.

For thousands of years, currencies have been developed (and lacked) by sovereign states – and we think of currencies primarily in that context. Not exclusively, I’m sure in such states, where we have the Western world. And the Bitcoin protocol is worth $250 billion – the cryptocurrency landscape is clearly something new. What does it mean for regulation?

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

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

Faced with a tricky policy question, it can be helpful to go back to basics. If you take any economic textbook definition of money, it will tell you it fulfills 3 criteria:

- a unit of exchange, (i.e. to pay someone);
- a store of value, which you can save;
- a unit of account, which can be useful for bookkeeping.

In the reality of the day, the primary purpose for many cryptocurrencies want to be a means of payment – Bitcoin’s ‘merch’, Satoshi Nakamoto defined Bitcoin as a peer-to-peer��统 electronic cash system. And indeed there are such across the UK where you can buy a pint of beer with Bitcoin.

More recently, one of the early uses for Bitcoins was for purchasing items on the dark web. Various platforms used Bitcoins because of its quasi-anonymous characteristics and fewer barriers. These factions can also make cryptocurrencies appearing for money laundering or terrorist finance, which is obviously of concern to us as a regulator. That is because such payments can bypass regulated financial institutions like banks, which play an important role in detecting financial crimes. However, the anti-money laundering directive will oblige cryptocurrencies exchanges and wallet providers to comply with anti-money laundering requirements.

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

All that said, most people view Bitcoin and other such coins as an asset class rather than a means of payment – hence cryptocurrencies which is probably both cause and effect of its surge in value. In 2017, the price of Bitcoin appreciated from around $1,200 to over $16,000 per coin (100x). Why would I use Bitcoin to buy a pint of beer when tomorrow it could be worth 20% more? Of course, less, then we have seen before: the other was, about $10 in the first quarter of 2018.

So do these price movements reflect rational expectations, or ‘animal spirits’? History offers many examples of excess market overvaluation, and subsequent crashes – investors ranging from financial to florists.

Speculators tend to be to be driven by irrationalities, and tend to sell with precision at the time. Financial regulators are not generally in the business of judging when specific assets are overvalued, especially niche assets which even at $250 billion do not appear to pose a systemic risk. However, given our consumer protection obligations, we do want to be concerned who is investing and how much, and we want to guard against people losing more than they can afford to.

We have had穰 legislators seeking to introduce legislation, such as the EU’s MiFID II, to regulate.

There was also some eye-catching research by analysts at Barclays, who used techniques for longitudinal studies to make the spread of Bitcoin fever.

The idea being that all the people who would know about this would be ‘traders’, and want to get involved, but since they are not significant issues, or real money businesses, they become ‘herd’. As a result, the market price of Bitcoin fever may have reached its peak, and there’s a risk that Bitcoin and other cryptocurrencies will thus become more stable and reliable.

But let me turn to the third talk today, for us not quite as new,

So we turn to the third talk today, for us not quite as new, for reasons I will come onto in a minute.

Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around $250 billion. How much is $250 billion? 8 kg, but not 8 kg.

Some of the world’s largest pension funds are invested at around $1 million, for example.

For thousands of years, currencies have been developed (and lacked) by sovereign states – and we think of currencies primarily in that context. Not exclusively, I’m sure in such states, where we have the Western world. And the Bitcoin protocol is worth $250 billion – the cryptocurrency landscape is clearly something new. What does it mean for regulation?

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

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

Faced with a tricky policy question, it can be helpful to go back to basics. If you take any economic textbook definition of money, it will tell you it fulfills 3 criteria:

- a unit of exchange, (i.e. to pay someone);
- a store of value, which you can save;
- a unit of account, which can be useful for bookkeeping.

In the reality of the day, the primary purpose for many cryptocurrencies want to be a means of payment – Bitcoin’s ‘merch’, Satoshi Nakamoto defined Bitcoin as a peer-to-peer electronic cash system. And indeed there are such across the UK where you can buy a pint of beer with Bitcoin.

More recently, one of the early uses for Bitcoins was for purchasing items on the dark web. Various platforms used Bitcoins because of its quasi-anonymous characteristics and fewer barriers. These factions can also make cryptocurrencies appearing for money laundering or terrorist finance, which is obviously of concern to us as a regulator. That is because such payments can bypass regulated financial institutions like banks, which play an important role in detecting financial crimes. However, the anti-money laundering directive will oblige cryptocurrencies exchanges and wallet providers to comply with anti-money laundering requirements.

