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1. Introduction

Two Twitter communities from the WICO Graph Dataset are examined and contrasted in this report:

5G_Conspiracy_Graph (cluster of false information)

Non_Conspiracy_Graph (normal/benign cluster of discussion)

The objective is to use Social Network Analysis (SNA) with Gephi to comprehend **how the structure of misinformation** networks varies from that of typical communities.

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2. Dataset and Methodology

Every network consists of:

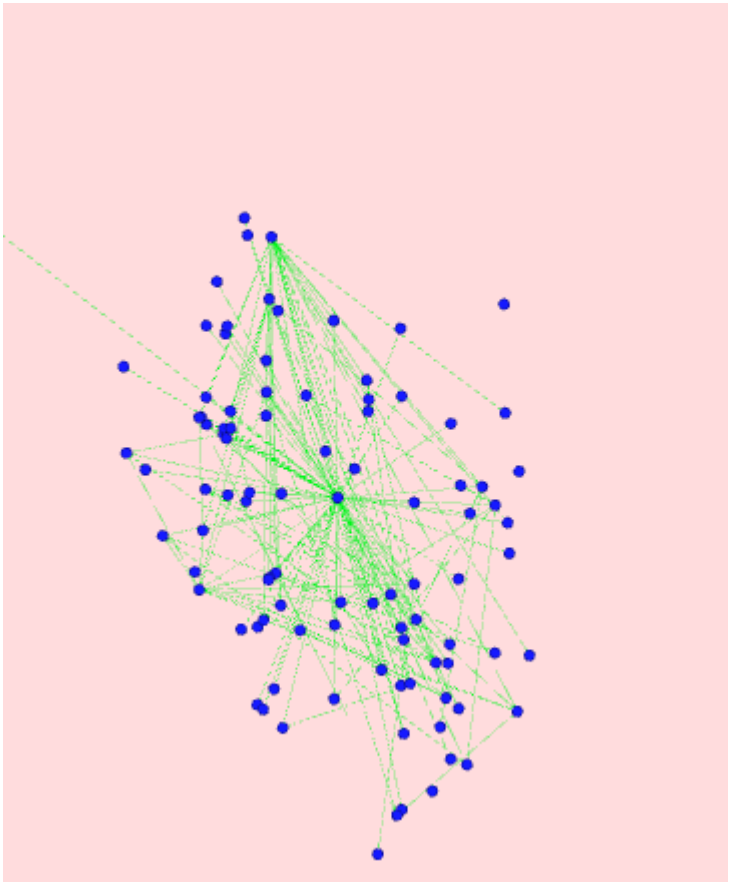
nodes.csv → Users on Twitter

Edges.csv interactions (retweets, mentions, replies)

Gephi was used to import both networks, **visualize** them using the **ForceAtlas2 layout**, and **analyze** them using the Statistics panel.
The metrics listed below were taken out:

