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HOW TO MAP AŞIKPAŞAZADE'S HISTORY: A Digital Analysis of an Early Ottoman Chronicle

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Abstract

The origin of the Ottoman Empire has been a subject of enduring debate, primarily owing to the scarcity of contemporary historical records. One of the most vital sources concerning this matter is the chronicle known as *Tevarih-i Ali Osman* by Aşıkpaşazade, which has been subject to numerous traditional analyses over time. Nevertheless, contemporary historiography has yet to adopt data-driven visual and analytical methodologies when exploring the early Ottoman Empire. This project's primary objective is to employ data-driven visual and analytical techniques to the whole sections of Aşıkpaşazade's chronicle. Upon extracting data from the chronicle and establishing a comprehensive database, digital tools from the field of Digital Humanities were employed to visualize the data. These visualizations unveiled that Digital Humanities tools offer valuable analytical insights into Aşıkpaşazade and his chronicle. Subsequently, the project progressed by statistically analyzing the datasets and visualizing the results with maps, graphs, and charts using Python. The findings currently are tried to be emphasized by incorporating Natural Language Processing (NLP) techniques, which will further enrich the project's perspectives.

Keywords: Ottoman history, Aşıkpaşazade, digital humanities, natural language processing, geographical information system

1 Introduction

Riding the Ankara-İstanbul high-speed train, one wonders what the earliest Ottomans that once inhabited the steppes that lie between these two historical and contemporary capital cities were thinking of as they moved from one small town to another. The look of the pastures from the wagon, the nothingness that stretches toward the horizon, makes it unlikely to dream of an Osman I, the eponymous "founder" of the Ottoman polity, planning of founding a state that would not only outlast dozens of rival emirates (*beğlik*s) of Late Medieval Anatolia but also cement its rule in the region as the "eternal state" and engage in global politics. It is hard to blame later Ottomans for fabricating glorious founders for their empires instead of writing the modest beginnings of their polities "as it actually happened (*wie es eigentlich gewesen*)."

Prioritizing contemporary sources, as historians often do to avoid later generations' fabrications, is also not an option while studying the earliest Ottomans since the earliest chronicles date to the late 14th and the 15th centuries. Therefore, the impossibility of getting a sense of past people's identities, motives, and actions becomes even more pronounced in studies of early Ottomans. Dozens of modern scholars have attempted to move beyond the confines of early Ottoman sources by referring either to other near-contemporary sources - Byzantine accounts, Arabic travelogs, and Seljuq histories -, or to the environmental factors that might have determined Ottoman path of expansion. Cross-examining early Ottoman sources and their different editions to reveal later fabrications, and, on the other end of the spectrum, examining late medieval Anatolian sources to get a better grasp of early Ottoman mentalities and identities have become some of the main venues of research.

Our aim here is neither rescuing "real Ottomans" from early sources nor generalizing to sketch early Ottoman mentalities. We study one early Ottoman source, Aşıkpaşazade's *Tevarih-i Al-i Osman* (lit., Histories of Osman's Dynasty), and dissect it into its pieces to examine how Aşıkpaşazade, a late 15th century Ottoman, narrated early Ottoman history. Aşıkpaşazade's choice of words in describing different periods, accentuation of certain regions at the expense of others, and the portrayal of relations between social groups surely reflect Aşıkpaşazade's own worldviews and, to some extent, the *Weltanschauung* of his generation and his milieu. We decode his narrative to see how Aşıkpaşazade reflected and reflected upon early Ottoman history. Surely, our emphasis on Aşıkpaşazade's chronicle as a narrative does not rule out it also representing the reality or at least the truth as it was transmitted from earlier generations to Aşıkpaşazade, especially given Aşıkpaşazade's access to sources that are now lost to us.

In our study of Aşıkpaşazade's chronicle, we embrace a novel approach that combines the expertise of distinct fields: We bring computer scientific techniques and history writing together. While graphs and heat maps allow us to present the data in ways that make our conclusions evident, diagrams that show relations between different actors and social groups enable us to dig into the connections between distinct concepts. Perhaps most importantly, as a novel challenge to history writing, Natural Language Processing (NLP) models trained on modern Turkish show us how the dominance of different sentiments and concepts shifted in different periods. The experimentative nature of our work does not only stem from the novel approaches we apply; the feat of bringing team members from distinct areas together in a field still dominated by one-man projects is spectacular. Interdisciplinary projects move us beyond the comfortable confines of our own domains and push us toward the frontiers of our fields.

In this project located at the frontiers of Ottoman Studies, we first introduce the readership to Aşıkpaşazade, his work, and the debates surrounding the identities of early Ottomans. We owe the

research questions we had to the scholars who have studied the early Ottomans. The literature review will allow readers to locate our project among earlier scholarly works. Then, we apply digital humanities' tools to Aşıkpaşazade's chronicle and briefly discuss what our findings entail. Finally, we conclude our report with a discussion of the possibilities, limitations, and challenges of the emerging field of Digital Ottoman Studies. The digital turn extends the tools at the disposal of historians to popularize their works while also exhibiting new epistemological possibilities and threats.

2 Literature Review

2.1 Who is Aşıkpaşazade?

Aşıkpaşazade's real name is Derviş Ahmed, also known as Aşıki, his sobriquet. He is the grandson of Aşık Paşa, a prominent figure in Turkish literature due to his religious poems in Turkish. Aşıkpaşazade is the author of the chronic *Tevarih-i Al-i Osman,* which has survived in multiple copies and contains valuable information about the early periods of the Ottoman Empire (Özcan, 1991). Our knowledge about Aşıkpaşazade's life is based on the information found in his work. According to these details, he is known to have been born around 1400 in Elvan Çelebi village, which is part of Mecitözü district in the Amasya Sanjak (Özcan, 1991). In his early years, Aşıkpaşazade traveled extensively and interacted with prominent figures of his time. He stayed at the home of Yahşi Fakih, the son of Tursun Fakih, who was the imam of Orhan Gazi (Özcan, 1991). It was during this time that Aşıkpaşazade received a gift of a history book written by Yahşi Fakih. Aşıkpaşazade mentions that he narrates the periods he did not personally witness from this gifted history book (Aşıkpaşazade, 2013). Unfortunately, Yahşi Fakih's chronic has not survived, and its whereabouts are unknown.

Aşıkpaşazade, just as he narrated the periods he did not witness from Yahşi Fakih's history, also wrote his historical work by adding events he witnessed during his lifetime. He bore witness to significant events during the Interregnum period, the reign of Sultan Murad II, the era of Mehmed the Conqueror, and the reign of Sultan Bayezid II (Özcan, 1991). He documented these events in writing, adding his interpretations. While numerous copies of the work exist abroad, more than nine copies are available. The work was published in 1929 by Friedrich Giese, in 1949 by Nihal Atsız, in 2003 by Yekta Saraç, and finally, in 2013, all the copies were brought together and published by Necdet Öztürk (Özcan, 1991).

