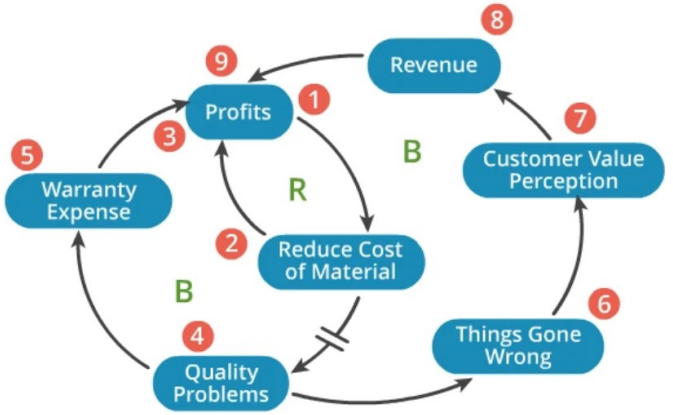
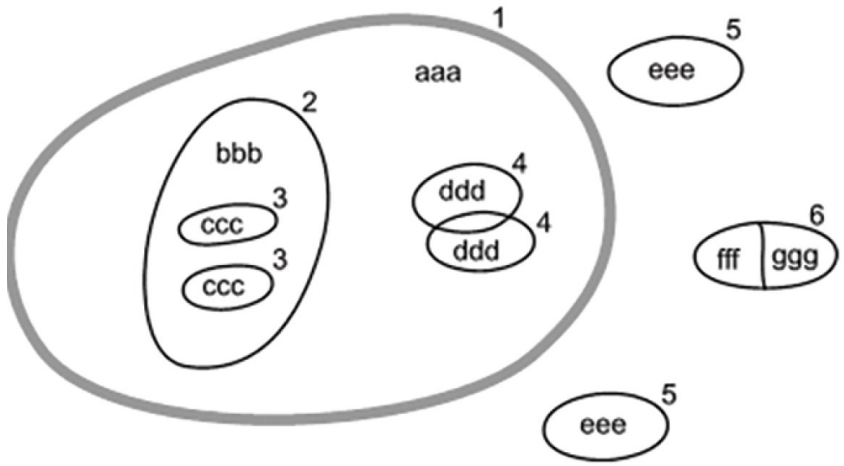


Systems' Diagramming

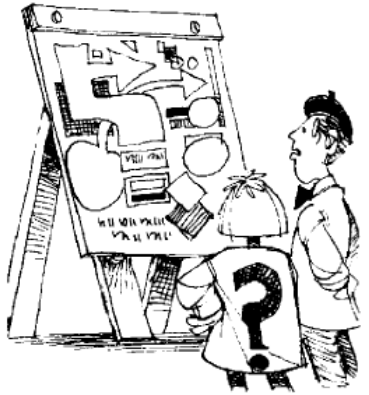


- **Systems diagrams:**

- Here the focus is on **using diagrams** to represent systems.

- It mainly involve the **arrangement** of words, phrases, lines or arrows on paper or on a screen.

- Use of such diagrams *does not depend* on **drawing abilities** but on **how deeply you think and feel** about the complex situation you are representing.



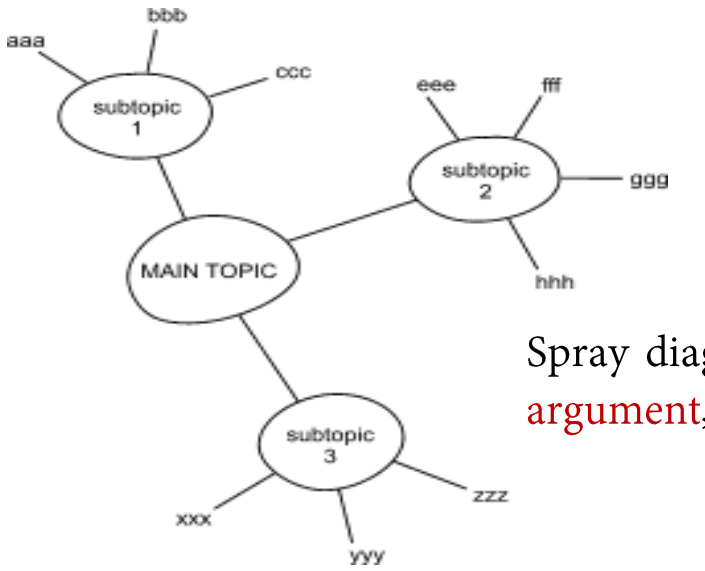
- **How do they help?**
- Diagrams can provide a clear and succinct summary, a review of a complicated situation or series of events.

