EXPLORING TRUMP WORLD

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OVERVIEW

- **Motivation**
- **BuzzFeed's TrumpWorld dataset**
- **Sociocentric vs ego centric**
- **Data transformation**
- **Discovery**
- **References**

MOTIVATION

- **Trump** is the **most powerful man** on planet **Earth**
- **Unprecedented network of connections and business**
- **Trump organization**, **advisors**, and **family**
  - An **astounding number of ventures** and **associations in foreign countries**
- **Muller Report** – Special Counsel investigation (2017–2019)
  - Was there coordination between Donald Trump's presidential campaign and the Russian government?

TRUMP WORLD DATASET

- **1,500+ people and organizations connected** to the Trump
- **Comma-separated values (CSV) file** hosted on Google Sheets and Github
- **Each row represents a connection between**:
  - *Person* and *organization* (e.g., The Trump Organization Inc. and Donald J. Trump)
  - *Person* and another *person* (e.g., Donald J. Trump and Linda McMahon)
  - Two organizations (e.g., Bedford Hills Corp. and Seven Springs LLC).
- Has around **3400 entries**
- **Last updated on April 24, 2017.**

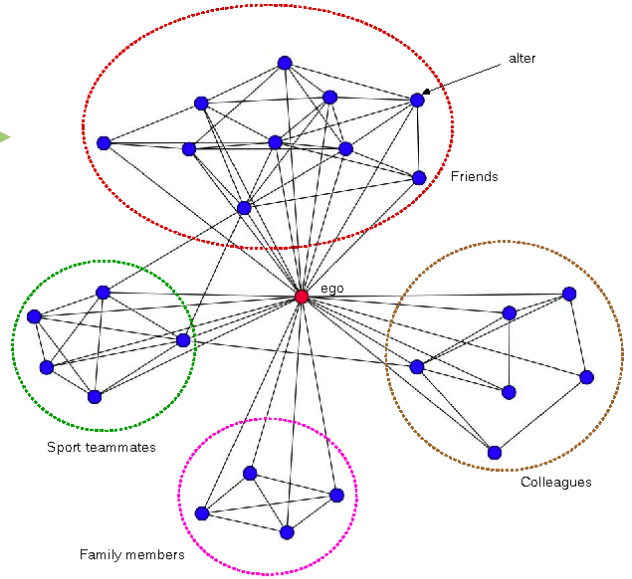
Entity A Type	Entity A	Entity B Type	Entity B	Connection	Source(s)
Organization	4 SHADOW TREE LANE MEMBER CORP.	Organization	4 SHADOW TREE LANE LLC	Ownership	https://www.documentcloud.org/documents/283869...
Organization	40 WALL DEVELOPMENT ASSOCIATES LLC	Organization	40 WALL STREET LLC	Ownership	https://www.documentcloud.org/documents/283869...
Organization	40 WALL STREET LLC	Organization	40 WALL STREET COMMERCIAL LLC	Ownership	https://www.documentcloud.org/documents/283869...
Organization	40 WALL STREET MEMBER CORP.	Organization	40 WALL STREET LLC	Ownership	https://www.documentcloud.org/documents/283869...
Organization	401 MEZZ VENTURE LLC	Organization	401 NORTH WABASH VENTURE LLC	Ownership	

sample dataset

SOCIAL NETWORK ANALYSIS

- **Sociocentric** = Whole networks
  - Creates one network
- **Egocentric** = Personal networks
  - Creates many stand alone networks
  - Today we are looking at *Trump*

