"Jerome", NO.4 and NO.32 are all named "Gretchen". To solving the problem, we express all names in other way such as Jerome16, Jerome34, Delores10, Gretchen4 and Gretchen32. Their probability respectively: 0.646, 0.461, 0.358, 0.401, 0.448. Since Jerome16 is highest so we can say Jerome16 is most likely to be conspirator.

5.3 Explore The Model on Conditions Change

The conditions change: Topic 1 is also connected to the conspiracy and that Chris is one of the conspirators. The same method we used as former, the result is shown in Table6

Table 6 Probability of 83 Members on Conditions Change

N	P	N	P	N	P	N	P	N	P
53	0.000	82	0.286	64	0.369	34	0.436	16	0.549
57	0.000	25	0.305	15	0.374	0	0.437	43	0.557
59	0.000	14	0.308	10	0.374	50	0.439	13	0.561
61	0.053	69	0.316	24	0.382	12	0.45	49	0.561
55	0.210	76	0.316	71	0.386	48	0.454	27	0.579
68	0.210	26	0.325	75	0.395	52	0.456	7	0.605
58	0.211	42	0.329	38	0.399	40	0.489	9	0.605
63	0.211	70	0.333	19	0.400	60	0.491	22	0.618
17	0.228	45	0.337	2	0.405	3	0.508	21	0.632
36	0.253	28	0.342	20	0.408	33	0.509	47	0.662
30	0.257	72	0.342	6	0.412	31	0.511	54	0.716
41	0.263	35	0.353	46	0.412	44	0.518	67	0.750
66	0.263	4	0.369	32	0.415	65	0.518	81	0.768
73	0.263	5	0.369	39	0.421	78	0.526	56	0.790
74	0.263	11	0.369	79	0.421	8	0.542	51	1.000
77	0.263	23	0.369	1	0.429	18	0.542		
80	0.263	62	0.369	29	0.434	37	0.547		

(N: on behalf of serial number. P: on behalf of conspiracy probability. The shaded means known conspirators)

Compared to the probability in different conditions, we can see they have little difference. The result is shown in Figure2.

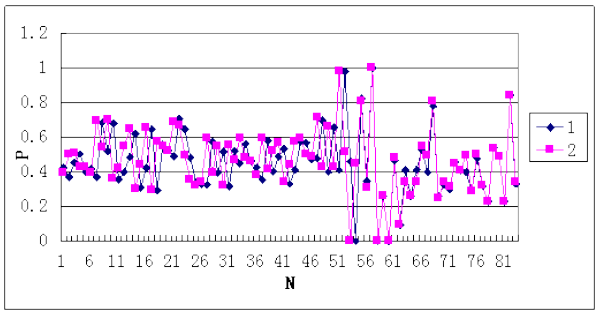

Figure 2 The Probability in Different Conditions

6. The Network Sociology Analysis

6.1 Background

1930, W. L. Warner pointed out that the social structure of a modern community type constitute by many sub-groups, such as family, church and classes.[4]

1972, Bruce Kapferer successfully predicted a strike. That greatly improved the level of theory and practice of network sociology. [5]

Network sociology may be subordinated to the future independent discipline network science (Weizhi Deng 2001) [6]

We propose a network sociology model to nominate the conspiracy leaders that is based on network analysis. The model is run in UCINET software which is one of most popular simple software of social network analysis at the present time.

Known by the common sense, it is very useful to combat the conspiracy leaders for fighting against criminal gangs. The leading figure is the hub of the network for

information exchange based on the social network model. If someone's degree centrality and betweenness centrality is rank in front of sequence we think he is the conspiracy leader. So we calculate the parameter of degree centrality and betweenness centrality to find the conspiracy leaders.

6.2 The Relationships Matrix and Network Diagram

We use 1 and 0 to describe the two whether linked or not and build the relationships matrix for conspirators. Then we draw the relationship network diagram by using UCINET software. The diagram is shown in Figure3

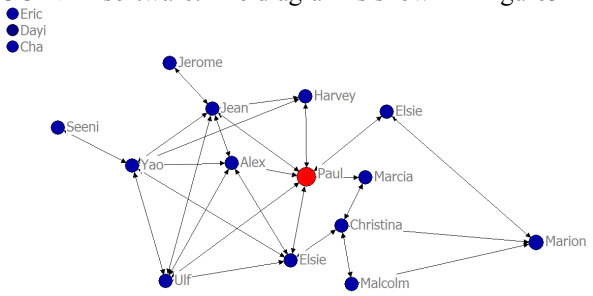

Figure 3 Network Diagram of Conspirators

6.3 The Degree Centrality and The Betweenness Centrality

For a network node, degree is the most basic connectivity metric parameters. Degree is expressed by the node and other nodes connection number d and divided into in-degree and out-degree. 1974, Nieminen put forward the calculation formula of degree centrality:[7]

$$C_D = \sum_{i=1}^{n} \alpha(p_i, p_k)$$

Table 7 The Degree Centrality of Conspirators

Number	Name	Degree	Number	Name	Degree
10	Paul	7.000	9	Elsie	2.000
5	Jean	6.000	8	Marcia	2.000
16	Yao	6.000	2	Malcolm	2.000
1	Elsie	5.000	17	Seeni	1.000
6	Alex	5.000	4	Jerome	1.000
14	Ulf	5.000	7	Eric	0.000
11	Christina	4.000	15	Cha	0.000
3	Marion	3.000	13	Dayi	0.000
12	Harvey	3.000			

We can see that Paul, Jean and Yao are the top three. Paul is the most probable conspirator leader whose degree centrality is 7.00.

Table 8 The Betweenness Centrality of Conspirators

Number	Name	Betweenness	Number	Name	Betweenness
10	Paul	25.050	8	Marcia	2.150
1	Elsie	17.400	12	Harvey	1.133
16	Yao	14.983	7	Eric	0.000
11	Christina	14.917	13	Dayi	0.000
5	Jean	13.800	2	Malcolm	0.000
9	Elsie	5.917	15	Cha	0.000
3	Marion	2.917	4	Jerome	0.000
6	Alex	2.367	17	Seeni	0.000
14	Ulf	2.367			

From the table above, Paul is also in the top and his betweenness centrality is 20.05.
Because Paul's degree centrality and the betweenness centrality is the highest from others.Paul is the most probable to be conspirator leader. In summary, Paul is the conspirator leader.

7. Model Evaluation

7.1 Model Promotion

The former models all took one aspect of factor into consideration. Basic model and improved model only consider "Conspirators". The semantic network analysis model and the network sociology model only take "Key words" into account. To improving our model, we consider four factors "Conspirators", "Key words", "Non-conspirators", "Suspicious topics". We make a comprehensive evaluation with four factors. The improvement ideas graph is shown in Figure4

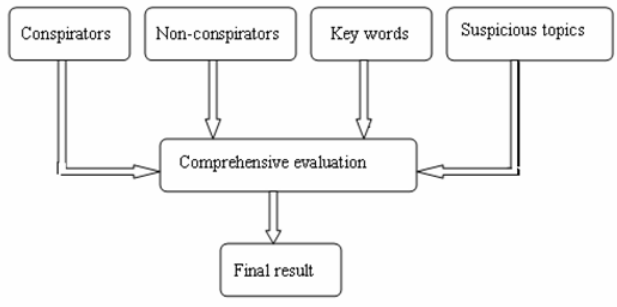

Figure 4 The Improvement Ideas Graph

The model improved could apply to the assessment of product quality, evaluation of the quality of hotel services, and also could apply to cluster analysis.

7.2 Strength

Basic model and improved model: we adopt principle of fuzzy mathematics. We start from known conspirators. We deal with the data and calculate the weight of topic contain conspirators node's boundary x_i,we regard this probability as conspiracy topic. Then we calculate in turn the conspirator probability of nodes. So, we quantify each node and it is easy to sorting, comparison and screening conspirators.

The semantic network analysis mode: we take conspiracy topic into account and pick out key word connected with conspiracy. We calculate weight with semantic analysis. Taking consideration from key words is close to our purpose and avoiding leaving out some conspirator when people discuss too much insignificant topic.

7.3 Weakness

Basic model and improved model: It is a bit one-sided to estimate the probability of conspiracy by frequency of conspiracy occurrence. If we comprehensive evaluate three factors "Conspirators", "Non-conspirators", and "Suspicious topics", the result will be better.

The semantic network analysis mode: The keywords selection and number determined directly determine the accuracy of the results. If the first step of selection keywords are wrong it could result in incalculable error on the overall.

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