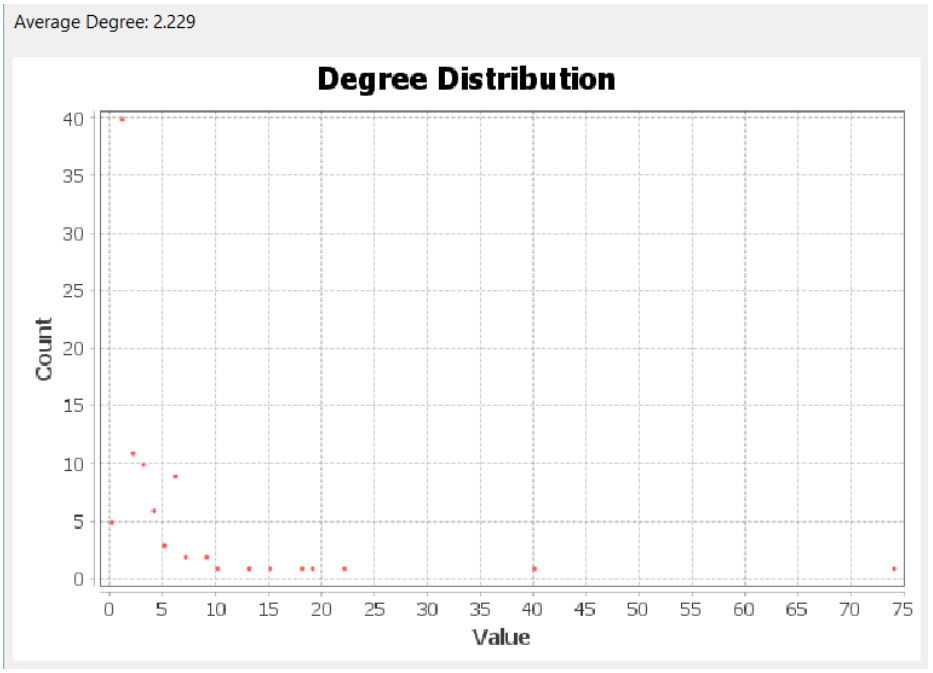
1. Number of edges and nodes
2. Average level of
3. Density of graphs
4. Clustering coefficient average
5. Number of communities and modularity
6. Average path length and network diameter
7. The centrality of betweenness and closeness
8. Connected parts

5G conspiracy



Average Degree

Average Degree: 2.229



Network Diameter

Diameter: 7

Radius: 0

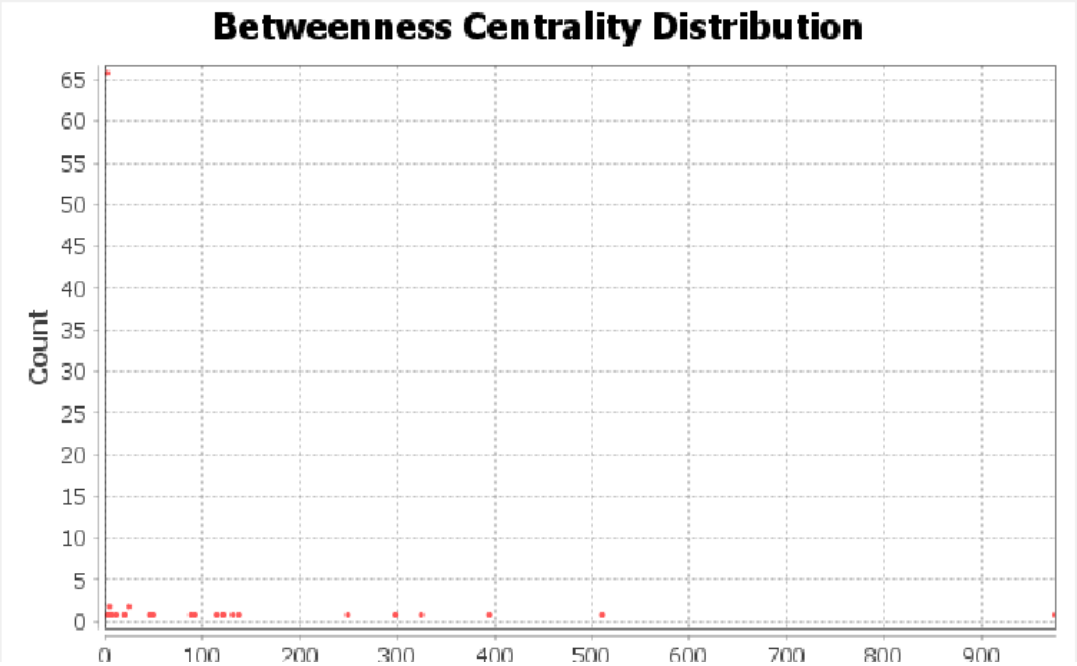
Average Path length: 2.9000984251968505

Parameters:

Network Interpretation: directed

Results:

Diameter: 7
Radius: 0
Average Path length: 2.9000984251968505



Graph Density

Parameters:

Network Interpretation: directed

Results:

Density: 0.023

Number Of Nodes and Edges

Context ×

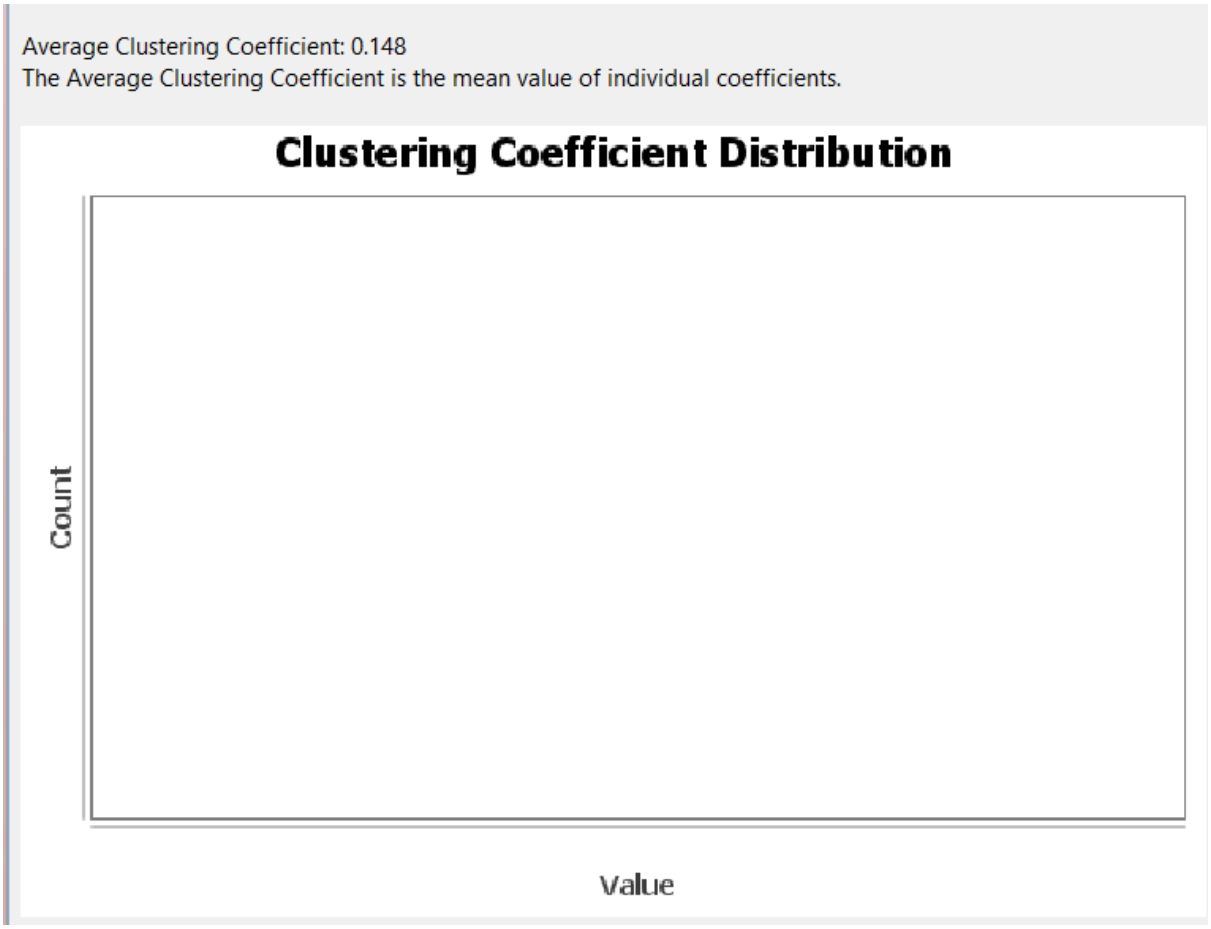
Nodes: 96

Edges: 214

Directed Graph

Average Clustering Coefficient

Average Clustering Coefficient: 0.148



Modularity (Community Detection)