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

All that said, most people view Bitcoin and other such coins as an asset class rather than a means of payment – hence cryptocurrencies which is probably both cause and effect of its surge in value. In 2017, the price of Bitcoin appreciated from around $1,200 to over $16,000 per coin (100x). Why would I use Bitcoin to buy a pint of beer when tomorrow it could be worth 20% more? Of course, less, then we have seen before: the other was, about $10 in the first quarter of 2018.

So do these price movements reflect rational expectations, or ‘animal spirits’? History offers many examples of excess market overvaluation, and subsequent crashes – investors ranging from financial to florists.

Speculators tend to be driven by irrationalities, and tend to sell with precision at the time. Financial regulators are not generally in the business of judging when specific assets are overvalued, especially niche assets which even at $250 billion do not appear to pose a systemic risk. However, given our consumer protection obligations, we do want to be concerned who is investing and how much, and we want to guard against people losing more than they can afford to.

We have had lawmakers seeking to introduce legislation, such as the EU’s MiFID II, to regulate.

There was also some eye-catching research by analysts at Barclays, who used techniques for longitudinal studies to make the spread of Bitcoin fever.

The idea being that all the people who would know about this would be ‘traders’, and want to get involved, but since they are not significant issues, or real money businesses, they become ‘herd’. As a result, the market price of Bitcoin fever may have reached its peak, and there’s a risk that Bitcoin and other cryptocurrencies will thus become more stable and reliable.

But let me turn to the third talk today, for us not quite as new,

So we turn to the third talk today, for us not quite as new, for reasons I will come onto in a minute.

Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around $250 billion. How much is $250 billion? 8 kg, but not 8 kg.

Some of the world’s largest pension funds are invested at around $1 million, for example.

For thousands of years, currencies have been developed (and lacked) by sovereign states – and we think of currencies primarily in that context. Not exclusively, I’m sure in such states, where we have the Western world. And the Bitcoin protocol is worth $250 billion – the cryptocurrency landscape is clearly something new. What does it mean for regulation?
Without getting too deep into the UK financial regulation system, it’s worth briefly touching on the FCA’s remit. The FCA exists to make financial markets work well, and has objectives within that: consumer protection, market integrity and promoting competition. We also support the Bank of England when it comes to financial stability.

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

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

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

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

More notably, one of the early uses for Bitcoin was for purchasing items on the dark web. Various platforms used Bitcoin because of its anonymity. Does anyone remember Silk Road?

In November 2017, the FCA issued a warning, the regulator (at the time) said: ‘The service is not regulated by the FCA and it is not subject to consumer protection. We have seen instances of people who have lost money.

As you can imagine, blockchain is incredibly exciting – it really is.

As a financial regulator, we thought it was important to look at the opportunities and challenges. Our thoughts are more optimistic.

Evaluating cryptocurrencies

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

Cryptocurrencies first emerged with Bitcoin, beginning in 2009. Since then we have witnessed a huge increase in the number and value of these products. There are now over 1,500 different coins and tokens, currently valued at around $250 billion. How much is $250 billion? Fig, but not literal.

Some of the world’s largest pension funds are invested at around $1 billion, for example.

For thousands of years, currencies have been developed (and attacked) by sovereign states – and we think of currencies primarily in that context. Not necessarily because of the rock-bottom value or because of the risks.

The financial system is not worth $250 billion – the cryptocurrency phenomenon is clearly something new. What does it mean for regulation?

Other applications for distributed ledger technology

In our recent discussion paper on distributed ledger technology (DLT) we defined DLT as a set of technological solutions that enables a single, sequential, decentralised and cryptographically secure record of activities to which all parties have access, and acted on, by different participants. This rather lengthy definition reflects the view that DLT has huge range of applications evolving around, including records of contracts, transactions, asset holdings and proof of identity.

