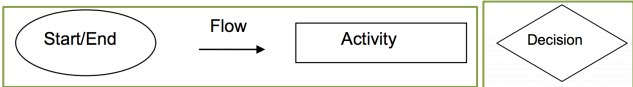


## 1 – Understanding processes and value creation

- **Uses of management accounting information:**
  - Formulation and implementation of strategy
  - Continuous improvement
  - Resource management
    - Planning – e.g. budgets
    - Control – e.g. performance measures
  - Cost estimation
  - Performance evaluation
- **Management accounting:** the processes and techniques that focus on the effective and efficient use of organisational resources, to support managers in their tasks of enhancing both customer value and shareholder value
- **Primary customer values (QTC)** are all interrelated
  - **Cost:** amount of resources consumed in a process
  - **Quality:** degree to which a product/service meets expectations
  - **Time:** two dimensions – duration and timeliness
- Problem: there are tradeoffs between QTC.
- **Secondary customer values:**
  - Responsiveness (to changing pattern of demand)
  - Productivity
  - Linkages: interdependencies between activities
  - Innovativeness and empowerment of employees
- **Resources:** inputs into an organisation's production process. Can be financial, non-financial, tangible and non-tangible
- **Process:** a group of logically related activities, which when performed in sequential order, utilise the resources of a business to produce a definite result
- **Four objectives of process analysis (UMPP)**
  1. **Understanding:** divides the business into processes and activities using *process mapping*
  2. **Monitoring:** comparing with benchmarks or target using *statistical process control (SPC)*
  3. **Prioritising:** decide which processes are most critical to the business' survival using *pareto diagram*
  4. **Problem solving:** using *root cause analysis and fishbone diagram*
- **Steps to process analysis:**
  1. **Identify the process of interest** using value chain analysis and benchmarking
  2. **Chart existing process** in logical sequence
  3. **Evaluate the process** – are activities in the process:
    - a. Value adding (VA) or non-value adding (NVA)
    - b. Efficient, effective, both or neither?
    - c. Valuable in terms of time, cost or quality?
  4. **Continuously improve or re-engineer process**
- **VA activity** provides value that is essential to customer or is essential to surviving the business. Consider:
  - Will removal reduce service or have a detriment effect?
  - Is the customer willing to pay for it?
  - Will it bring the product/service closer to completion?
- **NVA activity** does not add value to the product/service from the customer and business perspective
- Not everything can be categorised as VA and NVA
  - E.g. Inspection – why do you need inspection? Is it to identify defective product? Regulatory requirement? Part or R&D?
- **Efficiency:** the ability of activities/processes to use the **fewest** possible resources to meet customer needs.
  - Measure: **resource usage** (output to input ratio)
  - E.g. number of books printed per machine
- **Effectiveness:** ability of a process/activity to meet customer needs
  - Measure: **degree of goal attainment**
  - E.g. % of defective print in March
- Tradeoff: more resources may be required to achieve a higher level of goal attainment
- Good measure is comparable, specific and understandable

- **Tools to evaluate the process**
  - **Root cause analysis:** identification of the reason for activity
  - **Fishbone analysis:** 'spine' states primary problem and 'ribs' state main potential causes (e.g. machinery, material, method, labour, tools, money, environment)
  - **Statistical Process Control (SPC):** used to understand, monitor and reduce variability in a process
  - **Pareto diagram:** plots the causes of a problem according to the frequency of their occurrence
    - Facilitates prioritisation
- **(Process improvement)** activity-based improvement efforts are achievable by:
  - **Activity elimination:** removing NVA activities
  - **Activity selection:** choosing an activity with the lowest cost
  - **Activity reduction:** reducing resource consumed by the existing activity
  - **Activity sharing:** makes use of economies of scale by choosing an activity that permits sharing between different products and services
- **Business process re-engineer:** radical redesign of major business processes to dramatically improve cost, quality and delivery
  - Generally irreversible and very costly
  - Initiated by top management
  - Once-off
- **Continuous improvement:** smaller-scale, incremental improvements to individual parts of a process
  - Reversible
  - Initiated and implemented by employees
  - Ongoing
- BPR and CI are not mutually exclusive
- **Functional view:** business is separated by departments or functions
- **Processual view:** focuses on business processes and activities rather than departments and functions
  - Preferred, due to interdependencies of activities
  - Little can be gained by improving one activity in a business process

## 2 – Cost Basics

- Costs can be classified based on their behaviour patterns, traceability, controllability, value chain and function
- **Cost behaviour patterns**
  - **Variable cost:** directly affected by activity level
  - **Fixed cost:** do not vary with activity level
  - **Step-fixed cost:** fixed for a certain level before moving up to a new fixed level after a certain amount of activity
  - **Semi-variable cost:** have fixed and variable components
  - **Curvilinear cost:** costly per activity at first and at the end, but level out over a relevant range in the middle
  - **Engineered costs:** have defined physical relationship to the level of activity
  - **Committed costs:** result from the business' basic needs to survive. Difficult to change in the short term.
    - E.g. factory rent, depreciation of machinery, management salaries
  - **Discretionary costs** results from managers deciding to spend a particular amount of money on a purpose
    - E.g. R&D, advertisement
- **Traceability**
  - **Direct costs** can be traced back to a cost object in an economic manner
  - **Indirect costs** cannot, e.g. factory rent, security
- **Controllability**
  - Costs can be controllable and uncontrollable
- Purpose for controllability classification:
  - Accountability – managers should be held responsible for costs they can control or significantly influence
  - Performance evaluation of manager or department
  - Cost control
- **Responsibility centre:** unit in an organisation where the manager is held accountable for activities and performance

