Business Studies
L1 - so you’ve got an idea

Jack Lang and Stewart McTavish
jal1 sam56
What do you want to learn?

Up to three questions email
sam56@cam.ac.uk
41,890,320
280 ventures
90 member - 190 alumni

raised >£20m
raised >£5m
raised >$5m
raised >$10m
raised >$19m
raised >$7.5m
raised >$7m
raised >$2.5m
raised >$2m
raised >$2.5m
raised undisclosed
raised undisclosed
raised undisclosed
acquired undisclosed
acquired undisclosed
acquired undisclosed
acquired reported $150m
IPO Nov 2016
market cap ~£55m
why we do this

Try to encourage you to realise that you can change the world in big or small way (and make money doing it)

Expose you to people that have been in your position and are doing it

Highlight some of the key concepts and pieces of knowledge to help you do that
ideas to take to heart

Business is about the people

Trust networks are real and important

The job of an entrepreneur is to reduce risk by reducing uncertainty in a business proposition
CAMBRIDGE CLUSTER
EUROPE’S MOST SUCCESSFUL TECHNOLOGY CENTRE

50 years since inception, Cambridge is the oldest and most powerful cluster in Europe. Set against the backdrop of the University of Cambridge, the cluster has evolved into one of the world’s most enterprising networks of people and companies, with an explosion of technology, life sciences and service companies that has occurred in the city since 1962.

① Cambridge has over 1,525 TECH COMPANIES
② Employing more than 53,000 PEOPLE
That’s enough to stretch hand-in-hand from Silicon Roundabout to Cambridge
③ These companies had combined turnover of £11.8bn in 2011

④ Gross Valued Added per job is:
£45k Cambridge
£35k London
⑤ 6% of all SMEs produced 54% of jobs in the UK over the past 7 years
⑥ Market capitalisation generated is:
£50bn
⑦ Unemployment status is:
2.1% Cambridge
7.8% London
⑧ Scaling up companies generate:
Jobs
Top 50 companies hired 5901 people in the past year
UP 23.2%
Wealth
Top 50 companies increased their revenue by £1.3bn
UP 17.6%
⑨ 12 companies in Cambridge have achieved $1 billion valuations in the last 15 years:
Abcam, ARM, Autonomy, AVEVA, CAT, Chiroscience, CSR, Domino, Ionica, Marshall, Solexa, Virata.
“Chapter I - The Period

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way--in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.”
Definition of GDP - per capita (PPP): This entry shows GDP on a purchasing power parity basis divided by population as of 1 July for the same year.

Source: CIA World Factbook - Unless otherwise noted, information in this page is accurate as of June 30, 2015
Global growth incidence curve, 1988–2008

Y-scale displays the growth rate of the fractile average income (in 2005 PPP US$). Weighted by population.

Growth incidence evaluated at quintile groups (e.g. bottom 20%), top quintile is split into top 1% and 4% between P95 and P99.

The horizontal line shows the growth rate in the mean of 3.54% (1.1% p.a.).

US Credit Market Debt

Total Credit Market Debt as a Percent of GDP
<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>% of GDP</th>
<th>2015 Public Government Debt ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Japan</td>
<td>248%</td>
<td>$10,083</td>
</tr>
<tr>
<td>2</td>
<td>Greece</td>
<td>177%</td>
<td>347</td>
</tr>
<tr>
<td>3</td>
<td>Lebanon</td>
<td>138%</td>
<td>68</td>
</tr>
<tr>
<td>4</td>
<td>Italy</td>
<td>133%</td>
<td>2,342</td>
</tr>
<tr>
<td>5</td>
<td>Portugal</td>
<td>129%</td>
<td>257</td>
</tr>
<tr>
<td>6</td>
<td>Jamaica</td>
<td>120%</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Cyprus</td>
<td>109%</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Belgium</td>
<td>106%</td>
<td>478</td>
</tr>
<tr>
<td>9</td>
<td>United States</td>
<td>105%</td>
<td>18,870</td>
</tr>
<tr>
<td>10</td>
<td>Singapore</td>
<td>105%</td>
<td>302</td>
</tr>
<tr>
<td>11</td>
<td>Spain</td>
<td>99%</td>
<td>1,124</td>
</tr>
<tr>
<td>12</td>
<td>France</td>
<td>96%</td>
<td>2,236</td>
</tr>
<tr>
<td>13</td>
<td>Jordan</td>
<td>93%</td>
<td>33</td>
</tr>
<tr>
<td>14</td>
<td>Canada</td>
<td>91%</td>
<td>1,335</td>
</tr>
<tr>
<td>15</td>
<td>United Kingdom</td>
<td>89%</td>
<td>2,458</td>
</tr>
<tr>
<td>16</td>
<td>Egypt</td>
<td>89%</td>
<td>280</td>
</tr>
<tr>
<td>17</td>
<td>Croatia</td>
<td>87%</td>
<td>40</td>
</tr>
<tr>
<td>18</td>
<td>Austria</td>
<td>86%</td>
<td>302</td>
</tr>
<tr>
<td>19</td>
<td>Slovenia</td>
<td>83%</td>
<td>30</td>
</tr>
<tr>
<td>20</td>
<td>Ukraine</td>
<td>80%</td>
<td>37</td>
</tr>
</tbody>
</table>

Source: IMF
Note: Ranking excludes countries with public debt less than $10B in 2015. Public debt includes federal, state and local government debt but exclude unfunded pension liabilities from government defined benefit pension plans and debt from public enterprises and central banks.
USA Public Debt / GDP Level = 7th Highest vs. Major Economies

<table>
<thead>
<tr>
<th>Country</th>
<th>% of GDP</th>
<th>2017 ($)</th>
<th>Country</th>
<th>% of GDP</th>
<th>2017 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>240%</td>
<td>$12,317</td>
<td>Egypt</td>
<td>101%</td>
<td>$199</td>
</tr>
<tr>
<td>Greece</td>
<td>180%</td>
<td>403</td>
<td>Spain</td>
<td>99%</td>
<td>1,412</td>
</tr>
<tr>
<td>Lebanon</td>
<td>152%</td>
<td>80</td>
<td>France</td>
<td>97%</td>
<td>2,730</td>
</tr>
<tr>
<td>Italy</td>
<td>133%</td>
<td>2,798</td>
<td>Jordan</td>
<td>96%</td>
<td>39</td>
</tr>
<tr>
<td>Portugal</td>
<td>126%</td>
<td>301</td>
<td>Bahrain</td>
<td>91%</td>
<td>31</td>
</tr>
<tr>
<td>Singapore</td>
<td>111%</td>
<td>362</td>
<td>Canada</td>
<td>90%</td>
<td>1,482</td>
</tr>
<tr>
<td><strong>USA</strong></td>
<td><strong>108%</strong></td>
<td><strong>20,939</strong></td>
<td>UK</td>
<td>89%</td>
<td>2,532</td>
</tr>
<tr>
<td>Jamaica</td>
<td>107%</td>
<td>16</td>
<td>Mozambique</td>
<td>88%</td>
<td>12</td>
</tr>
<tr>
<td>Cyprus</td>
<td>106%</td>
<td>24</td>
<td>Ukraine</td>
<td>86%</td>
<td>92</td>
</tr>
<tr>
<td>Belgium</td>
<td>104%</td>
<td>561</td>
<td>Yemen</td>
<td>83%</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: IMF 2017 Estimates Note: Ranking excludes countries with public debt less than $10B in 2015. Public debt includes federal, state and local government debt but excludes unfunded pension liabilities from government defined-benefit pension plans and debt from public enterprises and central banks. FX rates as of 3/28/16.
Gold Prices - 100 Year Historical Chart

Interactive chart of historical data for real (inflation-adjusted) gold prices per ounce back to 1915. The series is deflated using the headline Consumer Price Index (CPI) with the most recent month as the base. The current month is updated on an hourly basis with today's latest value. The current price of gold as of October 23, 2017 is $1,278.30 per ounce.

http://www.macrotrends.net/1333/historical-gold-prices-100-year-chart
Global VC funds’ annualized cashflows by year

Source: PitchBook
*As of 3/31/2017
Global venture-backed exit activity

Source: PitchBook
Angel & seed deal value has slowly crept back toward highs of 2015

US angel & seed activity

PitchBook-NVCA Venture Monitor
Exit times lower slightly in 2018

Median and average time (years) to exit


Average
Median

6.5
6.0
5.5
5.0
4.5
4.0

PitchBook-NVCA Venture Monitor
*As of June 30, 2018
Human-Computer Interaction (1830s – 2015), USA = Touch 1.0 → Touch 2.0 → Touch 3.0 → Voice

- Punch Cards for Informatics (1832)
- QWERTY Keyboard (1872)
- Electromechanical Computer (23) (1941)
- Electronic Computer (ENIAC) (1943)
- Paper Tape Reader (Harvard Mark I) (1944)

- Mainframe Computers (IBM SSEC) (1948)
- Trackball (1952)
- Joystick (1967)
- Microcomputers (IBM Mark-8) (1974)
- Portable Computer (IBM 5100) (1975)

- Commercial Use of Window-Based GUI (Xerox Star) (1981)
- Commercial Use of Mouse (Apple Lisa) (1983)
- Touch + Camera - based Mobile Computing (iPhone 2G) (2007)

- Voice on Mobile (Siri) (2011)
- Voice on Connected / Ambient Devices (Amazon Echo) (2014)

Source: University of Calgary, "History of Computer Interfaces" (2014).
but what’s next
Outline Synopsis

1. So you’ve got an idea…
2. Money and Tools for it’s management
3. Legal aspects, contracts and copyright
4. People: How to organise a team
5. Project planning and management
6. Quality, maintenance and documentation
7. Marketing and Selling
8. Growth and Exit routes

