WEB ANALYTICS ASSIGNMENT: COMMUNITY & KEY PLAYER DETECTION

TITLE: A SONG OF GRAPH AND ANALYTICS

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Introduction: To analyse the network of relationship among the characters in Game of Throne series, which is an American fantasy drama television series premiered on HBO .The series has seven season till date.

Goal: To identify the key players and communities in each season and further overall season network analysis to estimate the key network metrics in each season and overall season.

Analysis:

Season 0:

Metrics:

Average Degree: 1.364

Communities:11 major communities can be detected

Density: 0.010

Diameter: 6

Average Path length: 2.1796875

Average Clustering Coefficient: 0.177

The clustering coefficient is a measure of an "all-my-friends-know-each-other" property. This is sometimes described as the friends of my friends are my friends.

Initially, there was peace and no chaos or separation. The 7 kingdoms lived in harmony. The clustering coefficient was higher compared to the overall scenario and the other seasons. Key player in the community is shown below:
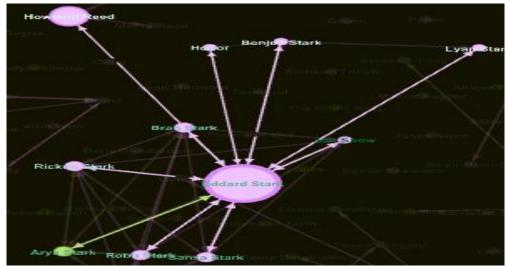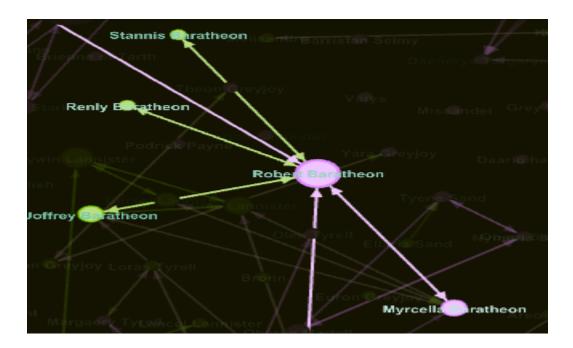

Figure 1: Key player Graph

Insight - Season 0 shows the relationship and the closeness of stark community which was led by Ned Stark who was supported by family members and friends in Figure1.

Insight - The king of the Westeros and his family. The betweenness is high as he is the **king of the all the lands as shown in Figure 2.**
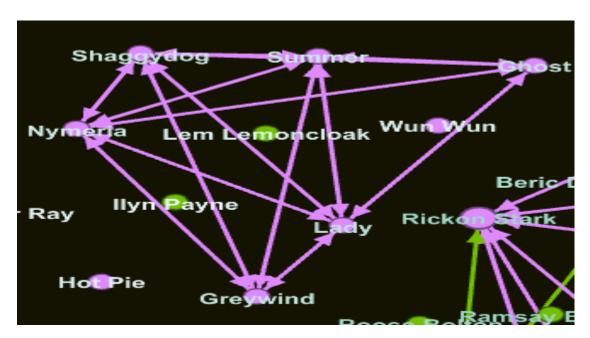

Figure 2: Betweenness

Clique can be found between the orphan dire wolves who later gets adopted. As they belong to a family a maximal clique has been formed. Clique has been formed assuming they belong to the same family.

Season 1:

Average Degree: 1.464

Density: 0.011

Diameter: 8

Average Path length: 3.0159680638722555

Average Clustering Coefficient: 0.136

7 major coherent communities have been identified.

Topmost: Starks, Lannisters, Targaryens, Night Watch, Baratheon etc.

<u>Insight -</u> A small community of Daenerys which is getting created and is a competition for the throne and the king gets to know about it.

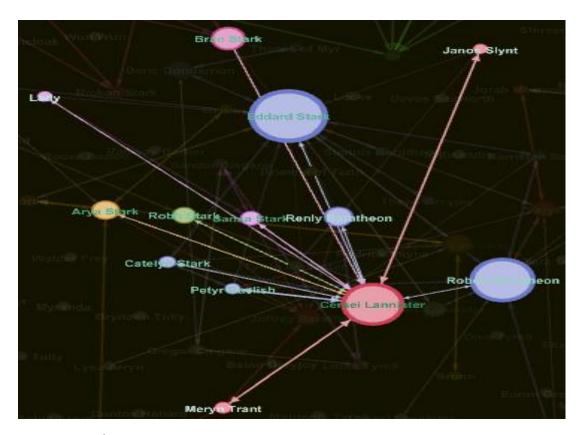**Key player** in the community is identified to be Cersei Lannister as in Figure 3.

Figure 3:Key player season 1

Key player due to betweenness in season one can be attributed to Cersei Lannister who is the wife of the King and wants her husband to die and son to take over. As we can see She has been attributed in communicating with her husband and the possible king after her husband.She shares a relationship between the key members of many other communities indicating her importance
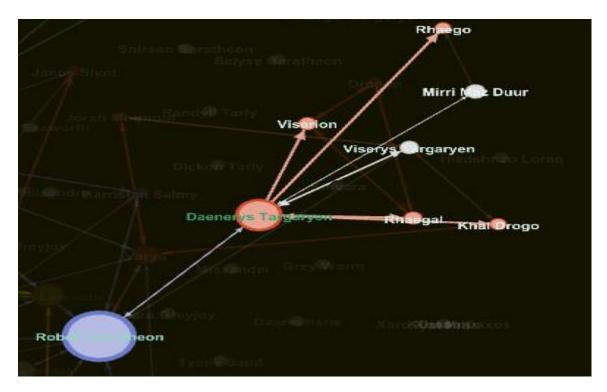
Figure 4:A small community which is getting created and is a competition of the throne and the king gets to know about it.
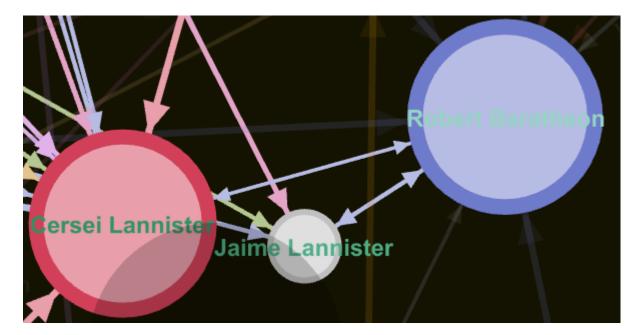

Figure 5:The hidden relationship

Hidden and secret relationship can also be found out between the queen and her brother as in Figure 4. This can be considered as a Small Tripate network were all are mutually related to each other.

Season 2

Average Degree: 1.071

Diameter: 8

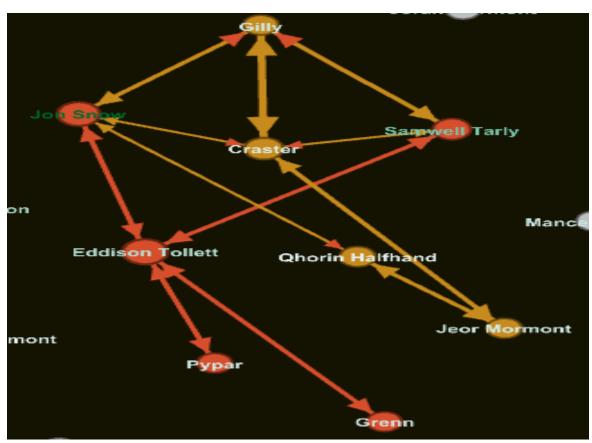Average Path length: 3.2725306416726747

Density: 0.008

Average Clustering Coefficient: 0.096

8 major coherent communities have been identified.

Topmost: Stannis's Army, Arya & friends, Robb Stark, Tyrion & etc.

Key players are Tyrion & Stannis in their respective community as below:

People hopping into different communities and forming a new community by creating a basic Clique.
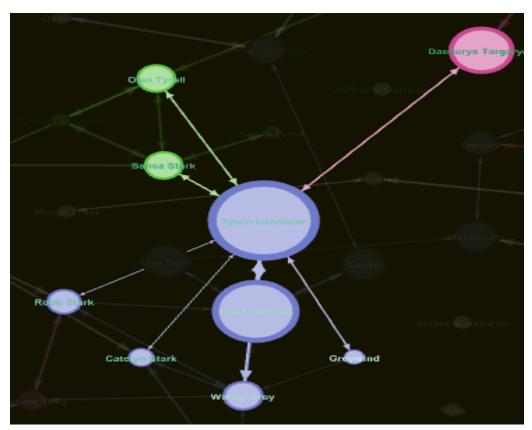
Season 3

Average Degree: 0.929

Density: 0.007

Diameter: 9

Average Path length: 3.5448851774530272

Average Clustering Coefficient: 0.101

5 major coherent communities have been identified.

Topmost: Targaryen army, Boltons, Tywin Lannister, Wildlings & etc.

It shows how important this character in making a series of events. The character leads to series of big events by chained connection. This season portrays the importance of this character across the entire communities and how his decision can affect the relationship and links between and within the communities.

Season 4

Average Degree: 0.950

Density: 0.007

Average Clustering Coefficient: 0.068

Diameter: 9

Average Path length: 3.18172268907563

5 major coherent communities have been identified.

Topmost: Bran stark, Jon Snow, Cersei & etc.

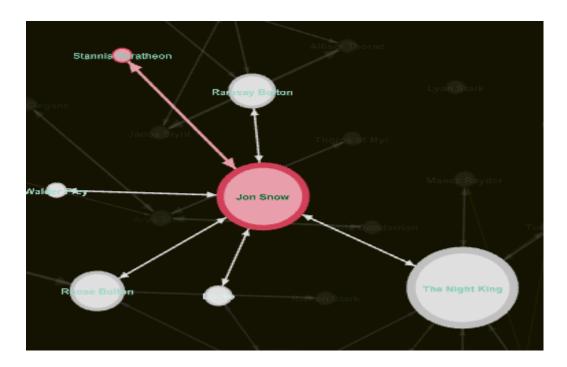Average Path length: 3.18172268907563

Figure 6: This portrays the new community encounters an enemy and how other member coordinate to plan.
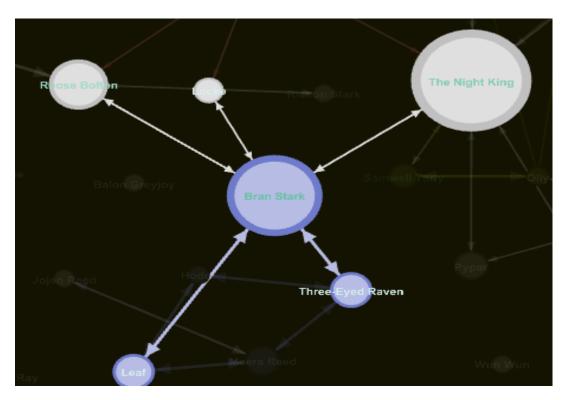

Figure 7:Hidden community too has been detected who is against the common enemy.

Season 5

Average Degree: 0.950

Diameter: 9

Average Path length: 3.3313069908814588

Density: 0.007

6 major coherent communities have been identified.

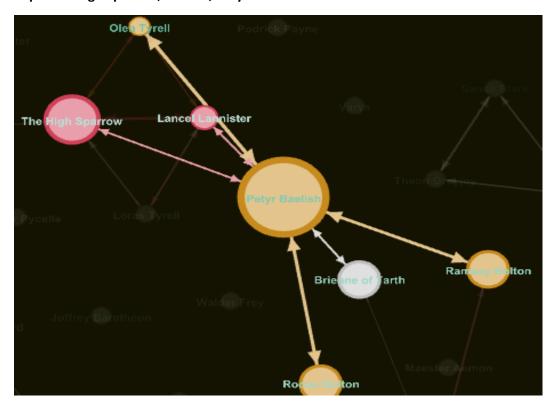**Topmost: High Sparrow, Stannis, Petyr Baelish & etc.**

Figure 8:This season portrays how a character who seemed to be not a key player has evolved across time and is a key decision maker in the movement of story
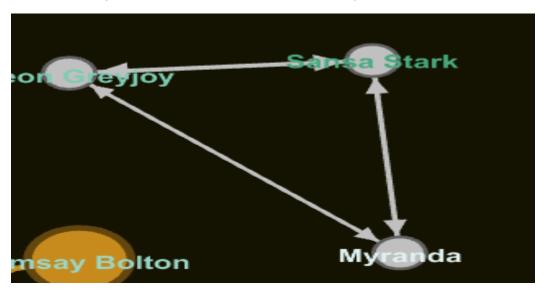

Figure 8:A tri-partite smaller community Clique detected and responsible to be separated and which in turn leads to formation of a new community.

Season 6

Average Degree: 2.186

Diameter: 11

Average Path length: 4.283783783783784

Density: 0.016

Average Clustering Coefficient: 0.167

5 major coherent communities have been identified.

Topmost: Cersei, Danerys, Jon Snow & Bran Stark

As we can see there has been multiple communities which has been formed without coordination and the network diameter has grown in this season which can be associated with the Average Path length increase.It is the shortest distance between the two most distant nodes in the network. In other words, once the shortest path length from every node to all other nodes is calculated, the diameter is the longest of all the calculated path lengths. The diameter is representative of the linear size of a network.
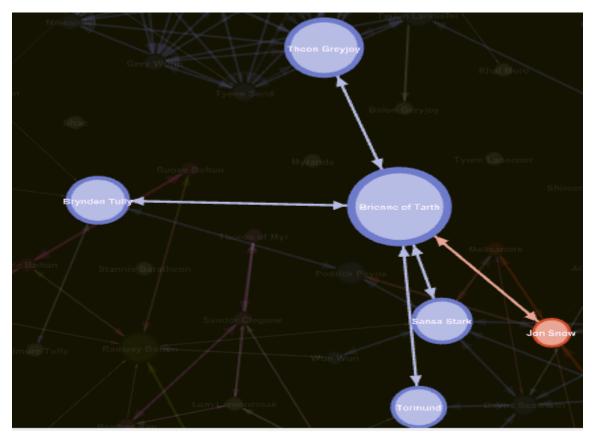

Figure 10:A key player who plays the role of binding with every community and carries mutual information across the communities.
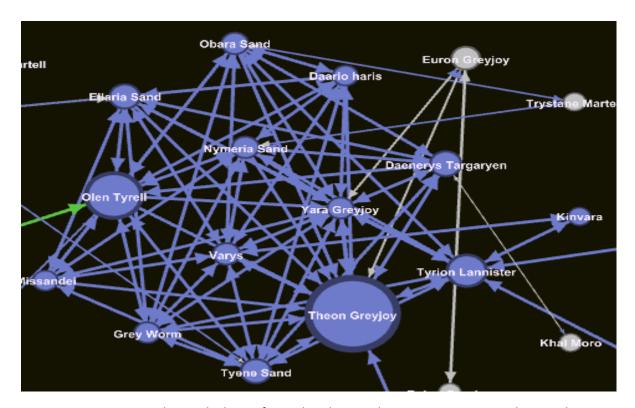
Figure 11:A maximum Clique which was formed to destroy the common enemy and attain the throne against the bad queen.

Season 7:

Average Degree: 0.929

Density: 0.007

Diameter: 8

Average Clustering Coefficient: 0.070

Average Path length: 3.453769559032717

3 major coherent communities have been identified.
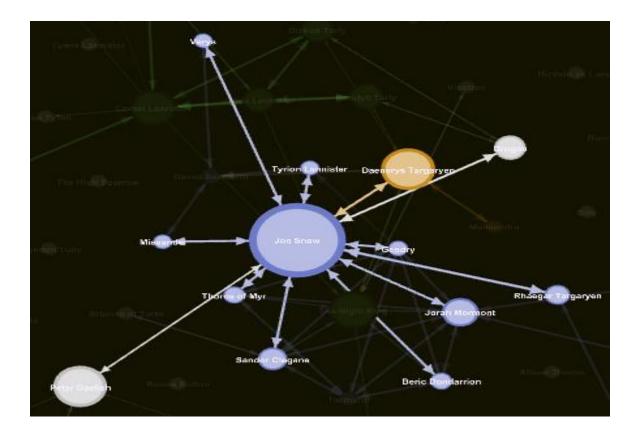
Topmost: Jon Snow, Danerys and Cersei

Figure 12:The number of unique clusters are reduced to a large extent as all the communities understood they fight against a single common enemy. Thereby many communities formed into allies to fight against a common enemy. And a key player who knows about the common enemy has been enhanced.
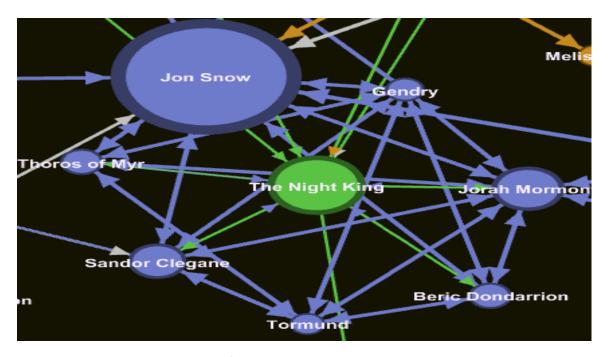

Figure 13:A maximal Clique getting formed surrounding the common enemy with the king

Overall Season(1-7):

Average Degree: 8.479

Diameter: 6

Density: 0.061

Average Path length: 2.687410071942446

Average Clustering Coefficient: 0.538

Nodes: 140

Edges: 1378

4 major coherent communities have been identified.

Topmost: Cersei, Tyrion, Danerys & Jon Snow

In the overall network, there are few notable key players who initially started unnoticed and have led to the formation of huge communities due to their season wise impact.
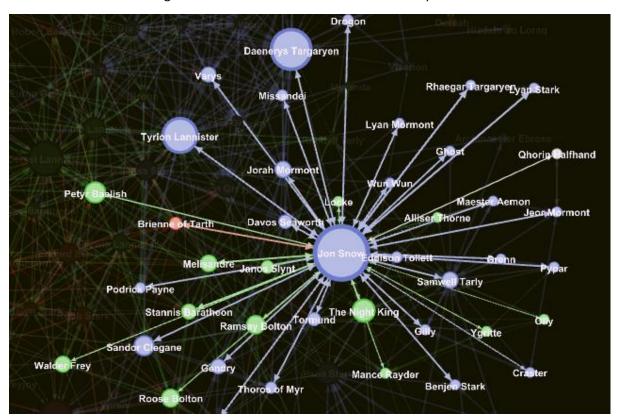

Figure 14:John Snow a key player who gathers armies and allies to fight against the common enemy and it can also be noticed that the key player also has information from other key players
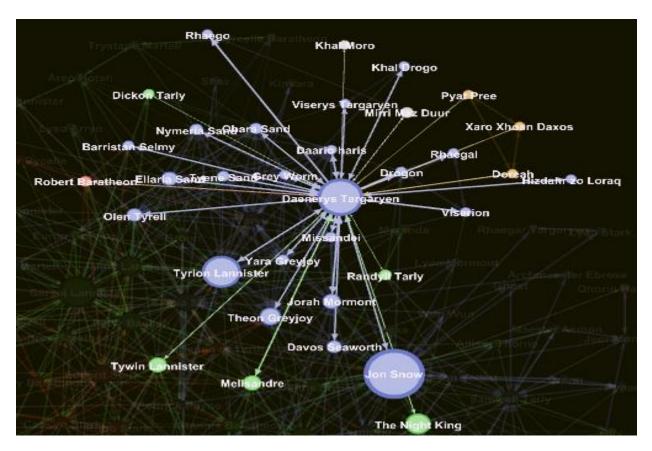
Figure 15:A community which was started from the scratch by the key player Dany and now merging with another community to fight against a common enemy
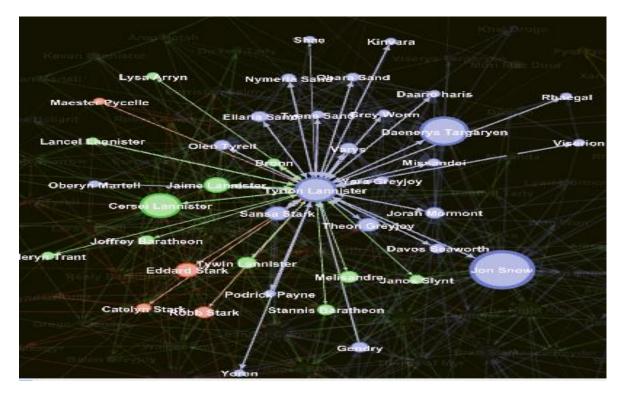

Figure 16:The most important character of all who binds all communities and is betweenness for major community connection is identifies through this.
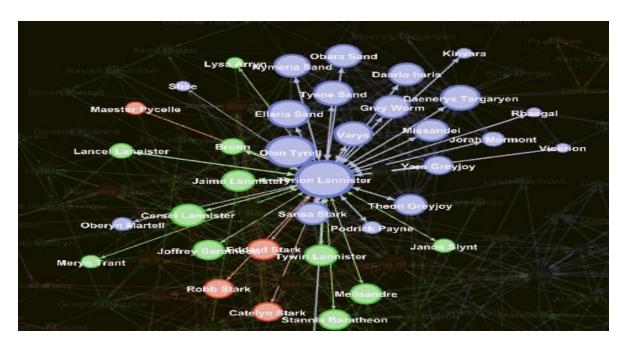
Hub

Figure 17:Very evident as Tyrion is the Major Hub as he knows most of the information and is responsible for inter community contacts.
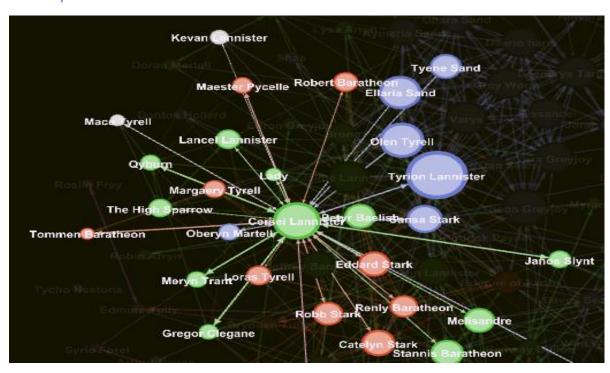
Authority

Figure 18:Being the queen, it can be associated having the authority.
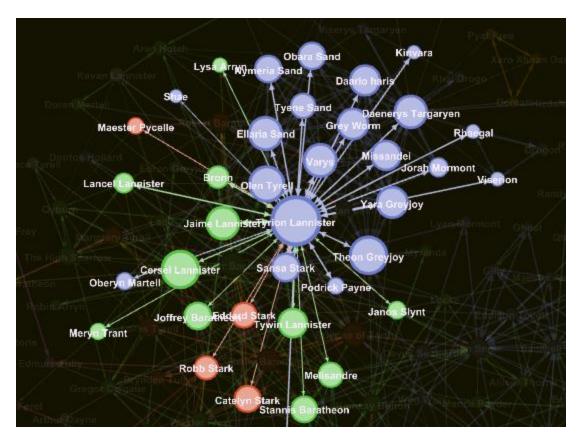
Figure 19:Being one of the key decision maker due to the gathering of data and being a hub Tyrion is the most important character of the entire story as he has the authority and hub.

Tool Implemented for Project:

Web Analytics Assignment