Types of N/w :- Social Media

1) Based on presence
   1) impliat N/w
   2) Explicit N/w
2) Based on Direction
   1) Directed N/w
   2) Undirected N/w
3) Based on Mode
   1) Single Mode
   2) Dual Mode
   3) Multimode
4) Based on weight
   1) Weighted N/w
   2) Unweighted N/w

1) Based On Presence

1) Implicit :- They are not terminated or Hidden by default & must be intentionally constructed using special tool & technique.
Ex- Co-citation N/w, Hyperlink N/w. etc.

2) Explicit N/w : explicit Social N/w are present by default. In other words, it is clearly designed for Social Media users to participate. Ex- fb N/w, twitter follow-follow N/w Linkedin prof N/w, YT Subscriber N/w, blogger N/w etc.

2) Based on Direction :

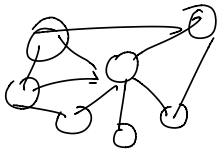
1) Directed N/w : A N/w with directed links bet^n node is called directed N/w. Links are usually drawn with arrow to indicate the direction of Relationship bet^n Nod.
ex Twitter, Insta (A) ⟶ (B)

2) Undirected N/w : In undirected N/w, the connection bet^n node have no direction. The fb friend N/w is the example of Omnidirectional N/w.

3) Based on Mode :-

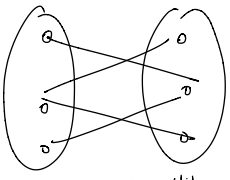
1) Single Mode :- A Single Mode N/w is formed bet^n Single set

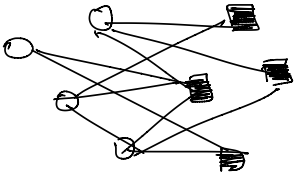
of peer Node. The fb friends N/w is an example of one Mode Net^n where Node form N/w connection



2) 2-Mode N/w (Dual):-

A bimodal N/w is also called as bipartite N/w
It is N/w with 2 sets of diffent classes.
In these N/w, Network connectivity exists only bet^n Nodes belonging to the different groups.





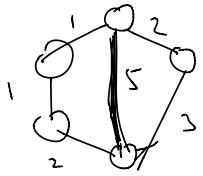

- event


- users.

3) Multimode N/w:- It is a heterogeneous Node are inter'connected.
It is can be viewed as a MixNw of 1-Mode & 2-Mode N/w

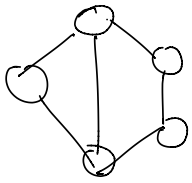
4) Based on weights

① weighted N/w -> The links bet^n Node are given a certain weight to indicate the strength of linlg bet^n node.

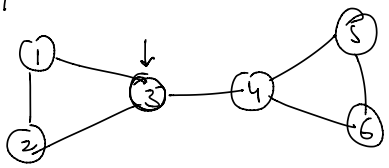


Ex- the relationship (connection) bet^n 2 friends (Node) on fb. becomes stronger the more they communicate.

2) Unweighted N/w: In this N/w, links bet^n node have no weight.
Links only indicate the existance of a relationship, not its strength.
It is easy to construct but may hide useful information



Degree Centrality / Centralization



→ It uses the distribution of a centrality measure to understand the N/w as a whole., it is also used to compare other Node.

$$C_D = \frac{d(i)}{n-1} \Rightarrow \frac{3}{5} = 0.6$$

Tie Strength :- To analyze tie strength in SN, the N/w must include relationship information, In N/w, it may be feasible to ask each person to rate the strength of their tie to other / each person

1) Time :- The amount of time people spend with each other
2) Emotional intensity :- close friends, family, More than casual friends
3) Intimacy / Mutual Confiding :- Sharing the secrets.
4) Structural :- Mutual friend
5) Social distance :- common attribute, age, Interest, education. etc
6) Emotional support :- Communicate
7) Reciprocal Service :- favor that people do for one another

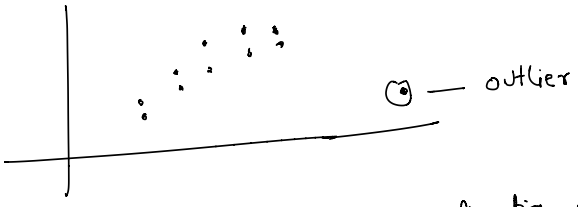
→ Strong tie characteristics in Social Media

1) Intensity :- No of words exchange on one another walls
2) Intimacy - no. of days since their communication
   - no of friends in common
   - keywords used bet^n users

3) Reciprocal Service:
- no of quiz shared on another wall.'s
- Application the user had in common

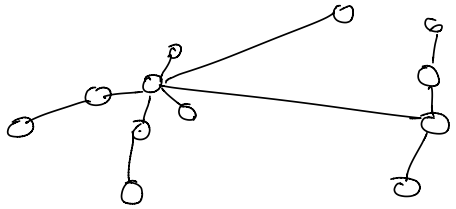
4) Social distance:
- Difference in the no. of educational degree
- no. of occupation
- no of attribute common.

graph layout :- Every N/w is made up of node & edge How they are laid out is critical to what an observer is able to understand about a N/w, their are many layout algorithm that position of node & edge in different way visualized the N/w.