- A diagram can show you an intricate pattern of relationships .

- Different types of diagrams offer different framings of a complex situation.

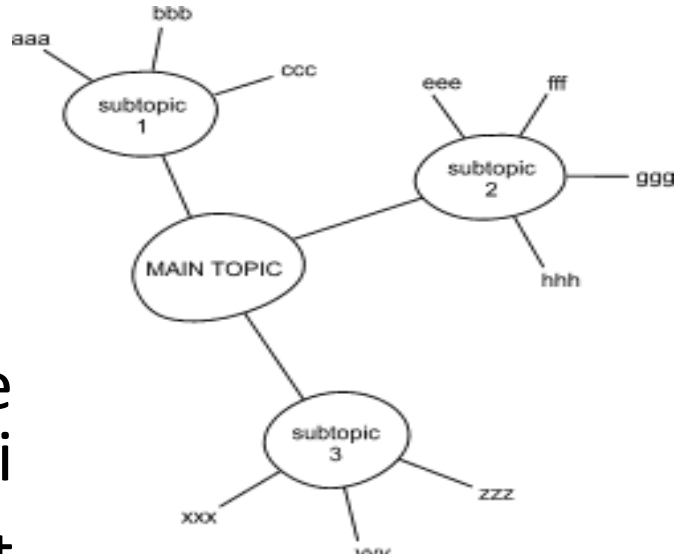
- Diagrams are hard ! → One is the **difficulty of drawing** the diagram. The other difficulty is **thinking clearly** about the topic.

- A **spray diagram** starts from a theme in the centre and the ideas arrange around that theme *showing the connections* or associations between the ideas.
- Sometimes it is useful to introduce a small number of sub-themes into which your subsequent ideas group.
- Important to brainstorm, build proof of concept arguments, i.e. in general related unstructured elements into a structured ideas.



Spray diagrams are mainly used for representing the structure of an argument, relationships between the ideas of others or for note taking.

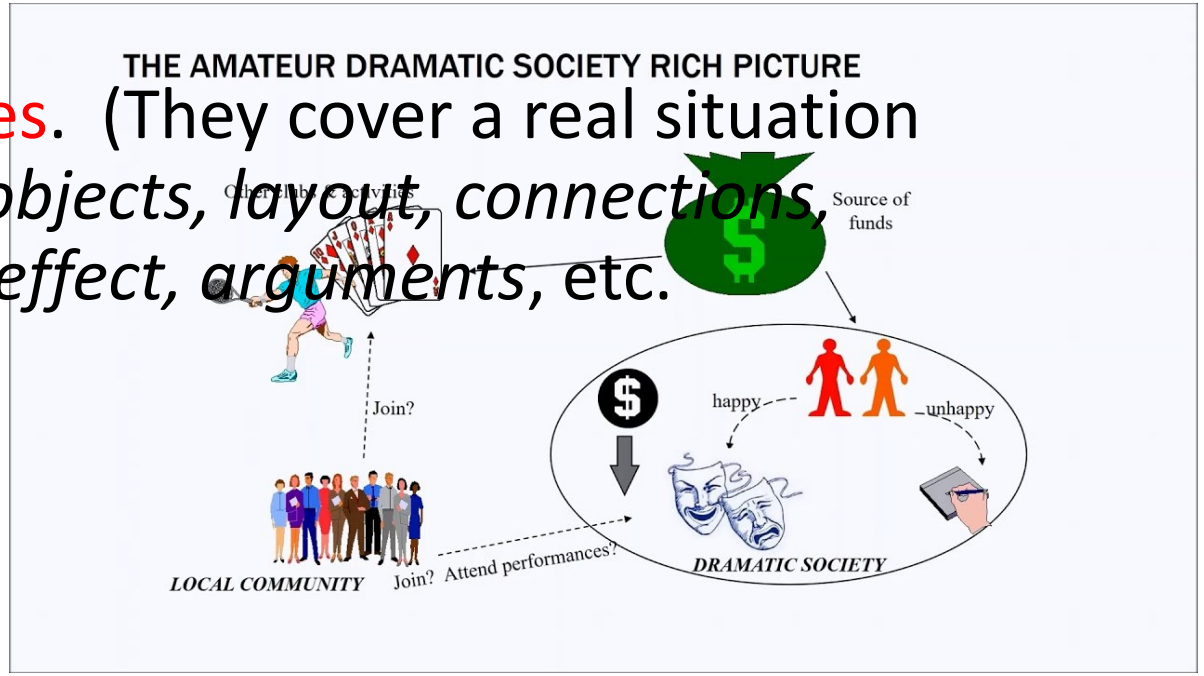
- **Components**:
  - A **title** describing the purpose of the diagram.
  - **Central circle** for the main theme or topic.
  - Blobs (not perfect circles) for **sub-themes** or sub-topics (optional).
  - **Branching** sets of lines.
  - **Words on the lines** or at the ends of the lines describing the various ideas you wish to incorporate.
  - There are ***no arrows.***