Aşıkpaşazade's History, the oldest and earliest historical chronic that has survived to the present day about the Ottoman Empire, has been a source of inspiration for Ottoman studies due to its inclusion of information about the early periods of the Ottomans. Other Ottoman chronicles containing information about the establishment and expansion of the Ottoman Empire have also drawn from Aşıkpaşazade's history, either by benefiting from it or quoting certain sections from the work.

When we look at the debates surrounding the establishment of the Ottomans, it is immediately apparent that there are differing opinions on this matter. Due to the lack of contemporary sources and the suitability of the historical context for debate, there have been numerous different views expressed by various authors regarding the early periods of the Ottomans. The first scholarly work on the establishment of the Ottoman State was carried out by Herbert Adams Gibbons in his book *The Foundation of the Ottoman Empire* (Gibbons, 2013). Drawing primarily from Western and Byzantine sources, Gibbons examined the establishment of the Ottoman State within the context of the contributions of Christian

populations and the failures of Byzantine administration. The fact that Gibbons did not work with Ottoman sources could be considered a weakness of his work. In response to this, M. Fuad Köprülü wrote a book titled *Les Origines de l'Empire Ottoman* (Köprülü, 1935), firmly defending the idea that the Ottomans descended from the "Kayı" tribe, and he criticized Gibbons' work. Sometime later, Paul Wittek wrote a new piece titled *The Rise of the Ottoman Empire* (Wittek, 1938), introducing the concept of the *Gaza* ideology. Wittek argued that the early Ottomans owed their rapid expansion and successful conquests to this ideology. This debate, which began in the first half of the 20th century, continued into the second half with contributions from various scholars. One of these contributions is Rudi P. Lindler's work *Nomads and Ottomans in Medieval Anatolia* (Lindner, 2017). Lindler emphasized that the early Ottomans emerged from a nomadic culture and discussed pagan beliefs. He highlighted the influence of the Ottomans' beliefs and nomadic traditions on the establishment of the State. One of the most significant recent contributions to the establishment debate is Cemal Kafadar's work *Between Two Worlds: The Construction of the Ottoman State* (Kafadar, 1995). In his work, Kafadar summarized previous discussions and aimed to find a middle ground by drawing from early Ottoman chronicles. He discussed the influences of the Gaza ideology and nomadic traditions.

As has been understood so far, due to the lack of sources from the period, debates have emerged on a wide range of significant topics, and these debates about the establishment period continue to this day. Aşıkpaşazade's work has inspired all of these discussions, and the conquests, military campaigns (Gazas), and expansion efforts he mentions in his work have been used as arguments in these debates. Aşıkpaşazade also stands apart from other early Ottoman historians regarding his style. Coming from an influential family, he does not hesitate to use a critical tone when discussing events he witnessed. He offers various comments on members of the religious scholars (*ulema*) and the attitudes of the Sultans towards them. His critical style led him to create a unique source for the early period because of his unique perspective; a famous article titled *How to Read Ashik Pasha-Zade's History* (İnalcık, 1994) was written by H. İnalcık. In this article, İnalcık provides information about Aşıkpaşazade's personality and offers insights into what type of writing style he might have chosen during different reigns of the sultans. İnalcık suggests approaches to interpreting elements in the text, such as the dream metaphor and other mystical elements specific to the Middle Ages.

Indeed, as long as the scarcity of sources about the early qualities, ideals, and lifestyles of the Ottomans persists, the ongoing debates will continue. However, thanks to the detailed information in Aşıkpaşazade's chronicle, his history will remain significant until then.

3 The Stage: Early Ottoman Geography and Conquests

3.1 Methodology

In this part, there were two aims. The first aim was to find all the places written in the book and to examine how frequently they were used, and the second was to identify the places according to their way of being captured.

For the first aim, we read the whole book and looked for the places written; then, the places found were checked to see if there were any missing ones. Then, the information was arranged as the chapter of the place mentioned, the period of the place mentioned, the name on the old version, the name on the new version, a standardized name of the place, and the coordinates of the place. This three-different-names technique was used to ensure that even though the names may have slight changes -and to see if there are any changes- in the old or new versions, each place would have a definite name to be used in the visualization process. The standardization of names was determined as the name of the place in the year 2023, to be easily found on Google Maps, the site used to coordinate the places. As an example of our naming strategy, the old name of a place was Furat, the new was Fırat, and the standardized name was Fırat Nehri. After identifying all these, the data was transmitted to an Excel sheet.

For the second aim, to identify the early Ottomans' expansion process, we skimmed the book again and looked for the names of places where the Ottomans had battled. In this part, the information was categorized according to the chapter of the place mentioned, the period of the place mentioned, the year that the event took place -if there was a year written in the book-, the standardized name of the place -the same standardization mentioned before was used-, if it is a type of gain or loss, the actors who played a role in the seizure of the place, how the place was captured, the religious identity of the people living in the place, and the coordinates of the place.

While reading the book, the types of seizures were tried to be determined to ease the visualization process. The seizing type is differentiated into four distinct types: capturing, defending, losing in a war, and handing over. Also, to show if the battle was successful or not, binary format was used as an analysis tool except for the features in this format.

Instead of writing the ruler's name for every battle that happened in that ruler's reign, we chose to write the leaders that administer the battling process to the leader of the battle part. There were cases when it was the actual ruler of the Ottomans, and others were mostly military leaders at those times. In making this distinction, we did not want to lose the information of in which ruler's reign the battles happened. Hence, we decided to mark the period in accordance with this to make use of this kind of timeline in the analysis process. Also, the type of gain/loss was identified with labels such as with battle, as a gift, etc.

The religious identities of the common people in the place were detected from the text, as there were some clues such as mentioning the head of the people as "tekfur" or "kafir" or writing about the religion of the commons of the place, and the religions were categorized as Muslim or non-Muslim. The binary format was used again to help the analysis process.

We found the coordinates of the places used in both aims according to the standardized version of the places, meaning the names in 2023. We found the names and coordinates from secondary sources such as *The Beginnings of Ottoman Empire* (Foss, 2022) by Clive Foss, *Osmanlı Yer Adları* (Sezen, 2017) by Tahir Sezen, *The First Capital of the Ottoman Empire: The Religious, Architectural, and Social History of Bursa* by Suna Çağaptay (Çağaptay, 2021), İslâm Ansiklopedisi, and Kültür Envanteri, as well as other scholarly articles and government sources. Then, we encoded the sources in the dataset with the acronyms: "CF-BOE," "TS-OYA," "SÇ-FCO," and "İA," respectively. When the source was Kültür Envanteri, only the relevant link was attached.