Next term e-commerce, apps, electronic money, block chain, etc and 6 seminars in Easter term
Reading list

The High-tech Entrepreneur's Handbook
Jack Lang

Paperback - 224 pages (2 November, 2001)

Students will be expected to able to use Microsoft Excel and Microsoft Project
Lecture 2

Useful websites
www.bvca.co.uk
www.etrade.co.uk
www.londonstockexchange.com
Lecture 3

Useful websites
www.patent.gov.uk
www.jordans.co.uk
Lecture 4

Useful software
Microsoft Project
Lecture 5
Lecture 6

Useful websites
www.standards.ieee.org
How to Start a Startup (Stanford Course: CS183B)

Michael Babich • 20 videos - 97,520 views - Last updated on 9 Jun 2015

Sam Altman and the folks from Y Combinator offer up an amazing course in "How To Start A Startup" at Stanford. Course includes lectures from: Sam Altman, Dustin Moskovitz, Paul Graham, Arron Cheung, Peter Thiel, Alex Schultz, Kevin Harte, ... more

1. Lecture 1 - How to Start a Startup (Sam Altman, Dustin Moskovitz)
   by How to Start a Startup
   43.53

2. Lecture 2 - Team and Execution (Sam Altman)
   by How to Start a Startup
   46.16

3. Lecture 3 - Before the Startup (Paul Graham)
   by How to Start a Startup
   48.08

4. Lecture 4 - Building Product, Talking to Users, and Growing (Adora Cheung)
   by How to Start a Startup
   52.22

5. Lecture 5 - Competition is for Losers (Peter Thiel)
   by How to Start a Startup
   50.17

6. Lecture 6 - Growth (Alex Schultz)
   by How to Start a Startup
   47.28

7. Lecture 7 - How to Build Products Users Love (Kevin Harte)
   by How to Start a Startup
   48.02

8. Lecture 8 - How to Get Started, Doing Things that Don't Scale, Press
   by How to Start a Startup
   52.14

9. Lecture 9 - How to Raise Money (Marc Andreessen, Ron Conway, Parker Conrad)
   by How to Start a Startup
   50.11

10. Lecture 10 - Culture (Brian Chesky, Alfred Lin)
    by How to Start a Startup
    50.26
Technology-enabled Blitzscaling

Greylock Partners • 20 videos • 49,744 views • Last updated on 7 Dec 2015
Class recordings from Stanford CS183C: Technology-enabled Blitzscaling.

1. Blitzscaling 01: Overview of the Five Stages of Blitzscaling
   by Greylock Partners [1:12:51]

2. Blitzscaling 02: Sam Altman on Y Combinator and What Makes The Best Founders
   by Greylock Partners [1:12:26]

3. Blitzscaling 03: Michael Dearing on Capitalism, Creativity, and Creative Destruction
   by Greylock Partners [1:19:36]

   by Greylock Partners [1:12:37]

5. Blitzscaling 05: John Lilly on Leveraging Community to Scale Mozilla
   by Greylock Partners [1:14:36]

6. Blitzscaling 06: Jennifer Pahlka on Founding Code For America and Starting the US Digital Service
   by Greylock Partners [1:02:18]

7. Blitzscaling 07: Mariam Naficy on Lessons From The Dot Com Days and Knowing When To Blitzscale
   by Greylock Partners [1:12:43]

8. Blitzscaling 08: Eric Schmidt on Structuring Teams and Scaling Google
   by Greylock Partners [1:22:39]

9. Blitzscaling 09: Reid Hoffman and Allen Blue on Why and How They Scaled LinkedIn
   by Greylock Partners [1:20:13]

    by Greylock Partners [1:21:33]

11. Blitzscaling 11: Patrick Collison on Hiring at Stripe and the Role of a Product-Focused CEO
    [1:18:17]
Course Syllabus

WEEK 1
Introduction to the Course
Startup Legal Mechanics
How to Succeed with a Startup
A Conversation with Paul Graham

WEEK 2
Building Product
Finding Product Market Fit - Case Study
A Conversation with Oshma Gag

WEEK 3
How to Get Users and Grow
How to Measure Your Product
A Conversation About Crypto-currencies and ICOs with Andy Bromberg

WEEK 4
Design for Startups Part 1
PR and Content for Growth
Design for Startups Part 2
A Conversation with Aileen Lee

WEEK 5
How to Sell

WEEK 1

Introduction to the Course

YC Partners Adora Cheung and Geoff Ralston introduce Startup School 2018.

Correction: The week turns over on Sunday 11:59pm Pacific. The first weekly progress update is due Sept 2 11:59pm Pacific. Weekly progress updates are due by Sunday 11:59pm Pacific every week.
1. So you've got an idea...

Introduction
Why are you doing it?
What is it? defining the product or service; types of company
Who needs it? an introduction to market analysis
How? Writing the business plan
Futures: some emerging areas for new computer businesses
One of you will become a Billionaire

• Most will be millionaires
  – And need to be
    – Pension issue
      • Say household income of £50K @ 4% -> £1.25M
      • Inflation for 40 year @ 3% -> x 3 -> £3.75M
      • House, etc say £250K -> 750K
      • Total £4.5M

• You won’t save £4.5M from a salary
  – Trading
  – Starting an Enterprise
Why?

Why now?
- Because I can: available time and resource
- Just graduated, or made redundant and nothing else to do
- Brilliant idea or market opportunity

Why me?
- Barriers to market entry
  - What have you got to make it through?
    - Expertise, resource, relationships
- Barriers to competition
  - What stops others doing the same thing
    - IPR, network effect, niche
- Unique advantages

Know yourself
- Know your motivation so you can motivate others
  - What counts as success?
Never a better time to start than NOW

- **Money**
  - Cambridge Angels, Cambridge Capital....

- **Support**
  - St Johns, Cambridge Enterprise....

- **Infrastructure**
  - Banks, lawyers, accountants
  - Office space

- **People**
  - Cambridge Network, mentors...

- **Government**
  - EIS Tax relief, TSB Awards, SFLGS/ Enterprise Finance Guarantee....
  - Princes Trust

- **Society attitude**
  - OK to lose,
    - “Better to have loved and lost than never loved at all”

- “Dare to Begin” (Horace)
  - Nothing will be attempted if all possible objections must be overcome (Samuel Johnson)
Why are you doing it?

• Wealth generation
  – You need £5M by the time you retire, for a modest lifestyle

• Better toys

• Make a difference
  – Social consequences
    • Generation of employment
    • Death of the nation state

• Fun or profit?
  – Lifestyle or high growth?
    • Funding
    • Eventual size?
An Entrepreneur is...

- Someone who starts a project without having the full resources or knowledge
  - Estimate, guess and gut feel
  - Risk taking
    - Market risk
    - Technology risk
    - Financial risk
- Value accrues as risk lessens
  - Guesses replaced by justified facts
  - As development progresses and market established
  - Transition from intangible hopes to reality and cash-flow
  - Risk lessens, hence value increases
Example

• (Almost) Risk Free return, eg Bank:
  – say 5% or P/E 20
  – after 1 year 100 -> 105

• Invest in companies, say 30% chance of failure:
  – After 1 year average return is $0.7(100+x)$ where $x$ is the IRR
  – For equivalent return $0.7(100+x) = 105$
  – $x=50\%$
Your job as an entrepreneur is to discover and build a business (& sell it)
High Profit vs High Growth

- High Profit
- Lifestyle
  - Restaurant/shop
- P&L
- Organic Growth
  - 20 years
- Debt finance

- High Growth
- Sell the Company
  - Chain of Restaurants/shops
- Balance Sheet
- Investment
  - Exit route
  - 5 years
- Equity
- BUT
  - Fairy Godmothers now extinct
  - Raise enough cash to get to profitability and survive
## Investor Criteria for a business

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Global sustainable under-served market need</td>
</tr>
<tr>
<td>Technical</td>
<td>Defensible technological advantage</td>
</tr>
<tr>
<td>People</td>
<td>Strong team</td>
</tr>
<tr>
<td>Financial</td>
<td>Believable plans, 60% IRR</td>
</tr>
<tr>
<td>Major Risks</td>
<td>Framework to understand and manage.</td>
</tr>
<tr>
<td></td>
<td>What do you know?</td>
</tr>
<tr>
<td></td>
<td>What do you know you don’t know?</td>
</tr>
<tr>
<td></td>
<td>How will you discover the things you don’t know you don’t know?</td>
</tr>
</tbody>
</table>
Market Need

- Largest risk factor: everything else is process or resource
- Who needs it?
  - Why?
    - Why do they need yours??
      - What are they doing now?
      - How much is it worth to them?
  - How is it sold, or advertised?
    - Routes to market
    - Alliances
    - Branding
  - Under served need
    - Competition
    - What other solutions?
  - Sustainable or one-shot wonder?
  - Growing market
    - Global potential
Global
Sustainable
Under-Served
Market Need
Market - who loves ya?

it's FAB because

**Feature** - techie speak
this chip uses a double super helical foolefarg

**Advantages** - the translation step
it uses less power, gives you more speed

**Benefits** - customer speak
it is cheaper, smaller, works better in marginal conditions, batteries last longer

because *your friends will be envious*
why people really buy it
Defensible advantage

Exclude competition
- Intellectual Property
- Asset monopoly

Outcompete
- Network effect
- Scale faster
- Company culture
Defensible technological advantage

• IPR
  - Patent
  - Copyright
  - Trademark

• Defensible technological leadership
  - against well-funded competition
  - Niche Market share
## Senior Team

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

- You can’t do it all by yourself
  - “Small” project >10 person-year
  - Team building
  - 1:3:10 rule

- Alliances

- Recruit experience
  - Financial Director
  - Sales & Marketing

- Training & experience
  - Merchant bank/Management Consultancy
  - MBA
Believable Plans

• Business Plan
• Development Plan
• Marketing plan
  – Adverts, mail shots, web-sites
• Sales Plans
  – Distribution, Direct Sales
• Quality Plans
• Financial Projections
  – Budget
    • 60% IRR
      – Pay back financing in third year
  – Cash flow
Writing the Business Plan

Executive Summary and funding requirement
1. Concept
2. The Market
   3.1 Global market size and need
   3.2 Sustainability
   3.3 Competition
   3.4 Marketing plans
4. The Team
   4.1 CEO
   4.2 CTO
   4.3 CFO
   4.4 VP Sales and Marketing
5. The technology and its IPR
6. Summary of plans
   6.1 Development plans
      6.1.1 Methodology
      6.1.2 Milestones
   6.2 Marketing
   6.3 Sales and distribution
   6.4 Quality and industry standards
7. Financials
Appendices:
Financial model
Key staff
Letters of support
Correspondence 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 hodgepodge of unwarranted optimism encased in an impenetrable fortress of buzzwords.

