

SOCIAL NETWORK



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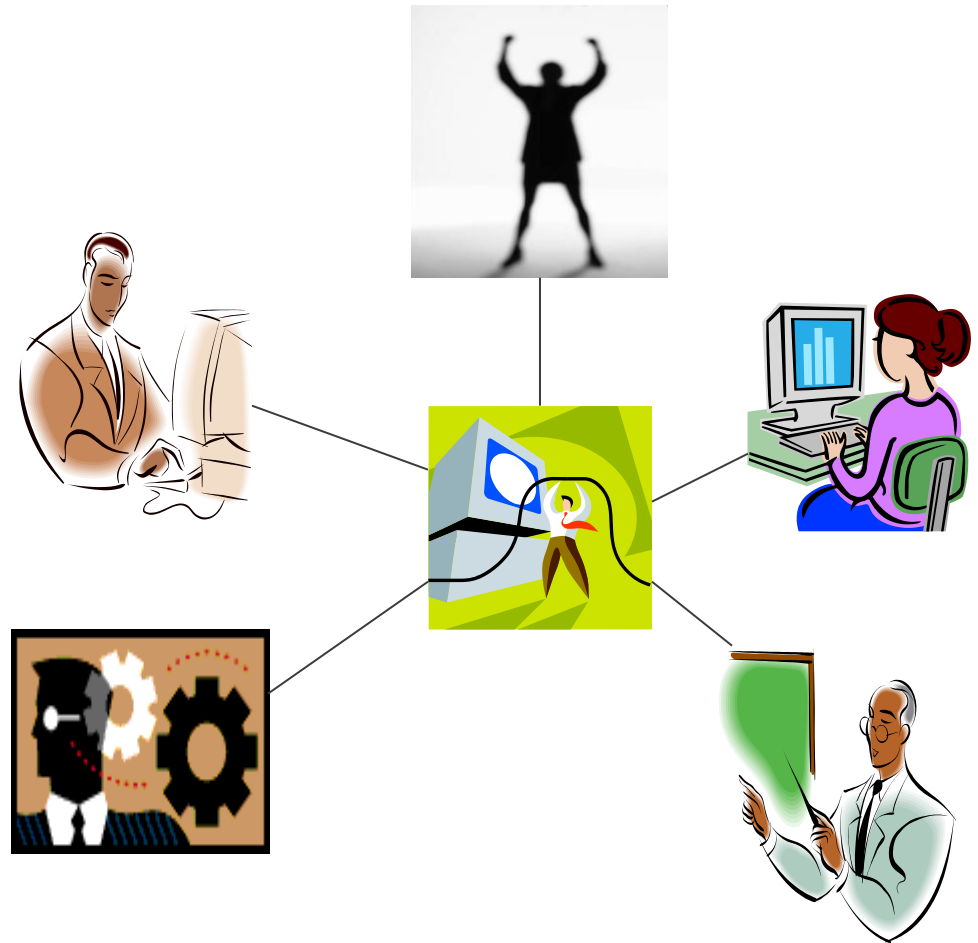
Extract from various presentations: B Wellman, K Toyama, A Sharma, Teradata Aster, ...

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Social Network

A social network is a social structure between actors, mostly individuals or organizations

It indicates the ways in which they are connected through various social familiarities, ranging from casual acquaintance to close familiar bonds

