

A Model for Investigating the Iraqi Politics During the Elections

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ABSTRACT

The Iraqi political arena has witnessed a dramatic change after the year of 2003. It moved from the dominated republican system to a democratic system. This movement in the political system has affected the situation in Iraq in terms of economic, education, industrial, trading, to mention a few. This paper analyses the Iraqi parliament representatives' affiliations in terms of their coalitions they formed in the elections. Moreover, this study tries enabling us to deeply understand how the Iraqi parliament representatives are connected to each other and the relations among them. It also provides us with information on how different provinces adopted different coalitions regardless their religion and other tendencies. Several political networks were generated and visualized based on the concepts of complex networks. Each network represents a particular political aspect of the current Iraqi parliament. This study also reveals a new trend of forming coalitions in Iraq and the strategy followed by the representatives in attaching to coalitions. Finally, we believe this is the first kind of work that uses this approach of analysis in understanding the trend of Iraqi politicians.

Keywords:

Iraqi Parliament; Iraqi Elections; Political Networks; Complex Network.

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1. INTRODUCTION

The Iraqi parliament council of representatives is considered as the unicameral legislature in Iraq. This council consists of 329 seats distributed to all the Iraqi provinces. Each province is assigned a particular percentage of seats based on their population size and components including all the religions and the social mixture in Iraq. In the the election of 2018, the Iraqi parliament seats distributed according to Table 1 and Fig 1, which include the political groups (coalitions) that participated and won the elections.

As mentioned, each province in Iraq has its own percentage of seats in the election. Fig 2 depicts the number of seats for each province and also the dominated coalitions at each part in Iraq.

In this paper, we base our analysis on the concepts of complex networks. This field of research [1] [2] is a branch of science that deals with the analysis of data. Complex networks analysis formed a given dataset to nodes and edges

among them aiming to create a graph that has its own characteristics [3]. The generated graph is called a Complex Network. There are many kinds of complex networks such as political networks [4], collaboration networks [5][6], biological networks [7], social networks [8], crime networks [9], etc.



Fig 1: The Iraqi Parliament Coalitions Seats. There are 329 Seats for All the Coalitions Formed by The Iraqi Politicians.

Table 1: The Iraqi Parliament Seats Distribution for Each Coalition. It should be Mentioned That The Name of Each Coalition is Written in English First Followed by its Arabic Name.

Political Group (Coalition)	# of Seats Assigned
Forward (Sairoon)	54
Fatah Alliance (Fatah)	47
Victory (Al Nasir)	42
State of Law (Dawlat Al Qanoon)	25
PDK (Al Democracy Al Kurdistan)	25
National (Al Watania)	21
Wisdom (Tayar Al Hikma)	19
PUK (Al Itihad Watani Kurdistan)	18
Reform (Al Iraqia)	14
Minorities	9
Others	55



Fig 2: The Number of Seats Dedicated for Each Iraqi Province and The Dominated Coalitions in Each Province. The Colors Used Are the Same in the Previous Figure When Mentioning the Coalitions.

In this work, we formed a political network for the 2018 Iraqi parliament representatives as a complex network and analyze the generated network based on the characteristics of complex networks. It was more appropriate to use the dataset of 2021, but the data was not ready (till the

time of performing this study) according to the Iraqi Independent High Electoral Commission.

This paper is organized as follows; in the next section, we present the works that related to our study. Section III we describe about our approach in the analysis of this work. In Section IV, we discuss our findings and the generated networks. Finally, we conclude our work in Section V.

2. RELATED WORKS

Complex networks have been used in the analysis of many different kinds of political systems. For instance, in [11] the authors analyzed the bias in media in supporting one of the two parties in the United States using complex networks concepts. In [12] and [13] the authors deeply analyzed the performance of the Brazilian political parties and the tendencies of their representatives during the elections. However, the Iraqi political issues have not given enough attention by the research community. A few numbers of researches have targeted the Iraqi parties and the parliament structure. A report [14] issued by the LSE middle East Center in 2018 mentioned that the recent election had witnessed a low rate of voters [15] comparing to the previous elections (2014) in Iraq, which was unexpected. The reason behind this, the Iraqi people feels bad towards the politicians and their performance in the recent election cycle [16]. Moreover, the lack in the basic services (e.g., water, electricity, healthcare sectors) in most of the Iraqi cities left a negative impression on the Iraqi people. The recent election witnessed a significant change in the structure of the coalitions formed in Iraqi provinces. Most coalitions were colorful of parties as well as there exists some parties participated in more than one coalition (e.g., Al-Hal party participated in Nineveh Hawiatona and Al-Anbar Hawiatona). In the analysis of this work, we target this phenomenon and how it impacted the recent election.