Would you like to read it?

There's that unwarranted optimism again.
where do you want to fit in?
2. Money and Tools for it's management

- Introduction to accounting
  - Profit and Loss
  - Cash flow
  - Balance Sheet
  - Budgets
- Sources of finance
- Stocks, Shares, Futures and Options
Introduction to accounting

• Why have accounts?
  – Instruments on the dashboard of the company
  – To control, you must first measure
  – Statutory duty

  – DO THE BUDGET
  – COMPARE WITH REALITY
Legal requirements;

- Keep proper books of account
- Annual audit
- Solvency
Double entry

- TERMS “Debits and Credits”
  - Debit: to receive. Income Owed to the company
  - Credit: to give. Outgoings. Owed by the company
- Ledgers and balances
- Accountancy programs e.g. Sage, Xero

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Amount</th>
<th>Date</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEBIT SIDE</td>
<td></td>
<td></td>
<td>CREDIT SIDE</td>
<td></td>
</tr>
</tbody>
</table>
Vertical Format

Income
  Sales
  Interest
  TOTAL Income

Expenditure
  Cost of goods
  Salaries
  Overheads
  Marketing
  TOTAL Expenditure
  Profit
if you form a limited company

the business is not you and you are not the business

so your money is not the business’s

and the business’s money is not yours
# Accounts

## Profit & Loss Account

<table>
<thead>
<tr>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Goods Sold (all goods for resale</td>
<td>Sales (invoices raised etc)</td>
</tr>
<tr>
<td>minus any stock left at the time)</td>
<td></td>
</tr>
<tr>
<td>Expenses (all the costs including wages)</td>
<td></td>
</tr>
<tr>
<td>Profit (always a balancing figure)</td>
<td></td>
</tr>
</tbody>
</table>

## Balance Sheet

<table>
<thead>
<tr>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Assets (eg Computer, Car)</td>
<td>Creditors (people you owe money)</td>
</tr>
<tr>
<td>Debtors (people who owe you money)</td>
<td>Loans (banks you owe money)</td>
</tr>
<tr>
<td>Stock (goods for resale)</td>
<td>Capital (the money you put in)</td>
</tr>
<tr>
<td>Bank (assuming a positive balance)</td>
<td>Retained Profit (the profit made so far)</td>
</tr>
</tbody>
</table>
Interlinking of Accounts

Diagram:
- Trade and other Debtors
- Sales and other income
- Capital
- Drawings
- Cash and Bank Balances
- Stock and assets
- Trade and other creditors
- Purchases
Account Example 1

Open a bank account with £1,000 to start your business
  • Debit: Bank £1,000
  • Credit: Capital £1,000

Go to market and write a £600 cheque for some Mushrooms
  • Debit: Stock £600
  • Credit: Bank £600 [We could say Debit: Bank -£600 but instead we copy what real Accountants do with minus numbers and change Debit to Credit]

Quick check on the bank
  • We put in £1,000 in and spend £600 leaves £400
    In accounting speak Debit £1,000 then Credit £600 leaves Debit £400
Account Example 2

Door to door we sell half the Mushrooms for £700 which we pay into the bank
- Debit: Cost of Goods Sold £300 (half of £600)
- Credit: Stock £300 (reducing stock for what we sold)
- Debit: Bank £700
- Credit: Sales £700

We can do some accounts

<table>
<thead>
<tr>
<th>Profit and Loss Account</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Goods Sold £</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Profit (=balance) £</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>700</td>
<td>700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock £</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Bank £</td>
<td>1100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>1400</td>
<td>1400</td>
</tr>
</tbody>
</table>
Account Example 2

The mushrooms are looking old - We sell the remainder to a caterer for £350
- Debit: Cost of Goods Sold £300 (the remainder of the stock)
- Credit: Stock £300
- Debit: Bank £350
- Credit: Sales £350

We can do some accounts

<table>
<thead>
<tr>
<th>Profit and Loss Account</th>
<th></th>
<th>Sales</th>
<th>£</th>
<th>1050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Goods Sold</td>
<td>£600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit (=balance)</td>
<td>£450</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>£1050</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock</td>
<td>£0</td>
<td>Capital</td>
<td>£</td>
<td>1000</td>
</tr>
<tr>
<td>Bank</td>
<td>£1450</td>
<td>Retained Profit</td>
<td>£</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>£1450</td>
<td></td>
<td></td>
<td>1450</td>
</tr>
</tbody>
</table>
Principles of Accounting 1

• Boundaries
  – Entity
  – Periodicity
  – Going concern
  – Quantative

• Ethics
  – Prudence - if in doubt, understate profits, overstate losses
  – Consistent - use the same rules throughout
  – Objective - avoid personal preference
  – Relevance “True and fair”
Principles 2

- Measurement
  - Money
  - Consistent cost basis
  - Realisation
  - Consistent time basis
  - Double entry
  - Materiality
# Example P&L Budget

<table>
<thead>
<tr>
<th>Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>12 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
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<td>100,000</td>
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</tr>
<tr>
<td><strong>Expenditure</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Programmers</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Overheads</td>
<td>5,000</td>
<td>5,000</td>
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<td>5,000</td>
<td>5,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>0</td>
<td>60,000</td>
</tr>
<tr>
<td><strong>Profit in the month</strong></td>
<td>20,000</td>
<td>-10,000</td>
<td>20,000</td>
<td>-10,000</td>
<td>-10,000</td>
<td>20,000</td>
<td>0</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Profit to date</strong></td>
<td>20,000</td>
<td>10,000</td>
<td>30,000</td>
<td>20,000</td>
<td>10,000</td>
<td>30,000</td>
<td>30,000</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Page 97 of 289
Welcome to a discussion space for the CST Business Studies course. Feel free to post questions, thoughts and comments.

Over the coming weeks we'll post answers and thoughts to questions submitted by email.

Edit welcome message  Clear welcome message
## Example P&L Budget

<table>
<thead>
<tr>
<th>Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>12 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
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<td><strong>Expenditure</strong></td>
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<tr>
<td><strong>Total Costs</strong></td>
<td>10,000</td>
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<td>10,000</td>
<td>10,000</td>
<td>0</td>
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<tr>
<td><strong>Profit in the month</strong></td>
<td>20,000</td>
<td>-10,000</td>
<td>20,000</td>
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<td>-10,000</td>
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</table>
## Example Cashflow

<table>
<thead>
<tr>
<th>Month</th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
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<th>Total</th>
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</tr>
<tr>
<td><strong>Total Costs</strong></td>
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<tr>
<td><strong>Profit in the month</strong></td>
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</tr>
<tr>
<td><strong>Profit to date</strong></td>
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</table>
# Revised Cashflow

<table>
<thead>
<tr>
<th>Month</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
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<td><strong>Income</strong></td>
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</tr>
<tr>
<td><strong>Expenditure</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Programmers</strong></td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
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<td>40,000</td>
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</tr>
<tr>
<td><strong>Overheads</strong></td>
<td>5,000</td>
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<td>5,000</td>
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<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>5,000</td>
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<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
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<td>80,000</td>
<td></td>
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</tr>
<tr>
<td><strong>Profit in the month</strong></td>
<td>-5,000</td>
<td>-10,000</td>
<td>20,000</td>
<td>-10,000</td>
<td>-10,000</td>
<td>20,000</td>
<td>-10,000</td>
<td>-5,000</td>
<td>30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Profit to date</strong></td>
<td>-5,000</td>
<td>-15,000</td>
<td>5,000</td>
<td>-5,000</td>
<td>-15,000</td>
<td>-25,000</td>
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<td>-15,000</td>
<td>10,000</td>
<td>20,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>
**Example Balance Sheet as at the beginning of Month 9**

<table>
<thead>
<tr>
<th>Fixed Assets</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
<td>3,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Assets</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-in-Progress</td>
<td>10,000</td>
<td>retainer, not yet invoiced</td>
</tr>
<tr>
<td>Trade Debtors</td>
<td>30,000</td>
<td>Amount invoiced, but not yet paid</td>
</tr>
<tr>
<td>Cash</td>
<td>0</td>
<td>Normally there would be some petty cash</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Less: Current Liabilities</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Creditors</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Bank Overdraft</td>
<td>15,000</td>
<td></td>
</tr>
</tbody>
</table>

| Net current assets       | 33,000 |   |

<table>
<thead>
<tr>
<th>Representing</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietors Capital</td>
<td>13,000</td>
<td>The proprietor paid for the computers etc.</td>
</tr>
<tr>
<td>Plus: Accumulated Profit</td>
<td>20,000</td>
<td></td>
</tr>
</tbody>
</table>
Tests