- NOTE:If you are stuck, start again with a new ce
  create a new diagram. Don't clutter up the origi
- You could perhaps just leave things for a while to give you time for some fresh thinking.

- **Rich pictures**:
- The purpose is to gather in one place, on one sheet of paper, all the data about a complex messy situation that you have collected.
- Using pictures or drawings is helpful in being able to collect it all together on one piece of paper, so that you can see everything together.

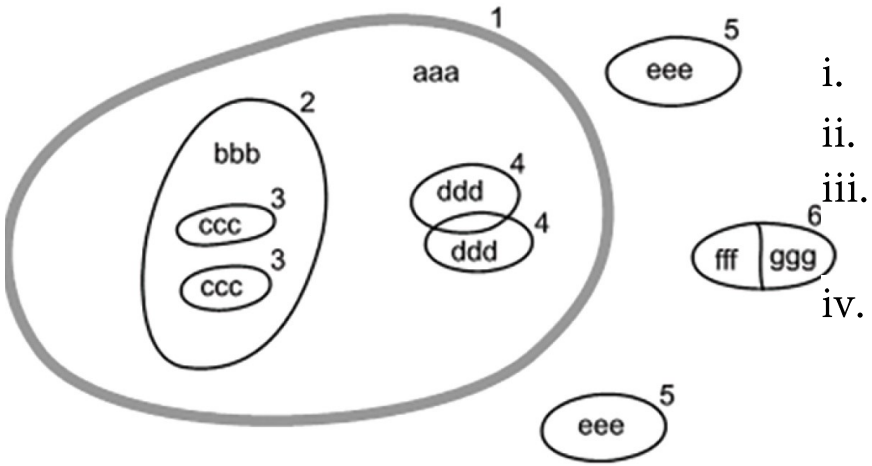
- Rich pictures are situation summaries. (They cover a real situation through a cartoon representation– *objects, layout, connections, relationships, influences, cause and effect, arguments*, etc.



- Components:
  - A **title** describing the purpose of the diagram.
  - **Pictorial symbols** representing things in the complex messy situation – these can be cartoon representations, sketches, or symbols (e.g. crossed swords representing an argument).
  - **Keywords** or phrases (e.g. speech bubble to convey attitude).

- **Systems map** is essentially a snapshot.
- It shows components of system and its environment together.
- It shows subsystems and/ or overlaps among components.
- *In such contexts, it carries much more impact, and is easier to grasp*.

- The **main uses** of systems maps are →to help you to decide how you are going to structure a situation and to communicate the interested area of system to others.



i. blob lines (1–6) represent boundaries of components.
ii. aaa, bbb, ccc, etc.→ name of each system or component
iii. Blob 5 and 6 (outside the main system boundary 1) represent components of the environment.
iv. Blob 2,3,4 are components of system (3 can be a subsystem)

- An **influence diagram** represents the main structural features of a situation and the important relationships that exist among them.