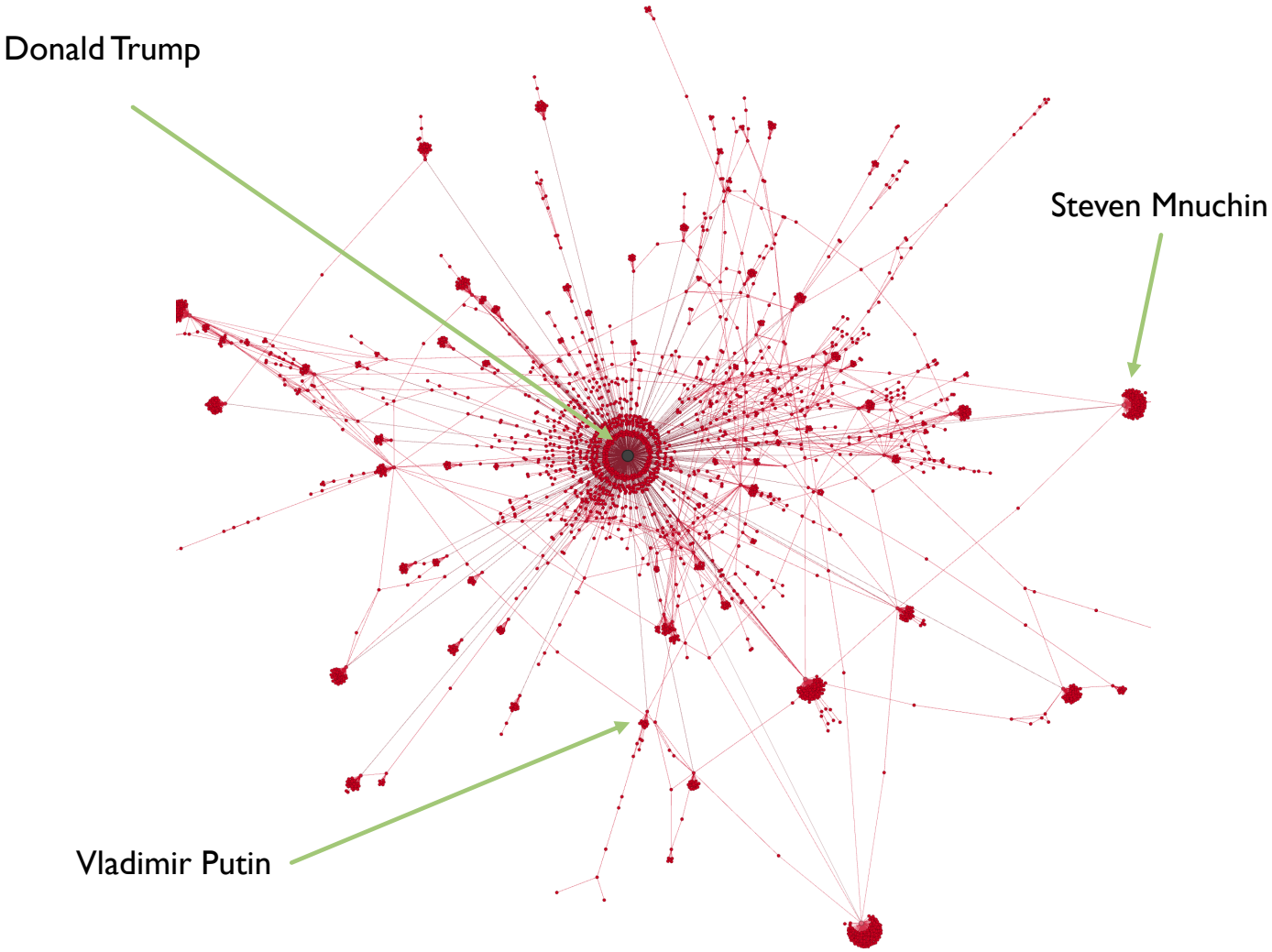
Ego network



Sociocentric network

TRUMP WORLD

- **Number of Nodes:** 2669
- **Number of Edges:** 3380
- **Diameter:** 13
- **Radius:** 7
- **Avg. Path Length:** 3.82
- **Avg. Clustering Coefficient:** 0.460
- **Total triangles:** 580

