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# INTRICATE GENEALOGIES: WHAT IS SAID IN THE EPIC POEM ABOUT NOGAY PEOPLE?*

## Karmaşık Şecereler: Nogaylar Hakkındaki Destanda Ne Söylemiş?

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**ABSTRACT**

This article examines communication blueprints of the Forty Knights of Steppe epic poem (original title in Kazakh "Қырымның қырық батыры"). The Forty Knights of Steppe is a cultural heritage of Turkic nations. The epic poem's text is an assemblage of ballads that are connected with each other. It consists of thirty-five ballads and depicts relationships of around two hundred characters. The epic poem's events have a historical origin that links to the Nogay nobility from the Golden Horde period. The main event in the epic poem develops around Edige and his descendants. The historical aspect of this epic poem positions it with the paragons of heroic literature such as "Shahnameh" and "Manas". The epic poem's text was first fully recorded in 1942 in Almaty by Muryn Zhyrau (real name 'Tilegen Sengirbekuly') by specialists from the Kazakh SSR Academy of Sciences. Unfortunately, the epic poem stayed unpublished for more than 60 years. The full text of the epic poem was published in 2005 after restoring the independence of the Republic of Kazakhstan. This research discovers the epic poem by analyzing their network. It focuses on mapping and visualizing links between characters described in the text. The authors used the methods of text mining, proposition, and semantic triangles for assembling information about contacts between characters into the databases. The databases include basic information, such as the names of characters and their contacts with other characters. The databases also contain information about the direction of every contact, relationship statuses of contactors, contactors' roles inside of genealogical lineage, kinship degrees of contactors inside their genealogies, and contactors' gender. In addition, the databases include information about the connection of contactors to genealogies, and information about the contacts of contactors outside of their genealogies. All databases were built in spatial data analysis compatible format. The databases were launched through data visualization software by switching on the environmental settings required for this type of research. The authors used Gephi data visualization software for this research to visualize databases. The visualization shows an intricate communicative network that covers almost all characters. The visualization demonstrates two types of contacts between characters of the epic poem. The first type is a structured type of contacts. This type of contacts develops inside of genealogies. It is a common type of contacts in the epic poem, and it follows the hierarchical order. The second type is a class-based type of contacts. This type of contacts ties characters from different genealogies and does not correspond to the hierarchical order. However, this type of contacts depends on the characters' roles and statuses inside their genealogies. Thereby, the second type of contacts is connecting different genealogies into whole network. The types of contacts demonstrate two levels of social communication in the narration of the epic poem. Considering the visualization results and according to the historical origins of the characters, the authors argue that the text of the epic poem shows the patterns of social communication typical for Central Eurasian medieval nomad cultures in the Golden Horde period. On the other side, the stratification into two types of contacts may demonstrate the levels of bureaucracy in social communication in the same historical period. The authors suggest that the social networks of the epic poem describe the transitional form of the chiefdom society with communication levels typical for tribal and chiefdom societies. In general, the paper's authors suppose that the example of this research on the epic poem's communication structure may give more data to understand the correlation between language and society.

**Keywords**

Cognitive mapping, communicative networks, information processing, Қырымның қырық батыры, The Forty Knights of Steppe.