Liquidity Ratios
- Current Assets
- Acid tests

Investment Ratios
- P/E ratio
- Gearing
- Earnings per share

Profitability Ratios
- Return On Investment
- Gross Profit
- Net Profit
- Mark up

Efficiency Ratios
- Stock turnover
- Asset turnover
- Debtor collection period
- Creditor payment period
Ratios

• Current ratio
  – Current Assets / Current Liabilities
    • Measures liquidity
    • < 1 indicates potential cash flow problems

• Acid test (Quick Health check)
  – (Current Assets - Stocks) / Current liabilities
    • Stocks may not be able to be sold quickly
    • Similar to Current Ratio, but shorter term

• Gearing
  – Net Borrowings / Shareholders’ Funds
    • Reliance on borrowings
    • Vulnerability to interest rate rises

• Return on Investment
  – Profit before Tax / Shareholders Funds
    • Efficiency - 40% for sustainable high growth
Budgeting

- Assumptions
  - “Pessimistic realism”
  - Tell the truth - know the worst
- Sensitivity analysis
- Comparison with actual
- Update!!
Debt and Equity

• Debt
  – Loan
    • Credit card, Overdraft, Mortgage, Student Loan, Debenture, Bond etc
    • Interest rates, term, conditions, collateral
    • Repay the same amount regardless performance

• Equity
  – Share of the company
  – Return depends on the performance of the company
    • Can be expensive money
    • Can be valueless if the company folds
    • Only valuable on an exit (sale, IPO etc)
      – Preference shares may have other conditions such as liquidation ratios attached

• Convertible Debentures
• Redeemable Preference Shares
How much will I need?

• DO THE BUDGET

• Working assumption no income for 1st year
  – One man band, working from home   £100,000
  – 5 people, office etc             £1M
  – 20 people, small factory        £5M
  – Game, software package          $5M
  – New complex chip                $100M
“Winter is Coming” message received by portfolio companies

https://www.slideshare.net/msuster/upfront-vc-analysis-2016/17-17Winter_isComingmessagereceived_byportfoliocompanies
Michael Beckwith, Sequoia Capital

OUR TAKE

MANAGE WHAT YOU CAN CONTROL
SPENDING
GROWTH ASSUMPTIONS
EARNINGS ASSUMPTIONS

FOCUS ON QUALITY

LOWER RISK

REDUCE DEBT

Early revenue
Low hanging fruit, Quick wins
Cash flow positive first, expansion later
Lightweight Companies

• Many computer companies need little capital to start
  – Virtual office
  – Spare time or labour for shares
  – Advanced payment from customers
    • Development clubs, Government/EU grants
    • Crowd funding

• Fail early, Fail often
  – Find the market
Sources of finance

• Family and friends £50K
  – Banks
    • Security
• Angels £500K
• Venture Capitalists £5M
  – VCA
  – VCB $25M
  – Mezzanine
• Stock Market floatation $250M
  – Acquisition
  – Exit

FAIRY GODMOTHERS ARE NOW EXTINCT!
Why stages?

- Risk/Reward profile differ
- Successive dilution
- Typically 30% dilution each stage
  - Investment = pre-money valuation/2
  - “Squeeze the Angels”

<table>
<thead>
<tr>
<th>Round</th>
<th>Investment</th>
<th>Pre-money</th>
<th>Post-money</th>
<th>Founders and staff options</th>
<th>FFF</th>
<th>Angel</th>
<th>VCA</th>
<th>VCB</th>
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</thead>
<tbody>
<tr>
<td>FFF</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td></td>
<td>67%</td>
<td>33%</td>
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<tr>
<td>Angels</td>
<td>500</td>
<td>1000</td>
<td>1500</td>
<td></td>
<td>44%</td>
<td>22%</td>
<td>33%</td>
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<tr>
<td>VCA</td>
<td>5000</td>
<td>10000</td>
<td>15000</td>
<td></td>
<td>30%</td>
<td>15%</td>
<td>22%</td>
<td>33%</td>
</tr>
<tr>
<td>VCB</td>
<td>10000</td>
<td>20000</td>
<td>30000</td>
<td></td>
<td>20%</td>
<td>10%</td>
<td>15%</td>
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<td>Total</td>
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<td>Exit</td>
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<td>10000</td>
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</tr>
<tr>
<td>All</td>
<td>15550</td>
<td>100</td>
<td></td>
<td></td>
<td>0.64%</td>
<td></td>
<td></td>
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</tbody>
</table>
UK Company types

- Sole Trader
- Partnership
- Private company
- Limited Private Company (Ltd)
- Public limited company (plc)
- Listed company
- Special cases (e.g. Trusts, Societies)
Stocks and Shares

• Shares
  – Ordinary and preference
  – Voting and dividend rights
  – Critical amounts (for normal Table A companies)
    • 25+% Blocks “Substantive” resolutions
    • 50+% Day-to-day control
    • 75+% Total control
    • Other trigger points for public companies
  – Other rights and Coupons
  – Directors accountable to shareholders
Buying and Selling Shares

- Illegal to advertise unless a member of an SRO (e.g. Broker),
- Private company usually requires Board approval
  - Stamp Duty 0.5%
- Public company:
  - Primary market: Floatation
  - Shares traded on a public exchange
    - Listing: admitted to the Official List (UK: LSE)
  - Secondary market
    - Settlement
    - Illegal to use or divulge inside knowledge
  - Bull market: upward trend
  - Bear market: downward trend
- Capital Gains Tax
Options and Futures

• Contracts to buy or sell at a fixed price at some future date
  – Typically 10%
  – Futures: Must complete as specified
  – Options: Completion optional
    • Option and future contracts can be traded

• Gambling - leave it to the professionals
  – Spread-betting www.igindex.com

• Markets are largely stochastic - no system
  – Frauds:
    • Ponzi
    • Boiler room
Fraud?

Cambs firm slated over share hike

BAD PRESS has hit Cambridgeshire varicose veins firm DioMed. The company, which is listed on the U.S. Nasdaq exchange, has become a target for the New York Post. The paper claims the company, originally a spin-out from Generics Group at Harston, is enjoying an unwarranted hike in its share price following the efforts of a stock promoter who has a large holding stashed away in the Cayman Islands.

"DioMed is exactly the sort of stock that should send any normal person fleeing the room at the mere mention of its name: suspect auditor (Andersen in the U.S.), offshore accounts, weird product, teeny-weeny revenues, board members with back stories -- this stock's got it all, the complete package," the New York Post says.

DioMed's share price has risen more than 200 per cent to $7 this year, the greatest gain of any listed stock on Wall Street in this period.

CEN 27th Mar 2002
Hewlett-Packard agrees deal to buy Autonomy for £7.1bn

19 August 2011  Business

Hewlett-Packard is to buy UK software firm Autonomy for £7.1bn ($11.7bn).

The offer, which has been accepted by Autonomy’s board, is 64% above the firm’s market value.

It came as the US company announced a massive strategic shake-up, involving stopping making hardware in order to refocus on software.

Shares in HP spiked as rumours of the various news - now confirmed by HP - broke, but the firm eventually ended the day down 7.6%.

That came on top of a 3.9% fall on Tuesday that was prompted by a warning from rival Dell that it expected demand in the US market to weaken in the coming months.

‘Positive for UK’

Autonomy was set up by researchers at Cambridge University and specialises in pattern-recognition technologies.

Founder Mike Lynch, whose 8.2% stake could be worth several hundred million dollars, has pledged to vote for the deal, told the BBC: “HP understands the special culture we have. This is about building Autonomy. It will be a positive thing for Cambridge and the UK.”

HP will pay 2,550 pence per share, compared with a closing price in London on Wednesday of 1,558p.

The implied valuation of the company is equivalent to 47 times the pre-tax profits earned by Autonomy in the 12 months to June this year.
Hewlett-Packard unveils details of $5bn Autonomy fraud case

US firm claims Mike Lynch inflated revenues by $700m, but Autonomy founder says HP has failed to produce ‘smoking gun’

Hewlett-Packard has unveiled full details of its $5bn (£3.3bn) fraud case against the founder of the UK software company Autonomy, claiming that Mike Lynch inflated the revenues of his business by about $700m over a two-and-a-half-year period.

HP, which bought Autonomy in 2011 for $11bn, has filed a claim against Lynch and his finance director, Shobhan Hussain, in the high court in London, alleging...
Autonomy founder Mike Lynch sues HP for $160m over fraud claims

HP has accused Mike Lynch and Autonomy's chief financial officer of accounting fraud that forced it to write down the value of the deal by $8.8bn

By Christopher Williams, in San Francisco
9.17PM BST 01 Oct 2015

Mike Lynch, the founder of Autonomy, has sued Hewlett-Packard for more than $160m over the allegations of massive fraud it has levelled against him.

He challenged Meg Whitman, the Silicon Valley giant's chief executive, to a High Court showdown over the disastrous takeover of the FTSE 100 software company.

In his counterpunch to HP's own $5.1bn damages claim, Dr Lynch accused HP of using "extortion and manipulation" to secure the Autonomy acquisition.

http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/electronics/11905834/Autonomy-founder-Mike-Lynch-sues-HP-for-160m-over-fraud-claims.html
Crowd Funding

• Preselling
  – Street Performer
  – Need a prototype or good mockup

• Kickstarter, Indiegogo
  – https://www.kickstarter.com/
  – https://www.indiegogo.com/

• Up to £1m
How much is it worth?