Already through our work we are starting to see some of the exciting applications of DLT to solve problems or efficiencies in the existing systems. Many of you may have heard of the tokenisation (I), but those of you who are not familiar with it, let me give you a brief overview. The concept is in ‘sales space’ where businesses can test innovative products, services, business models and delivery mechanisms in the real market, with real consumers.
## 5 Things You Need to Know About ICOs

<table>
<thead>
<tr>
<th>[-]</th>
<th>ICOs can be securities offerings.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICOs, based on specific facts, may be securities offerings, and fall under the SEC's jurisdiction of enforcing federal securities laws.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[-]</th>
<th>They may need to be registered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICOs that are securities most likely need to be registered with the SEC or fall under an exemption to registration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[-]</th>
<th>Tokens sold in ICOs can be called many things.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICOs, or more specifically tokens, can be called a variety of names, but merely calling a token a &quot;utility&quot; token or structuring it to provide some utility does not prevent the token from being a security.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>[-]</th>
<th>Ask questions before investing.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If you choose to invest in these products, please ask questions and demand clear answers.</td>
</tr>
</tbody>
</table>
Remote transaction

1. Please issue LoC: Here is deposit

2. LoC: “Pay bearer after 30 days if you have Bill of lading and Inspection Certificate

3. Order + LoC

4. Goods

5. Bill of Lading

6. Bill of Lading

7. Bill of Lading

8. Money

9. Goods

Customer

Manufacturer

Shipper

Inspector

Customer’s Bank

Correspondent Bank

Trust relationship and mutual accounts
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

Issuer e.g. Bank

Brand e.g. VISA

Acquirer

Merchant

😀

😀
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

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

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?

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

Digital assets / customisation

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

Michael Potuck

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

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

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

The report also notes that the popularity of the game really took off thanks to……
Fair Market

Group of willing buyers and sellers
   “Fair price”
   Not under compulsion
   Price discovery

Equality of information
   “Reasonable knowledge of relevant facts”

Anonymity
   Pre transaction e.g. Stock market
   Pseudo anonymity e.g. Ebay (reputation)
   Post transaction

Settlement mechanisms

Shared regulatory framework
Hot Topics

Anonymity
   Dark web

Who controls your identity?
   Government, Bank, or Apple / Google
   Identity cards, MS. Net

Lots of issues?
   liability
   control
   civil liberties
   protocol attacks
   etc

Privacy
   who owns your information?
   what is it worth?
   power and monopolies
E-Commerce - 2

Business Models and Strategy
Remote transaction

1. Please issue LoC: Here is deposit

2. LoC: “Pay bearer after 30 days if you have Bill of lading and Inspection Certificate

3. Order +LoC

4. Goods

5. Bill of Lading

6. Bill of Lading

7. Bill of Lading

8. Money

9. Goods

Customer → Manufacturer

Customer’s Bank → Correspondent Bank

Trust relationship and mutual accounts

Inspector → Shipper

Shipper
What is money?

Exchange of value
Store of value
Measure of value

Fiat money

Money issued by the Government, can’t go bust, can always print more
- may cause inflation, exchange rate drop etc
- “cash is trash”

“Unforgeable” bearer certificates

Anonymous, immediate

Trusted (mostly)
Fair Market

Group of willing buyers and sellers
  “Fair price”
  Not under compulsion
  Price discovery

Equality of information
  “Reasonable knowledge of relevant facts”

Anonymity
  Pre transaction e.g. Stock market
  Pseudo anonymity e.g. Ebay (reputation)
  Post transaction

Settlement mechanisms

Shared regulatory framework
Macro economics: Modern Monetary Theory

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

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

Where

- \(G\) is government spending
- \(T\) is taxes
- \(S\) is savings
- \(I\) is investment
- \(NX\) is net exports

or

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

\[\Rightarrow\text{Private Wealth} \sim \text{Government deficit or trade surplus}\]
Debt:GDP vs 10yr Avg. Prod. Growth

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

Metcalf’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

Utility

Users

Almost nobody uses it

Almost everybody uses it who ever will
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

\[ P \]

\[ Q \]
Long tail economics

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

Long tail economics

http://www.aurorawdc.com/ci/long_tail.gif
JINAL!  SINAL!  WANL!!
Regulations

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

Electronic Commerce (EC Directive) Regulations 2002

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

EU Consumer Rights Directive 2011

Consumer Rights Act 2015 - included “Digital content”
Consumer Contracts - 1

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

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

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

Details of any delivery costs

Details of how payments can be made

If payment is required in advance, you must supply your full **geographic address**
Consumer Contracts - 2

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

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

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

For how long the price of the offer remains valid.