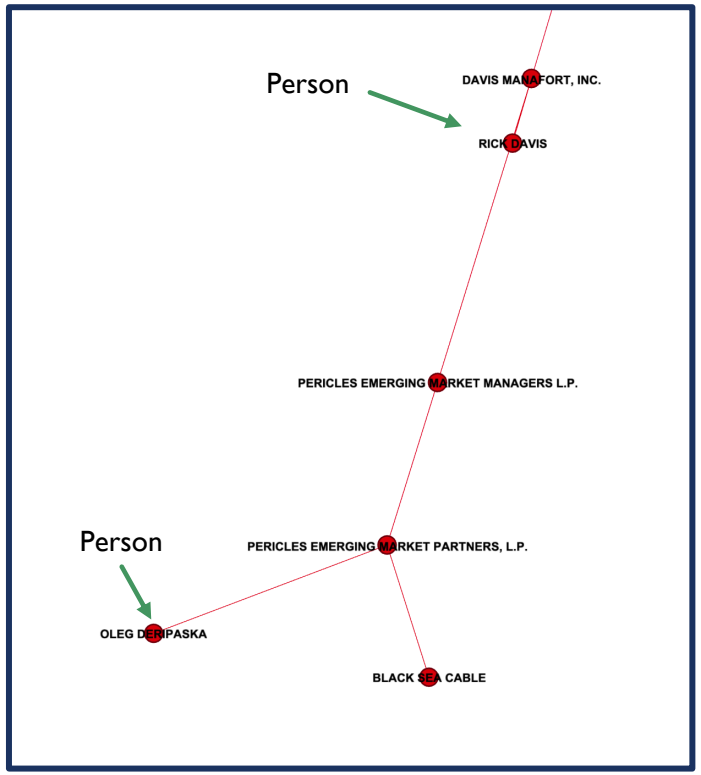


NOTE: Nodes are drawn proportional to their degree

PROBLEMS

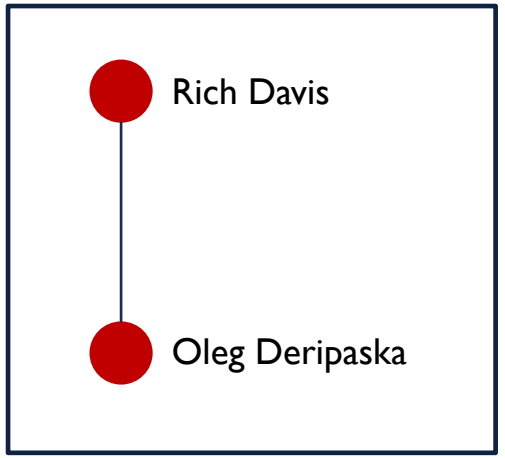
- **Too much data**
- **Care about people to people relationships <u>NOT</u> people to organization**

Complex network



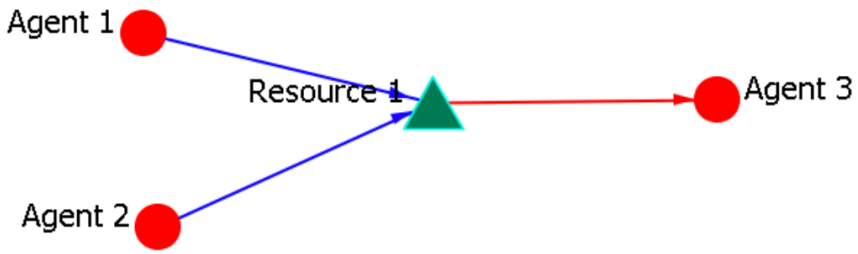
transform

Simplified network



HOW TO SIMPLIFY NETWORK

- **<u>Approach #1</u> – Borrow from social network analysis**
- Use **relational algebra** to **define relationships**
- **Relational algebra** gives us a simple easy-to-understand way to describe all relationships



$$X = A \times R$$ ← Q = ***Agent*** is owner of ***Resource***

$$X^T = (A \times R)^T = R \times A$$ ← W = ***Resource*** is used by ***Agent***

$$XX^T = AR(RA)^T$$ ← E = ***Agent*** relation to ***Agent***

HOW TO SIMPLIFY NETWORK

- **Approach #1 – PROBLEM**
- **Diameter=13** and **radius=7**
- **If:**
  - A = Person x Person
  - B = Organization x Organization
  - C = Federal Agency x Federal Agency
  - D = Person x Organization
  - E = Organization x Federal Agency
  - F - Person x Federal Agency

- **Equation becomes hard to model especially length of diameter**

One equation:

$$A + DEF^T + DBD^T + FCF^T + \cdots$$

Does this even capture all relationships across diameter?

- **Computationally expensive**

$$O(m * n^2)$$

HOW TO SIMPLIFY NETWORK

- **Approach #2 – Simple algorithm**
- **Transitivity** – if A is connected to B and B is connect to C, then A is connected to C
- **reduce(G) → G'** such that G' has all *organization* nodes removed
  - **visit(n)** → visit each node and iterate all edges
  - **rewire(G, e)** → rewires the edge to specified criteria
- Inspired by *A depth-first algorithm to reduce graphs in linear time* by Miklos Bartha & Miklos Kresz

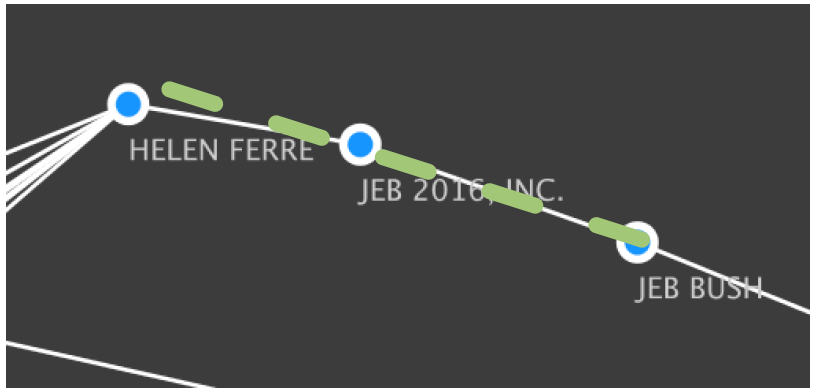
$$O(E\log(V) + E) = O(E\log(V))$$

BFS rewire()