- **Value chain** – costs can be categorised as:
  - Upstream
  - Manufacturing areas
  - Downstream
- Purpose for value chain classification:
  - Analyse cost structure and strategies
  - Measure performance
- **Function** means looking at manufacturing and non-manufacturing costs. It involves a specific cost object:
  - **Direct material (DM)**: raw materials used in the production process, which appear on the final product and its cost can be traced economically
  - **Direct labour (DL)**: any labour used to produce the product/service
  - **Manufacturing overhead (MOH)**: all costs other than DM and DL i.e. indirect materials and indirect labours
    - E.g. employee overtime and idle time
- **Prime costs = direct material + direct labour**
  - Major costs that can be associated with the product
- **Conversion costs = direct labour + manufacturing overhead**
- **Cost behaviour**: relationship between a cost and the level of activity or cost driver. Its purposes are:
  - Cost estimation
  - Cost management
  - Cost prediction
- **Cost driver**: an activity or factor that causes costs
- **Selecting the best cost drivers**:
  - Strong correlation between cost and cost driver
  - Cost driver is easy and economical to measure (benefit outweighs cost)
  - Input vs output measure:
    - Cost drivers for delivery cost – output measure (number of delivery) and input measure (number of litres of fuel)
- **Methods of cost estimation** – managerial judgement, engineering approach and quantitative analysis
- **Managerial judgement** – managers estimate costs using their experience. Reliability depends on ability of managers.
- **Engineering approach** – studying the processes that result costs.
  - Uses time and motion studies – observing the steps required and time taken by employee to perform particular activities, to estimate a cost function
    - Problem: is the data produced accurate? Will employee act different when observed
  - Time-consuming and expensive
  - Useful when there is no reliable past data
- **Quantitative analysis**: formal analysis of past data to identify relationship between cost and activities

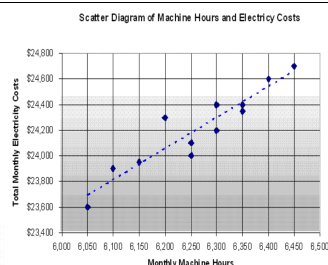
#### 1. Scatter diagram

##### Advantages:

- Visual assessment
- Highlight outliers

##### Disadvantage:

- Judgement in selecting the 'best' line
- Only one cost driver



2. **High-low method** – observing the highest and lowest levels of activities to develop a cost function and estimate costs

$$VC = \frac{\text{cost of highest activity} - \text{cost of lowest activity}}{\text{value of highest activity} - \text{value of lowest activity}}$$

Fixed cost → use highest or lowest activity level

Cost function = fixed cost + variable cost (quantity of activity)

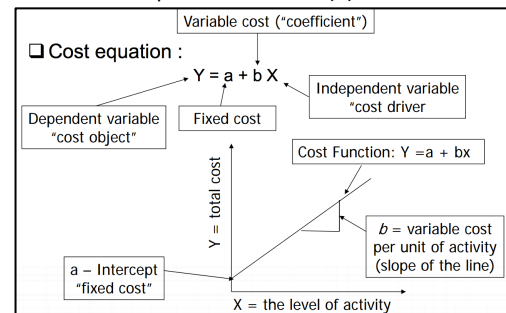
Month	Km travelled by buses	Cost (\$)
Jan	12 700	11 700
Feb	15 000	12 000
Mar	22 000	12 500
Apr	8 000	11 000
May	10 500	11 400
June	12 600	11 600

$$VC = \frac{12\,500 - 11\,000}{22\,000 - 8\,000} = 0.11 \text{ km}$$

$$FC = 12\,500 - 0.11 (22\,000) = 10\,080$$

Cost = 10 080 + 0.11 km (high activity)  
Cost = 10 120 + 0.11 km (low activity)

- Advantages:
  - Easy to compute
  - Little data required
- Disadvantages:
  - Less accurate – only 2 data points are used
  - Can be affected by outliers
  - Only consider one cost driver
- 3. **Regression analysis**: uses all observations to determine cost function
  - **Simple regression** – estimate the relationship between dependent variable (Y) and one independent variable (X)



- **Multiple regression**
- **Evaluation of the regression analysis**
  1. **Economic plausibility** – does it make economic sense?
  2. **Goodness of fit** – determine how well Y (cost object) is predicted by all X (cost driver/s)
    - **Adjusted R<sup>2</sup>** indicates % change in Y that is explained by all change in all cost drivers
  3. **F-statistics** – test the significance of the regression equation as a whole
    - Determine the probability that the relationship between the cost and all cost drivers has occurred by chance
    - Statistically significant if probability < 0.05
  4. **t-statistics** – test the significance of each independent variable in the regression model
    - Determine the probability that the relationship between each cost driver and cost has occurred by chance
    - Statistically significant if probability < 0.05

#### Issues in cost estimation

- Lack of knowledge
- Data
  - Missing data
  - Outliers
  - Mismatched time period
  - Trade-offs in choosing the time period (accuracy vs timeliness)
  - Allocated fixed costs – fixed costs are sometimes allocated on a per unit basis
  - Inflation
- Learning curve
- Low priority for high accuracy (cost-benefit principle) – subjective cost estimates may be good enough

### 3 – Overhead Costs

- Indirect/OH costs can be classified as
  - MOH: all other costs other than DM and DL (this topic)
  - Non-manufacturing overhead (next topic)
    - Upstream and downstream costs
- **(Technique 2a) Network diagrams** – display project activities as a network. Two types: