Week 1 Introducing Business Metrics

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Data analytics process

- Step 1: To find the right questions to ask, and then find the best answer in the time and with the resources available.
    - Right question: What change, in our business processes can and should we make **right now**?
        - Increase revenue, maximise profitability, reduce risk
        - right now
            1) Realtime, computerised systems that optimise for certain dynamic metrics
            2) Just in time. Respond to individual customer after accessing full historical record.
            3) Changes happen as soon as it has been empirically tested and shown to work
               e.g. A/B testing: Creating two different versions, A and B, and comparing which performs better.
    - Metrics: numbers that **we can impact** when we change our business processes.
- Step 2: Translate into specific recommended actions and communicate to the relevant decision makers using visual metaphors and non-technical language.

Metrics

- Classification
    - <u>Revenue metrics</u>: sales & marketing
        - Sales
            - sale in a given time interval compared to the same time interval last year and the year before
            - sales by region, by product, by new versus repeat customers
            - sales funnel: the potential future customers who have been identified, and where they are in the step by step process of moving towards making a purchase
        - Marketing
            - effectiveness of marketing campaign
            - seen by how many ppl, percentage of respondence
    - <u>Profitability metrics</u>: about operational efficiency
        - how much cash is tied up in the form of unsold **inventory**
        - how much production is unsaleable due to spoilage or wastage,
        - how often the company is unable to meet urgent customer requests and loses sales because of insufficient production or inventory.
        - What portion of products off a production line are rejected as defective
        - how much is spent on variable costs, raw materials and labor, per unit product,
    - <u>Risk metrics</u>: risk management and creditors
        - **Net cash out** - How many months can the company survive at the present burn rate?
        - Churn rate: the rate at which new subscribers drop off within a year
          The greater the reliance on long term recurring revenue customers, the less dependent a company is on constantly successfully converting new prospects into clients and that's a lot less risky.
        - (Financial) volatility of returns & max historical drawn down from high water mark
- Traditional vs dynamical metrics
    - Traditional metrics: standard financial & managerial accounting categories
        - usually important for long-term decision making
    - <u>Dynamical metrics</u>: conveys urgent
        - significant change over a month or less
        - there are specific actions the company can take that can visibly or significantly

impact the metric in the short term

Case Study: profit & cashflow

- Financial terms
  - Profit & loss (P&L) statement & statement of cashflows
    - unprofitable companies can survive for ages (e.g. Amazon),
    - unprofitable + run out of cash disappear without a trace
    - massively profitable companies may collapse if they can't meet their short-term cash obligations (e.g. world's largest insurance company AIG)
      - often caused by uncontrolled/unplanned sales growth
  - "Net 60" payment terms: average time from delivery until when retailers pays is 60 days
  - Cash on delivery (COD): pay for the raw material when they arrive at the door
  - variable costs: raw beans, fuel, packaging, labour, transportation etc
  - fixed cost:
    - capital investment: roasting machine, last 3 years
      - Depreciation: allocation of capital expenditures over time
        - straight-line depreciation
    - General & administrative (G&A) expenses: rent, utilities, insurance, licenses, salaries
  - negative float: deliver service now and get paid later
  - accounts receivable: moneys that our customers owe us for products already delivered
    - aged account receivable
- steady growth vs fast grow -> a profitable, growing company can go bankrumpt

Revenue metrics - traditional enterprise sales funnel

- enterprise sale: any sale that requires involvement by full-time sales people in your company.
  - expensive, so pay-off must be large
  - minimum size enterprise sale - roughly $250,000 for a one-time sale, or $100,000 per year on a recurring sale to justify an enterprise sales effort (US)
- Sales funnel metrics
  - lead: a person you know
    - qualify a lead
      - have a plan to buy
      - have a budget to buy in your price range
  - identify the correct decision maker
    - expression of interest
    - get directly to the top guy and short-circuiting the potentially limitless meeting process
    - soft-circle sale is completed
- Case study: Amazon's use of dynamic metrics
  - Search
    - match the search terms and their controlled vocab index (subject index) by using a giant thesaurus
    - identify the best-selling book within the subject subcategories
  - Co-occurrence data
    - profit-maximising frequently bought together metric
  - recommendation engine: what is ultimately bought if we bought the first book
  - recommendation based on the purchases people made who looked at but did not buy the first book.

Profitability/efficiency metrics: inventory management

- Inventory management: one of the primary ways that operating companies can reduce their costs and maximize profitability without lowering the quality of what they sell in any way.
- inventory: a finished product waiting to be bought
- Inventory days
  - Reasons for minimising inventory days
    - negative float

        - fixed costs of storage
        - wastage
        - obsolescence
    - Estimate day inventory by annual reports
        - ~(inventory on hand at the end of the year / total annual cost of goods sold * 365) days
    - Dynamics metrics:
        - trace inventory turnaround & days inventory at the individual product SKU level
        - each product SKU has its own expected days of inventory: adjusted for region and seasonal factors using a mathematical model that helps determine how much shelf space should be allocated to it
        - empty-handed lost customer metric
            - a good proxy is a number of times inventory of any particular SKU reached zero.
            - ask when a potential customer walk out empty-handed
- Hotel room & airline seats occupancy optimisation
    - price discrimination: charge a variable price
        - rack rate; floor rate; intermediate promotion rate
    - try different price and see whether they are sold too quickly/slowly
        - by listing them on OTA sites
    - very lowest price can be found in a opaque, inventory market.
        - OTA sites offer rooms in a given city by price only, but they do not disclose the hotel name. Buyers only learn what hotel they'll be staying at after their purchase is complete. -> not appeal to business travellers
    - send emails to its mailing list

Risk metrics: leverage and reputational risk

- <u>excessive leverage</u>
    - owes more money than it is worth; depends upon making loans -> the risk to you if your customers default is magnified many times.
- <u>reputational risk</u>
    - e.g. food contamination for grocery store/retailers etc
        - Costco: how long it takes them to contact every potentially at-risk customer when a level one product recall occurs. - Costco store information of customers, and keep a record of every transaction