
Social Network Analysis: Its Application to Industrial Clusters

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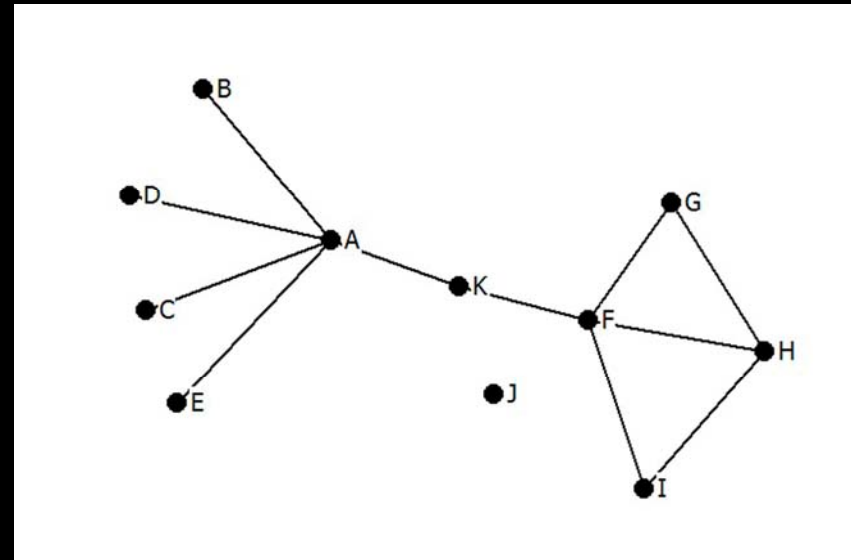
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What is Social Network Analysis?

- Used to analyze the structure of **interpersonal relationships** within a group of individuals
- Collectively, these relationships constitute a **network**
- Individuals – **nodes**
- Relationships – **linkages**



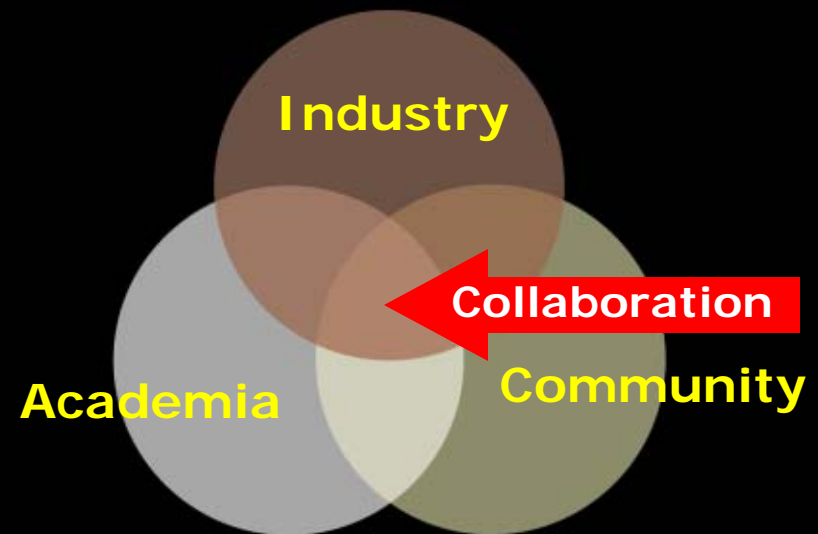
Social Network Analysis and Clusters

- Social Network Analysis (SNA) can be used in analyzing industrial clusters
- Will use example of northwest Ohio greenhouse cluster to demonstrate value of SNA



The northwest Ohio greenhouse cluster

- Began in January 2005
- Objective is to help the 60+ greenhouses in northwest Ohio increase their competitiveness through the process of **collaborative problem solving**



NW Ohio Greenhouse Cluster

Industry

Individual Greenhouses

Suppliers to the Industry such as Waldo & Associates and Palmer Energy

Customers of the Industry such as The Andersons

Industry Associations, e.g. Toledo Area Flower & Vegetable Growers

Academia

Local Universities such as UT, BG, and OSU

UT Urban Affairs Center

UT Plant Science Research Center

OSU Extension

Community

Toledo Botanical Gardens

Center for Innovative Food Technology

Toledo Area Rapid Transit Authority

City of Toledo

Toledo Choose Local

Local Garden Clubs

Maumee Valley Growers

- Maumee Valley Growers (MVG) is the central organization within the northwest Ohio greenhouse cluster
- Established in November 2005 to manage and run the cluster



MVG Governance

- Managed and operated by an Advisory Board, Program Manager, and Champion
- Supported by 5 Grower Ambassadors



Collecting the Data for an SNA

- Everyone in the cluster receives a survey that lists everyone else in the cluster
- Everyone identifies other members of the cluster with whom they have
 - Collaborated on a project
 - Received new ideas from
 - Sought advice and support from
- Individuals are allowed to add names of others, not on the list, with whom they have interacted

	Collaboration	New Ideas	Advice & Support
Neil Reid			
Leena Zittling	X	X	X
Perttu Huusko	X		X
Jukka Teras			X

Data Analysis

- Once the data are collected they are analyzed using a SNA software
 - InFlow
 - UCINET



Key Cluster Question 1

- How dense is the network of interactions within the cluster and how is this density changing over time?
- High density networks desirable
 - Information flows more rapidly
 - Higher network durability



Density

- **Density** = actual number of connections within a network as a percentage of maximum potential connections.
 - Ranges from 0 to 100%
- NW Ohio greenhouse network has a density of **6%**



Key Cluster Question 2

- How well connected with other members of the cluster are key people such as Cluster Manager, Champion, and Ambassadors?
- Use a measure called **centrality** to measure connectedness of individuals
- People with **high centrality** have ability to bring people together and make things happen



Centrality

- Centrality
 - Degrees-in
 - Number of times someone is mentioned by other people in the network.
- Centrality measures are normalized and range from 0 to 1.