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**ÖZ**

Bu çalışma, Kırım'ın Kırk Batırı destanının (Kazakça asıl ismi 'Қырымның қырық батыры') iletişim planını incelemektedir. Kırım'ın Kırk Batırı destanı Türk halklarının kültürel mirasıdır. Destanın metni, birbiriyle bağlantılı bir baladlardan oluşmaktadır. Otuz beş baladdan oluşur ve yaklaşık iki yüz karakterin ilişkilerini tasvir eder. Destanın olayları, Altın Orda döneminden Nogay soylularına bağlanan tarihsel bir kökene sahiptir. Destandaki ana olay Edige ve onun soyundan gelenler etrafında gelişir. Destanın tarihî yönü, onu "Şahname" ve "Manas" gibi kahramanlık edebiyatı örnekleriyle aynı seviyede yer almaktadır. Destan metni ilk olarak 1942'de Almatı'da Murın Jırav (asıl adı 'Tilegen Sengirbekulı') tarafından Kazak SSR İlim akademisi bilim insanlarının yardımı ile kaydedilir. Ama destan 60 yıldan fazla bir süre yayından kalır. Destanın tam metni, Kazakistan Cumhuriyeti'nin bağımsızlığını kazandıktan sonra 2005 yılında yayımlanır. Bu makale, destanın iç bağlantılarını analiz ederek incelemektedir. Çalışma, destanda anlatılan karakterler arasındaki ilişkilerin haritalandırılmasına ve görselleştirilmesine odaklanır. Yazarlar, karakterler arası ilişkiler hakkındaki bilgileri veritabanlarına toplamak için metin madenciliği, önerme ve anlamsal üçgen yöntemlerini kullandılar. Veritabanları, karakterlerin adları ve diğer karakterlerle olan ilişkileri gibi temel bilgileri içerir. Veritabanı, her bir bağlantının yönü, kişilerin ilişki derecesi, kişilerin soyağacındaki kendi dallarındaki rolü, soyağacı içindeki kişilerin akrabalık derecesi ve kişilerin cinsiyeti hakkında bilgi içerir. Ek olarak, veritabanları, kişilerin şecerelere bağlantısı hakkında bilgiler ve kişilerin şecereleri dışındaki ilişkileri hakkında bilgiler içerir. Tüm veritabanları mekânsal veri analizine uyumlu formatta oluşturulmuştur. Veritabanları, bu tür araştırmalar için gerekli çevresel ayarlar yapılarak veri görselleştirme yazılımı aracılığıyla başlatılmıştır. Yazarlar, veritabanlarını görselleştirmek ve araştırma için Gephi veri görselleştirme yazılımını kullandılar. Görselleştirme, neredeyse tüm karakterleri kapsayan karmaşık bir iletişim bağlantısını gösterir. Görselleştirme, destanın karakterleri arasında iki tür ilişkiyi gösterir. İlk tip, yapılandırılmış bir kişi türüdür. Bu tür ilişkiler soyağacının içinde gelişir. Destanda yaygın bir ilişki türüdür ve hiyerarşik sırayı takip eder. İkinci tür, sınıf tabanlı bir kişi türüdür. Bu tür kişiler, farklı soyağaçlarından karakterleri birbirine bağlar ve hiyerarşik sıraya uymaz. Bununla birlikte, bu tür temaslar, karakterlerin soyağaçlarındaki rollerine ve durumlarına bağlıdır. Böylece, ikinci tip ilişkiler, farklı soy ağaçları tüm kişilere bağlanmıştır. İlişki türleri, destanın anlatımında iki düzeyde sosyal iletişim gösterir. Yazarlar, görselleştirme sonuçlarını göz önünde bulundurarak ve karakterlerin tarihsel kökenlerine göre, destan metninin Altın Orda döneminde Orta Avrasya, Ortaçağ konargöçer kültürleri için tipik olan sosyal iletişim kalıplarını gösterdiğini savunuyorlar. Öte yandan, iki tür temas hlinde tabakalaşma, aynı tarihsel dönemde sosyal iletişimdeki bürokrasi düzeylerini gösterebilir. Yazarlar, destandaki sosyal bağların, hem topluluk hem de kabile için karakteristik bağlantı düzeylerine sahip geçiş tipi bir kabile topluluğunu tanımladığına inanmaktadır. Genel olarak, makalenin yazarları, destanın iletişim yapısı üzerine yapılan bu araştırma örneğinin, dil ve toplum arasındaki ilişkiyi anlamak için daha fazla veri sağlayabileceğini varsaymaktadır.

**Anahtar Kelimeler**

Bilişsel haritalama, iletişim ağları, bilgi işleme, Қырымның қырық батыры, Kırım'ın Kırk Batırı.

## Introduction

The Forty Knights of Steppe epic poem is the cultural heritage of Turkic-speaking nations. The epic poem's text is an excellent example of Turkic oral literature. The epic poem is famous by huge number of characters and intricate genealogies. Significant part of characters has historical prototypes that links to the Golden Horde period nobility. This fact burnt the interest of specialists in different fields. However, the epic poem stayed unpublished for a long time. The Communist Party banned the epic poem from being published from WWII until the 70th. Certain parts of the poem were published after censorship and ideological revision in the Soviet period. The full text of the epic poem had been published after restoring the independence of the Republic of Kazakhstan. The book was released under the title "Қырымның қырық батыры: Ноғайлы жырлары" (Сәкенов 2005). It consists of an original text obtained from the manuscripts.