- **Market value**
  - What someone will pay
  - Comparisons

- **Utility value**
  - Customers, lock in, staff, technology
  - Cost to reproduce

- **Asset Value**
  - Often small for startups
    - Not what it cost
  - IPR

- **NPV**
  - Net present value of future profit
  - EBITDA

- **DCF**
  - Discounted cash flow – maybe easier to estimate

- **Statistical models**
  - Black – Scholes
Disclaimer

ftaod tinla
jinal
sinal
twasnl
wdeptoti
flaaal
bhtswhraaaspliifyf
3. Setting up: Legal aspects

Setting up: Company Formation

Brief introduction to business law; duties of Directors

Shares, stock options, profit share schemes and the like

IPR
Company formation

Legal entity

Purchase
- Solicitor
- Agent (website)
- Mem and Arts; Objectives; Share conditions

Company books
- Minute book: initial resolutions
- Appointment of Bank, Auditors, insurance
- Employee handbook
Company formation 2

Register company, directors and shareholders

Register for tax

Register as employer

Find a pension provider

Register with ICO
Details

Premises

Phone and internet

Letterhead (with company number)

Accounts and accounting system

Purchasing system; Contracts

Asset control
More details

Insurance
Recruitment
Furniture
Equipment
Planning

Budget
  Keep track of your resources

Project Plan
  What are you going to do and when

Quality Plan
  how are you going to know you’ve built the right thing

Marketing Plan
  how are you going to reach your market and enable them to reach you
Brief introduction to the duties of Directors

Ensure solvency
Maintain fiduciary duty to shareholders
Ensure the business complies with all applicable laws

- Companies Acts
- Financial Services Act
- Shops Offices and Premises Act
- Discrimination Acts
- Data Protection Act
- Taxes: VAT, ACT ....
- Etc, etc, etc

There are books and courses available - IoD
Brief introduction to the duties of Directors

Companies Act 2006 - codified seven duties
- Act within their power to abide by M&A and Shareholder Decisions
- Promote the success of the company
- To exercise independent judgement
- Exercise reasonable care and skill
- Avoid conflicts of interest
- Not to accept benefits from third parties
- Declare an interest in a proposed transaction with the company
Shares and share structure

Shares govern ownership of the company:
- Distribution of control
- Distribution of capita
- Distribution of profits (dividend)

Shareholders agreements
- Pre-emption rights
- Tag-along / Drag-along and anti-dilution clauses
- Appointment of Directors

Preference Shares
- Liquidation ration

Taxation issues
- EIS relief
Control

Normal limited company under Table A of Companies Act 1985 if incorporated before 1 Oct 2009 afterwards Companies Act 2006 Model Articles

- 25%+ Blocks “Substantive” resolutions
- 50%+ Day to day control
- 75%+ Absolute control - but must respect the rights of minority shareholders
Stock option scheme

Agreement to sell shares at fixed price
   Part of renumeration package
   Recruit and motivate key staff

Relevant for high growth companies
   In a large company problem to make scheme relevant to work done
   Exit route

Balance advantages to company and staff
   Nominal (par) price
   4 year monthly accrual; 1 year cliff
   Lock in as employee

Tax implications
Other remunerations

Profit share

Commissions (paid when?)

Pension scheme

Car (bike hire purchase scheme)

Discretionary budgets, sabbatical and training programmes
IPR

Intellectual Property Rights

Patent
Copyright
Trademark
URL
Design right
Registered Design
Database right
Trade Secret
Plant Breeders rights
Patents

Absolute right to invention

Bern convention

Expensive: need professional advise
  - separate jurisdiction

Must be
  Novel
  Reducible to hardware

Provisional Patent:
  low cost
  one-year
  can be challenged
Undesirability of Patents

Expense
- £3k first application
- £10k grant
- £100k international filings
- £1m to defend

Network effect
- Bio vs tech
- Utility increases with square of users
- Standard

Timescale
- Moore’s law

Untimely Publication
Undesirability of Patents  cont.

Hard to administer

Typically
- tech has many weak patents
- ways around invention
- Bio-tech has strong patents

Conclusions
- Usually defensive rather than offensive for tech
- Be very selective
- Handy for bean counters (and investors), but can suppress innovation
Trademarks

Right to exclusive use of name or mark
- register by classes of goods
- local jurisdiction
- in USA use must be shown

Company name does not imply trademark
Copyright

Copying prohibited
- but not re-invention
- “clean-room” clones
- Techniques: include nonsense signatures

Self-declarative
- Copyright <year> <author>
- library rights
- include statement of rights (e.g. backup)

FAST
Internet and Copyright

Overextension of Copyright
- 70 years from death of Author
- DRM etc

“Fair Use” text only
- “Deep linking” other than through main page
  - probably ok but
    - Germany Paperboy case
    - US: Ticketmaster vs Microsoft
    - UK: Shetland Times vs Shetland Chronicle in the UK

- “Direct Linking” eg directly linking in another’s picture without permission NOT OK

- Search Engines
  - Still ongoing
Internet Issues

Legality of Encryption

Signatures and contracts
  Jurisdiction
  Audit trails
  Liability

Domain names

“Fair use” and copies
Contracts

Complex law
- exchange of value
- fairness

Signatures
- Problem for Internet

- TTP’s, CA’s
  - Trust and Liability

- Signifying assent
  - But can you prove it?
  - Audit trails
Contracts … cont

Making the contracts you want to make, and avoiding the commitments you don’t want to accept

Mechanics
- Offer and acceptance
  - Offers to treat
  - Writing and signature

- Incorporating terms

One world?
- Applicable law
- Place of litigation
- Enforcement of foreign judgements
- Arbitration
Tort

Avoiding infringements of the rights of others, and giving adequate notice to others of your rights that you may want to enforce

Defamation - Derogatory statements you cannot prove true, or linking to others’ statements

Negligence - Careless advice causing injury or (sometimes) loss

Copyright - making derivative work, publishing others work

Trademarks - taking others reputation, domain names, metatags, inlining, marking

Patents - novel non-obvious inventions, scope differences US/UK/EU
Tort

Complying with regulations, so as to avoid penalties, so that your rights are enforceable

Consumer Contracts Regulations 2014
- Consumer Protection (Distance Selling) Regulations 2000 for contracts up to 12 June 2014
- Detailed rules on content of “selling” webpages

Data Protection Act 1998
- ICO, need to register, “fairness” may require opt out

Consumer Credit Act 1974
- Amended by Consumer Credit Act 2006
- Formalities for credit agreements, cooling off period
- Financial protections for cardholders

Special cases
- share dealing, insurance, banking, gambling, prescription drugs, pornography, tobacco, alcohol, fireworks, guns, etc.
- Radio Spectrum Consumer protection (CE), HSE …
- Value Added Tax (especially import and export)
Business Studies
L4 - People: how to organise a team

Jack Lang and Stewart McTavish
jal1 sam56
4. People

“There go my people. I must follow them, for I am their leader.”
(M. Gandhi, quoting Alexandre Ledru-Rollin, (1848)
“Eh! Je suis leur chef, il fallait bien les suivre”)

Motivating factors
Groups and Teams
Ego
Hiring and firing; Employment law
Interviews
Meeting techniques
Management

Culture lead

Goal setting
- Overall direction
- Measures of success
- Strategy rather than tactics

Accountability

Communication
Management Theories

“7 people is a hunting group”
- Amazon’s two pizza rule
- Company growth break points: 7, ~50, ~350 …

Classical / Hierarchical

Human Relations
Classical

Formal and rational approach

Focus on STRUCTURE of organisation

Tasks reduced to simple elements -> boring and repetitive

Assumptions that individuals primarily motivated by PAY
Management Tasks - Classical model

Fayolism - Henri Fayol (1841-1925)

General Theory of Business Administration
Planning
Organisation
Staffing
Direction
Co-ordination
Controlling

Management Tasks - Classical model

Fredrick Winslow Taylor (1856-1915)

Principles of Scientific Management
  • Replace rule of thumb work methods with methods based on scientific study
  • Select, train and develop each employee rather than letting them train themselves
  • Provide “detailed instruction and supervision”
  • Divide work between planning and doing

https://en.wikipedia.org/wiki/Frederick_Winslow_Taylor
Management Tasks - Classical model

Lilian (1878-1972) and Frank Gilbreth (1868-1924)

Time and motion study and human factors
- Clipboards and stopwatches
- Reducing actions to atomic parts - “therbligs”
- Find “the best way” early CQI

Management Tasks - Classical model

Henry Gantt (1861-1919)

The Gantt chart

Task and Bonus system

Social responsibility of business

Human Relations

Consider individuals
- social needs
- motivation
- behaviour

Focus on WORK done

People are the key assett
Theory X and Theory Y

Douglas McGregor (1906-1964)

Theory X
Authority, direction and control

Theory Y
Integration and self-control

Theory X

People don’t want to work, they have to be made to do so
People must be coerced, controlled, threatened
Hierarchical structure, defined roles, task orientated, little flexibility
Poor communication, status demarcations - “Them and us”
Slow to change or adapt
Traditional industries
Theory Y

People want to work, but are prevented from doing so
They will exercise self-control when committed to common objectives
Accept and seek responsibility
Flat management structure (e.g. Matrix)
Good communications, little status
People orientated: flexible work teams
Adapts well to rapid change
Most modern computer companies
Management Structures

Hierarchical Organogram

Matrix example

<table>
<thead>
<tr>
<th>Project -&gt;</th>
<th>Home Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>People/Skill</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Alice</td>
<td>A</td>
<td>L (75%)</td>
<td>25%</td>
<td></td>
<td></td>
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<tr>
<td>Bob</td>
<td>B</td>
<td></td>
<td>L (75%)</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Charlie</td>
<td>B</td>
<td>50%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dave</td>
<td>A</td>
<td>25%</td>
<td></td>
<td>L (75%)</td>
<td></td>
</tr>
<tr>
<td>Elizabeth</td>
<td>A</td>
<td>25%</td>
<td></td>
<td>75%</td>
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</tr>
<tr>
<td>Fred</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td>L (75%)</td>
</tr>
</tbody>
</table>
Groups and Teams