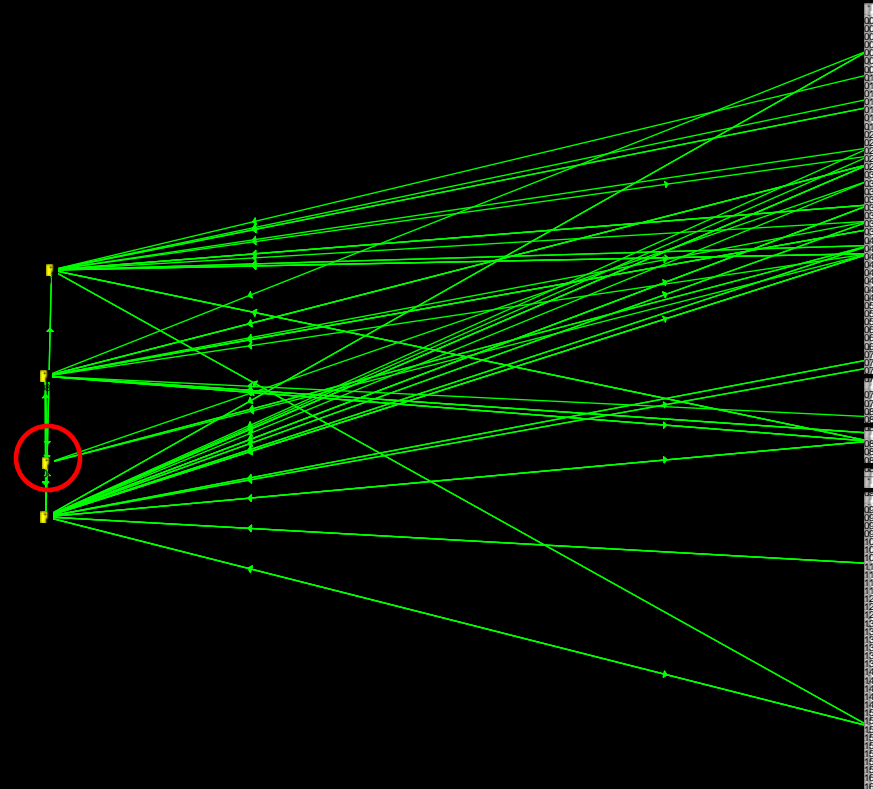
Centrality Score Examples

- Cluster Manager
 - 0.222
- Champion
 - 0.165
- Cluster Mean
 - 0.059
-
- People with **high centrality** have ability to bring people together and make things happen



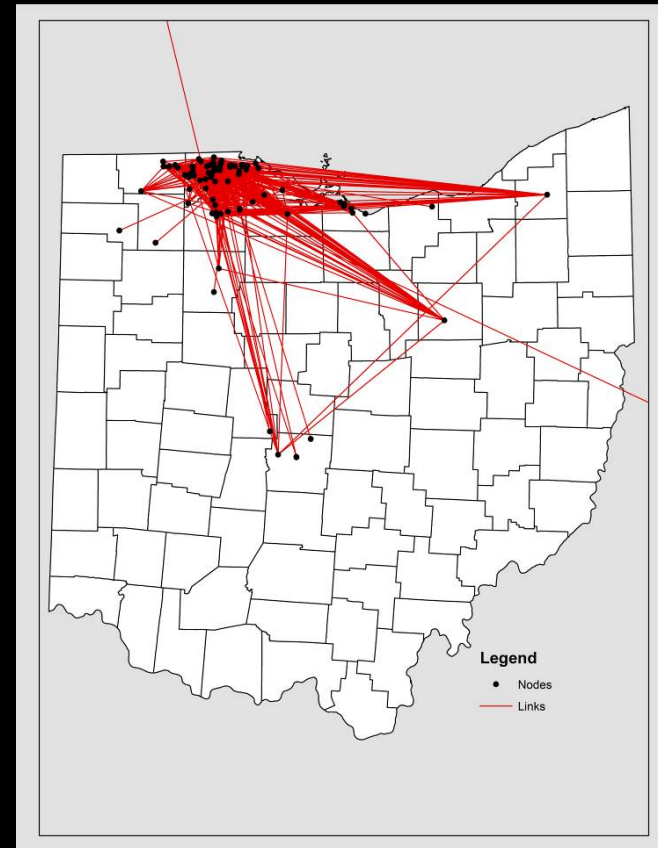
Ambassador Links

- Goal to communicate with growers.
- One ambassador had few links.
- One ambassador did not complete survey.
- Some growers had no links with Ambassadors.



Global Pipelines

- Using **Geographic Information System (GIS)** software it is possible to plot the geographic distribution of linkages
- Few external links or **global pipelines**
- Attributable to the **geographic horizon** of the growers, which is local
- 75% see their competition as being in their home county or an adjacent county



Network Weaving

- By examining existing network graphs, one can identify **communication gaps** that should be bridged
- This can be done via a process called **network weaving**
- Network weaving is the process of **intentionally facilitating collaborative relationships** between cluster members



Future

- Currently doing SNA again
- First done in 2007
- Will be able to assess cluster progress
 - How has the density of network density increased?
 - Has composition key players in the network changed?
 - How has the centrality of key individuals such as the cluster manager changed?
 - How has the number and composition of global pipelines changes?



Questions/Comments



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