As we wrote above, the epic poem's text is distinguished by its complicated structure, detailed chronology, the historical roots of events, and wide network. This syncretic aspect of the epic poem was noted by scholars in Soviet times. After the publication of the epic poem's full text, the syncretic aspect of the poem is shown in the new cultur-

al layers. For instance, S. Sakenov focused their attention on the toponyms, and he claims that the text of the epic poem described geographic places which actually for modern Western Kazakhstan (Сәкенов 2006: 63). B. Abdulgaziyeva, in their research, paid attention to the epic poem as a literary heritage that saved their style of narration (Абдулғазиева 2011: 239).

In 2007, the epic poem was translated by F. Türkmen and M. Arıkan into Turkish, and released under the title "Kazak destanları: Kırım'ın Kırk Batırı" (Türkmen and Arıkan 2007). The epic poem's text became available to Turkish-speaking people through this publication. After that, the detailed scientific description of the epic poem narration was published by Dr. Aylin Çakır in Turkish (Çakır 2008). Then, we also found an interesting publication in Turkish that is dedicated to prayers and curses found in the text of the epic poem and their significance in narration (Gün and Gözcü 2019).

We found several papers that link the Forty Knights of Steppe indirectly. For example, Kobilandi Kidirbauli is the character's name in the epic poem. Z. Sabitov's paper analyzes the differences between medieval personalities, known under the name of "Kobilandi". He focuses on the names "Kobilandi Toktarbayuli" (name in original transliteration 'Қобыланды Тоқтарбайұлы') and "Kobilandi Kidirbayuli" (name in original transliteration 'Қобыланды Қыдырбайұлы') (Сабитов 2016: 49). "Alaw" is the character's name in the epic poem. According to the results of this genetics research, the authors claim that Alau, who probably lived in medieval times, is the founder of some Western Kazakh tribes (Zhabagin et al. 2021: 707).

A multidisciplinary interest to the epic poem arises from the syncretic nature of its text. In this field, we observed that the epic poem's text needs a deep revision of its structure. So, in this research, we analyzed the network that connects the epic poem's ballads. The main aims of the research were a description and analysis of internal contacts between characters of the epic poem. To implement this task, we explored the epic poem's text for interparticipant connections. Exploration included methods like text mining, a proposition, semantic triangles, and their variables. Collected data were assembled into the database and visualized on the Gephi data visualization software. The scientific significance of this research is the evaluation of data visualization instruments (i.e., Gephi) possibilities in analyzing a massive historical text. The practical benefits of research are in the cross-linguistic value of collected data and the interpretation of the visualization results. Because the epic poem and its text are an object of attention for researchers from various fields of science, the results of this research can be helpful for researchers in their discoveries.

The mentions about the Forty Knights of Steppe epic poem recorded by local researchers from the Mangistau region (modern Western Kazakhstan) in the 30th. These records are represented through several short reports from different authors. These reports usually illustrated excerpts from the ballads and names of the epic poem characters (e.g., knights, kin, opponents) and some information about the historical origins of the epic poem. So, those facts formed a vector of investigation for early cohort researchers. For instance, V. Zhirmunsky supposed that the texts of the epic poem represent events related to the Golden Horde nobility who lived between 14 and 15th centuries (Жирмунский 1974: 410). V. Meletinsky claimed that the epic poem characters related to the Nogay aristocracy (Мелетинский 1985: 587). S. Sakenov declared the correlation of events depicted in the epic poem with the Nogay Horde's chronicles (Сәкенов 2011: 58). Most researchers followed to matching the knights' names with their historical prototypes. An early cohort of epic poem researchers also focused on

investigating characters in the epic poem's events without access to the texts. They had no access to the epic poem's text. So, this strange situation biased the epic poem's perception for a long time. Considering these facts, this study focuses on the text and searches for an answer to the question of 'how is the epic poem linked inside?'. We decided to conduct our research in an experimental context using data visualization technologies. We chose the contacts between characters and correspondence between genealogical houses as the unit of analysis. In contrast with research papers published about the Forty Knights earlier, materials for this article relied on the empirical data extracted through text mining. The article contains the following parts: Materials, Methods, Results, Discussion, Conclusion, and Acknowledgements.