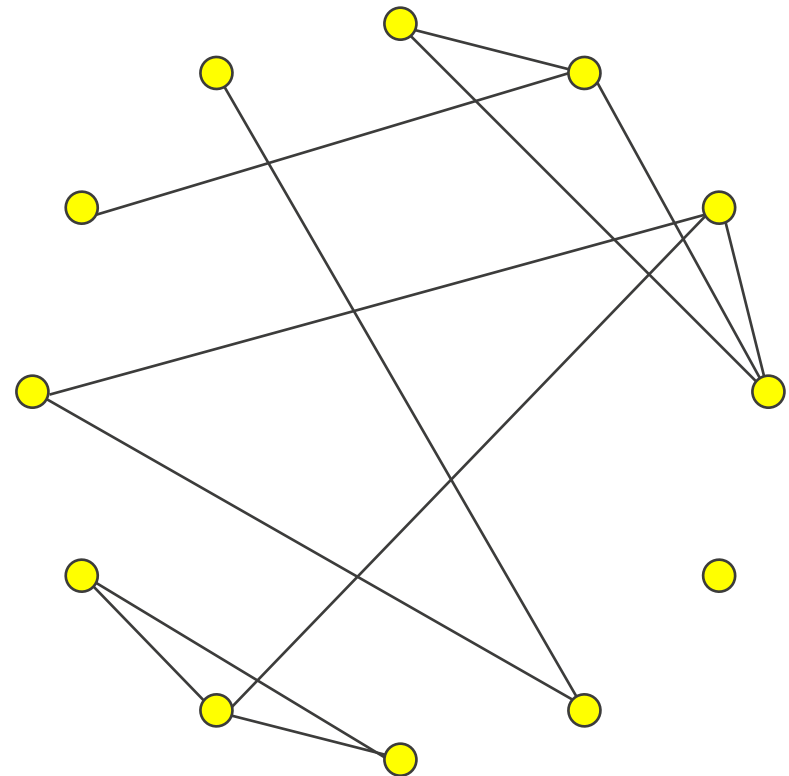


Society as a Graph

People are represented as nodes

Relationships are represented as edges: *relationships may be acquaintanceship, friendship, co-authorship, etc.*

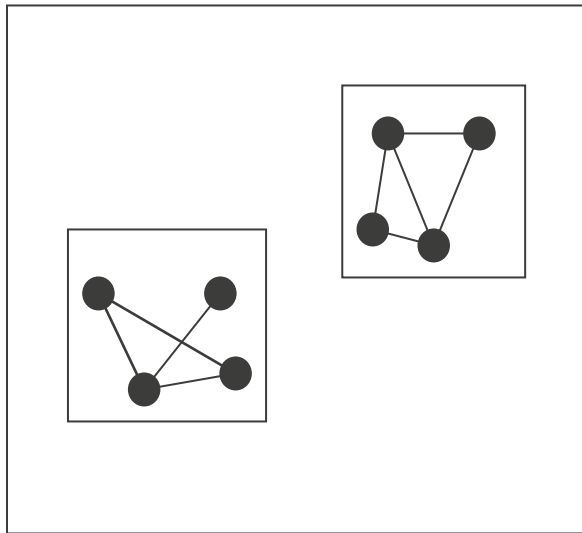
Allows analysis using tools of mathematical graph theory



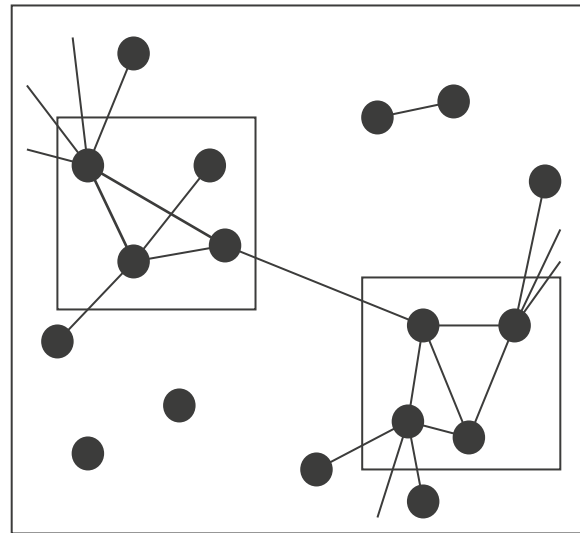
Social Network Analysis

Social network analysis [SNA] is the mapping and measuring of relationships and flows between people, groups, organizations, computers or other information/knowledge processing entities:

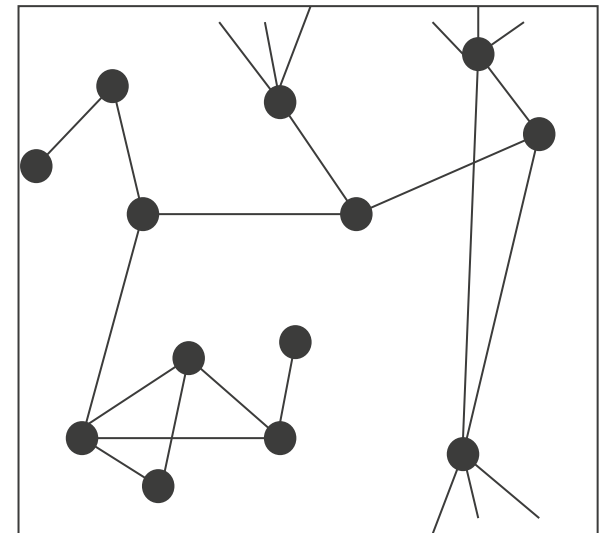
Little Boxes



Glocalization



Networked Individualism



Connections

- **Size**
 - > **Number of nodes**
- **Density**
 - > **Number of ties that are present / the amount of ties that could be present**
- **Out-degree**
 - > **Sum of connections from an actor to others**
- **In-degree**
 - > **Sum of connections to an actor**

Distance

- **Walk**
 - > **A sequence of actors and relations that begins and ends with actors**
- **Geodesic distance**
 - > **The number of relations in the shortest possible walk from one actor to another**
- **Maximum flow**
 - > **The amount of different actors in the neighborhood of a source that lead to pathways to a target**

Some Measures of Power & Prestige

- **Degree**
 - > **Sum of connections from or to an actor**
 - **Transitive weighted degree** → **Authority, hub, pagerank**
- **Closeness centrality**
 - > **Distance of one actor to all others in the network**
- **Betweenness centrality**
 - > **Number that represents how frequently an actor is between other actors' geodesic paths**

Cliques and Social Roles

- **Cliques**

- > **Sub-set of actors**

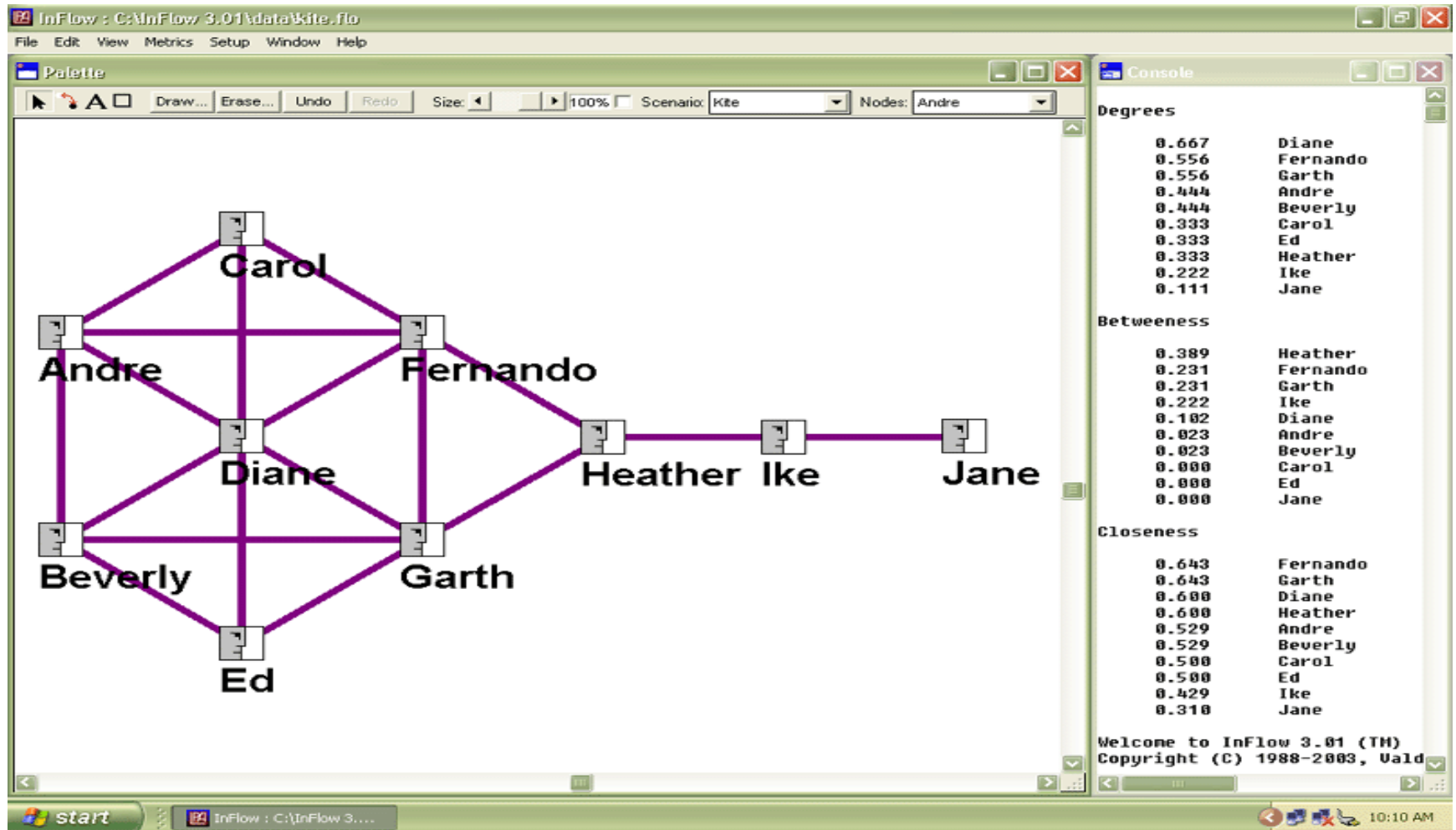
- More closely tied to each other than to actors who are not part of the sub-set:**