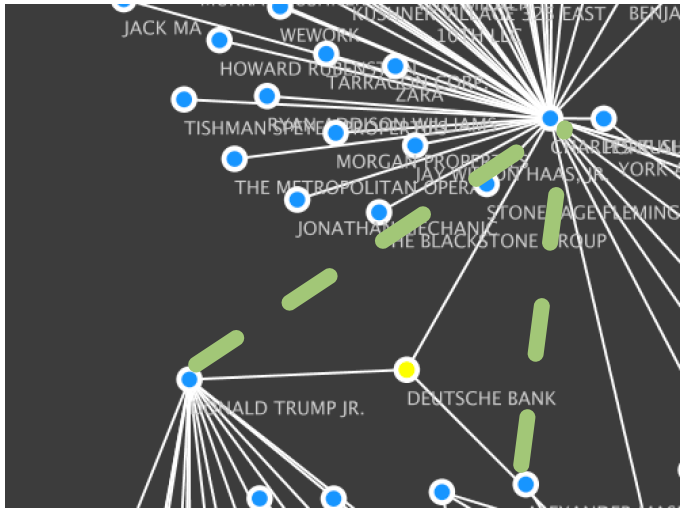
```
rewire(G, source, target):
    # rewire from target if target
    # doesn't match the criteria

visit(G, s, queue):
    # Get all adjacent vertices of the
    # dequeued vertex s.
    for e in G.edges(s, data=True):
        source, target, data = e
        if visited[target] == False:
            queue.append(target)
            rewire(G, source, target)
            visited[target] = True
```

```
reduce(G):
    # Mark all the vertices as not visited
    visited = {}

    # Run BFS.
    # This loop ensures all nodes are visited where
    # in traditional BFS, we supply a starting node
    for n in G.nodes:

        # See if the node is already visited and
        # if so, skip running BFS
        if visited[n]:
            continue

        # Create a queue for BFS
        queue = []

        # Mark the source node as
        # visited and enqueue it
        queue.append(n)
        visit(G, n, queue)

        while queue:

            # Dequeue a vertex from queue
            s = queue.pop(0)

            pending_tasks = []

            # Get all adjacent vertices of the
            # dequeued vertex s. If a adjacent
            # has not been visited, then mark it
            # visited and enqueue it
            visit(G, s, queue)

    return G
```