The minimum duration of the contract where good or services are to be provided permanently or recurrently and that you will pay the cost of your consumers returning any product that you supply as substitutes because the goods or services originally ordered are not available.
Consumer Contracts - 3

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

The information above

When and how to exercise their rights to cancel including
  for goods - whether you require goods to be returned by the consumer and
  if so who will pay for their return
  for services - the consequence of agreeing to a service starting before the
  end of the usual seven working day cancellation period

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

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

If a contract lasts more than a year or is open ended, the contractual
conditions for terminating it.
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
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
The European Union Directive on Copyright in the Digital Single Market

Article II
Protection of press publications concerning digital uses

1. Member States shall provide publishers of press publications with the rights provided for in Article 2 and Article 3(2) of Directive 2001/29/EC for the digital use of their press publications.

2. The rights referred to in paragraph 1 shall leave intact and shall in no way affect any rights provided for in Union law to authors and other rightholders, in respect of the works and other subject-matter incorporated in a press publication. Such rights may not be invoked against those authors and other rightholders and, in particular, may not deprive them of their right to exploit their works and other subject-matter independently from the press publication in which they are incorporated.


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 11
Protection of press publications concerning digital uses

1. Member States shall provide publishers of press publications with the rights provided for in Article 2 and Article 3(2) of Directive 2001/29/EC for the digital use of their press publications.

2. The rights referred to in paragraph 1 shall leave intact and shall in no way affect any rights provided for in Union law to authors and other rightholders, in respect of the works and other subject-matter incorporated in a press publication. Such rights may not be invoked against those authors and other rightholders and, in particular, may not deprive them of their right to exploit their works and other subject-matter independently from the press publication in which they are incorporated.


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.

“link tax”

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
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.

“meme ban”

https://www.wired.co.uk/article/what-is-article-13-article-11-european-directive-on-copyright-explained-meme-ban
When in doubt ask a lawyer
Capturing / Extracting Value

Business models (Where's the money?)

Landgrab

Merchant

PPV, Subscription, Freemium, Shareware, etc

Market

Advertising hoarding

Lotteries and scams
Land grab

Maximise market share now; worry about profitability later

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

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

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

Sells goods or services for more than they cost

Basic to most businesses

Internet technologies add maybe 20% efficiency
  - Disintermediation
  - Lower cost market comms
  - Lower cost order taking
  - Lower cost distribution, especially for informational goods
  - ‘Just in Time’ gives lower cost for stock and inventory
  - Better modelling and control
    - Mexican cement plant example

BUT still must be a sound business!!!
  - Established players may be asleep, but are not dead
PPV or Subscription

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

Subscriptions
  Actuarial calculations
  All you can eat models
  Administration issues - charging model never stays simple!
    Matrix of services and products
    Freebies, promotions, etc

Copying issues
  Provide service
  Street Performer Protocol
Market

Commission on other people's trades
   No stock cost
   Low barriers to entry

Place for buyers and sellers to meet
   eBay, B2B auctions, lastminute.com, bookfinder.com

Liquidity, liquidity, liquidity
   Network effects

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

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

Death of the portal (and maybe rebirth)
Better ways to trade - Platforms

Network effects
  Single marketplace for each class of goods
  Markets illiquid for large trades, inefficient for small trades
  What is a ‘fair market’?

Clearance and settlement
  Issues for very large and very small trades
  Warranties provided by CC & banks
    Dispute resolution
  Bearer certificates?
  Tax and jurisdiction?
  Privacy vs money laundering
Advertising

Typical rate £10 pct (thousand impressions)
   More for personalisation and target adverts
Advertising industry, and advertisers are very conservative
Monitoring

High traffic sites
   ISP home pages
   Need to drive traffic to the site
   Need to refresh site often / build community to keep users returning

Agency sales
   Google, Facebook

Market saturating
   Rates dropping
   Different formats
   Flash inserts; streaming media
   Email, digital TV, etc
Lotteries and Scams

Lotteries: tax on the ignorant
    Poor estimate of low probability events

Premium rate telephone scams
    TV quiz shows and auctions
    Phone this number to win…

Straight frauds
    Ponzi schemes (Pyramid sells)
    Credit card and other personal details
    Telecom scams
    Boiler room operations
Lightweight startups

Virtual office and presence

Licence don’t manufacture

Cloud based resources (e.g. Amazon S3)

Low hanging fruit

Crowd source - Kickstarter
   Establish market
   Pre-sell product

Test assumptions not just predict miracles
E-Commerce - 3

Design and implementation
Web design

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

Get the domain name right
Inventive: business.com vs PlentyOfFish (dating site)

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

Health warning!
www.dokimos.org/ajff/
www.zombo.com
Web design mistakes

Ego: Believing people care about you and your website
   Why are they looking at your site?
   What are they trying to do?
   Do you help them achieve THEIR goals?