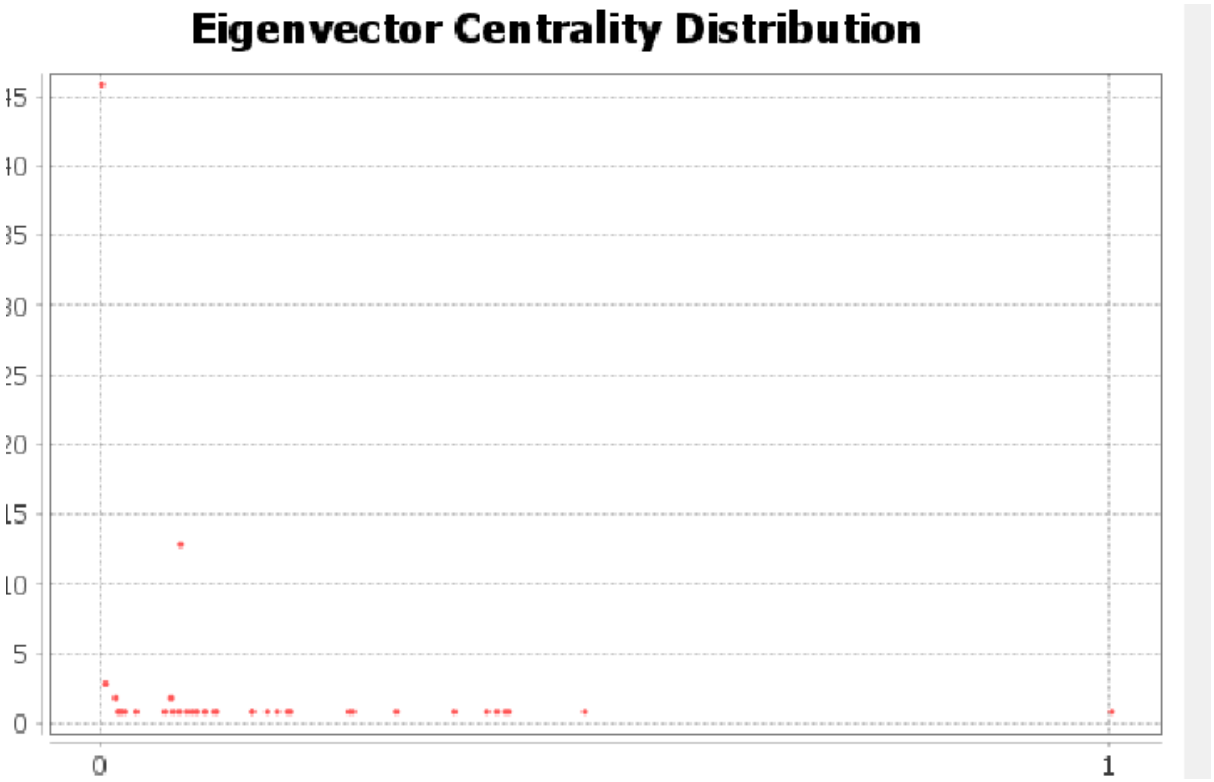
Parameters:	Results:
Randomize: On	Modularity: 0.388
Use edge weights: On	Modularity with resolution: 0.388
Resolution: 1.0	Number of Communities: 12

6. Connected Components

Number of Weakly Connected Components: 6
Number of Strongly Connected Components: 57

7.Eigenvector Centrality

Network Interpretation: directed
Number of iterations: 100
Sum change: 0.009284353854310505



3. Results: 5G_Conspiracy Graph (Malicious Cluster)

3.1 Basic Network Metrics

Metric	Vale	Interpretation
Average Degree	2.29	Low connectivity; users interact with ~2 others on average.
Network Diameter	7	Max distance between users is small → fast spread.
Avg. Path Length	2.9	Very short → “small-world” effect, rapid propagation.
Graph Density	0.023	Very sparse network. Typical for rumor networks.
Connected Components	6	Several isolated groups.
Clustering Coefficient	0.148	Low triadic closure; weak user-to-user interaction.

