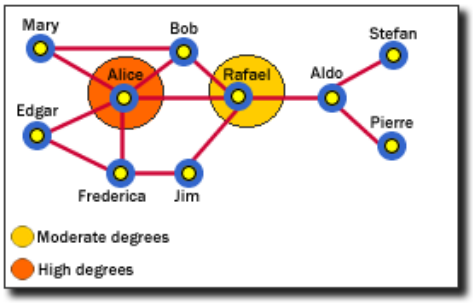
Sentinel Visualizer®

An Introduction to Social Network Analysis

Sentinel Visualizer provides you with automatic analysis, providing definition and meaning in any network, simple or complex. The heart of the analysis is the application of Social Network Analysis, SNA, as a set of tools to identify centrality. SNA provides a set of methodologies and formulas for calculating a variety of criteria that map and measure the links between things.

Degree Centrality

Degree centrality is simply the number of direct relationships that an entity has. An entity with high degree of centrality:

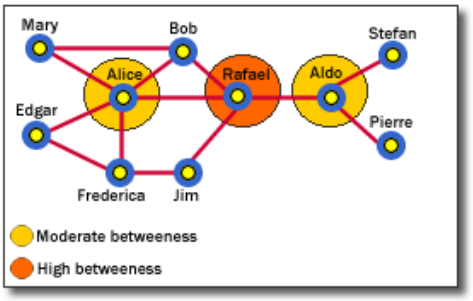


- Is generally an active player in the network.
- Is often a connector or hub in the network.
- Is not necessarily the most connected entity in the network (an entity may have a large number of relationships, the majority of which point to low-level entities).
- May be in an advantaged position in the network.
- May have alternative avenues to satisfy organizational needs, and consequently may be less dependent on other individuals.
- Can often be identified as third parties or deal makers.

In our example network diagram (represented by the colors as noted on the key), Alice has the highest degree centrality, which means that she is quite active in the network. However she is not necessarily the most powerful person because she is only directly connected within one degree to people in her clique—she has to go through Rafael to get to other cliques.

Betweenness Centrality

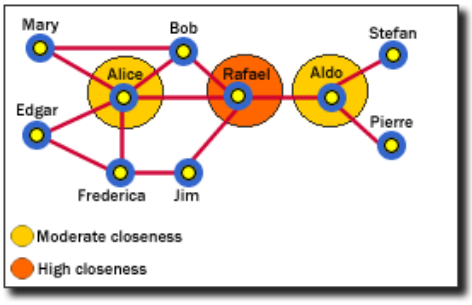
Betweenness centrality identifies an entity's position within a network by its ability to make connections to other pairs or groups in a network. An entity with a high degree of betweenness centrality generally:



- Holds a favored or powerful position in the network.
- Has a greater amount of influence over what happens in a network.
- Represents a single point of failure—take the single betweenness spanner out of a network and you sever ties between cliques.

In this example, Rafael has the highest betweenness because he is between Alice and Aldo, who are between other entities. Alice and Aldo have lower betweenness because they are only within their own cliques. So although Alice has a higher degree centrality, Rafael may have more importance in the network.

Closeness



Closeness centrality measures how quickly an entity can access more entities in a network. An entity with a high closeness centrality generally:

- Has quick access to other entities in a network.
- Has a short path to other entities.
- Has high visibility as to what is happening in the network.

As with the betweenness example, Rafael has the highest closeness centrality because he can reach more entities through shorter paths. As such, Rafael's placement allows him to connect to entities in his own clique, and to entities that span cliques.

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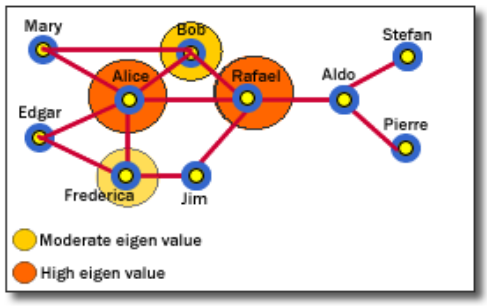
Eigenvalue

Eigenvalue measures how close an entity is to other highly close entities within a network. In other words, Eigenvalue identifies the most central entities in terms of the global or overall makeup of the network. A high Eigenvalue:

- Indicates an actor that is more central to the main pattern of distances among all entities.
- Is a reasonable measure of one aspect of centrality in terms of positional advantage.