**1. Materials**

The Forty Knights of Steppe epic poem was recorded during WWII in Almaty by the Kazakh SSR Academy of Sciences staff. Unfortunately, the epic poem was banned from publication for political reasons in 1944. Finally, the epic poem survived the Soviet regime and released without political pressure and censorship. It happened in 2005 through financial support of the Ministry of Culture of the Republic of Kazakhstan. As we know the epic poem consists of 36 ballads. The ballads are organized into three chapters. Every ballad represents brief biographies and clashes of knight. The knight from one separate ballad is usually linked to the knight or knights from the other. So, the contacts create network in the scale of the epic poem. Unfortunately, the content of the epic poem does not represent actual internal network and genealogies. For instance, according to the content of the Forty Knights of Steppe epic poem, the epic genealogies are represented as follows:

Chapter 1. It includes ten knights and one 'awliye' (Islamic saint). Their names and hierarchical order look like this: 'Anshibay' > 'Baba Tukti Shashti Aziz' (Islamic saint) > 'Parpariya' > 'Kuttikiya' > 'Edige' > 'Nuradin' > 'Musa' > 'Mamay' (son of Musa, elder brother); 'Orak' (son of Musa, younger brother) > 'Karasay' (son of Orak, elder brother); 'Kazi' (son of Orak, younger brother).

Chapter 2. It includes ten knights. Their names and hierarchical order look like this: 'Karadon' > 'Zhubanish' > 'Suyinish' > 'Begis' > 'Kogis' (son of Begis, stepbrother of Tegis); 'Tegis' (stepson of Begis, stepbrother of Kogis) > 'Tama' (son of Kogis) > 'Tana' > 'Narik' > 'Shora'.

Chapter 3. This part includes several little genealogies and the knights without genealogy. It is placed like there:

'Kobilandi' (no genealogy).

'Asankaygi' (elder brother of Togan, father of Abat); 'Togan' (younger brother of Asankaygi, uncle of Abat) > 'Abat' (son of Asankaygi).

'Kargaboyli' (elder brother of Kaztugan); 'Kaztugan' (younger brother of Kargaboyli).

'Kulinshak' (no genealogy).

'Kokshe' (father of Kosay) > 'Kosay' (son of Kokshe).

'Kenes' (no genealogy).

'Manashi' (father of Tuyakbay) > 'Tuyakbay' (son of Manashi).

'Zhanbirshi' (father of Telagis) > 'Telagis' (son of Zhanbirshi).

'Ahmet' (cousin of Alaw and Amet); 'Alaw' (cousin of Ahmet, elder brother of Amet); 'Amet' (cousin of Ahmet, younger brother of Alaw).

'Shintas' (father of Torehan) > 'Torehan' (son of Shintas).

'Sultankerim' (no genealogy).

'Kartkozhak' (no genealogy).

As we can see, the epic poem's genealogical structure is entirely heterogeneous. The content of Chapter 1 and Chapter 2 are structured and follow to own hierarchical order with separation into branches. Chapter 3 has no unified genealogical order. It consists several little genealogies and few knights without genealogies. The genealogies in Chapter 3 are not linked to each other. So, referring to formal observation, we can see a collection of the ballads represented under one title.

**2. Methods**

As we know, an analysis of complicated text requires the following particular order. It helps to build logically flexible data for research. It also helps to overcome potential conflicts and helps raise the research's validity. In the case of the Forty Knights of Steppe epic, we see the paragon of complicated and massive text. The text of the epic contains 24506 poetry strings smashed with stories and narratives from the author. Structurally, the text of the epic poem contains 35 ballads, and a few parts have no full text. In another field, the text of ballads does not have a universal chronology in the frame of the epic poem. Some ballads have an isolated chronology that includes only their genealogy. Thus, the positioning of ballads in hierarchical and chronological order needs to be revised. This situation creates markedness in cognition of the epic poem respectively. We needed help uncovering why the epic poem recognize as one whole. An unestablished order and chronology of ballads negatively influence the perception of the epic. So, to solve the problems described above, we discovered the text of the epic poem by using one of the unique technologies in data science at the exact moment: data visualization.

Data visualization is one of the best decisions to structure massive, complicated information. The main pros of decisions like this are flexibility and abilities to use vivid tools to explore different data. For the implementation of this research was chosen Gephi Network Visualization Software, version 0.9.2. It is Open-Source software widely used by researchers around the world. Gephi is an optimal product for network research and analysis in the cohorts of analogs. Like other similar products, Gephi requires to follow specific algorithms. Following Gephi's technical requirements, we created database contacts of the epic poem participants.