Metric	Vale	Interpretation
Modularity (Q)	0.388	Medium; multiple communities around central influencers

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3.2 Interpretation of Structure

The **majority** of users are **not directly connected** to one another, as evidenced by the **network's poor** overall connectivity.

The **path structure is very brief** despite the **low connectivity**, which allows rumors to spread quickly.

Very few accounts have a high Betweenness Centrality, which means they serve as "**bridges**" that regulate the information flow.

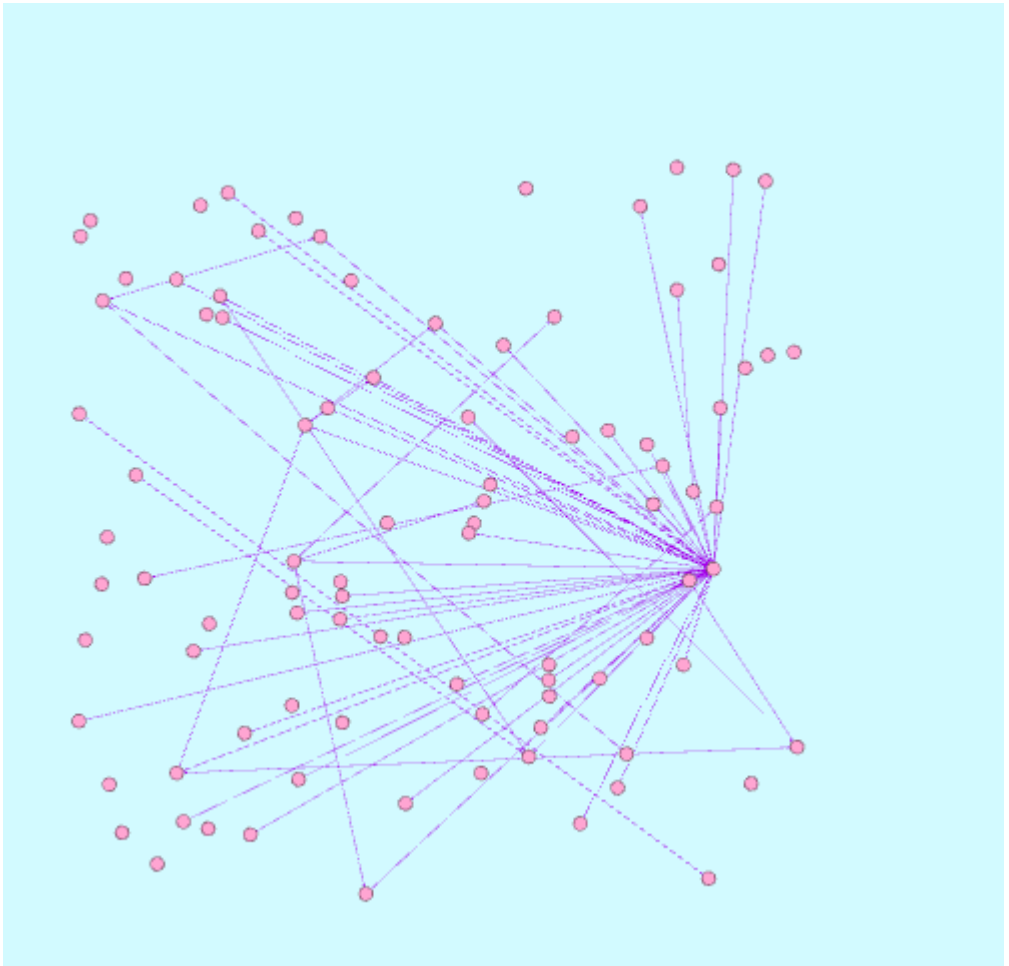
The existence of several communities suggests user groups **focused on accounts that spread conspiracies.**

A low clustering coefficient indicates that **users primarily interact with the source of false information** rather than with one another.