- **A lot of work on “trawling” for communities in the web-graph**
 - **Often, you first find the clique (or a densely connected subgraph) and then try to interpret what the clique is about**

- **Social roles**

- > **Defined by regularities in the patterns of relations among actors**

Network Analysis Example

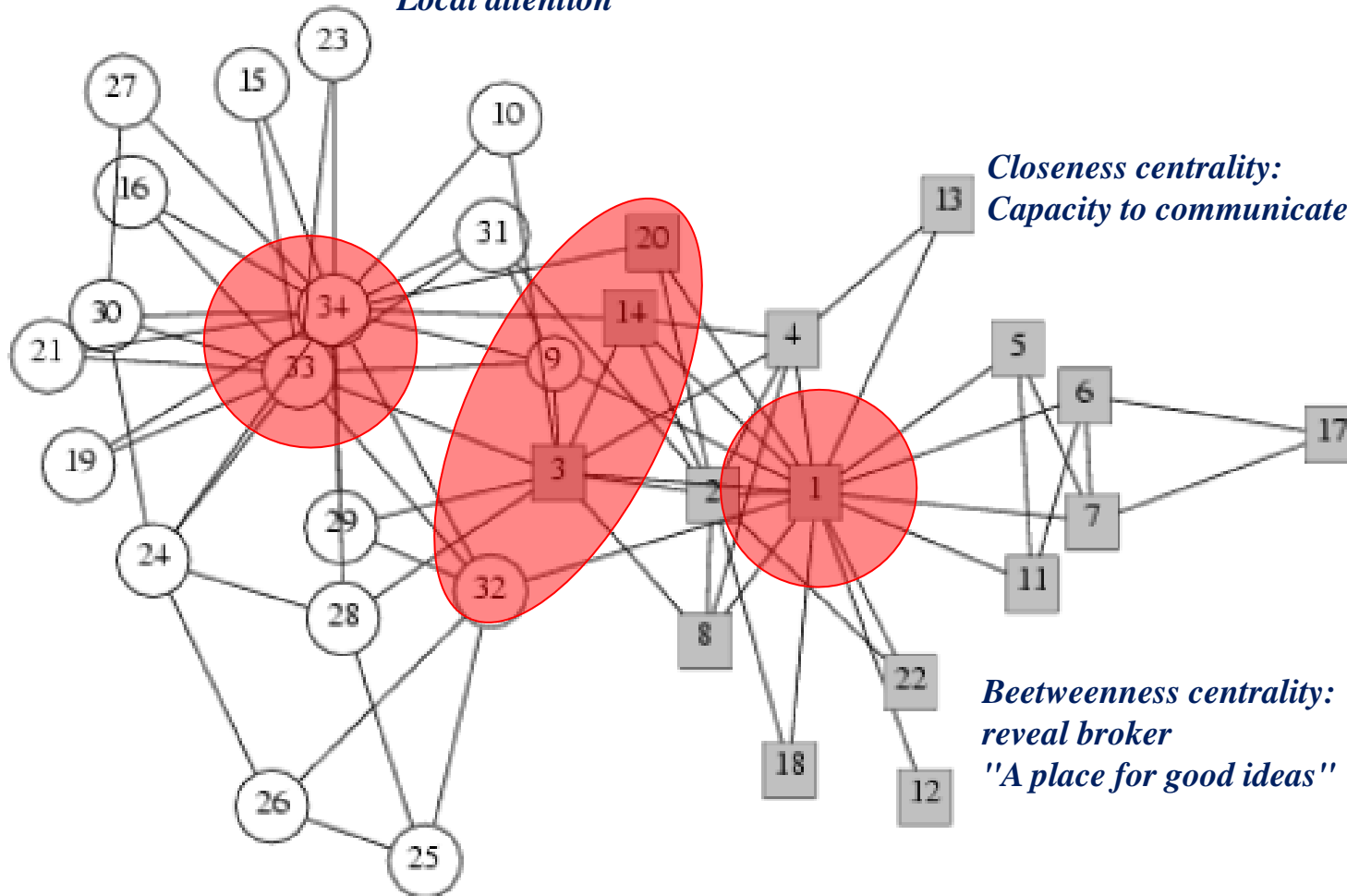


Centrality: strategic positions

*Degree centrality:
Local attention*

*Closeness centrality:
Capacity to communicate*

*Betweenness centrality:
reveal broker
"A place for good ideas"*



Social Network Analysis: what for?

- **To control information flow**
- **To improve/stimulate communication**
- **To improve network resilience**
- **To trust**

- ***Web applications of Social Networks examples:***
 - > ***Analyzing page importance (Page Rank, Authorities/Hubs)***
 - > ***Discovering Communities (Finding near-cliques)***
 - > ***Analyzing Trust (Propagating Trust, Using propagated trust to fight spam - In Email or In Web page ranking)***

Tangible Outcomes from SNA

Sell More

*Organisational Re-structures
that work*

*Better Knowledge
Sharing*

Preserving Expertise