We assembled the database of participants. We collected the names of all participants in one column and represented them in the data table of nodes. This database includes names of knights, names of knights' kins, names of knights' allies, names of knights' opponents, and names of neutral participants. The column "Name" represents their names.

The database of nodes also includes information about the gender of participants in the column titled "Gender".

One of the datasets indicates the status of each participant according to their role in the epic. We must clarify some details about it. The indication of participants' statuses basis on their role to the knight because the knights are a core element of the epic. The column titled "Label".

We added information about the participants' affiliated genealogy to the database of nodes. The information on genealogies includes information mined during text analysis only. The column titled "House" indicates it.

The next column, titled "Color" indicates the colors of genealogies. This column mirrors the dataset from the column "House" but displays a unique color for every genealogy in the HEX color codes.

So, the program generated the identification number for every participant. The column "Id" indicates the identification numbers.

Therefore, after the creation database of nodes, we started to form the database of edges. The database of edges indicates contacts between participants. This database includes the following datasets:

The database includes contacts between 'Contactor 1' and 'Contactor 2'. The column for 'Contactor 1' is titled "Source," and the column for 'Contactor 2' is titled "Target" respectively. Technically, all contacts have a direction from 'Contactor 1' to 'Contactor 2' and are marked "Directed" as default. The column "Type" represents the contact's direction.

Every contact in the database of edges has a unique identification number. The program automatically generated the identification numbers for the contacts and indicated them in the column "Id".

All contacts added to the database of edges got a weight following the technical requirements of Gephi. It is for technically fine mapping of data during the visualization. So, each contact got weight with an index of 1.0 as default. The column "Weight" indicates it.

Then, we added the column "Kind" to indicate the relationship statuses between 'Contactor 1' and 'Contactor 2'. It represents the kinship status of both contactors in relevance to each other.

We also added a column for indicating the kinship degrees of the contactors. The column "Kinship degree" represents it.

Finally, we added the color to the database of edges for indication of contacts in the data visualization. The column "Color" represents it in the HEX color code.

In this field, we need to clarify some details about assembling data. During the database creation, we extracted all data for the databases by text mining. The text mining technique includes methods like a proposition, semantic triangles, their variations, and chaining. During the text mining, we excluded from the database a) names and contacts of cultural heroes of Persian poetry; b) names (pseudonyms, public names, local names) and contacts of Islamic saints (except 'Baba Tukti Shashti Aziz'). Then, we optimized assembled database for the technical requirements of Gephi. We converted the charset of the databases to CSV-compatible format.

Finally, the databases of nodes and edges ran in the Gephi system. We chose the "Force Atlas 2" layout for the visualization and launched the databases on this layout. Because the "Force Atlas 2" layout is one of the valuable tools for data mapping (Jacomi et al. 2014), it widely uses for the spatialization of detailed data in different fields of science. For this study, we built the "Force Atlas 2" layout like there:

Threads number: 7; Tolerance speed: 1.0; Approximate Repulsion: False; Approximation: 1.2; Scaling: 10.0; Stronger Gravity: False; Gravity: 1.0; Dissuade Hubs: False; LinLog Mode: False; Prevent Overlap: True; Edge Weight Influence: 1.0; Primary Size of Nodes: 10. The size of nodes increases in every mention in the data tables of edges.

**3. Results**

The data visualization demonstrates that relationships between participants are more complex than those, shown in the epic poem's content. For instance, data visualization shows that the communication network covers more participants than we suggest. Most of them are first and second-degree kins of knights. Results approve partial coinciding contacts explored during text mining to genealogies described in the content of the epic. Results also show that interparticipant contacts are more variable than we

thought. The visualization results give a map of genealogies and the communication networks below.

*Contacts inside and between genealogies.*

The house of 'Anshibay'. According to the visualization results, the genealogy reflects the contact order in Chapter 1. It also shows the expansion of genealogy outside of Chapter 1. Part of the knights and participants from Chapter 3 belong to this house, and according to Figure 1, the house includes the knights 'Ahmet', 'Alaw', 'Amet', 'Zhanbirshi', 'Telagis', 'Asankaygi', 'Togan', 'Abat' and their kins. The house of 'Anshibay' covers eighteen knights and twelve house members. In the visualization, this house is colored blue (HEX #00CCFF).