Clive Foss' study was beneficial for locating the exact places that Aşıkpaşazade mentioned in his chronicle. In our study of the period that fell into the era before the Ottoman crossing to the European mainland, we utilized his study to match the places with the equivalents in our day. Google Maps was

used to get the latitudes and longitudes of these locations. For the remaining sites, the database of Kültür Envanteri was partly used to search for the names of the places and their coordinates.

Sometimes, the vocabulary that Aşıkpaşazade operated in for places was too broad; for instance, he mentioned regions or geographical features. In those cases, we did not include the places in the visualization process. Instead, we only kept them in the dataset while highlighting them with red, meaning that it was not possible to pinpoint that location. For instance, places such as Anatolia and the River of Sakarya fell under that category. Also, the areas that were troublesome to find -such as İteşeni- are highlighted with red.

On the other hand, there were instances where we could not find the exact location of a place, but we believed or knew that it existed. In such a case, we highlighted those places in our dataset with orange. For instance, places such as Temaşalık and Akçahisar fall under that category.

When Aşıkpaşazade used a rather precise vocabulary for the places -for instance, when he mentioned the name of the city or fortress- we tried to find them by researching the aforementioned secondary sources. To locate a town in our dataset, we chose to include the coordinates of historical buildings such as mosques, bridges, tombs, or castles that were contemporary to Aşıkpaşazade or ancient sites that were even earlier than his time, such as Achaion in Çanakkale.

3.2 Discussion and Findings

After this data collection, columns that indicated a region were disregarded in the data frame created by Python's Pandas module. Then, from the geospatial data in this data frame, various maps were created using Python's Folium module. This module provided a framework to create a dynamic user interface for users to get all the information we abstracted from the book about the places and battles. To make the visualizations less confusing and to make the analysis of the rulers, we have created a dropdown menu from the Panel module's built-in widget Select. This allowed us to see the expansions and actions in different ruler eras (see Figure 1).