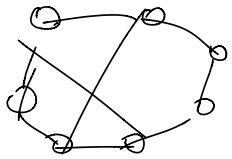
general guidline that make N/w visualization easier to understand
- Every node is visible
- for every node you can count its degree
- for every link you can follow it from source to destination
- cluster & outlier are identifiable.

1) Random layout :-

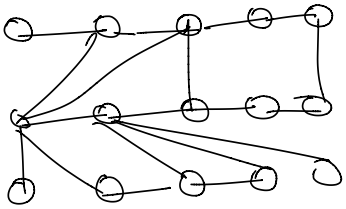


→ when loading data into a visualization tool, the node are placed randomly. This is called as random layout & it often does not provide much insight into structure of N/w

2) Circular layout :- It place all the node in a circle & add edge bet^n them. Some circular layout place node closer to one another when they are more closely connected

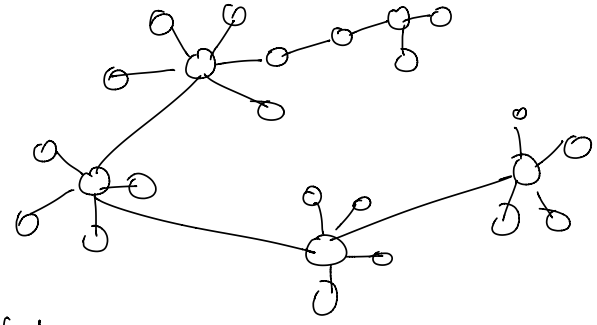


3) grid layout :-



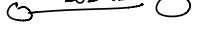
→ degree of node is clearly shown high in the grid layout.

4) force directed layout :- Most graph are not laid out randomly or in one of them format with a predetermined structure. Instead the layout is dynamic & determined by the connection bet^n node.



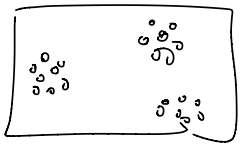
Visualizing N/w feature

- layout algo help to placement node & edge
- other feature like weight, label, cluster, visual

→ Label 

→ Shape, size, color used in graph for categorical.

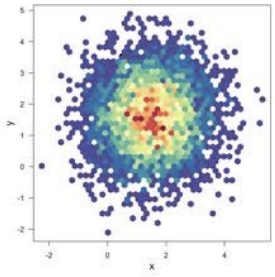
→ Larger graph properties - cluster



Scale Issue :-

In N/w shown so far have been relatively small a few Hundred node & few Thousand edge.

- visualization is very useful for analysing N/w of the size larger or smaller when N/w becomes much larger the quality of visualization diminishes.



→ example shows a N/w from peer to Peer file sharing N/w Node represent Host & edge represent relationship.

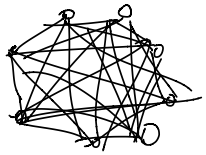
→ 11,000 node in this N/w, 40,000 edge density very low - (0.001) There are still too many node & edge to see much of anything.

→ Depending on the Structure of N/w, it is sometime possible to get ~~used~~ useful visualization with up to 10,000 Node However N/w under 1000 node are typically safest.

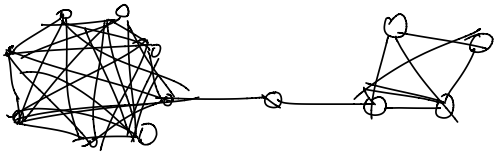
2)→ Density.
3) filter
4) graph Simplification

2) Density:- It can also be a problem for visualization even if the no. of edge is small. if no of node is 100 but over 4100 edge.

- the edge filtering apply only those with a weight of 40% or more are visible. However as this N/w shows there are no interesting pattern visible. with the threshold of 40%. the N/w is simply too dense



3) filtering for visual pattern:- It is often difficult to see any pattern in very dense N/w. one way to compensate for this is to filter the N/w when possible



3) Graph simplification: An active area of research in N/w visualization is graph simplification. bcz large N/w are very common when working with SNA, problem of scale are common.

- It shows tree structured N/w visualized with P tool is called Space tree. It represent node as cluster or group of nodes.