Limit to project size an individual can tackle

“7 people is a natural hunting group”

Informal as well as formal communications
Groups

John Adair (1934), Trinity Hall ‘59

Groups have
- definable membership
- shared identity
- shared purpose
- interdependence
- interaction

https://en.wikipedia.org/wiki/John_Adair_(author)
Work Types

Meredith Belbin (1926), Clare College ‘45

Team roles
- Co-ordinator
- Ideas Person
- Shaper
- Teamworker
- Implementor
- Resource Investigator
- Monitor Evaluator
- Completer Finisher
- Specialist

https://en.wikipedia.org/wiki/Meredith_Belbin
Team formation

Bruce Tuckman (1938-2016)

Forming
before individuals see themselves as a team, feels difficult, anxious, unsure

Storming
challenge the leader, hostility aggression, emotions high

Norming
organise tasks, agreeing ways of co-operating, feels secure and comfortable

Performing
work surges ahead, people perform well, openness, mutual trust and support enthusiasm, inspiration

https://en.wikipedia.org/wiki/Bruce_Tuckman
Egoless Programming / Work

Gerald Weinberg (1933)

The Psychology of Computer Programming - 1971

Structure work and create a culture to minimise personal factors so quality of work can be improved

Open communication allows information to flow
Feedback is objective and not personal
Asking for help is good and to be encouraged

https://en.wikipedia.org/wiki/Gerald_Weinberg
Networking and Corporate Communications

Robin Dunbar (1947),
Professor of Evolutionary Psychology, University of Oxford

Dunbar’s number 100 - 250 (~150) the number of relationships in which an individual knows who each person is and how each person relates to every other person

Teams do not exist in a vacuum they depend on help and co-operation with other teams

If they do not network with, learn about or connect with other teams companies fall foul of

intergroup hostility, inward thinking, NIH syndrome

Having employees
About us

- Effective relationships and good practice in the workplace help organisations succeed and the economy grow.
- Acas provides expert and impartial advice on good practice, and support in finding solutions when relationships go wrong.
- For every £1 Acas spends, there is at least £12 benefit to the economy.

Acas (Advisory, Conciliation and Arbitration Service) provides free and impartial information and advice to employers and employees on all aspects of workplace relations and employment law. We support good relationships between employers and employees which underpin business success. But when things go wrong we help by providing conciliation to resolve workplace problems.

We also provide good value, high quality training and tailored advice to employers. Our expertise is based on millions of contacts with employers and employees each year and we are governed by an independent Council, including representatives of employer and employee organisations and employment experts.

Do you know Acas?

Watch our video to find out who we are and what we do.
Hiring and firing

Employment contract / Statement
- Hours and holiday
- Remuneration
- Grievance procedure

Letting people go
- Firing - 2 verbal, 2 written warnings - keep written records
- Redundancy
- or Settlement Agreements
Non-discrimination

Equalities Act 2010 - protected characteristics
Age
Disability
Gender reassignment
Marriage and civil partnership
Pregnancy and maternity
Race
Religion and belief
Gender
Sexual orientation
Recruitment

Job Spec / Role Description
  responsibilities
  work
  personal characteristics

Personal contacts
Referrals
Advertisements
Agencies (head hunters)
Interviews

Recruitment and Appraisal

Why
- Learn more about person
- Compare with job spec
- Provide further information about organisation and role
- Encourage positive feeling about organisation and role

Preparation
- Who needs to know or be present?
- Who greets, refreshments, room, seating
- Questions and outline
- Report form
- Circulate papers
Conducting Interviews

Problems
- Pre-conceived ideas
- Only remembering last candidate
- Eye conduct
- Projection
- Leading questions

Discussion
- Create rapport - smile
- Summarise / reflect
- Listen - don't talk
- Tone
- Body language
Interviews

Questions
- Speed / pace
- Open / closed
- Situational
- Probing
- Stress - why?

Close
- Check plan - covered everything?
- Any questions?
- Explain next stage
- Check still interested
Conducting Interviews

Make the decision
- Skills
- Personal qualities
- Best compared to rest
- CVs, check references, unexplained gaps, unusually short jobs

Follow-up
- Offer
- Contract
- Induction
Appraisals

Purpose
- Enable team members to get a clear idea of how they are doing
- Identify where they might need support / training
- Set objectives
- Personal career / growth

Form
- Date, Name, Job title, Assessor
- Self assessment
- Assessor or line management assessment
- Key objectives
- Development plan
- Actions - jointly agreed
- Follow up
Interview

Opportunity to sell yourself

Opportunity to learn about the company, the role and future prospects

Be yourself

Enthusiasm, achievements

Questions - do your homework and have some
Communication skills

Say it three times

Not more than three major points

What does the target audience know?

Say what you mean and mean what you say
Business Studies
L5 - Project planning and management

Jack Lang and Stewart McTavish
jal1          sam56
5. Project planning and management

Role of a manager

Charts and Critical Path Analysis

Estimation Techniques

Monitoring
Role of a manager

Directs resources for the achievement of goals

LEADER also provides

- vision
- inspiration
- rises above the usual

No one right way to manage
Management Continuum

authoritarian
autocratic

consultative

democratic
participative

solves problems alone
dictates decisions
discusses problems
makes decision
chairperson
agrees problem
creates consensus
Managerial Roles

Henry Mintzberg (1939)

**Interpersonal**
- Figurehead, leader, liaison

**Informational Roles**
- Monitor, disseminator, spokesperson

**Decisional Roles**
- Entrepreneur, resource allocator, disturbance allocator, negotiator

Managerial and Leadership Qualities

Technical / Professional knowledge
Organisational know-how
Ability to grasp situations
Ability to make decisions
Ability to manage change
Creative
Mental flexibility
Learns from experience
Pro-active
Moral courage
Resilience
Social Skills
Self Knowledge
Project Management Variable

Resource

Time

Function

You can have any two of quick, good or cheap, but not all three.
Development cycle:

<table>
<thead>
<tr>
<th>Effort</th>
<th>Specification</th>
<th>Analysis</th>
<th>Build</th>
<th>Test</th>
<th>Maintain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alpha</td>
<td>Beta</td>
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</tbody>
</table>
Crossing the Chasm

- Geoffrey Moore, after Everett Rogers
Approaches and methodologies

Top Down
- waterfall decomposition

Bottom Up
- meta machine

Rapid Prototype
- successive refinement
- agile engineering

Muddle through
In February 2001, 17 software developers met at the Snowbird resort in Utah to discuss lightweight development methods. They published the *Manifesto for Agile Software Development*, in which they said,

**Manifesto for Agile Software Development**

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck  
Mike Beedle  
Arié van Bennekum  
Alistair Cockburn  
Ward Cunningham  
Martin Fowler

James Grenning  
Jim Highsmith  
Andrew Hunt  
Ron Jeffries  
Jon Kern  
Brian Marick

Robert C. Martin  
Steve Mellor  
Ken Schwaber  
Jeff Sutherland  
Dave Thomas
Agile explosion

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

Popular agile software development frameworks include

- Adaptive software development (ASD)
- Agile modeling
- Agile Unified Process (AUP)
- Crystal Clear methods
- Disciplined agile delivery
- Dynamic systems development method (DSDM)
- Extreme programming (XP)
- Feature-driven development (FDD)
- Lean software development
- Kanban
- Scrum
- Scrumban

- Acceptance test-driven development (ATDD)
- Agile modeling
- Backlogs (Product and Sprint)
- Behavior-driven development (BDD)
- Business analyst designer method (BADM)[37]
- Cross-functional team
- Continuous integration (CI)
- Domain-driven design (DDD)
- Information radiators (scrum board, task board, visual management board, burndown chart)
- Iterative and incremental development (IID)
- Pair programming
- Planning poker
- Refactoring
- Scrum events (sprint planning, daily scrum, sprint review and retrospective)
- Test-driven development (TDD)
- Agile testing
- Timeboxing
- User story
- Story-driven modeling
- Retrospective
- Velocity tracking
- User Story Mapping

The Agile Alliance has provided a comprehensive online guide to applying agile these and other practices.

https://www.agilealliance.org
Scrum, Sprints, Timeboxes

Product Backlog → Sprint Backlog → Sprint → Working increment of the software

- Product Backlog
- Sprint Backlog
- Sprint
- Working increment of the software

24 h
30 days

By Lakeworks - Own work, GFDL, https://commons.wikimedia.org/w/index.php?curid=3526338
Sample Burndown Chart
Microsoft Solutions Framework 4.0
adapted from http://slideplayer.com/slide/6868969/

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Goals</th>
</tr>
</thead>
</table>
| **Envision**                                                                 | Develop a clear understanding of what is needed within context of project constraints  
| Vision / scope document                                                      | Assemble necessary team to envision solution with options and approaches to meet needs given constraints  
| Project structure document                                                   |                                                                       |
| Initial risk assessment document                                             |                                                                       |
| Project structure document                                                   |                                                                       |
| Initial risk assessment document                                             |                                                                       |
| **Plan**                                                                     | Evolve conceptual solution into tangible designs and plans so it can be built in the build phase  
| Functional specifications                                                    |                                                                       |
| Master project plan                                                          |                                                                       |
| Master project schedule                                                      |                                                                       |
| Completed solution                                                           | Build various aspects of the solution in accordance with plan track deliverables  
| Training materials                                                           |                                                                       |
| Documentation                                                                |                                                                       |
| Marketing materials                                                          |                                                                       |
| Updated master plan, schedule and risk document                              |                                                                       |
| **Test**                                                                     | Expose issues, uncover design flaws and identify unexpected behaviour  
| Proactive - leads build effort                                               |                                                                       |
| Supportive - follows build effort                                            |                                                                       |
| **Stabilise**                                                                | Improve solution quality to meet release criteria for deployment to production  
| Pilot review                                                                 | Validate solution meets stakeholder needs  
| Release-ready versions of solutions and accompanying collateral             | Validate solution usability  
| Testing and bug reports                                                      |                                                                       |
| Project documents                                                            |                                                                       |
| **Deploy**                                                                   | Place solution into production at designated environments  
| Operations and support information systems                                   | Facilitate smooth transfer of solution from project team to operations team as soon as possible  
| Revised processes and procedures                                             |                                                                       |
| Repository of all solution collateral                                         |                                                                       |
Scrum Meetings

