Social Capital

Role of Social Structure

- social structure plays key role for opportunities and constraints wrt access to key resources
- network ties serve as important conduits for knowledge and intangible resources such as social support
- establishing links to those control tangible resources give benefits to individuals and also their followers
- Nahapiet and Goshal define "social capital as the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit"

Social Capital and Intellectual Capital

- *social capital* based on the framework of Nahapiet and Ghoshal describes social capital as a function of intellectual capital
- social capital creates intellectual capital through exchanging and combining of knowledge possessed by individuals
- Ex. Semantic Web community - accumulation of knowledge in the fields of Knowledge Representation and Web science and combination of two
- Intellectual capital brings socialization, leads to creation of new intellectual capital

Dimensions of Social Capital

- Nahapiet and Goshal three main dimensions of of social capital :

- Structural
- Relational
- Cognitive

- **structural dimension** of social capital - refers to patterns of relationships or positions that provide benefits in terms of accessing networks

- social capital put a single node (the ego) in the center and provide a measure for the node based on his connectivity to other nodes (the alters).

Measures of Structural Dimensions

- Some of the measures of structural dimensions are:

- Degree of centrality
- Closeness centrality
- Betweeness centrality
- Structural Holes

Degree of Centrality

- It is a measure of degree, i.e. the number of (incoming, outgoing or all) links of a node
- high degree nodes provide efficient access to the network
- Does not take into account the wider context of the ego (Sometimes high degree nodes disconnected from the large networks)
- Important measure in scale free network

Closeness Centrality

- It calculates the average (geodesic) distance of a node to all other nodes in the network
- Characterizes the reach of the ego to all other nodes of the network.
- *local closeness centrality* - constrain size of neighborhood in large network

Betweeness centrality

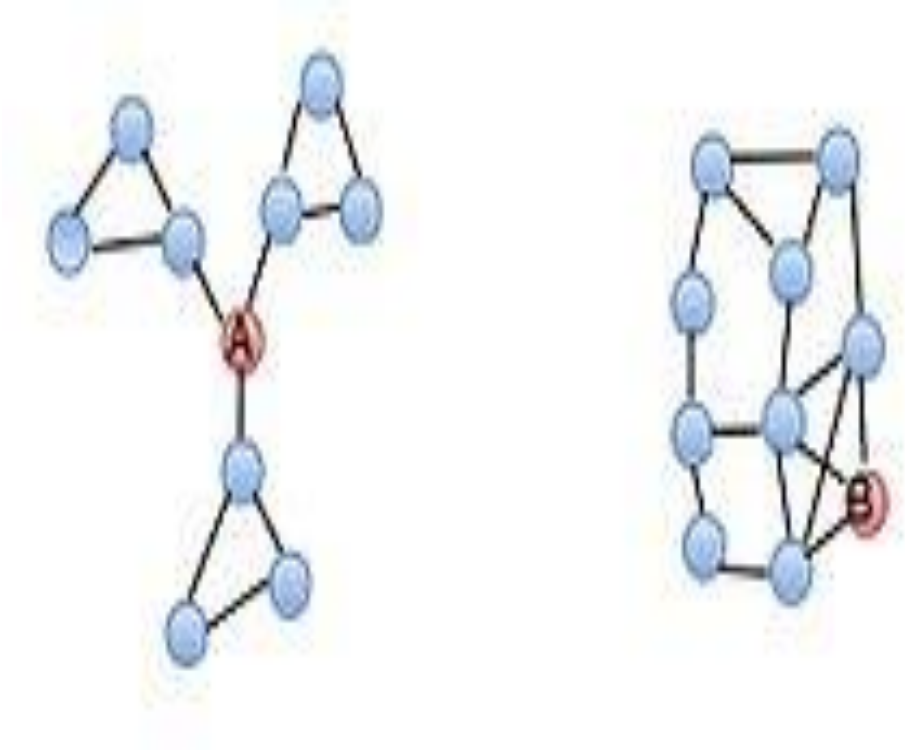
- Ties spanning communities are sparse compared to networks of cohesive subgroups , results in few *bridges across communities*

- *broker positions* and *weak ties* - A broker gains advantage by standing in between disconnected communities

- *Betweenness centrality* "identifies broker positions by looking at the extent to which other parties have to go through a given actor to conduct their dealings"

Structural Holes

- Ronald Burt is related to the idea of *structural holes in social network*
- A structural hole occurs in the space that exists between closely clustered communities
- According to Burt, a broker gains advantage by bridging such holes



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- node A and node B have same no. of links, due to the position, node A is more likely to get novel information than node B
- Because node B is highly connected and get redundant information
- On contrary, the position of node A makes it serve as a bridge or a ‘broker’ between three different clusters, hence node A is likely to receive some non-redundant information from its contacts

Strong ties vs Weak ties

- In contrast to Burt, Coleman stresses the importance of a dense network with strong ties
- Network knowledge easily shared due to high general trust and well-established norms
- Density can be measured by computing the clustering coefficient measure on a neighborhood of the individual

Relational Dimension

- It is a kind of personal relationships that people have developed with each other through a history of interaction

- Relationships of pairs of actors occupy similar network positions in similar network configurations differ based on their past interactions and action

- Mark Granovetter found benefits as a function of weak tie through experiments Ex. response on urban development, individuals finding jobs

Advantages of Strong and Weak ties

- Weak Ties by Burt - “birds of a feather” i.e. individuals with similar resources, knowledge, ideas and social access are unlikely to provide the informational advantage

- Strong Ties by Coleman - Personal trust, the accumulated experiences, the mutual lasting obligations that characterize strong ties reduce the cost (by reducing the risk) of many exchange transactions

Cognitive Dimension

- **Cognitive dimension of social** capital refers to those resources providing shared representations, interpretations and systems of meaning
- In particular, cognitive ties are based on the existence of shared languages, signs and narratives, which facilitate the exchange of knowledge
- Certain forms of cognitive embedded possess distinct advantage E.g. in Semantic web community
- However, excessive cognitive similarity (associated with strong ties) is likely to lead to cognitive overembeddedness

Statistical Network Analysis

- Various aspects of social capital are used in analysis
- Measures are analysed “cases-by variables” and are correlated with some output variable using regression analysis
- E.g. structural holes measure correlates with creativity
- Done by establishing a linear equation between individual characteristics on one side of the equation and creativity on the other side

case	var_1	var_2	…	var_n	var_o
Anna	0.92	0.23	…	0.37	3.2
Bill	1.73	…			…
Cecile	…				
David					

$$\lambda_1 var_1 + \cdots + \lambda_n var_n + c = var_o + \varepsilon$$