The house of 'Kidirbay-Karadon'. As visualization shows, the genealogy repeats the hierarchical order depicted in the content of Chapter 3. Results also show that the house includes some knights and participants from Chapter 3. They are the knight 'Kobilandi' and his kin. In another field, this genealogy has two branches at the beginning of the hierarchy. Considering that fact, we renamed this genealogy to the house of 'Kidirbay-Karadon'. It contains eleven knights and thirteen members of the house. In the visualization, the house is colored green (HEX #7FFF00).

The house of 'Akzhonas'. This genealogy includes a knight (i.e., Kenes) and four house members. The house of 'Akzhonas' is colored a shade of yellow (HEX #D4AF37).

The house of 'Karakus'. This genealogy includes the knights 'Kokshe' (father), 'Kosay' (son), and their kin. The house of 'Karakus' covers two knights and four members. In the visualization, the house has colored a shade of yellow (HEX #FFBF00).

The house of 'Kazak'. This genealogy includes the knights 'Kargaboyli' (elder brother), 'Kaztugan' (younger brother), and two members. A bright yellow (HEX #F8DE7E) is the color of this house.

The house of 'Shintas'. This genealogy includes the knights 'Shintas' (father), 'Torehan' (son), and four house members. In the visualization, a shade of yellow (HEX #F4C430) is the color of this house.

The house of 'Manashi'. This genealogy includes the knights 'Manashi' (father), 'Tuyakbay' (son), and three house members. A shade of yellow (HEX #F3E5AB) is the color of this house.

Knights without genealogies. The visualization also shows three knights without genealogies. They are the knights 'Kartkozhak', 'Kulinshak', and 'Sultankerim'. In the visualization, red (HEX FF0000) is the color for indicating those knights.

Other participants. The analysis results also discovered links to a big group of opponents of knights and several neutral characters. We identified and marked them in relevance to affiliation to the knight or knights. Magenta (HEX #FE28A2) is the marking color for opponents and neutral characters in the visualization.

According to the visualization results, we noticed contacts between genealogies. The contacts are mainly limited. However, the functions of contacts are broader and more variable. In contrast to the contacts inside of genealogies, the contacts between genealogies tie the epic poem into one narrative. So, as the visualization shows, the contacts between genealogies cover almost all the ballads except the knights without genealogies.

*Specification of contacts.*

Following the visualization results, we have discovered two types of contacts. The first type of contact is solid and constant one. Generally, it builds hierarchical commu-

nications inside genealogies. According to the visualization data, the first type of contact exists inside genealogies. It is a solid and constant connection. Generally, it builds hierarchical communications inside genealogies. This type of contact has common marks: a) the contacts inside genealogies follow substantial hierarchical order; b) every participant has at least two links to the other participant from his/her/own genealogy; c) the genealogies develop in the paternal line, it develops from father to son; d) the genealogies may include female members; e) the female members of genealogies are usually linked to their first-degree kins or their husband's first-degree kins only; f) the genealogies may forge into two branches but continually develop within only one branch; g) marriage is a tool to incorporate new members into the genealogies.

The second type of contact has a different specification. The second type of contact is not strong and has no hierarchical order. Generally, this type of contact covers intergenealogical relations, and also covers the knights without genealogies. Taking into consideration the visualization, this type of contact organizes the epic poem in one network. It demonstrates that the house of 'Anshibay' is a crucial genealogy of the epic poem. The communication network of this genealogy covers all other genealogies as a whole, except the Manashi house and knights without genealogies. The house of 'Kidirbay-Karadon' is the following essential genealogy. Its network area covers one genealogy (i.e., the house of 'Anshibay') and the knight without genealogy (i.e., 'Kulinshak') directly, and two genealogies (i.e., the house of 'Akzhonas' and the house of 'Akzhonas') indirectly.

According to the visualization, we observed that the Manashi house is only one isolated genealogy. It has no links to other genealogies and knights. The knights 'Kartkozhak' and 'Sultankerim' are also isolated characters of the epic poem. They have no links to other genealogies and knights. Thus, by the results of visualization, we noticed the following signs, typical for the second type of contact:

The second type of contact does not follow a hierarchical order;

Not all members of genealogies will contact representatives from the other genealogy;

The knights usually make contact with different genealogies;

The contact between representatives of different genealogies will continue over two generations;

Contacts between representatives of different genealogies may be direct and indirect.