HOW TO SIMPLIFY NETWORK

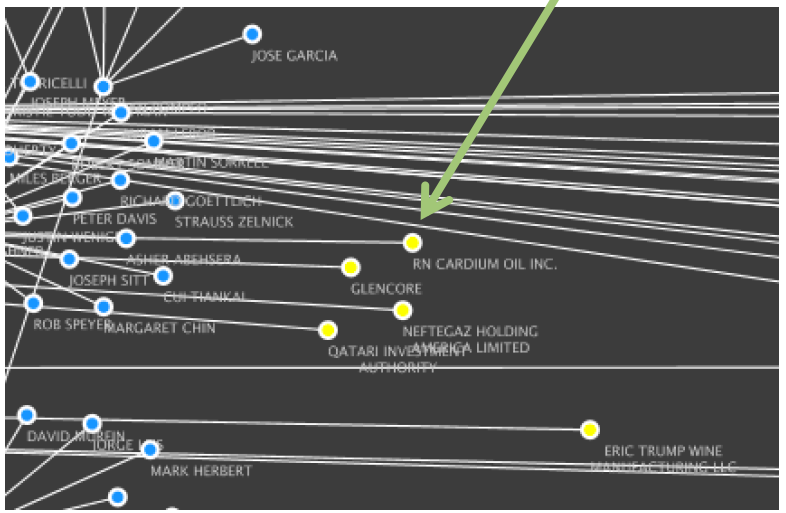


Case 1: person → organization → person



Case 2: organization → person → person

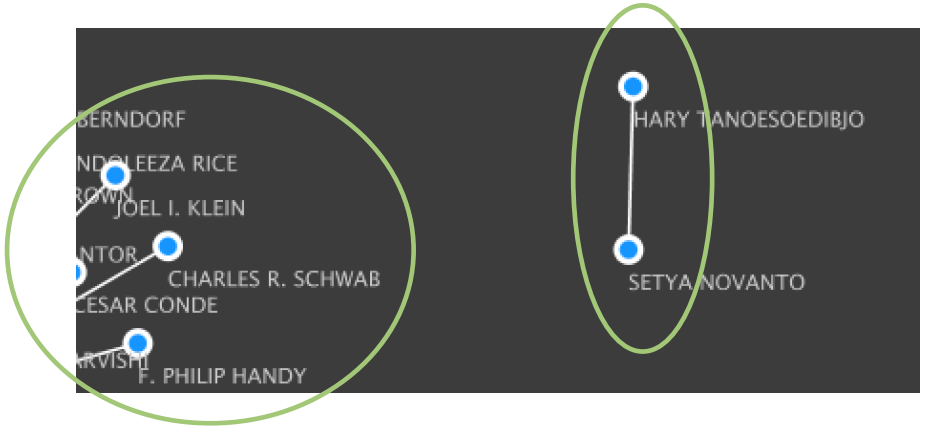
Drop nodes



Case 3: organization → person

Case 5: trivial case – person → person

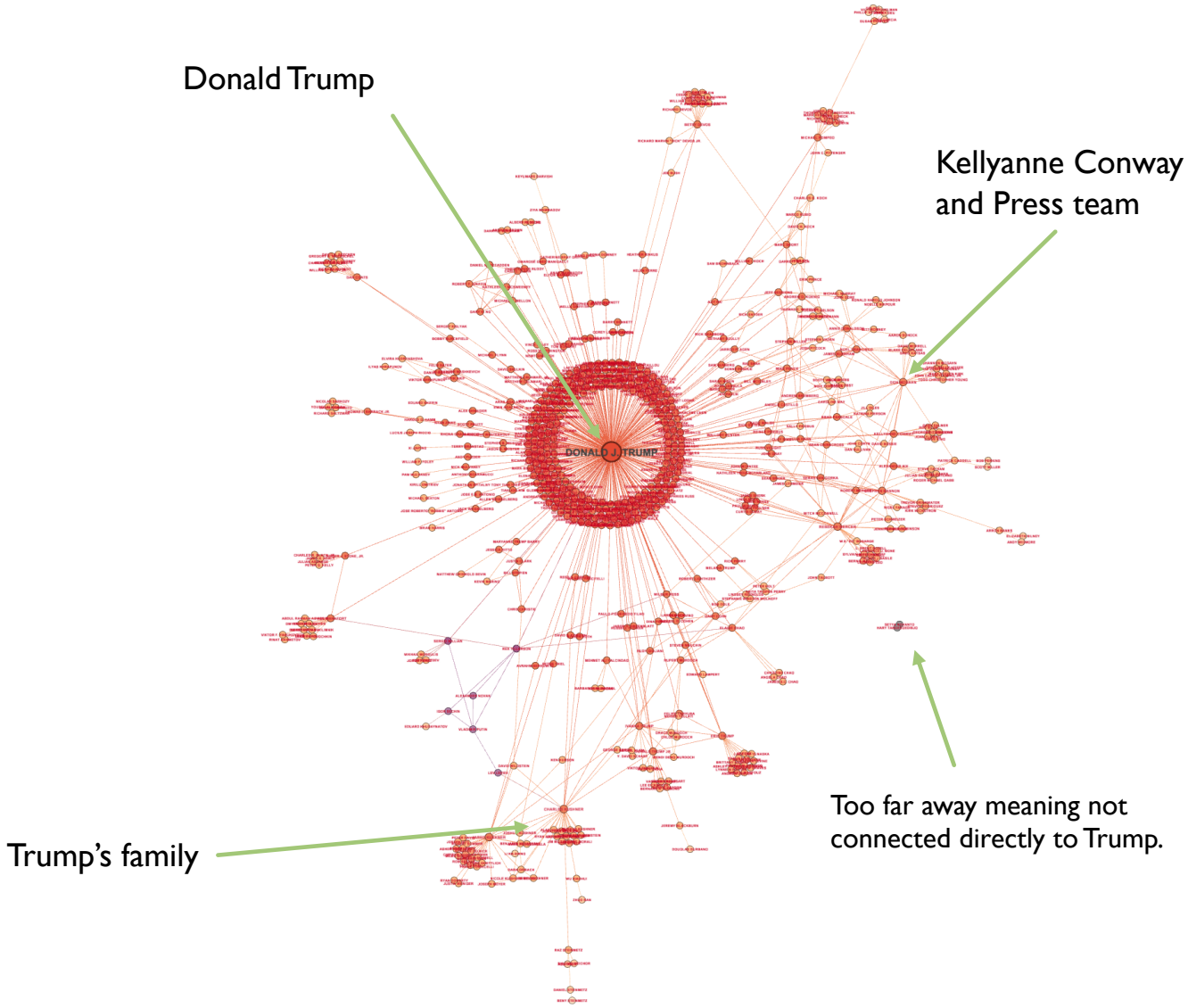
Connected components



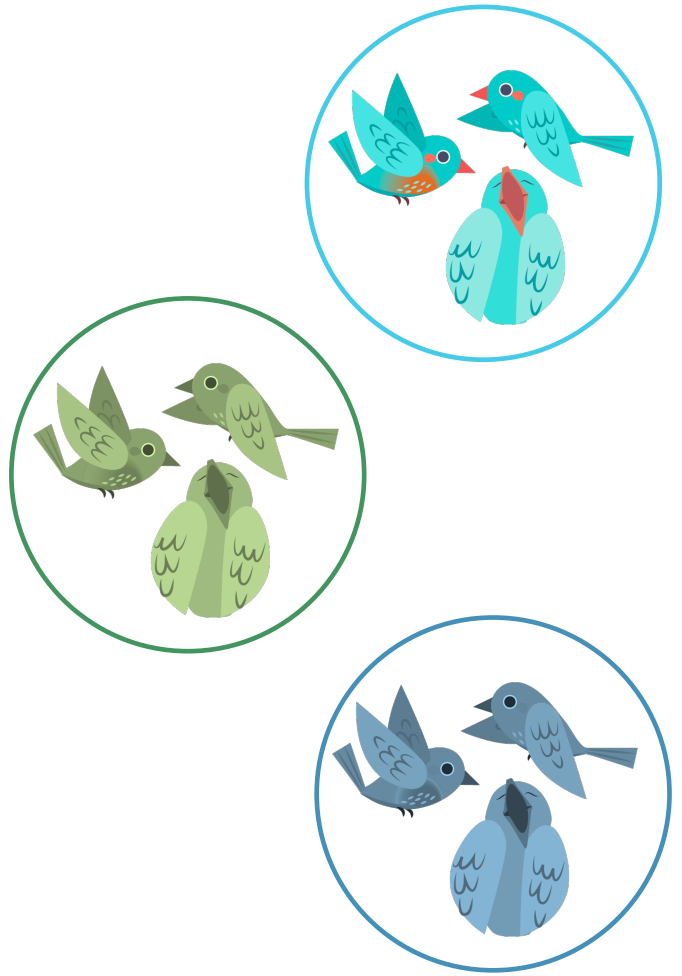
Case 4: person → organization → organization → organization → person