3. OUR APPROACH

This section describes the suggested research methodology. It starts from the dataset collection and ends with the analysis results and facts about the structure of the Iraqi political network. The general steps of this work are summarized in Figure 3.

3.1 Dataset

The dataset used in this work was taken from the Independent High Electoral Commission (IHEC) [17], which is the most accurate official source of information on the Iraqi elections and the parliament representatives. The data considered in this work belongs to the 2018 elections. As mentioned in the previous section, it was more

adequate to use the data of the 2021 elections. However, the data has not yet been accredited by the IHEC. The dataset includes many attributes such as the Iraqi parties that participated in the elections, the politicians who are affiliated to the involved parties, the province of each politician, and the coalitions formed in the elections including their parties and candidates. Moreover, in this study, we are not looking for descriptive statistics, instead, we aim at investigating the patterns existed in the Iraqi political parties and their relations to each other. In the 2018 election and after announcing the winners, the process of counting the votes was recounted after many obligations issued by some of the Iraqi politicians who participated in the election. Therefore, the IHEC repeated the process of votes counting and issued a new list of winners, which is considered as our dataset in this work. The used dataset in forming the Iraqi political network, contains information on each single representative including, representative ID in his/her coalition, affiliation coalition ID, province, affiliation party, and number of votes that the representative obtained in the election. We, then, structurally converted this dataset to be appropriate for visualization and analysis purposes.

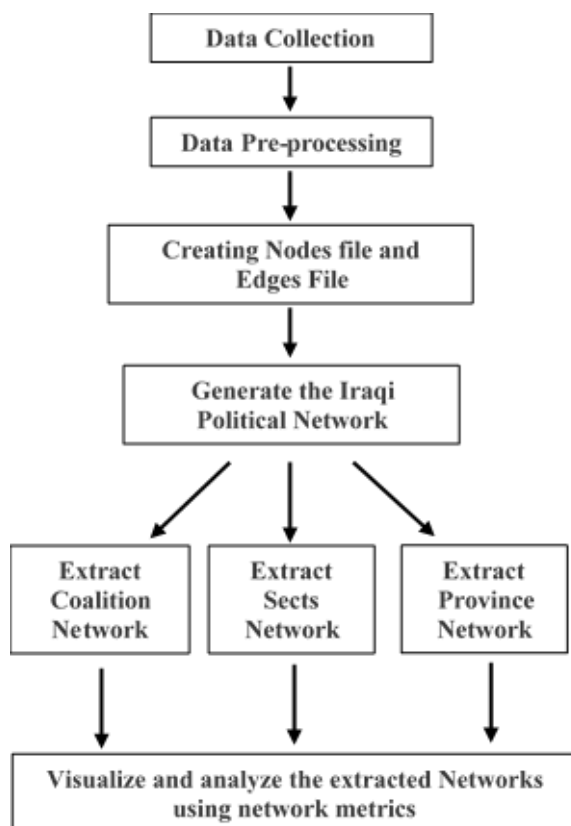


Fig 3: Block diagram of the general steps of the proposed work.

3.2 Network Creation Method

A network of the Iraqi parliament representatives was created. The network is structured as nodes (V_1, V_2, \dots, V_n) and edges (E_1, E_2, \dots, E_m) among them. Each node (V_i) denotes a representative and the edges are the relations among them. Our approach in forming the edges among the representatives was based on two strategies working together as follows:

- a) When having two representatives belong to the same coalition there exists an edge between them regardless any other affiliations (e.g., province or religion).
- b) The second strategy followed in building the edges was based on the party the representatives belong to. An edge exists between two representatives if they belong to the same party.

These two strategies are important to reveal the actual relation between each two representatives and among the coalitions themselves. It should be mentioned that in the 2018 election, a party could participate in more than one coalition at the same time using different of parties' representatives. For instance, Al-Hal party participated in three different coalitions, namely, Nineveh Hawiatona, Salahudin Hawiatona, and Al-Anbar Hawiatona [17].