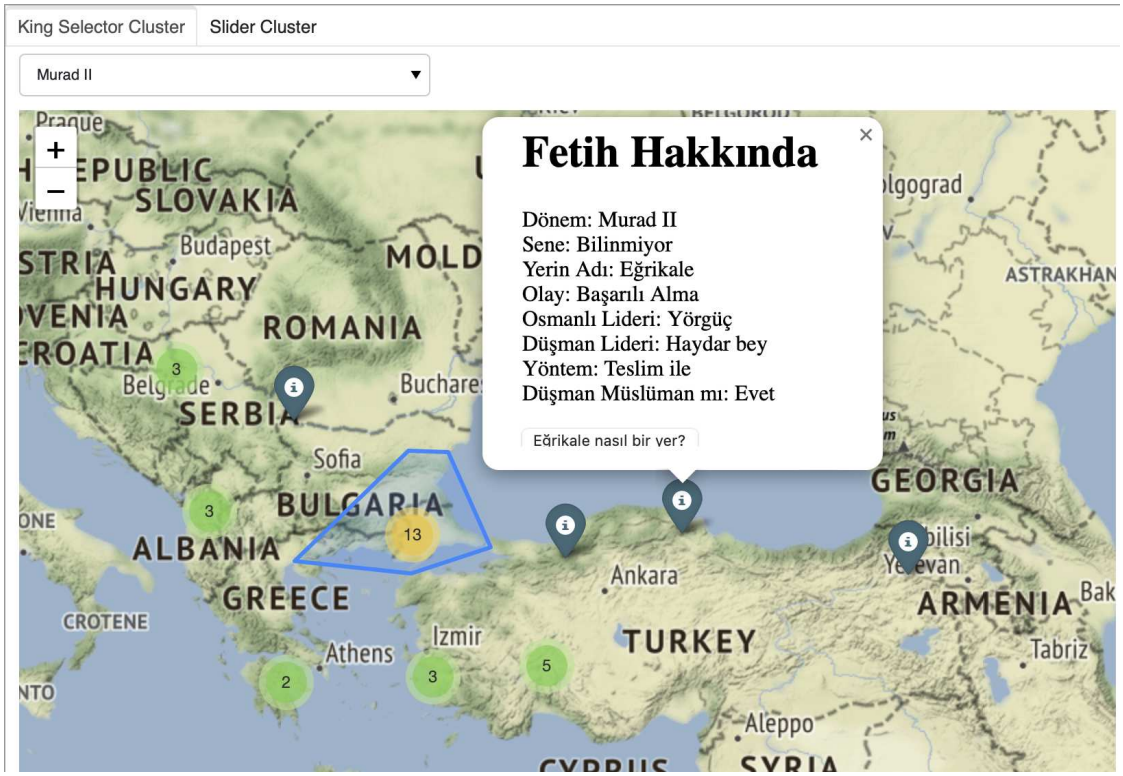

Figure 1. Map of the Conquests Happened In Different Ottoman Reigns

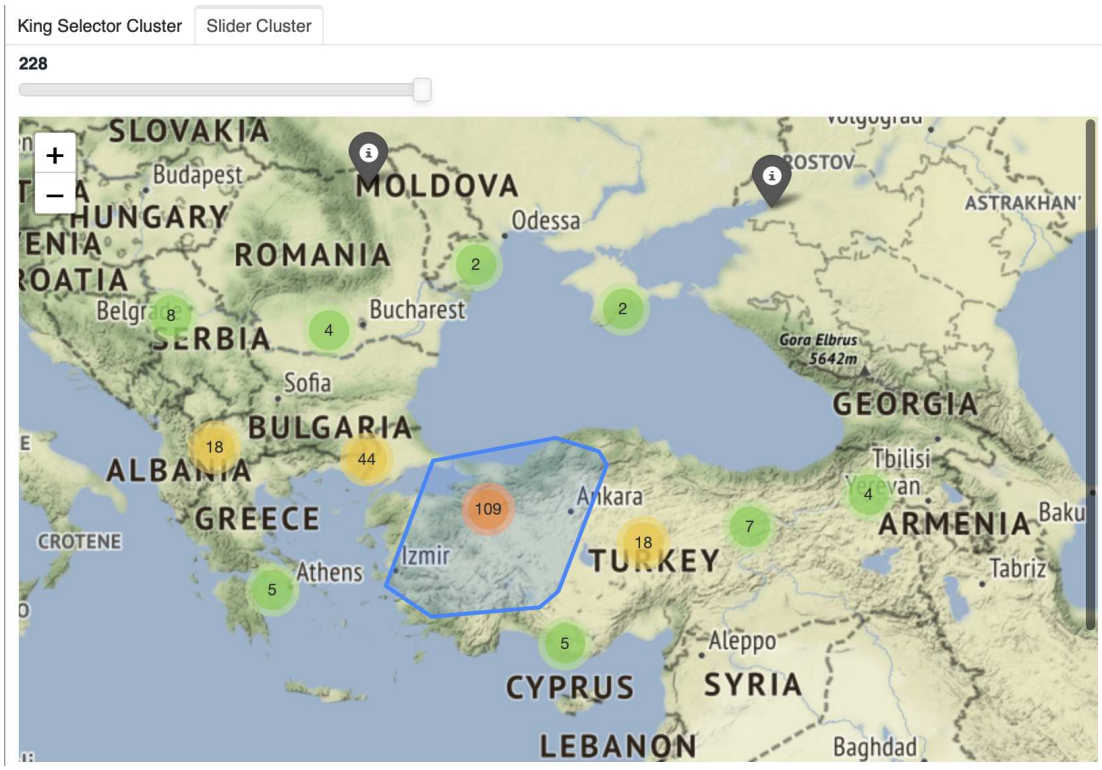

Figure 2. Cumulative Battle Map of the Early Ottoman Empire

In addition, a slider widget was created using the same module to see the continuum of battles cumulatively (see Figure 2). This allowed us to see the expansion process of the Early Ottoman Empire more clearly and directed us to a more understandable density visualization, heat maps. The motivation behind this was to examine every Ottoman ruler (see Figure 3) and, in general, the Early Ottoman Empire's (see Figure 4) main focus of expansion in terms of regions. The same Panel widgets were used to serve that purpose. Ultimately, these maps were embedded in a Flask App to transform the contents into a website where all findings can be publicly shared.

The maps show that Ottoman conquests were more intense around northwestern Anatolia, i.e., the region where the earliest Ottomans were active. Although this can be taken to represent the intensity of fortresses, villages, cities, etc., conquered by the Ottomans in the region, it is more plausible to investigate the underlying reasons behind the overrepresentation in Aşıkpaşazade's narrative. After all, the concentration of fortifications in the exact region where Ottomans originated is improbable. Aşıkpaşazade mentions more places conquered around Bursa compared to the Balkans, not because there were more fortresses or settlements conquered around Bursa.

One reason behind overrepresentation might stem from Aşıkpaşazade's acquaintance with the region as he was born in Amasya and lived in Edirne, Konya, and Geyve - all, perhaps except for Amasya, situated in regions that seem overrepresented in the sample (Özcan, 1991). Aşıkpaşazade often utilized the regions' names (which went unrepresented in our maps) while referring to the conquests made in the Balkans, while pinpointing exact locations of even villages in northwestern Anatolia; the underlying reason behind this might be Aşıkpaşazade's lack of knowledge of the region. A likelier explanation is the importance of even relatively small conquests to the earliest Ottomans; the baby steps that took the beğlik from one village to another were important to the narrative of Aşıkpaşazade's chronicle, whilst, later conquests were worth mentioning only when they brought whole regions or strategic holdings with them.

Apart from this bias, however, the intensification of conquests in northwestern Anatolia reflects early Ottoman attempts at consolidating their rule in the region, which would be the empire's administrative center for centuries, replacing the Byzantine rule that was centered here. The maps also show the Ottoman expansion towards the west in the reign of Osman I, the early conquests in Rumelia under Orhan I and Murad I, the turn toward the east under Bayezid I, the reconsolidation of rule in the imperial heartland under Mehmed I, the expansion into the west and the east under Murad II and Mehmed II, and the consolidation in the reign of Bayezid II.

We believe our maps of early Ottoman geography and expansions can be a fine alternative to the static, extremely anachronistic maps that are often used in textbooks, as they offer an interactive interface that shows the pace of conquests and different concerns of early Ottomans in different time periods. Also, the dataset we have created can be used to make comparisons between different histories or isolate certain time periods to examine how a specific conquest was carried out.