SIMPLIFIED NETWORK

- **Number of Nodes:** 637
- **Number of Edges:** 845
- **Diameter:** 7
- **Radius:** 1
- **Avg. Path Length:** 2.755
- **Avg. Clustering Coefficient:** 0.529
- **Total triangles:** 235



HOMOPHILY



- Idea that **people with similar background or interest hangout together**
- Sociologists used this idea of similarity to **compute ego characteristic**
  - **Criminality**
  - **Sexuality and promiscuity level**
- If **Paul Manafort is corrupt, chance his immediate circle is corrupt high**

HOMOPHILY

- People indicted in the Muller Report or those that have criminal charges or committed some violation.

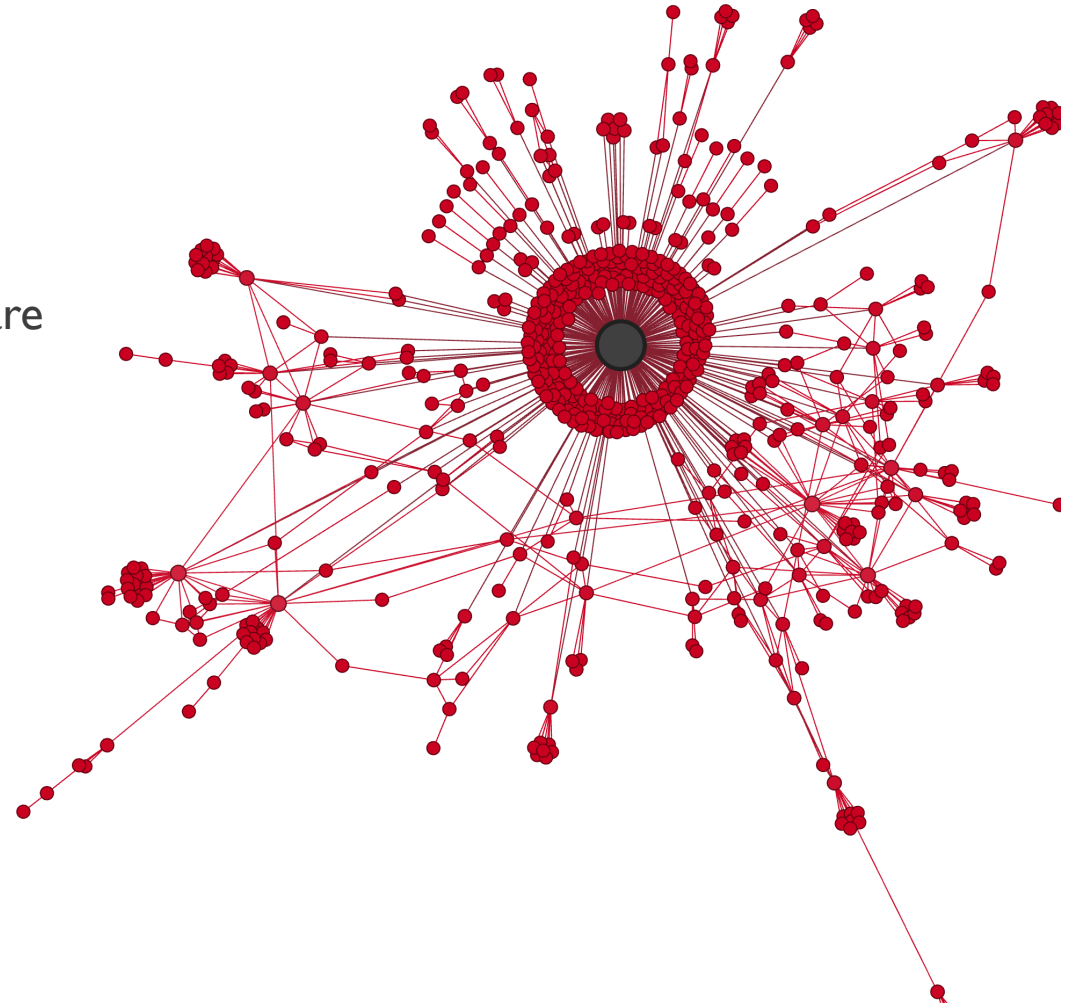
Charge or violation	People involved
Irregular spending by Trump's inaugural committee	**Ivanka Trump, Eric Trump, Donald Trump Jr.**, Rick Gates
Violation of campaign finance laws	**Michael Cohen**
Unregistered foreign lobbying	Paul Manafort's lawyer Gregory Craig, Vin Weber, and Tony Podesta
Irregular super PAC finances	**Paul Manafort**, Sam Patten
United States v. Maria Butina – influence elections	Maria Butina
Russian disinformation campaigns	Elena Alekseevna Khusyaynova
Improper Turkish influence inside Trump's campaign and administration.	**Michael Flynn**, Bijan Kian, and Kamil Ekim Alptekin