*Building Better
Communities*

More Innovation

Competitive Intelligence

Teradata Aster: See the Network

Understand connections among users and organizations

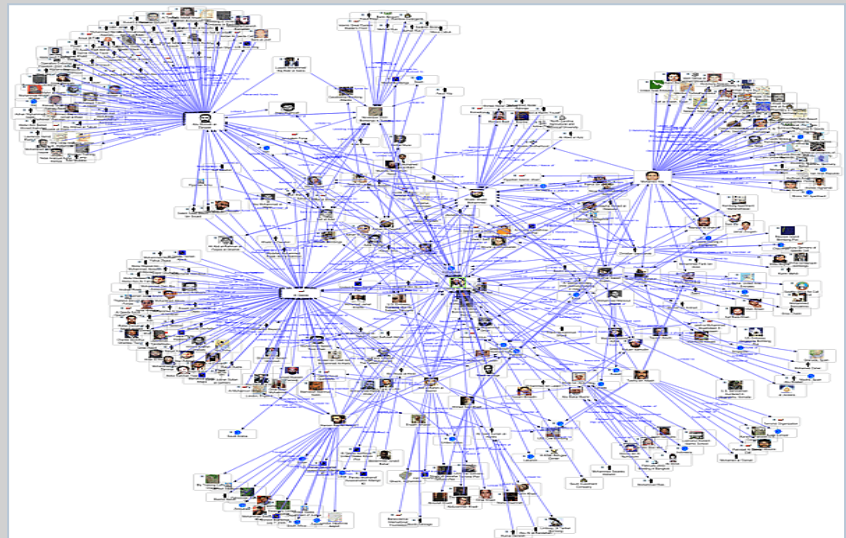
Challenges

- Large number of entities with rapidly growing amount of data for each
- Connectivity changing constantly

Aster Data Value

- SQL-MapReduce® function for Graph Analysis eases and accelerates analysis
- Ability to store and analyze massive volumes of data about users and connections
- High loading throughput and incremental loading to bring new data into analysis

Examples



- **Link analysis:** predicting connections (among people, products, etc.) that are likely to be of interest by looking at known connections
- **Influence analysis:** identifying clusters and influencers in social networks

Teradata Aster References

Social Network & Relationship Analysis

Select Aster Data Customers in Digital Marketing Optimization



Analysis of user behavior, intent, and actions across search, ad media and web properties, in order to drive increased ROI.



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