4.Conclusion,

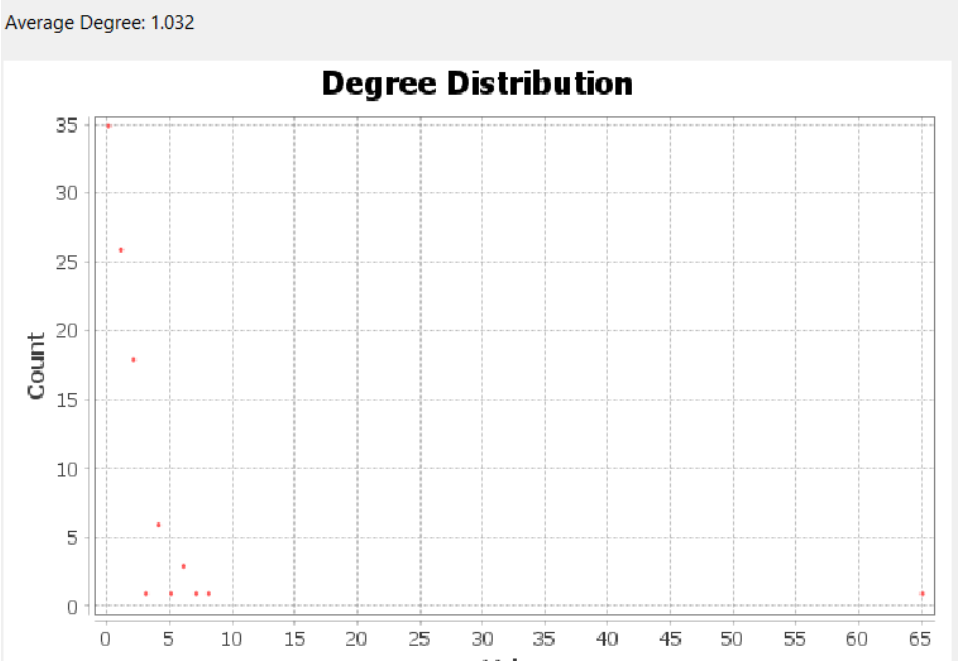
this structure is consistent with common **misinformation networks**:
sparsely connected, **controlled by a small number of powerful accounts**, rapidly disseminated, and **highly centralized**