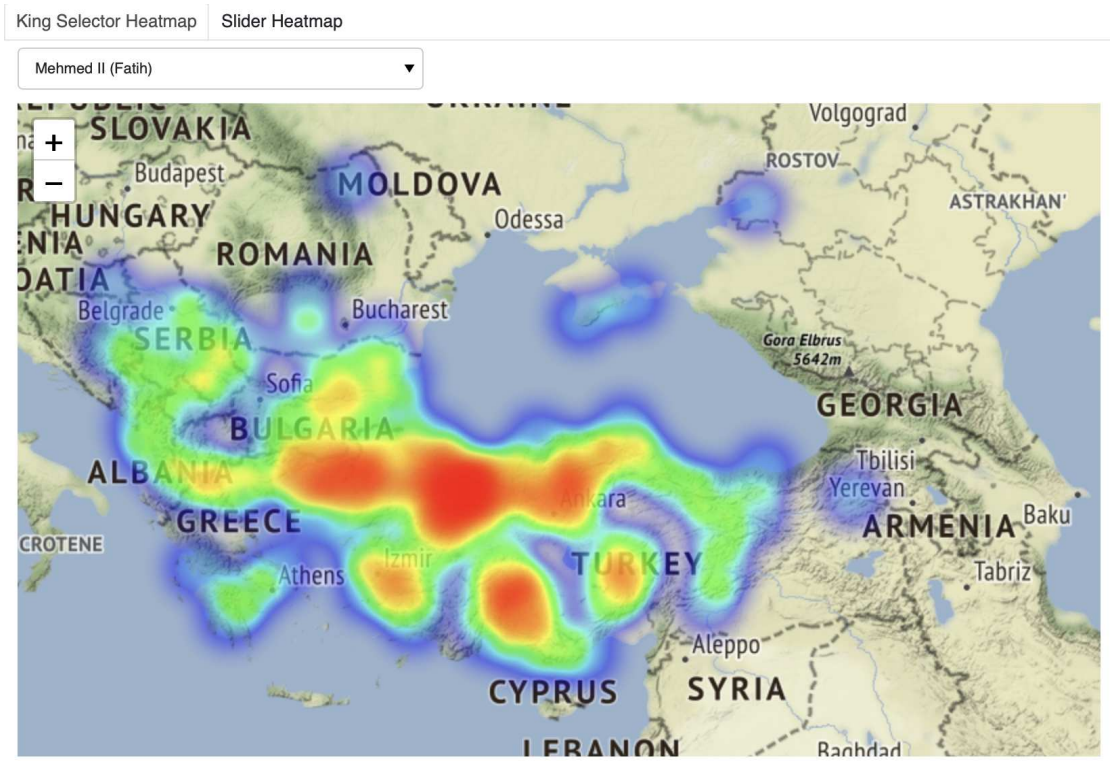

Figure 3. Ruler's Expansions in Heat Map

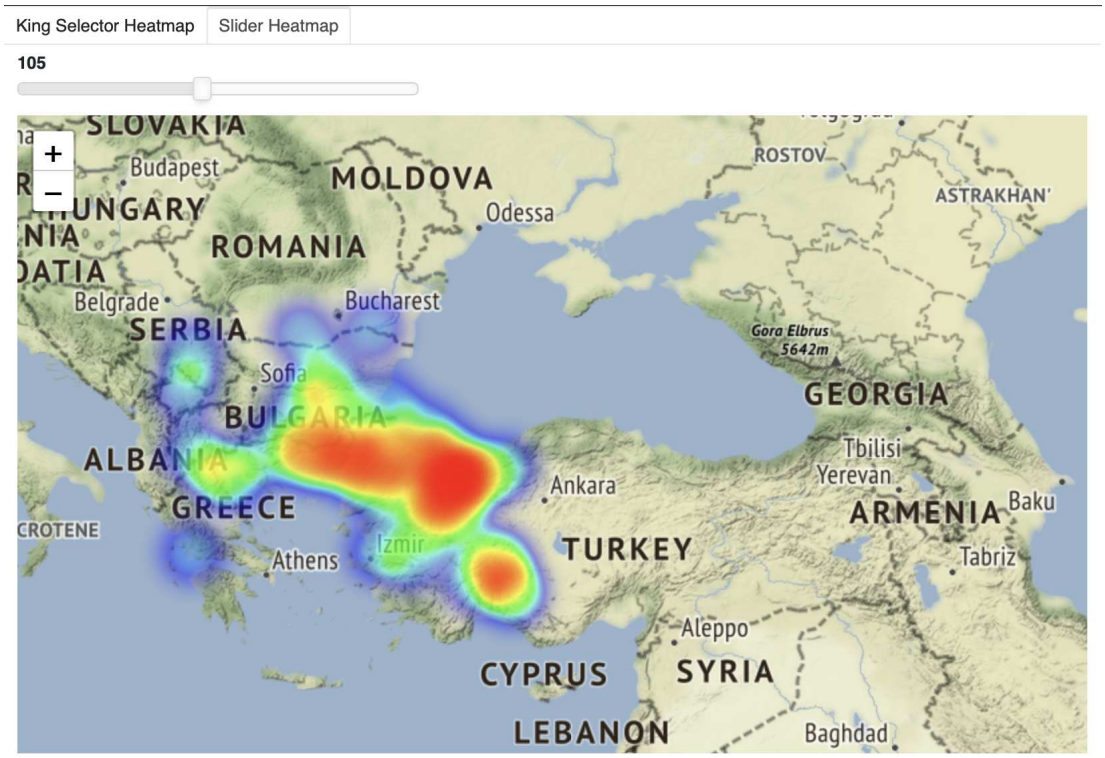

Figure 4. General Expansion in Heat Map

4. The Decor: Objects and Their Lives

4.1 Methodology

Regarding the objects that have been mentioned in the book, we first created a data frame in Excel with detailed columns and one object per row. These columns were the ruler, the name of the object, the owner of the object, the attribute of the object, the action of the object, and to whom/from whom. With these detailed columns, we have acknowledged the importance of each single object in detail. When the data frame was completed, our team moved on to analyze the data with Python and its useful libraries like pandas, NumPy, and plotly. Since Aşıkpaşazade did not give enough detail about some objects, we had to pre-process the data to make it analyzable and then send it to the algorithms that will perform analytical operations. When the pre-processing was done, we moved to the analysis and the visualization of the findings and conclusions about the objects data frame. To visualize our findings, we have used the plotly library of Python. It has created interactive plots that can be viewed in detail for small amounts of data that cannot be that much visible in the whole graph. Lastly, to deploy and publish these findings, we have created a Flask app in Python. This library makes Python scripts deployable in websites, to create an interface for making it easier to view our interactive plots.

4.2 Discussion and Findings

About this data frame, we were trying to understand whether we could analyze the objects passing through the book. In that analysis, we have grouped the objects according to their attributes like "religious, governmental, political military, sea transport, land transport" and examined the distribution of each attribute according to the era of the ruler. In light of examining the columns, we tried to understand which objects were more prominent in each sultan's period. Also, we tried to test whether the qualities we attributed to the objects would allow us to form an opinion about a sultanate period.

Figure 5. The distribution of power-related objects to different time intervals signifying sultans' reigns.

As can also be understood from the table above, we observe that in the data we have collected in the periods when the Ottomans experienced political crises, and there were problems in the transfer or sharing of power, the elements of power are also concentrated, even at the highest level.

Figure 6. The distribution of maritime transport-related objects to different time intervals signifying sultans' reigns.

As can also be understood from this image, although the Ottomans did not have intense military or commercial activities at sea in their early period, they turned into a maritime state over time, and the elements mentioned under the category of marine vessels in the text have increased significantly.

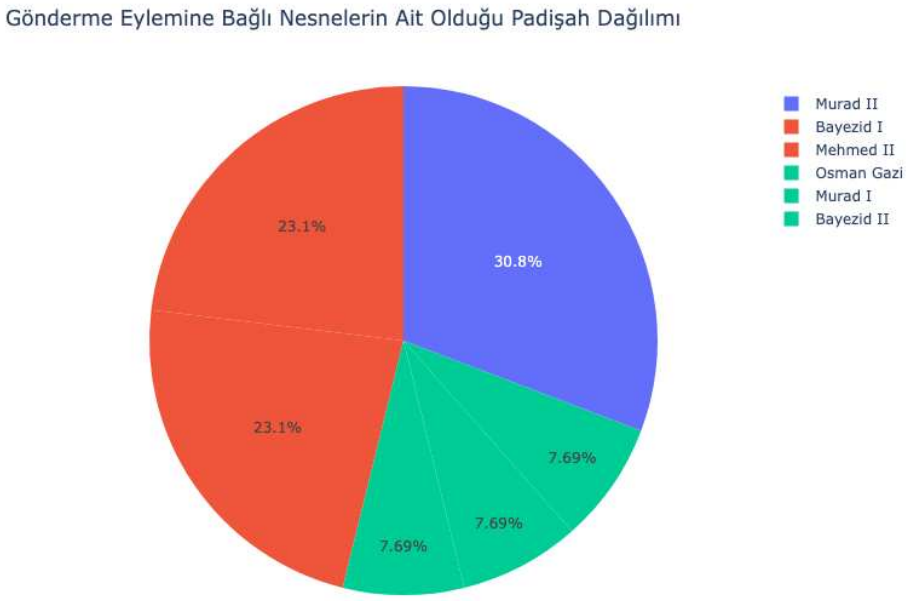

Figure 7. The distribution of delivery-related objects to different time intervals signifying sultans' reigns.