*** exists in TrumpWorld dataset**

As of March 4th, 2019

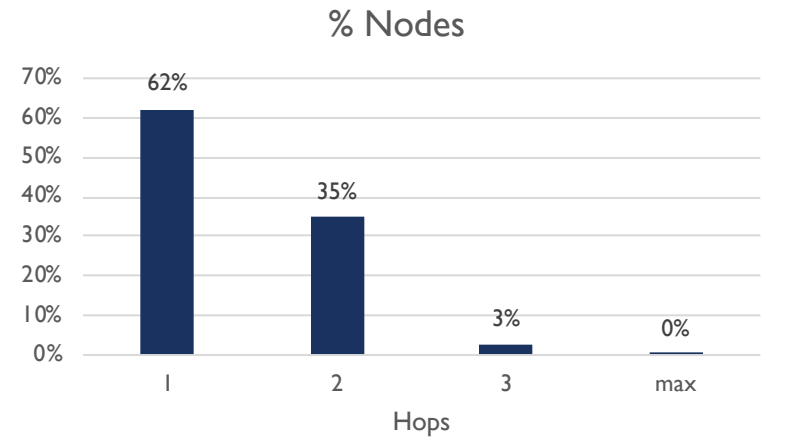
HOMOPHILY

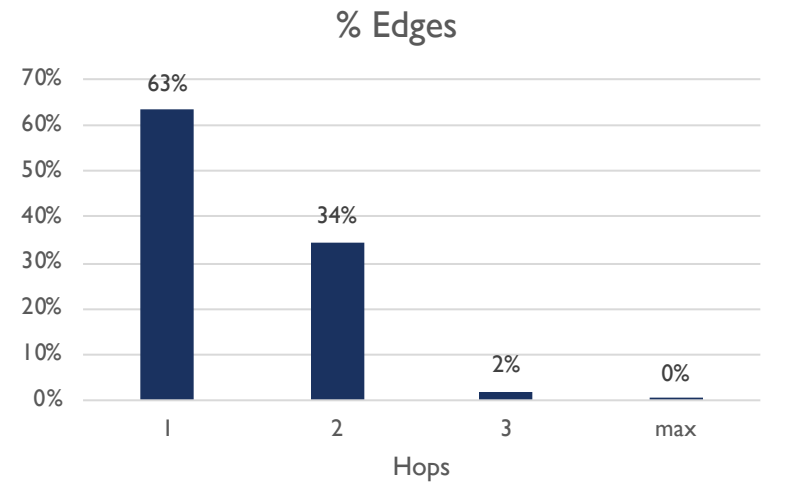
- **Drop all the nodes that are marked as corrupt**
- Ivanka Trump, Eric Trump, Donald Trump Jr. kept as there are no formal charges against them
- **Number of Nodes:** ~~637~~ → 622
- **Number of Edges:** ~~845~~ → 826



HOPS AWAY

Hops away	Nodes	% Nodes	Edges	% Edges	Description
1	396	62%	535	63%	Close associates, family members, Trump organization, campaign staff
2	221	35%	291	34%	**Putin**, Staff, attorneys, low-level diplomats, campaign staff
3	17	3%	17	2%	Teritary diplomats, low-level attorneys, Trump org, campaign staff
max	2	0%	1	0%	Setya Novanto and Hary Tanoesoedibjo