Non-Conspiracy Graph



Average Degree

Average Degree: 1.032

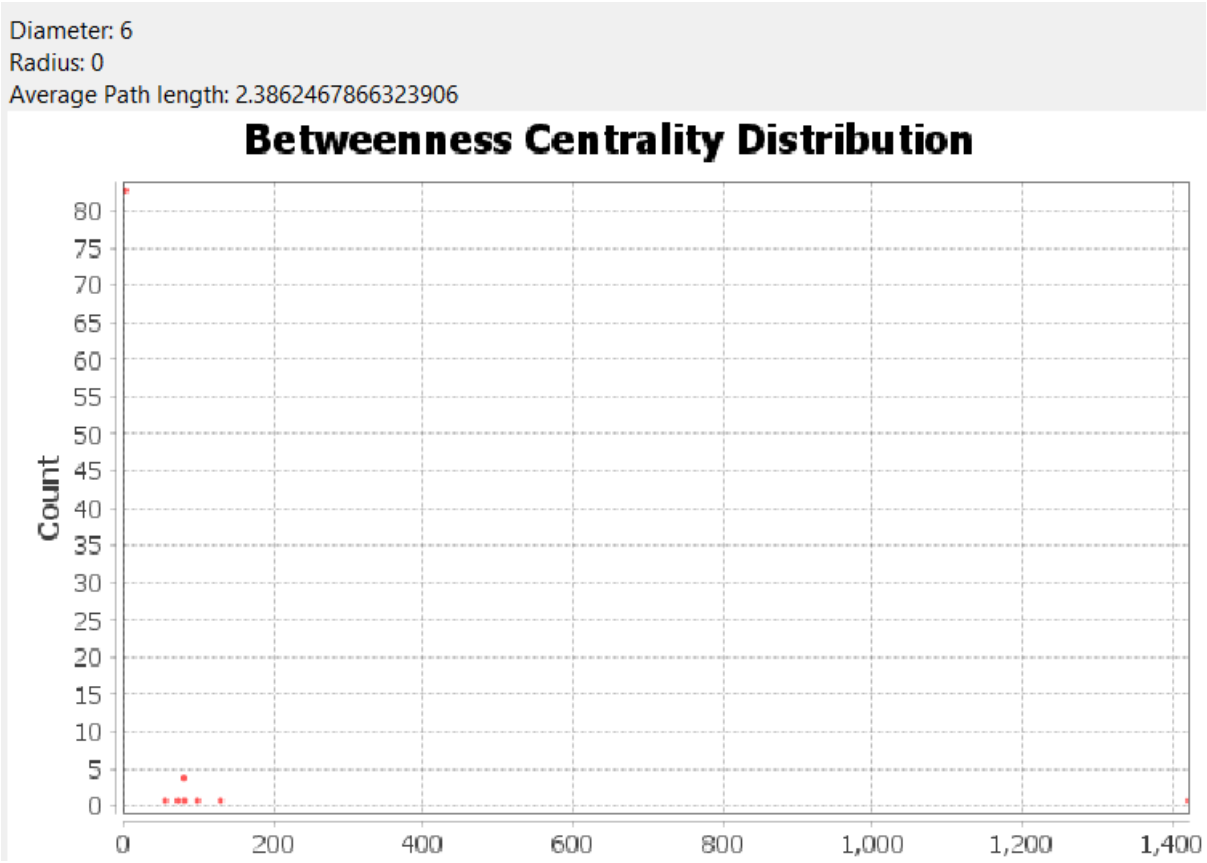


Network Diameter

Diameter: 6

Radius: 0

Average Path length: 2.3862467866323906



Graph Density

Density: 0.011

Connected Components

1. Number of Weakly Connected Components: 38
2. Number of Strongly Connected Components: 64

Clustering Coefficient

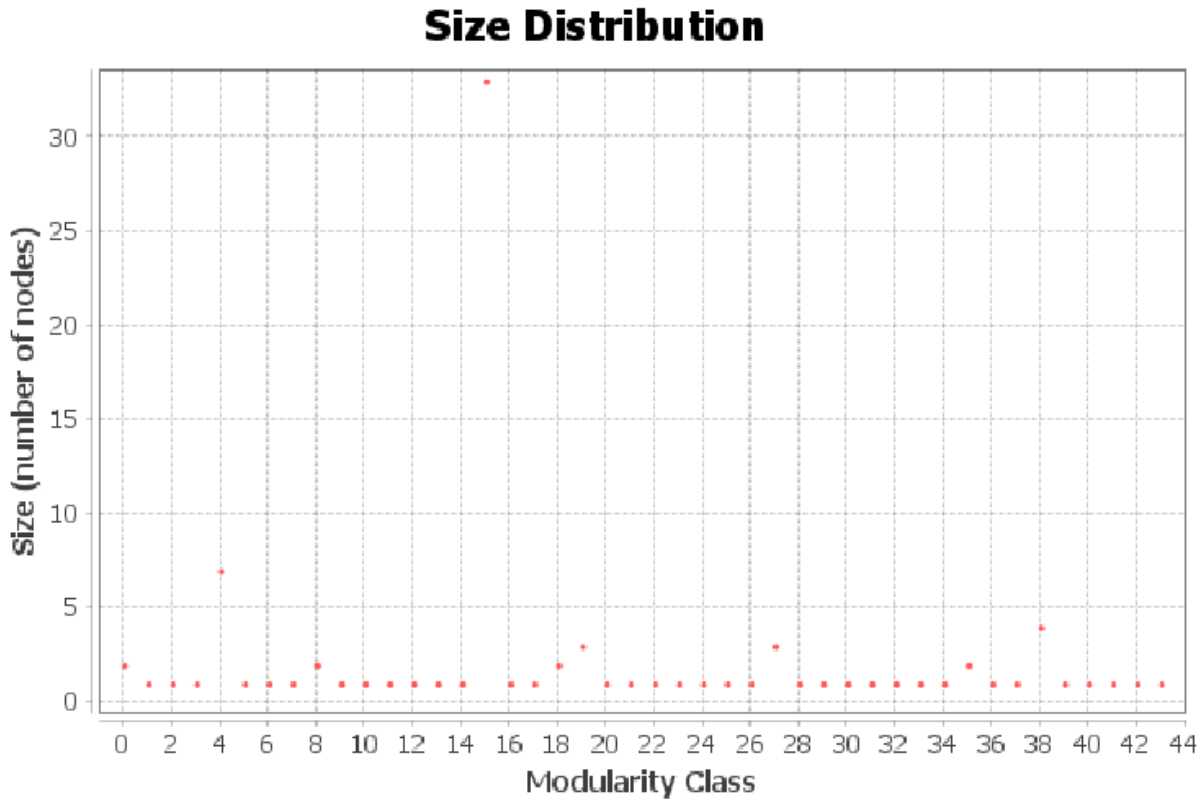
Average Clustering Coefficient: 0.065

Nodes: 93

Edges: 96

Modularity

1. Modularity: 0.375
2. Modularity with resolution: 0.375
3. Number of Communities: 44



Average Path Length

1. Diameter: 6
2. Radius: 0
3. Average Path length: 2.3862467866323906

B) Non-Conspiracy Network (Folder 5)

Main Metrics

Metric	Value	Interpretation
Average Degree	1.032	Very low connectivity; users interact with ~1 user
Graph Density	0.011	Very sparse but due to inactivity, not coordination
Clustering Coefficient	0.065	Almost no closed triads → random interactions
Modularity (Q)	0.375	Many isolated mini-groups (not echo chambers)
Connected Components	38	Extremely fragmented → no central structure
Diameter	6	Slightly smaller due to graph size
Avg. Path Length	2.386	Short paths; graph is small + interactions light

Interpretation

Users **hardly ever communicate** with **one another and do not create communities**.

Without powerful hubs, there would be no coordinated action.

In contrast to the closely clustered conspiracy graph, the network is highly fragmented (consisting of 38 components).

Here, sparse structure is **typical and represents real,** uncoordinated interactions.

In conclusion

There are **no indications of an organized spread;** this network is **decentralized, naturally** occurring, and **only loosely connected**.

4. Comparative Analysis

Feature	Conspiracy Graph	Non-Conspiracy Graph	Meaning
Average Degree	2.229	1.032	Conspiracy users interact more due to echo chambers
Density	0.023	0.011	Conspiracy more “tightly-knit” around influencers
Clustering	0.148	0.065	Conspiracy forms clusters; benign graph is random
Modularity	0.388	0.375	Both have communities, but reasons differ (echo-chambers vs fragmentation)
Components	6	38	Conspiracy is coordinated; benign is scattered
Path Length	2.9	2.38	Rumors spread very fast

Influencers	Strong hubs	No hubs	Conspiracy controlled by few accounts