*Representation of society*

Thus, the results obtained in the research give exciting information about networks in the epic poem. The value of information arises from the communicative structure of the epic poem. The positioning of characters in the field of their genealogical house gives a vision of relationships. It represents that several genealogical lines which are usually developed in parallel. The communication inside of genealogies continues from the first-degree kinship till to fifth-degree kinship. For instance, in the epic poem, we identified 177 participants. So, a significant part of them is communicating inside their genealogy. The kinship with division by age and gender is typical for the relationship inside genealogy.

The relations between different houses is implemented by links between the limited number of knights from different genealogies. The genealogies' leaders contact each other in the familiar cultural environment. The class identity of the leaders of genealogies is the leading indicator for their communication outside of genealogy. Conse-

quently, the leaders of genealogies in the epic poem recognize each other as being equal by status.

Thus, we observe the situation with hierarchically ordered contacts inside genealogies and limited contacts between different genealogies. The communication patterns described above coincide with the prototypical society types formulated by W. Croft (Croft 2003: 10). Considering Croft's classification, the epic poem's communicative structure depicts a chiefdom society with two-level bureaucracy. Taking that into consideration we observe the transition from a kin-based egalitarian society to a kin-based stratified society.

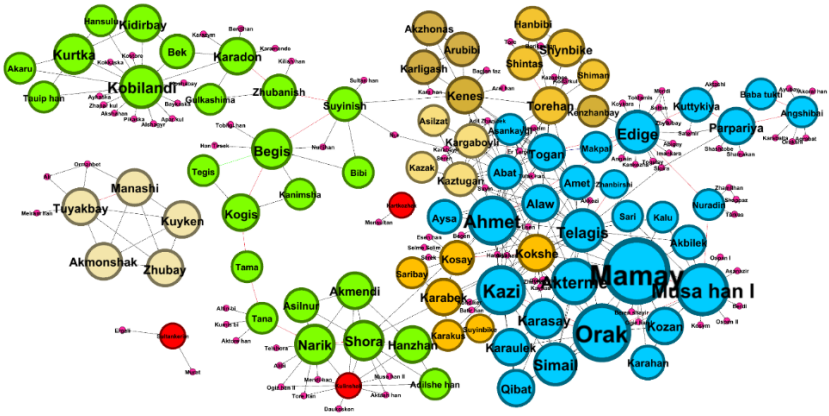


**Figure 1.** Map of genealogies. Legend: Anshibay house - blue, Kidirbay-Kobilandi house - green, little genealogies - shades of yellow, knights without genealogies - red, other participants - magenta.

## 4. Discussion

At the beginning of the research, the authors described general information about the Forty Knights of Steppe epic poem. Then, the authors marked an area of discovery that focused on the text of the epic. The author indicated that the scope of research is focused on epic's internal links. The authors also put an accent that the research's context is designed as experimental and chose the Gephi data visualization software as an application for this research. Following the parameters described above, the research's main goal was to analyze the links which arranged the epic poem as a whole. The research's main benefit is clarifying the epic poem as an assemblage of historic ballads represented under one title. However, to understand that the epic poem is a multilayered informational structure with complex communications. In such a situation when a massive text lacks: a) the beginning and end; b) the structured description of events; c) several parts of content. In the case like above, the investigation by using data visualization tools will help us to receive objective information. The researchers chose interparticipant links and inter-genealogical relations as the purpose of the research. Interparticipant contacts are semantic chains which connect all parts of the poem as a whole. In this field, the research also may give more empirical data about the Central Eurasian medieval nomad family structure and the development of tribal communities. It will help to understand the roots of events described in the poem's text. Understanding the events which happened in the epic poem represent the cross-linguistic value of this research. So, the epic poem's social contacts which we noted above are crucial to understanding hidden aspects of social relationships in medieval times.

The visualization of contacts demonstrated the two types of contact. The first type of contact is inside-genealogical communication. It is mainly an ordered type of contact: kinship degrees and identification of every member's roles are typical. Taking into consideration the regularization aspect of the contacts, we can define the status of every participant to the other one. This type of contact follows solid order, making circumpolar hierarchical structures in the epic poem.