BETWEENNESS, CLOSENESS, AND OTHER METRICS

name	Average Shortest Path Length	Betweenness Centrality	Closeness Centrality	Degree
DONALD J. TRUMP	1.40694006	0.9611251	0.71076233	395
CHARLES KUSHNER	2.26182965	0.07336831	0.44211994	29
JARED KUSHNER	2.27760252	0.06326399	0.43905817	28
MICHAEL POMPEO	2.3533123	0.04427181	0.42493298	12
ERIC TRUMP	2.33438486	0.03766302	0.42837838	19
BETSY DEVOS	2.36435331	0.03578837	0.42294863	14
REBEKAH MERCER	2.29022082	0.03165578	0.43663912	28
DON MCGAHN	2.28864353	0.03085429	0.43694004	22
STEPHEN BANNON	2.29810726	0.03011202	0.4351407	20
PAUL MANAFORT	2.36119874	0.02826492	0.42351369	12
DONALD TRUMP JR.	2.29495268	0.02641828	0.43573883	15
DAN COATS	2.38170347	0.02197736	0.41986755	9
KELLYANNE CONWAY	2.32018927	0.01919752	0.43099932	12
IVANKA TRUMP	2.29810726	0.01757038	0.4351407	15
SUSAN POMPEO	3.33596215	0.01572304	0.29976359	6
ALEXANDER NIX	2.35962145	0.0126967	0.42379679	7
ROGER J. STONE, JR.	2.37697161	0.0125884	0.42070338	6
THOMAS J. BARRACK JR.	2.39116719	0.0125884	0.4182058	6
RAZ STEINMETZ	3.24763407	0.01258341	0.30791646	4
STEPHEN MILLER	2.38012618	0.01095268	0.42014579	8
ELAINE CHAO	2.35173502	0.01089704	0.42521797	10
REX TILLERSON	2.36435331	0.01087824	0.42294863	7
SERGEI MILLIAN	2.38643533	0.01084844	0.41903503	5
JEFF SESSIONS	2.37697161	0.01084231	0.42070338	9
NOEL FRANCISCO	2.35488959	0.01078173	0.42464836	12
BRAD PARSCALE	2.3785489	0.01027039	0.4204244	9
MIKE PENCE	2.36277603	0.00832745	0.42323097	14
ANNIE DONALDSON	2.35646688	0.00779873	0.42436412	9
SEAN CAIRNCROSS	2.36750789	0.00740083	0.42238508	6

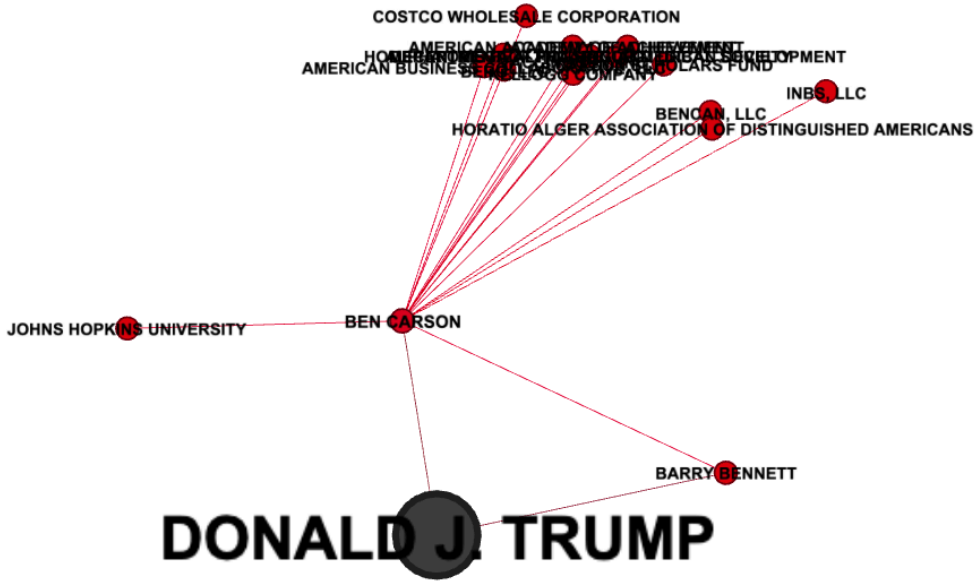
Data sorted by betweenness centrality

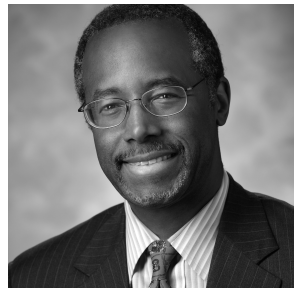
DOES TRUMP HAVE CLOSE TIES TO RUSSIA?

- **From the data, NOPE!**
- No direct connections to Russia, Putin, or Kremlin
- K-core truss to find structures that support each other
- Homophily – Filtering by corrupt (indicted) nodes, ties to Russia remain

OTHER FUN FACTS

- **Tiffany Trump missing**
  - The dataset includes members of Trump family who are part of *Trump Organization*
  - Zero involvement in Trump organization
  - Does Trump really hate her?
- **Ben Carson**
  - United States Secretary of Housing and Urban Development
  - Previously, Director of Pediatric Neurosurgery at *Johns Hopkins Hospital*
- **Johns Hopkins → Ben Carson → Trump**





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