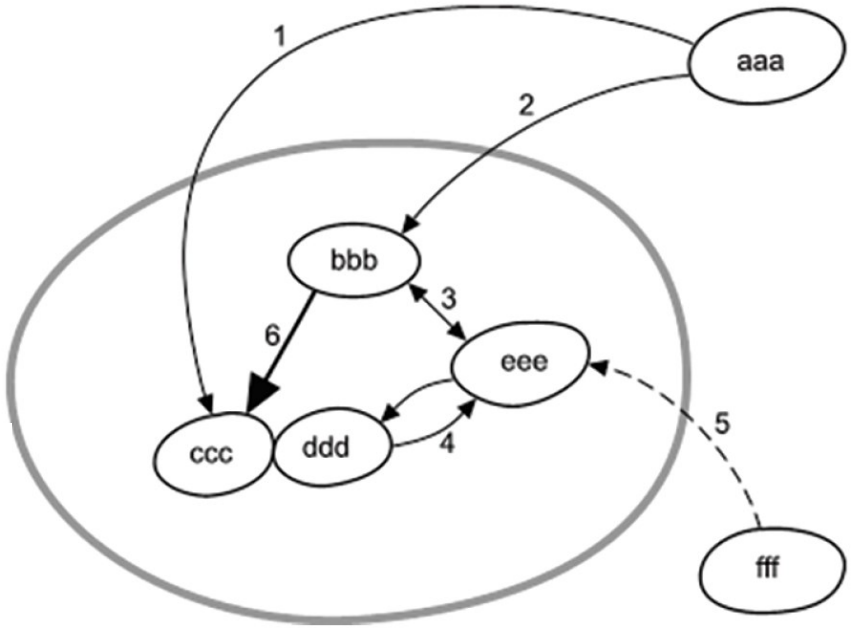
- It is **used** either to know those interrelationships, (may be for regrouping/ redefinition of the system, components) or to express a broad view of things one is considering.

- Can be developed from a systems map by adding arrows to show type of influence.

i. An arrow (1 from aaa or 2) joining component bbb/ ccc shows that aaa does influence bbb / ccc.

i. double-headed arrow (3) denote a two-way identical influence.

ii. (4) is two-way non-identical influence.

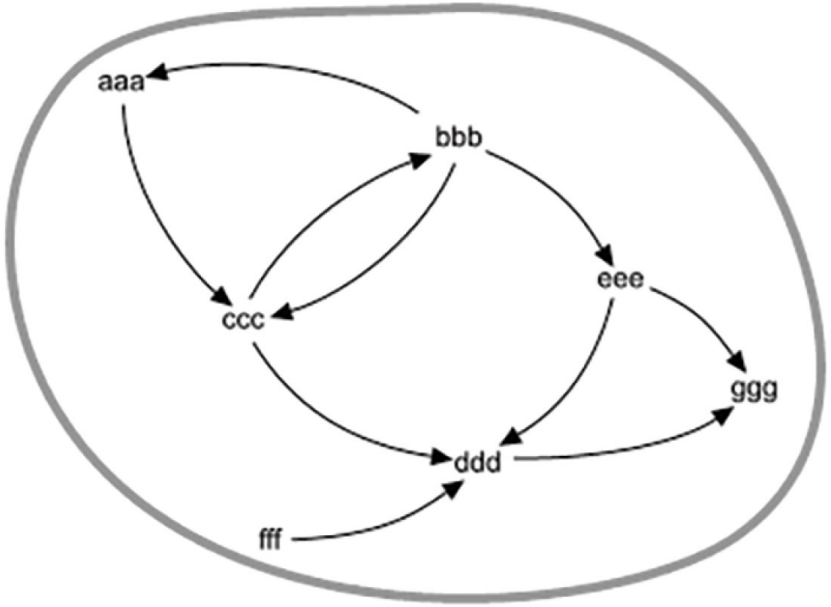


- **Multiple cause diagram** is used to explore why a given event happened / events tends to occur.

- **not** intended to **predict** behavior, but may be used to develop a list when considering *comparable circumstances* in the future.

- To check why something went wrong (causal loop) and take action.

- Its purpose is→ to consider events, and states c the city), and to explore the causal connections



- The **nodes** →consist of phrases that relate to a **state or an event.**

- **Arrows** indicate→ the **causal connections** between the phrases (directions of cause)

- arrows are not labelled/ labelled (indicating the cause)

- **Causal loop** diagrams are similar to multiple cause diagrams.

- Causal loop diagrams are used to graphically depict **dynamic interrelationships** among variables you may not have considered before.

- They can be used as the basis for a computer simulation model.

Task #1

- Consider a scenario of seasonal changes (winter, summer, autumn, etc) which is determined by the amount of sun light (A) which is determined by two factors namely, length of the day (B) and height of the sun above the horizon (C). Further, these two factors will be determined by tilt of axis (D) and position in orbit (E). Further, (A) will led to temperature variations (F). Moreover, if (B) is smaller, it leads to winter (G), else if longer leads to summer (H). Similarly, if (C) is smaller it leads to (G), else if longer, leads to (H). For the given scenario, use the following system thinking diagramming formats: (note: use assumptions if necessary w.r.t any missing data)
    - Spray diagrams
    - Multi-cause diagrams
    - Influence diagrams