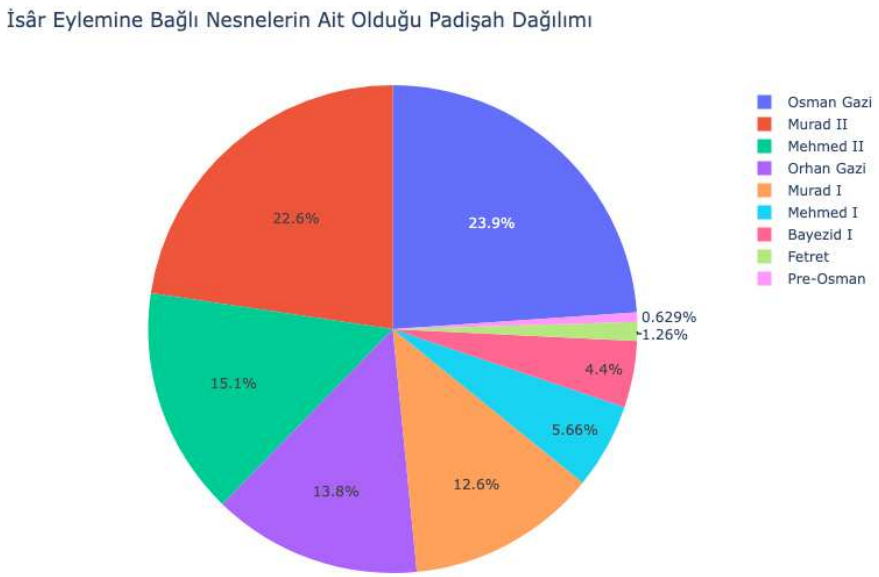

Figure 8. The distribution of bestowment-related objects to different time intervals signifying sultans' reigns.

As can be understood from these tables, the Ottomans engaged in more gift-giving activities in the founding stage, while the gifts they received from the ruling class increased significantly as the *beylik* became an empire. From this, it can be observed that a bureaucracy was formed in the Ottoman Empire and that the communication between regions increased.

Many other tables are open to interpretation like these, and these tables confirm many ideas that are generally accepted among historians. The object study has shown us that it is possible to read the context and agenda of the period by starting from the objects mentioned in Aşıkpaşazade's work.

5 The Actors: Gazis, *Dervişes* and their Enemies

Aşıkpaşazade extensively conveys attributions, adjectives, and distinctive traits to depict and define various character types within his chronicle. In this section, we extracted these attributions and created connections between characters and social groups. We began the construction of the dataset called "Types" by contemplating two fundamental questions. The first question targeted to establish the foundation of the dataset by examining how Aşıkpaşazade attributed characteristics to individuals and social groups encountered during the early years of the Ottoman Empire. This question led us to extract specific adjective phrases from the historical chronicle in relation to these individuals and groups. The second question is whether we could analyze a historical narrative by considering the influencers of the sultan's decisions. In response to this question, the dataset required us to document the information concerning the decisions made by the sultans and compile a list of the characters who had an impact on shaping these decisions. The development of this dataset prompted us to explore additional inquiries. Answers to these new questions could be uncovered using Digital Humanities tools, which allow for visualizations and associations within the dataset.

Analyzing positive and negative characteristics provided profound insights into how Aşıkpaşazade views individuals and groups. As anticipated, Aşıkpaşazade appears to favor attributing a

greater number of positive descriptive words when referring to individuals associated with the Ottoman Empire, as illustrated in Figure 9. We might propose that Aşıkpaşazade's bias influences how he conveys attributions when describing characters in the chronicle. When we investigate whether there is a correlation between social groups and attribution usage, it becomes abundantly clear that individuals bearing the title "Ulema" are consistently associated with a greater number of positive adjectives in the chronicle, as depicted in Figure 10. Aşıkpaşazade's strong religious inclinations and deep connection with religion can help us understand this assertion.

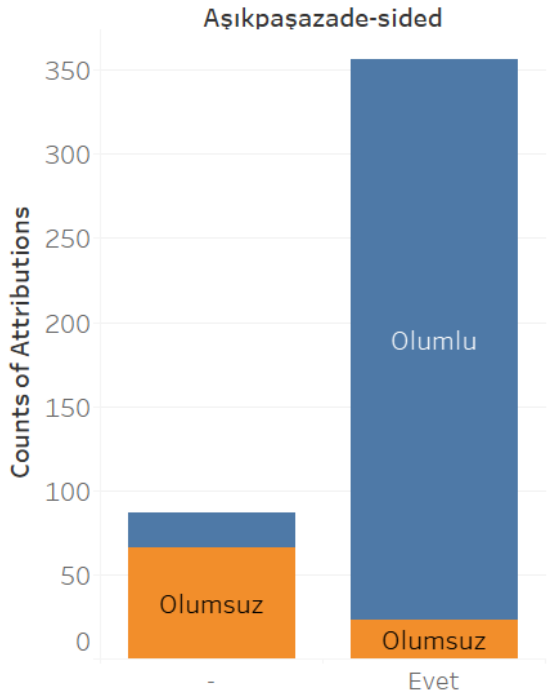

Figure 9. Positive and negative attributions according to Aşıkpaşazade's notion of "us."