Daily Scrum

Scrum of scrums

Sprint Planning Meetings

Sprint Review Meetings

Sprint Retrospective
Pert and Gantt Charts

Visual representation of project

Microsoft Project
Example: Getting up in the morning

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Alarm rings</td>
<td>0</td>
</tr>
<tr>
<td>2. Wake Up</td>
<td>3</td>
</tr>
<tr>
<td>3. Get out of bed</td>
<td>5</td>
</tr>
<tr>
<td>4. Wash</td>
<td>5</td>
</tr>
<tr>
<td>5. Get dressed</td>
<td>5</td>
</tr>
<tr>
<td>6. Put kettle on</td>
<td>2</td>
</tr>
<tr>
<td>7 Wait for kettle to boil</td>
<td>5</td>
</tr>
<tr>
<td>8 Put toast on</td>
<td>2</td>
</tr>
<tr>
<td>9 Wait for Toast</td>
<td>3</td>
</tr>
<tr>
<td>10 Make coffee</td>
<td>3</td>
</tr>
<tr>
<td>11 Butter Toast</td>
<td>2</td>
</tr>
<tr>
<td>12 Eat Breakfast</td>
<td>10</td>
</tr>
<tr>
<td>13 Leave for Lectures</td>
<td>0</td>
</tr>
</tbody>
</table>
Pert Chart

Get out of bed 8:56am 8:56am
Wash 8:56am 9:01am
9:01am 9:06am
8:56am 9:01am
Get dressed 9:01am 9:06am
Put kettle on 9:06am 9:09am
9:09am 9:14am
9:06am 9:12am
Wait for kettle to boil 9:12am 9:17am
9:14am 9:17am
Make coffee 9:17am 9:20am
9:14am 9:20am
Eat breakfast 9:20am 9:30am
9:20am 9:30am
Put toast on 9:06am 9:11am
9:11am 9:16am
9:16am 9:20am
9:06am 9:11am
Wait for toast 9:11am 9:16am
9:16am 9:20am
9:11am 9:16am
Butter toast 9:16am 9:20am
9:16am 9:20am
Leave for lectures 9:30am 9:30am
9:30am 9:30am
Critical Path Analysis

Compute earliest and latest start / finish for each task

The difference is the slack

The Critical Path joins the tasks for which there is no slack

Any delay in tasks on the Critical Path affects the whole project
Gantt Chart
Example
Example Pert
<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Duration</th>
<th>Scheduled Start</th>
<th>Month 2</th>
<th>Month 3</th>
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<tr>
<td>1</td>
<td>Start</td>
<td>0w</td>
<td>30/4/95</td>
<td>19</td>
<td>20</td>
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<tr>
<td>2</td>
<td>Phase 1</td>
<td>8w</td>
<td>1/6/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Analyze</td>
<td>4w</td>
<td>1/6/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Code</td>
<td>3w</td>
<td>29/5/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Test</td>
<td>1w</td>
<td>19/5/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Phase 2</td>
<td>6w</td>
<td>29/6/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Analyze</td>
<td>3w</td>
<td>28/6/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Code</td>
<td>4w</td>
<td>19/6/95</td>
<td></td>
<td></td>
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<tr>
<td>9</td>
<td>Test</td>
<td>2w</td>
<td>20/6/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Phase 3</td>
<td>10w</td>
<td>19/6/95</td>
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<td></td>
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<tr>
<td>11</td>
<td>Analyze</td>
<td>4w</td>
<td>19/6/95</td>
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<td></td>
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<td>12</td>
<td>Code</td>
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<td>17/7/95</td>
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<tr>
<td>13</td>
<td>Test</td>
<td>2w</td>
<td>31/7/95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>End</td>
<td>0w</td>
<td>25/6/95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Programmer**

- Overallocated: Red
- Allocated: Blue

**Peak Units**

- 0.2
- 0.4
- 0.6
- 0.8
- 1.0
- 1.2
- 1.4
- 1.6
- 1.8
- 2.0

**Resources**

- 1
- 2
- NUN

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Levelling

Adjust tasks to match resources available
Automatic system available, but does not always give an optimum result
Tasks may be delayed within slack without affecting project dates
Otherwise consider extending project, or using more resource
Adding resource to a late project may cause RECURSIVE COLLAPSE
  consider carefully whether the benefits outweigh the additional learning delays and overheads
Derive costings
Larger example
Estimation Techniques

Experience

Comparison with similar tasks

20 lines of code / day

can vary by 2 orders of magnitude

Decomposition

Plan to throw one away

20 working days per month BUT 200 per year
Rules of Thumb

Software projects
estimate 10 x cost and 3 x time

1/3/10 rule
1 cost of prototype
3 cost of creating a product
10 cost of sales and marketing

Hartree’s Law
The time to completion of any project, as estimated by the project leader, is a constant (Hartree’s constant) regardless of the state of the project
A project is 90% complete 90% of the time

80% rule
Don’t plan to use more than 80% of available resource
Cynic’s Project Stages

Enthusiasm
Disillusionment
Panic
Persecution of the innocent
Praise of the bystander
6. Quality, maintenance and documentation

Development Cycle
Productisation
Plans for quality
Plan for maintenance
Plan for documentation
Development cycle:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Analysis</th>
<th>Build</th>
<th>Test</th>
<th>Maintain</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alpha</td>
<td>Beta</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effort</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Productisation

Generalisation

- Does the product work on all target systems?
  - Hardware variants
  - OS variants (run time environment variants)

- Internationalisation
  - Language, number, date and time formats

- Testing
  - Usability
  - Market
  - Standards approvals
Productisation II

Documentation

- System manual, maintenance documentation
- Conformance

Legals

- IPR generated (Copyright, trademark)
- IPR used
- Licence, contract, liability
Productisation III

Packaging
- Artwork, Box, Deliverable

Manufacture
- Reproduction, Manual printing, Stocking
- Distribution set-up

Marketing Materials
- Leaflets, brochure, advertisements
- Text, Artwork, approvals
Productisation IV

Maintenance and after sale support

- Support organisation setup and training
- Help desk, staff, facilities, FAQs, training
- Report forms, databases and summaries
Supply side management

Quality control - monitoring and contingency planning

Information Systems - stock control, JiT, shipping, supplier integration

Reliability of supply - multiple sources

Change management - evolution, tracking and support
Scale Up

Takes time and money

New markets
- Regulations, translation, adaption
- High volume manufacturing

Time
- 18 week lead time or more for new silicon
- Line set up
- Staff recruitment and training
- Approvals (and testing)
Plan for Quality

Cheaper in the long run

Build in from the start; can’t be added later

Board-level function

“Good Practise”
Standards

ISO 9000 / BS 5750
  - Quality management systems
  - Traceability

BS 7799
  - Information Management and Security

Internal standards
Control and review

Record key decisions

Control key documents

Control versions and deliverables

Define standards
- coding standards (naming, structure, testing)
- documentation standards (style, conventions and examples)

Review and Audit
Key Documents

Project Definition
- User Requirements Document
- Project Constraints Document

Base definition
- Functional Specification or prototype
- Top Level Design

Control
- Project Plan
- Project Log
- Quality Plan
- Document Plan
Detailed Controlled Documents

Sub-system specs and interfaces

Data model and dictionary

Module specs and interface

Released code and documentation
Monitoring

Early warning of impeding disaster
- Time to do something about it
- Avoid unpleasant surprises

Culture
- Communication (internal and external)
- OK to ask for help
- Requests taken seriously

Milestones
- Roughly one every 1-2 weeks

Review meetings
- Weekly
Meetings

Keep it short
  - meetings are expensive
Circulate agenda and papers BEFORE
Start on time
Purpose and structure
Finish on time
1 page minutes
Brain-storming

Problem solving
Purpose
List ideas/topics, no matter how crazy
Vote
Work on top three
  - break up into subgroups
Report back
Board Meeting

Place for decisions, not discussions

Agenda
- Call to order
  - Attendance
  - Minutes
  - Matters arising
- Statutory Business
- Reports
  - Finance
  - Business Development
  - Personnel
  - Shareholder’s Issues
- AOB
- Date of next meeting
SWOT

Strengths
Weaknesses
Opportunities
Threats
Testing

Test plan

Test suite
- Base functionality
- Specific bugs
- Performance
- Correct failure
- re-run the entire suite each time

Bug reports and database

Action plan for fixes & prioritisation
Plan for maintenance

The relationship goes on

- Revenue stream
  - 12% p.a.
- Future sales channel

Levels

Help desk

Internal documentation

Record keeping
Plan for documentation

10 x the coding effort

Specialist skill

Levels of documents

- User
- Training
- System
- Maintenance

Avoid forward references!