Can’t figure out what your website is about in less than four seconds
   www.genicap.com

Mystery Meat
   Navigation you have to roll over
   Zero intelligible
   www.bluebell.com
   www.zombo.com

Too much stuff
   www.arngren.net
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
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
Title confused with keywords
Far too much material
Mixes fonts
Navigational mess
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

Home page

Help
- Search
- Sitemap
- About Us
- Contact

Company

Products
- Product search
- Payment

Services
- Service 1
- Service 2
- Service 3
- Service 4

Support
- Free
- Paid
- Downloads
- Chat

Shortcuts
- Search from every page
- Payment from free support page
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
E-Commerce - 5

Creating a business
Merchant System

Requirements

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

Examples

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

More complex than it seems
confusion pricing

Service levels
matrix

Special cases
government, students, …

Special offers
time limited

<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>
Don’t Just Roll the Dice
A usefully short guide to software pricing
Neil Davidson

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, 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
       JD Sports

Buy your competitor’s brand name
   Ford
       Advert for Toyota dealer

Buy your target
   Nike (Boycott Nike)
   Coke (Killer Coke)
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
ACQUISITION

ACTIVATION

RETENTION

REVENUE

REFERRAL

How do users find you?

Do users have a great first experience?

Do users come back?

How do you make money?

Do users tell others?
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 download page visitors</td>
<td>15141</td>
<td>17.84%</td>
<td>18.4%</td>
</tr>
<tr>
<td>new registrations</td>
<td>4318</td>
<td>5.09%</td>
<td>28.5%</td>
</tr>
<tr>
<td>new trial users</td>
<td>3192</td>
<td>3.76%</td>
<td>73.9%</td>
</tr>
<tr>
<td>new paying user</td>
<td>95</td>
<td>0.11%</td>
<td>3.0%</td>
</tr>
<tr>
<td>cancelled subscriptions</td>
<td>17</td>
<td>0.02%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>
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

Customer Retention Rates by Month and Country

United States

Japan

United Kingdom

Germany
Apps

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

Controlled by vendor
- Limits revenue

Fashion (mostly)
- Top 10 list important
Social Media

Keep in touch

Human face

Consistent voice

Community

Feedback
Platforms

Messaging

Social Network

OS

Browser
Future

Mobile

TV

Clicks and mortar

Multiple devices

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

Content will no longer be free

Pay for E-mail
Conclusions

Invent your future

Go out there and build something

Sell it
Bonus material
Financing e-commerce

Raising money

Valuation

Winners and losers

Futures
Lean startup

Book ‘the lean startup’ by Eric Reis
Minimum viable product
  feedback
Early and frequent customer contact
  build the case that there is a viable market
  low hanging fruit
  ‘the best is enemy of the good’
Analytics
  understand the value to the customer
Virtual company
  fail early and cheaply
Agile engineering

the web makes this possible easier, hackathons, crowdfunding
Sources of finance

<table>
<thead>
<tr>
<th>Source</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family and friends</td>
<td>£50k</td>
</tr>
<tr>
<td>Banks (need security)</td>
<td>£100k</td>
</tr>
<tr>
<td>Angels</td>
<td>£250k - £500k</td>
</tr>
<tr>
<td>Venture capital</td>
<td>£2m - £25m</td>
</tr>
<tr>
<td>IPO</td>
<td>£50m - 250m</td>
</tr>
</tbody>
</table>
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.

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

Would you like to read it?

There's that unwarranted optimism again.
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 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 10Mb/s</td>
<td>high speed network 100Mb/s</td>
<td>Wifi / 4g 100Mb/s</td>
</tr>
<tr>
<td>central datastore</td>
<td>department</td>
<td>individual</td>
<td>Company database Private Network</td>
<td>Data centre</td>
<td></td>
</tr>
</tbody>
</table>