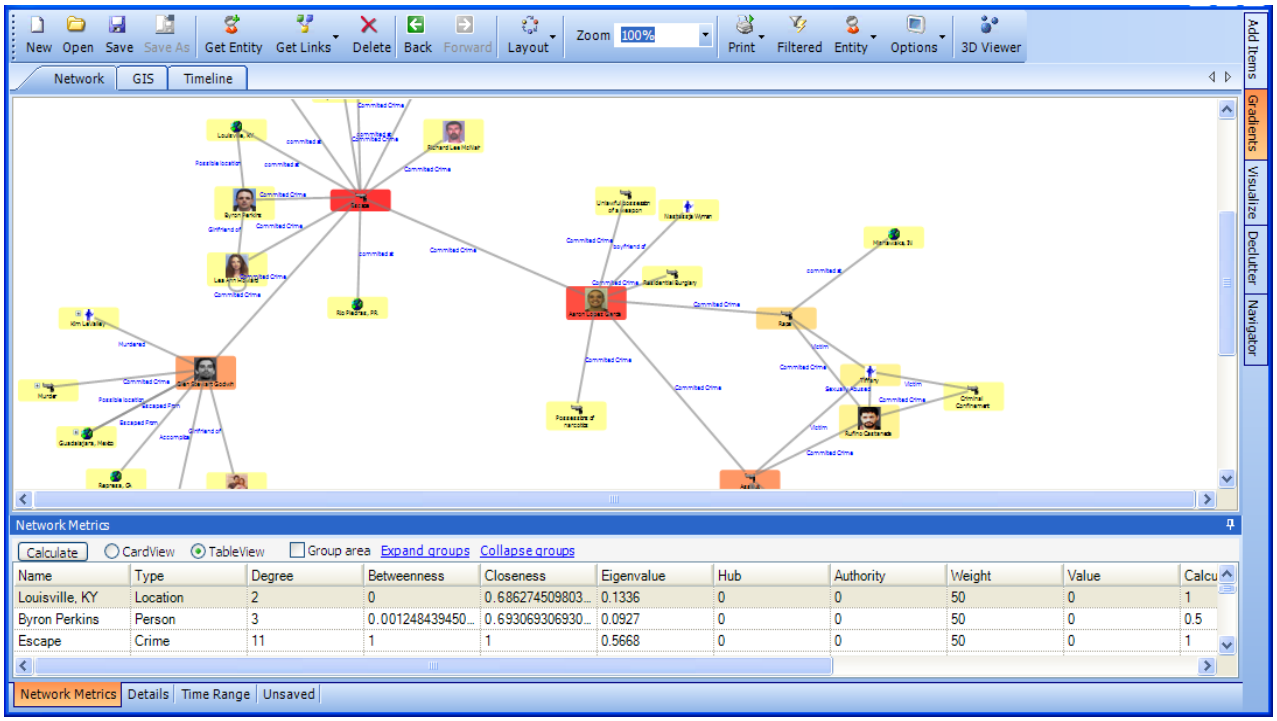
In this example, we can see that Alice and Rafael are closer to other highly close entities in the network. Bob and Frederica are also highly close, but to a lesser value.



Putting Social Network Analysis to Work

Sentinel Visualizer uses Social Network Analysis to automatically identify key nodes and groups within your data. In addition to the metrics already listed, it provides valuable data on other aspects such as hubs and authorities, entity and relationship weight, entity types and statuses, and various other parameters. The result is highly accurate analysis that reveals the hidden patterns and trends in your data.

SNA is directly integrated into the visualization form and is as simple to access as pressing a button. Once Sentinel



Visualizer has generated SNA numbers for your data, you can easily sort by any of the values, an color code them directly on the network view.

The application of Social Network Analysis is just one of the many ways Sentinel Visualizer truly defines the next generation in analytical software.