Conformance
7. Marketing and Selling

Sales and marketing are different
Basic economics
Marketing; Channels; Market Communications
Stages in Selling
Control and Commissions
Sales and marketing are different

Marketing
- what to sell,
- to who
- how

Selling
- moving the product

Relationship management
Marketing

What
- Product characteristics - ACCTO
- Price sensitivity

Market Characteristics
- Size
- Defensible
- Sustainable

How?
- Channels

Inform
- Routes
ACCTO

Criteria for customer acceptance

80% of new product failures are due to customer acceptance

A - relative Advantage over competitors
C - Complexity; can I understand it?
C - Compatibility with working practise
T - Trial-ability, can I try it out first?
O - Observability, can I notice the benefits?
Market Requirement Document

User Profile
who will use it and what are they trying to achieve

Product Description
features, advantages and benefits

Customer Profile
who will buy it and how do they make decisions

Competitive analysis
what are table stakes and what are USPs

Positioning
the one thought potential customers have in their head when they hear the product name
Market Requirement Document II

Market Trends
what is happening in the market your will be operating in

Market Size
the total available market

Route to market / Distribution
how do you deliver to your customers

Pricing
how much is the customer prepared to pay

Customer support
how will the user but trained and supported (documents, helpdesk, etc)
Market Requirement Document III

Business Opportunity
in this market with this product at this price you can make this amount of money [do this one last]

Alliances and Partners
who do you need on side

Marcoms
how will you tell the market about your product
Market - who loves ya?

it's FAB because

**Feature** - techie speak
this chip uses a double super helical fooglefarg

**Advantages** - the translation step
it uses less power, gives you more speed

**Benefits** - customer speak
it is cheaper, smaller, works better in marginal conditions, batteries last longer

because *your friends will be envious*
why people really buy it
Product or Service Requirements

Customers need to

- know about it
- have the opportunity to purchase it
- be satisfied that it meets a real or perceived need
- be able to afford it (but don’t make it cheap)
A brief introduction to market analysis

Desk research
- existing market or solutions
- competition, actual and potential
- demographics

Market surveys
- qualitative; groups and usability testing
- quantitative; surveys, testing marketing

Distribution channels

Market communications
Channels

Direct Sales

Distributor / Retailer - they are your customers
- National
- International

Choose carefully
- changing is expensive and difficult
- key sales
- opinion formers
Market Communications

Targeting

Advertising
- Image
- Message
- Sales - MOP
  - General - Newspapers, TV
  - Specific - Trade press, specialist magazines

PR

Direct mail
- List brokers (1-2% response)
- Control and record-keeping
Direct sales

Bespoke
- sales staff / customer relationship manager
- cash flow

Mail order requirements
- Product
- Guarantees
- Stocking
- Support
- Key accounts
- Market communications
Discovering a market from the bottom up
Discovering a market from the bottom up

Understand Problem → Define Solution → Validate Qualitatively → Verify Quantitatively

Problem / Solution Fit

Product / Market Fit
Pricing Models

Market comparison
needs to be an order of magnitude better or cheaper to replace incumbent

Utility
How much is it worth to the customer (efficiency gains to suer, payback time)

Cost + profit
(+distribution + tax)

Loss leader
## Ballpark pricing

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>£ 1,000.00</td>
</tr>
<tr>
<td>Factory price: (60%)</td>
<td>£ 600.00</td>
</tr>
<tr>
<td>Cost (30% of factory price)</td>
<td>£ 200.00</td>
</tr>
<tr>
<td>Net profit / unit (10% of factory price)</td>
<td>£ 60.00</td>
</tr>
<tr>
<td>Annual sales (Million):</td>
<td>1.00 (guess)</td>
</tr>
<tr>
<td>Profit (£M)</td>
<td>60.00</td>
</tr>
<tr>
<td>Set-up and fixed costs (£m)</td>
<td>50.00 (including initial marketing)</td>
</tr>
<tr>
<td>Stocking (£m)</td>
<td>100.00 (6 months at cost)</td>
</tr>
<tr>
<td>Capital need (£m)</td>
<td>150.00</td>
</tr>
<tr>
<td>Payback time</td>
<td>2.50 years</td>
</tr>
</tbody>
</table>
Exhibitions

Expensive, hard work

Make it obvious

Place for meetings, not cold sales

Preparation
  - Research and contact attendees
  - Stand
  - Exhibits
  - Manual
  - Travel and accommodation

Be attentive

Follow-up
  - Timeliness
Sales techniques

Listen to the customer

Needs

Concerns

Authority
Stages in Selling

Prospecting
Pre-approach
Approach
Survey
Proposal
Demonstration
Close
Service
Prospecting

Locating the most likely buyers

Cold calling
- Directors Guides, Yearbooks
- Local council offices, Chambers of Commerce
- Institutional meetings

Qualified Prospects
- Marketing response: Advertising, PR, Mailings
- Lookalike Audiences - Facebook, Google etc
- Service organisations, exhibitions

How many
- 10% result in sale
- Maybe 2 calls per day
Pre-approach

Research
- Who are the decision makers?
- What is the management structure?
- What are their concerns?

Preparation
- Presentation
- Visiting cards, brochures
Approach

Listen, establish mutual ground

Contact building

Generalities
Survey

Needs, requirements

Constraints

Budget

Structure, contacts, decision points

Timescale
Proposal

Sell the benefits to the customer
- FAB, USPs
- Price is not an issue; value is
  - lifetime cost
  - service, reliability, reputation

Sales Proposal
- Introduction,
- Objectives
- Recommendations
- Benefits
- Financial Justification
- Warranty and service
- Company Background
- Price and conditions

Follow up
Demonstration

Objectives

Administration
- Who, where, maps, car parking, accommodation
- Greeting, seating
- Catering: coffee, lunch or sandwiches

Script
- Presentation
- Visiting cards, brochures

Sum up

Agree follow-up
Close

Small step at a time

Advantages

Customer concerns
- hidden agenda

Sum up
- discount
- limited offer
Service

Relationship management

- communications
- contact point
- regular liaison
- early warnings

Spec changes and the consequences

Meeting milestones
Planning and Records

Graded Prospect List

Sales Forecast

Call analysis

Sales Cost analysis
## Graded Prospect List

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
<th>Contact Name</th>
<th>Decision Maker</th>
<th>Potential %</th>
<th>Previous Contact</th>
<th>Next Contact</th>
</tr>
</thead>
<tbody>
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# Sales Forecast

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Control and Commissions

Control
  Sales organisation structure
    - by product, geography, channel, key account

Measurement
  - Cost per sale
  - Response rate
  - Timeliness
  - Individual measures, targets

Commission
  Don’t stint
    - Basic salary
  Pay on delivery, or payment
Business Studies
L8 - Growth and Exit Routes

Jack Lang and Stewart McTavish
jal1 sam56
8. Growth and Exit routes

New markets: horizontal and vertical
Problems of growth; second system effects
Communication
Exit routes: M&A, IPO, MBO or liquidation
Places to look for new enterprises
Conclusion; over to you!
New markets

Horizontal
- Similar products or services
- New Customers
  - Geographical, application, pricing

Vertical
- New products or services
  - New model, vertical integration
- Similar Customers
Problems of growth

Communication
Control and Monitoring
Structural change; different skills, people
Formalisation
Cash
Second system effects
Communication

Formal channels
Charters
Newsletters
Company meetings and informal events
Needs conscious effort: company culture
Management structures

Groups and sub-groups

Charters

Reporting structures
Exit routes

Acquisition
  - Sell to another company

Floatation
  - Sell to the public

Management Buy Out
  - Sell to the staff

Liquidation
  - Sell the assets
Acquisition

Natural process
- Wildflower model
- Forced sale

Marriage - doesn’t happen quickly
- Courtship - selling the company as a product
  - Pre-nuptial relationship - distributor, customer, JV, competitor
- Tying the knot - Due diligence process
- Clergy - lawyers, bankers, accountants, M&A specialists
- Honeymoon - learning to live together, culture clash, rationalisations, lock in
Valuation - how much is it worth?

- Asset value
- NPV of profitability
- DCF
- Utility
- Comparison with similar
- Market value
- Probabilistic methods - matrix, black scholes
- Paper vs Cash
- Lock-in periods
Floatation

Sales of shares to the public
- Primary Market

- Highly regulated
  - Potential for fraud
  - Expensive
  - Get advise!
    - undewriter
Floatation II

Sales of shares to the public
Admittance to an exchange
Primarily for raising capital
Floatation III

Primarily for raising capital
- £10m +
- Valuation of the company
- Capital raising
- Exit for founders and investors
  - Lock-in
Management Buy Out

MBO
- buy-out
- variants

Easier to fund
- existing cash flow, staff, customers, etc
- easier to value

Mature company
- new blood
Liquidation

Voluntary

- stop trading
- asset sale
  - not usually as valuable as going concern
  - except for asset stripping opportunities
- distribute proceeds
Liquidation II

Compulsory
- e.g. failing to pay the taxman
- Bankruptcy
  - illegal to trade if insolvent
  - Receiver and Directors accountable to Creditors (not shareholders)
- Half-way houses
  - Bankruptcy (insolvency) need not force liquidation
  - Administration (US Chapter 11)
  - Creditor arrangement - talk to them
- Bank guarantees
  - Arrangement
  - Talk to them EARLY
Kübler-Ross model - Managing Traumatic Change

Exits and M&A are traumatic times within the company.

Change counsellors recognise four stages

Denial
- need information, who, what, when

Anger
- need sympathetic hearing
- safe environment

Resignation
- needs information and planning
- small steps, quick wins

Acceptance

Where to look for startup ideas?

Jack’s list
- Internet and Digital TV evolution
- Civil liberties: identity, privacy, censorship, ownership, dark web, etc
- Intelligent agents (e.g. EPG)
- PDA’s / Cell phones
- Electronic currency
- Voice recognition
- Embedded and SoHo systems
- Reversion to local data
- 3D & AR
Conclusion

Building the future - social responsibility
Generation of Wealth
Generation of employment
Now you do it

http://www.camring.ucam.org
http://www.cue.org.uk
http://www.cutec.org
http://www.enterprisenetwork.group.cam.ac.uk