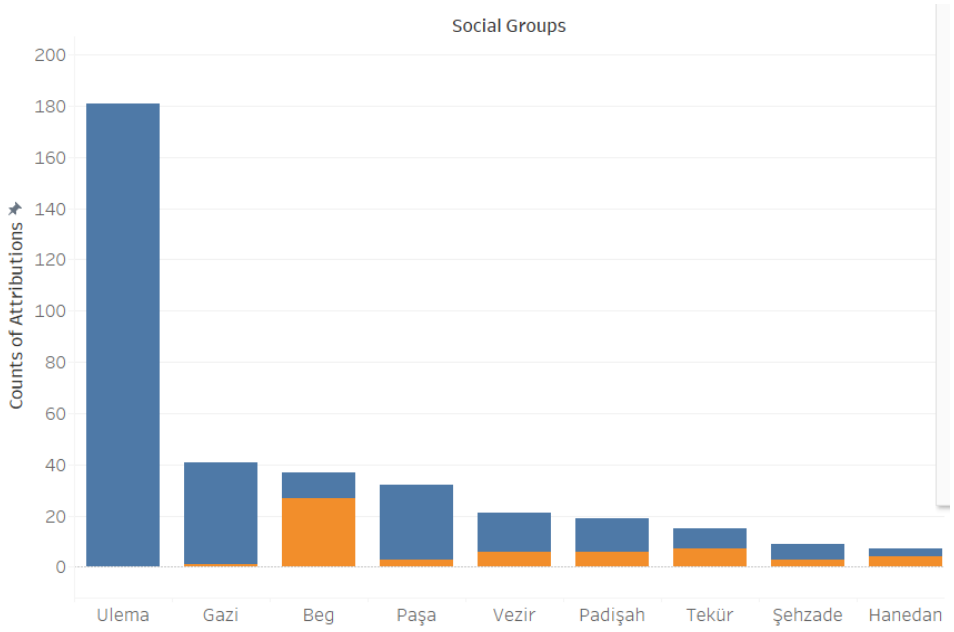

Figure 10. The distribution of attributions according to social groups (Bottom).

The analysis of attributions usage according to different historical periods could bring us some evidence of a unique and politically motivated narrative by Aşıkpaşazade. In the accounts of the Bayezid and Mehmed II periods, when we compare the total number of attributions used by Aşıkpaşazade to other periods, it becomes evident that there is a heightened presence of negative attributions compared to attributions in other periods, as illustrated in Figure 11. This visual representation might also be explained by the growing divergence among the characters during the Bayezid and Mehmed II periods, as well as Aşıkpaşazade's perception of the influence of "outsiders" within the ruling hierarchy. The predominance of negative attributes during the reign of Mehmed II is plausible since homes and properties in Istanbul were rented out to those who had been relocated here. This situation created an unpleasant environment around the ulemas and *tebaa*. The near absence of negative attributions and the peak of positive attributions during the reign of Bayezid II can also be explained in relation to this matter. During Bayezid II's reign, almost every subject, including Aşıkpaşazade, was pleased due to the return of all properties to the tebaa. Therefore, these factors can explain the prevalence of positive attributions within the section of Bayezid II.

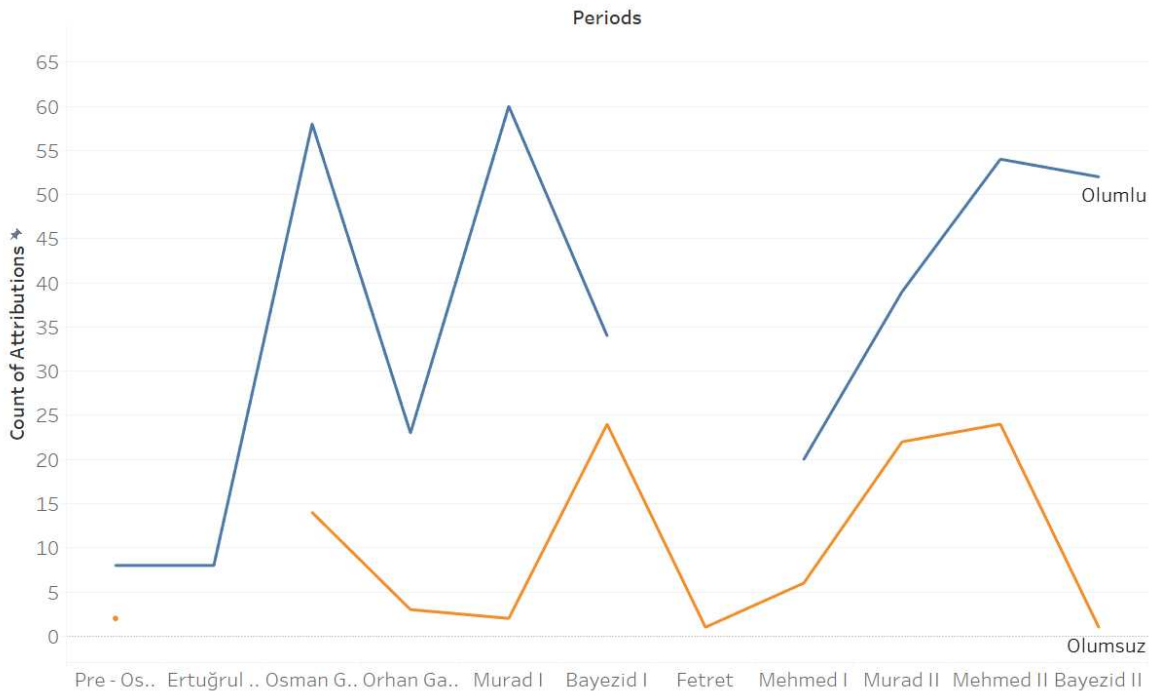

Figure 11. Periods and Attribution Usage

The data on Actors and Social Groups provides insights into the distribution of social groups actively involved in significant decisions made by the sultans. Upon examining this data, it becomes evident that three key social groups, namely the pasha, vizier, and *beğ* social groups, exerted a substantial influence on the sultan's choices (as depicted in Figure 12). This graph lends support to the argument that individuals holding high-ranking positions in the Ottoman Empire, such as the pasha, played a significant role in the administration, a notion consistent with Aşkpaşazade's narrative. Conversely, the number of decisions made during the reigns of various sultans is indicated by the Effectors and Periods data. This chart reveals that the highest number of accepted decisions occurred during Sultan Murad's reign (Figure 13). This can be attributed to the increase in the number of pashas and viziers from the social groups that influenced the sultan's decisions during Sultan Murad's era.