After creating the datasets, we generated networks and visualized them for analysis purposes. Furthermore, all the generated networks were based on the same dataset mentioned above. Moreover, all the networks in this work depended on clustering the nodes according to the coalitions they belong to. Moreover, the number of nodes generated is 329 (number of representatives) and the number of edges generated is 381 edges among all the representatives.

3.3 Coalition Network

In this network, nodes denote representatives while the edges among them reflect the fact that they belong to the same coalition. Fig 4 depicts the Coalitions Network (CN), which includes all the coalitions in the 2018 Iraqi parliament. Each coalition has a particular color that shows how coalitions' representatives connect with each other. According to the strategies mentioned in the previous section for generating edges among nodes, we noticed that the biggest coalitions did not have parties in common. This means, most the Iraqi parties preferred to participate in one coalition instead of participating in many small coalitions and lose their power.

In the analysis of the generated networks, we use some complex networks measurements as we can see next. One of the most popular measurements used in this kind of networks is the *Average Clustering Coefficient* that can be formalized as follows [20]:

$$C_i = \frac{2|\{R_{jk}: n_j, n_k \in N_i, R_{jk} \in E\}|}{k_i(k_i - 1)}, \quad (1)$$

where R_{jk} is a representative between the representative n_j and n_k . N_i is the total network representatives and k_i is the neighbors' representatives in the network. The average clustering coefficient $avg(cc)$ of the network is defined as follows:

$$C_G = \frac{\sum_{i=1}^n C_i}{N}, \quad (2)$$

when the value of C_G is 1 meaning that the network is fully connected, while 0 means the network is disconnected. In the case of CN network, the $avg(cc)$ equals 0.32, which means that the representatives do not reflect strong tendencies to connect to each other and the network is relatively weakly-connected taking into consideration we are dealing with a political network. Another measurement used is the *degree centrality*, which is for a particular representative reflects how many connections he/she has to the other representatives. The average degree in CN network is equal to 2.316, which means that the average number of connections for a particular representative to the other representatives is below than 3. This also a negative indicator that leads us to the fact that in the 2018 elections the representatives tended to connect to only the head of coalitions (influential representatives) and ignoring the others. This finding reflected what has been stated in the distinguished work of Newman [18] (the highly connected nodes are more likely to receive more connections). Moreover, the CN network diameter equals 5, meaning that the longest distance between any two representatives in the network, which is long in the CN network. On the other hand, the average path length between any two representatives can be formulaed as follows [20]:

$$d_{ij} = \frac{1}{n(n-1)} \sum_{i \neq j} \quad (3)$$

where d_{ij} is the length between author i and author j . This metric shows an average values of the path length within the network equals 2.573 (about half the network diameter). The average path length should be lower than the current value according to [12][19] for this size of networks (329 nodes and 381 edges).

Furthermore, we calculated the best-connected representatives according to the value of betweenness centrality, which reflects how a representative is important in the flow of information within the network. In other words, the betweenness centrality (C_b) represents how often a representative appears in the shortest path between any two representatives in the CN network and can be formalized as follows [21]:

$$C_b(j) = \sum_{i \neq j \neq k} \frac{\sigma_{ik}(j)}{\sigma_{ik}}, \quad (4)$$

where σ_{ik} is the shortest path between the representatives i and k . $\sigma(j)$ is the number of paths that pass through representative j .

Another important metric we used in this work is the Closeness centrality (C_c). It measures how close a representative is from the other representatives in the network and can be defined using the following equation:

$$C_c(i) = \frac{N-1}{\sum_j d(ji)}, \quad (5)$$

where $C_c(i)$ is the distance between the representative i and j .

Table 2 shows the top 10 best connected representatives in the 2018 Iraqi parliament. This table also shows the values of closeness centrality (how close representatives to each other), the degree of representatives (the number of connections), the number of votes obtained, and the province of the representatives. Furthermore, this table shows that Forward coalition dominated the list along with Al-Istiqama party (the main party in this coalition).

For a representative, the number of votes obtained does not give much impact insofar as the position of the representative in the network gives. For instance, Khalid Al Obaidi and Noori Al Maliki gained about 72743 and 102474 votes respectively (highest votes obtained in the 2018 elections) but they are in the 6th and 7th positions in the list respectively. Therefore, the position of a particular representative in the network gives more power than the other factors. In the real life, accessing people or other resources can be easily performed when having many relations and connections to others.

3.4 Sects Network

The Sects Network (SN) was visualized based on the three main sects in Iraq; Sunnis, Shiites, and Kurds. Fig 5 depicts the main Iraqi sects in the 2018 parliament. The nodes with the red color denote Sunnis, the grey nodes for Shiites, and the nodes with yellow color for Kurds. It is clear that

the biggest sect in Iraq is the Shiites component. During the 2018 elections, the Iraqi political arena witnessed a domination of the Shiites component since it leads almost all the coalitions in Iraq except the Kurds coalitions.

Now, we aim at revealing the actual positions of the Sunni representatives and how they are connected. In Fig 6, we see how the Sunni representatives are distributed over the CN network (the red nodes). They do not even have one cluster for their component as the Shiites and Kurds. Instead, the Sunnis prefer to join to the strongest components. In our opinion, the reason behind this can be summarized as follows:

- The Sunnis representatives strongly believe that the Shiites are the main source of power in Iraq due to their relations to the main source of power in the region. Moreover, most the victories against ISIS gangs were achieved under the Shiites lead, which in turn left a positive impression towards the Shiites.
- The Sunnis representatives do not (relatively) trust each other since they have experienced this before in the previous parliament cycles and how they performed in the recent years. The war against ISIS also left a negative impression on the Sunnis representatives and their bad performance led the Sunnis regions to be invaded, which made them not to cluster together under one coalition.

It would be a great power in the 2018 Iraqi parliament if the Sunni representatives formed a coalition that includes all the Sunnis components (Nineveh, Salahuldeen, Anbar, part of Kirkuk, part of Diyala, and part of Baghdad). Instead of that, they transferred their power to the power of the other components. For instance, Khalid Al Obaidi gained about 72743 votes alone; these votes went to the Victory coalition under the leading of Haidar Al Abadi.

As a very specific example of power transfer is the case of Nineveh province, which is the second largest province in Iraq after Baghdad. Most of the powerful representatives in Nineveh chose to work under the coalitions of other provinces or another component. Fig 7 depicts the representatives of Nineveh (red nodes) and how they are distributed to the coalitions of other components. This distribution caused these representatives to transfer their actual power to the other coalitions instead of being a strong independent power and effective decision makers. The only Sunni coalition in Nineveh is Nineveh Hawiatona that gained only 3 seats. This actually does not make sense since Nineveh province is considered as a powerful province in terms of population size and has 34 seats in the parliament.

In fact, most of the people of Nineveh hope their destroyed regions to be repaired after the war and they expect improvements in the basic services. This actually can be performed by the support of the representatives they voted for in the 2018 elections. Now, taking into considerations the fact that the heads of the coalitions that won in Nineveh are from other provinces, the question here is: How much the representatives of other provinces that won in Nineveh can support Nineveh? Answering this question can determine whether the strategy followed by the Sunnis in the 2018 elections is successful.

3.5 Provinces Network

The other network we generated is called Provinces Network (PN) in which each node represents an Iraqi province, the edges between two provinces exists when there exists a coalition and representatives in common. Increasing the number of coalitions and representatives in common increases the weight of an edge between two provinces. Fig 8 shows the projection of nodes to their actual coordinates on the Iraqi map and the edges among these nodes as well. It can be seen that the relations between the pairs (Baghdad-Basrah, Baghdad-Qadisiya, and Najaf-Muthana) have the highest weight among the PN network. This leads to the fact that these provinces formed the most powerful coalitions in Iraq that belong to Shiites component.

Another finding can be observed is that the degree of nodes for the Kurdish provinces is low comparing to the other provinces in Iraq. This means the Kurds did not tend to participate with coalitions out of their regions, which is clear from the PN network. The case we mentioned in the previous section, Nineveh has links to most of the Iraqi coalitions including the Kurds coalitions.

4. DISCUSSION

According to the findings of this work, the 2018 Iraqi parliament consists of many coalitions that in turn include representatives from all the Iraqi provinces and components. Shiites are the dominated in the 2018 Iraqi parliament followed by the Kurds, then the other components and minorities in Iraq. The Sunnis representatives--the second major component in Iraq--were mainly mixed with the Shiites and Kurds coalitions. The largest number of votes that came from the most influential Sunnis representatives went to the largest Kurds and Shiites coalitions (see Table 3).

This transfer in power is considered as a new trend in the Iraqi political arena. In the previous Iraqi parliaments, each component has its own coalitions that reflect the regions they belong to.

On the other hand, the three major Sunni provinces (Nineveh, Salahuldeen, and Anbar) exported most of their votes to coalitions out of their provinces. Nineveh is the most attracted case that exported their votes mostly to the Shiites and Kurds coalitions.

The findings also revealed the relations among the Iraqi provinces that have coalitions and representatives in common. The pairs (Baghdad-Basrah, Baghdad-Qadisiya, and Najaf-Muthana) reflected a very strong relation among them, which is clear due to the weights appeared in the tie of each pair of provinces.

This study also ranked the current Iraqi parliament representatives according to their relations with the other representatives in the parliament as shown in Table 2. The ranking list also reflected the fact that the most influential representatives in Iraq are not necessary to be the ones who gained the highest number of votes in the elections. Moreover, the list contains 20% Female representatives (1st and 4th ranks in the aforementioned table) out of the top 10 list, which is considered as a positive indicator that the Iraqi women are playing their role in the government and they have become influential in the Iraqi social and political settings.

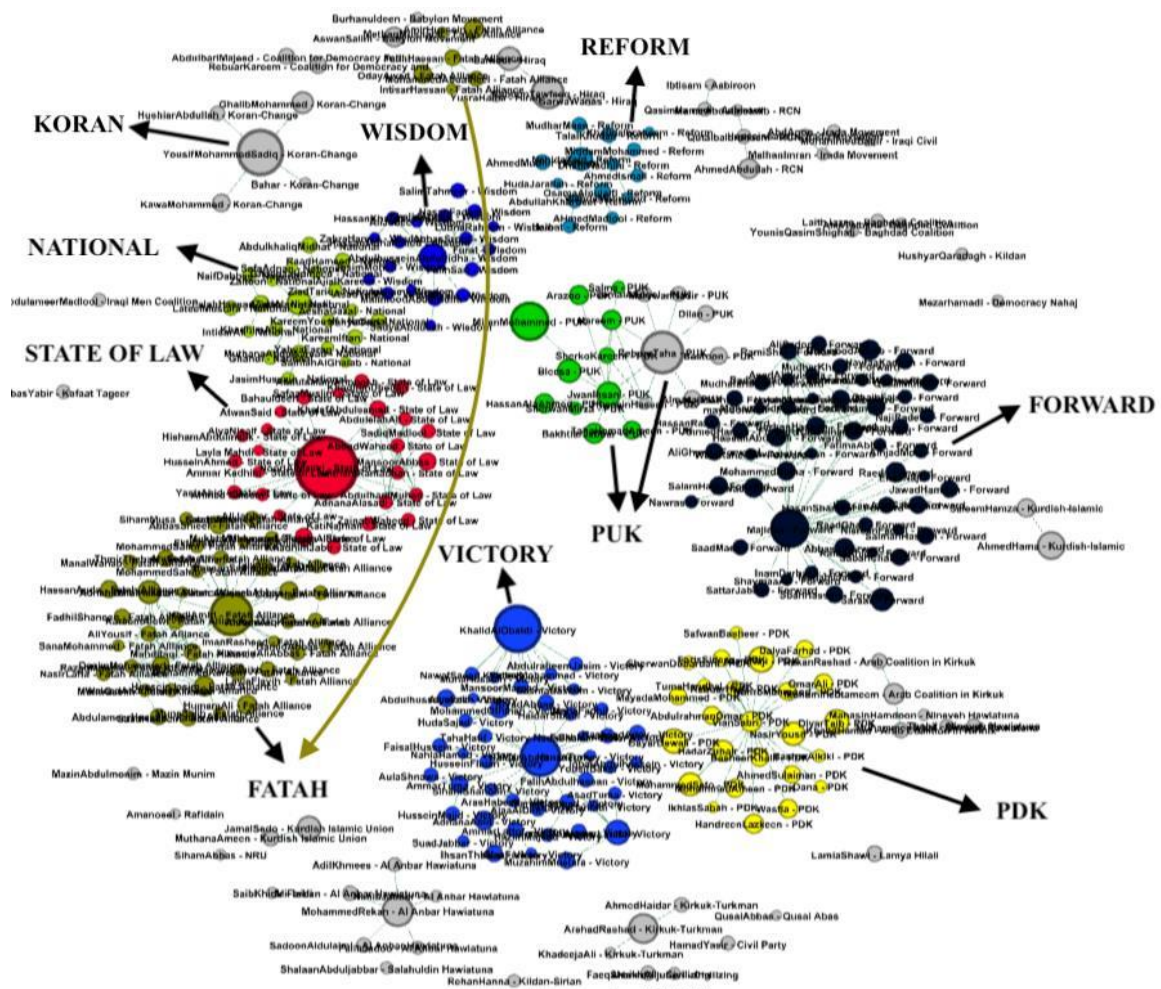


Fig 4: Network of Iraqi Coalitions in The 2018 Elections. This Network Contains Clusters, Each Cluster Represents a Coalition. The Largest Node with High Degrees Denotes the Heads of Coalitions (Cluster Head).

Table 2: Top 10 Best Connected Representatives in The 2018 Iraqi Parliament.

Rank	Name	Coalition	Party	Betweenness	Closeness	Degree	Votes	Province
1	Majida Al Tamimi	Forward	Al Istiqama	881	0.609	27	55184	Baghdad
2	Haidar Al Abadi	Victory	Victory	814	0.661	21	59710	Baghdad
3	Hadi Al Aamiri	Fatah	Badir	600	0.661	20	63568	Baghdad
4	Vian Sabri	PDK	PDK	276	1	24	21479	Dohuk
5	Sadiq Hameed	Forward	Al Istiqama	265	0.540	13	15343	Dhi Qar
6	Khalid Al Obaidi	Victory	Bayariq Al Khair	237	0.477	10	72743	Nineveh
7	Noori Al Maliki	State of Law	Together with Law	221	0.757	17	102474	Baghdad
8	Jamal Fakhir	Forward	Al Istiqama	211.7	0.535	9	15616	Missan
9	Rami Jabbar	Forward	Al Istiqama	202	0.438	11	13257	Basrah
10	Ayad Alawi	National	Al Wifaq	177	0.714	12	28069	Baghdad

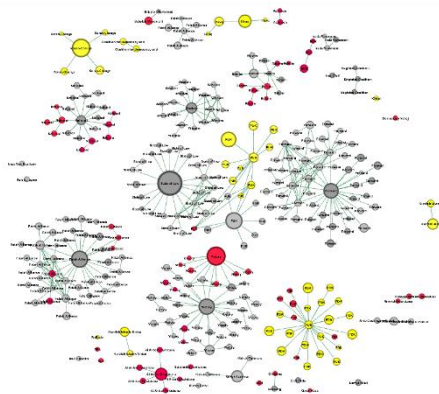


Fig 5: The SN Network Of Iraqi Sects; Shiites (grey), Sunnis (red), And Kurds (Yellow).

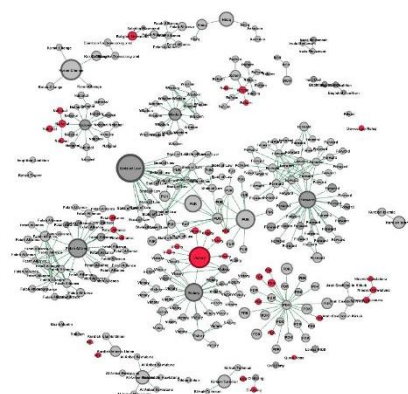


Fig 7: The Distribution Of Nineveh Representatives Over The Coalitions Different Components.

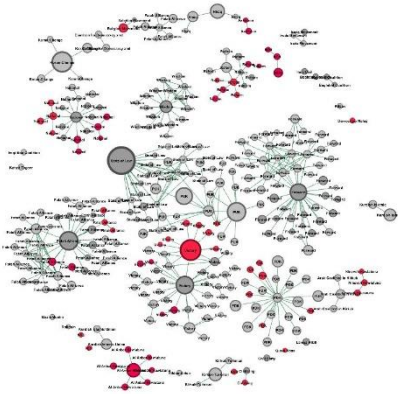


Fig 6: The Distribution of The Sunnis Representatives Over The Iraqi Coalitions.

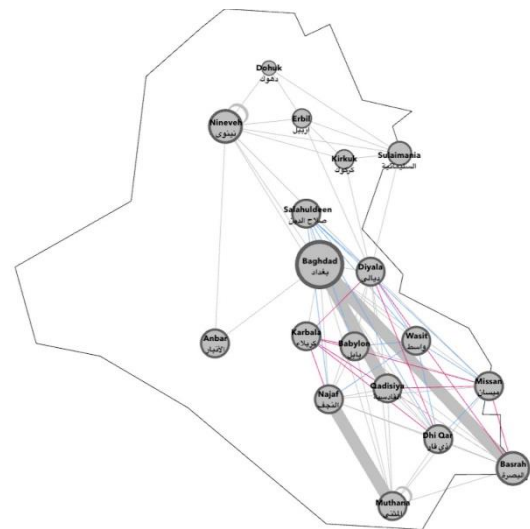


Fig 8: The PN Network Of The Iraqi Provinces And How They Have Coalitions And Representatives In Common.

Table 3: The Percentage of Seats That Nineveh Provinces Gives for The Sake of Other Coalitions and Components. For instance, 24% of the PDK votes came from Nineveh province and so on.

Coalition	# of Seats given
PDK (Al Democracy Al Kurdistan)	24.00%
Victory (Al Nasir)	16.66%
National (Al Watania)	19.04%
Fatah Alliance (Fatah)	6.38%
PUK (Al Itihad Watani Kurdistan)	5.55%

5. CONCLUSION

In this paper, we have generated and visualized complex networks for describing the 2018 Iraqi parliament representatives. The dataset used in this work was taken from the Independent High Electoral Commission (IHEC) in Iraq, which is official and the most accurate source of this kind of datasets. The main goal of this study is to understand the affiliations of the Iraqi representatives in the current parliament and how they are connected to each other under particular coalitions.

Based on the visualization and the analysis of the networks generated, we see that the 2018 elections had witnessed dramatic changes in terms of the Sunnis political affiliation and their strategies in attaching to coalitions. This change may play a significant role in the future since it may contribute in improving the performance of all the Iraqi representatives in the parliament. According to the findings, this paper can be summarized by the following facts:

- The biggest coalitions in Iraq belong to the Shiites, which in turn contains many influential Sunnis politicians.
- Although the Sunnis provinces represent the second biggest component in Iraq, there is no big coalition that contains their component as performed with Shiites and Kurds.
- The most influential Sunnis' politicians preferred to work under Shiites and Kurds coalitions. This led their power to be transferred for the sake of other components.
- The number of votes gained by a particular representative does not reflect his/her impact on the Iraqi political arena. The most influential politicians in Iraq did not gain the highest number of votes in the elections.
- The findings also showed that there exist strong relations among some of the Iraqi

provinces due to the coalitions and representatives they have in common such as Baghdad-Basrah, Baghdad-Qadisiya, and Najaf-Muthana.

- The women in the 2018 Iraqi parliament are considered to be influential since they are positioned in the list of the top 10 most influential politicians in Iraq. This fact is a new trend in the Iraq and a positive indicator for the women to take their opportunities in the political settings and contribute in developing the country.

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نموذج حوسبي للتقصي عن السياسات العراقية خلال الانتخابات

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الملخص

شهدت الساحة السياسية العراقية تغييراً جذرياً بعد عام 2003، حيث انتقلت من النظام الجمهوري إلى النظام الديمقراطي. وقد أثرت هذه الحركة في النظام السياسي على الأوضاع في العراق، على سبيل المثال لا الحصر، اقتصادياً وتعليمياً وصناعياً وتجارياً. يقوم هذا البحث ببناء أنموذج حوسبي رياضي لغرض تحليل انتماءات أعضاء مجلس النواب العراقي من حيث تشكيل التحالفات خلال فترة الانتخابات. علاوة على ذلك، تحاول هذه الدراسة تمكيننا من فهم عميق لكيفية ارتباط أعضاء البرلمان العراقي ببعضهم البعض ودراسة العلاقات فيما بينهم. كما أن هذه الدراسة تزودنا بمعلومات حول كيفية تبني المقاطعات المختلفة ائتلافات مختلفة بغض النظر عن توجهاتها العرقية والدينية والتوجهات الأخرى. تم تكوين وتصوير العديد من الشبكات السياسية بناءً على المفاهيم الرياضية للشبكات المعقدة. تمثل كل شبكة مكونة جانباً سياسياً معيناً من البرلمان العراقي. كما تكشف هذه الدراسة عن توجه جديد لتشكيل الائتلافات في العراق والاستراتيجية التي اتبعتها النواب في الارتباط بالائتلافات. وأخيراً، أن هذه الدراسة هي الأولى من نوعها في استخدام هذا النهج الرياضي في تحليل وفهم توجه السياسيين العراقيين.

الكلمات الدالة:

البرلمان العراقي، الانتخابات العراقية، الشبكات السياسية، الشبكات المعقدة.