The second type of contact is inter-genealogical communication. In contrast to the first type of contact, this type of communication is developed through a limited number of genealogy members. Usually, the leaders of genealogies make contact with each other. Thus, genealogy leaders play a moderator role. Their role has a function of correspondence with the leaders who play a similar role. Contacts demonstrate the egalitarian relationship between the leading knights from different genealogies. It also demonstrates that knights recognize each other in a shared cultural environment. In this field, the second type of contact may indicate the class-based relationship between leaders of every genealogy depicted in the epic.

The representation of a society in historical texts is a complicated problem. The fractional consistency of information about social networks and the structure of society makes complexity in its representation. Traditionally, researchers rely upon sources referred to the same historical period. Generally, sources include texts recorded on papers, stones, bones, and metal plates. In addition, researchers rely on archeological papers. The basis of the archeological papers generally is data obtained in fieldworks. However, in a situation with a nomadic culture, we encounter with barriers during in receiving valid information. Due to the nomad people had only a few stable settlements, available archeological data cannot give sufficient information about the structure of social contacts inside nomad culture. This situation arises from nomad people's lifestyle. Nomad lifestyle is based on animal husbandry, and an economy which is required for regular migration. So, regular migration does not permit the development of elementary production units which are crucial for producing writing materials.

Taking that into consideration we can only see historical data about Central Eurasian nomads written by neighboring sedentary nations. Thus, we suggest raising the importance of oral poetry traditions as the nation's memory in the above-mentioned situation. In case of when the transition of information about historical events by means of written manuscripts is impossible, the oral tradition will take the essential role of a nation's memory. The commemorative aspect of oral traditions, especially in medieval Central Asian poems, has been observed by professor D. DeWeese (DeWeese 1994: 411-412). He claims that oral tradition is based on the synergy of historical and mythical roots of events. These roots of oral tradition can be found in the epic poem. The oral traditions widely represents information about social relations in a given historical period. Furthermore, The Forty Knights of Steppe epic poem's text is a paragon of the oral epic tradition. According to the data visualization, the information about interpersonal contacts enriches the epic poem's content. Their network partially corresponds with historical origins (Nagamine 2019: 121). So, it adds a new layer of understanding the epic poem about Nogay nobility.

At the beginning of this study, the researchers had some limitations. The authors took only one entire publication of the epic's manuscripts for this study. We excluded from analysis parts of the epic poem published in the Soviet period because of censoring them. The limitations of this study are related to Central Eurasian Oral traditions. There exist much more versions of narratives dedicated to Nogay knights. These ver-

sions circulate in the oral literature of Turkic nations that were part of the Golden Horde. Taking that to account, the authors limited their research by studying the Kazakh version of the epic poem recorded by Muryn Zhyrau in 1942. This limitation made it possible to avoid speculations on various versions of the epic poem about Nogay knights.

The research authors recognize the Nogay period oral literature as a shared cultural heritage of Central Eurasian Turkic nations. Every version of the narrative is unique. Thereby, authors consider how to avoid matching the epic versions for ethical reasons. Thus, this limitation of the research focuses on the genealogies represented in the epic poem. As we mentioned in Introduction, the epic poem has a historical origins, and knights from the epic poem have a historical prototype. However, the research authors focused their attention on the genealogies within the epic poem's frame. Taking that into account, the authors put focus of their research on the analysis of genealogies extracted during text mining without matching the conformity of it with historical data. The authors believe that historians are more competent in discovering historical representations of personalities from the epic poem. The authors also hope that the data collected during this research will be helpful for their research.

**Conclusion**

Most researchers discovered the Forty Knights of Steppe epic poem in relation of knights to their historical prototypes. Unfortunately, this type of discoveries continued without delving into the text of the epic poem for a long time. Thereby, it made gaps in understanding the content of the epic poem as a medieval drama with historical origins. However, analyzing internal communication ties in the epic poem exhibited a complicated communication structure. The epic poem's content keeps syncretic methodological information about blueprints of social relationships that were common for a relevant historical period. We hope that the researchers will pay attention to the oral literature of the Central Eurasian Turkic nations as a source to understand the social processes that occurred in the same period. Furthermore, mapping social contacts will help historians and anthropologists see a clearer picture of nation-building processes in the Central Eurasian region.

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**ABBREVIATIONS**

WWII – Second World War.
Kazakh SSR – Kazakh Soviet Socialist Republic.
HEX – Hexademical.
CSV – Comma-separated values.
LinLog – Linear and logarithmethic.

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