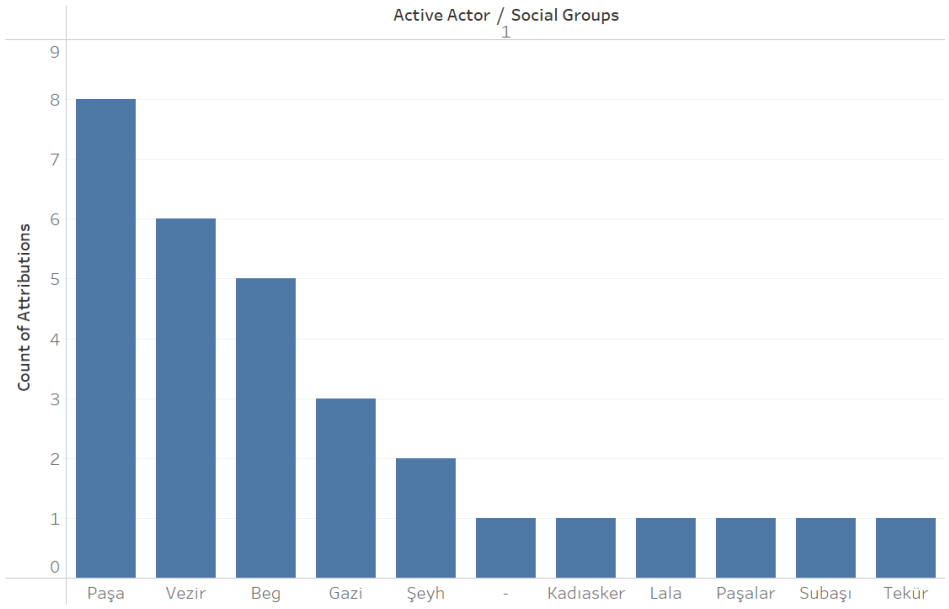

Figure 12. Active Actor / Social Groups and Attribution Usage

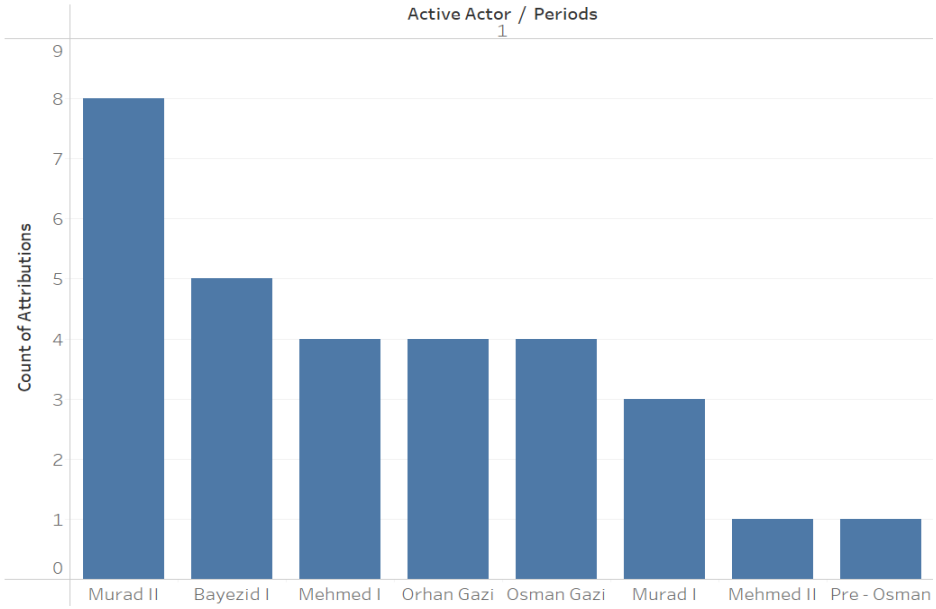

Figure 13. Active Actor / Periods and Attribution Usage

6 The Play: Early Ottoman Activities

In the activities sheet, in order to portray the vitae of these beğs as portrayed by Aşıkpaşazade, we tried to document the activities of every Ottoman beğ of the Foundation Era. For documentation in a database, we used Google Sheets. After considerable elaboration and close reading, the categories we thought to be the most illustrative were chosen by last year's group. These categories include the location, the type of activities beğs are involved in, names of beğs' companions and opponents, and their social and

religious identities. Our group used the research questions formed by last year's group. Research questions are: What was the relationship between location and events? Where did these events take place? What was the dominant type of activity during the reign of each Ottoman ruler? Was religion a prerequisite for becoming their companion, and what were the identities of the ruler's companions and counterparties? How did the geography of the narrative change during the century in question? To be able to answer these questions, first, the dataset was examined, the necessary adjustments were made, and the missing chapters were completed. While doing these operations on the dataset, we followed a standardization to create a standardized dataset for activities, and we filtered the dataset because all the activities were not indicated specifically enough by Aşıkpaşazade. So, we eliminated the activities that included missing information. Then, we visualized the data extracted from the text according to what we were looking for in the story of Aşkpaşazade.

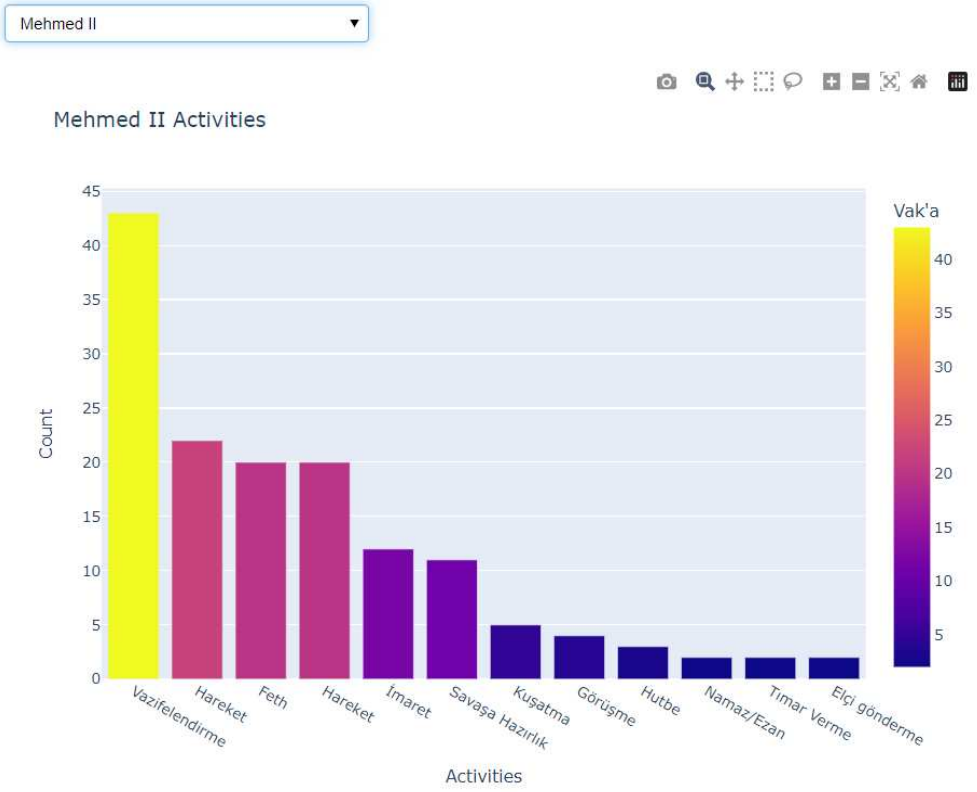

Figure 14. Ruler vs. Activities

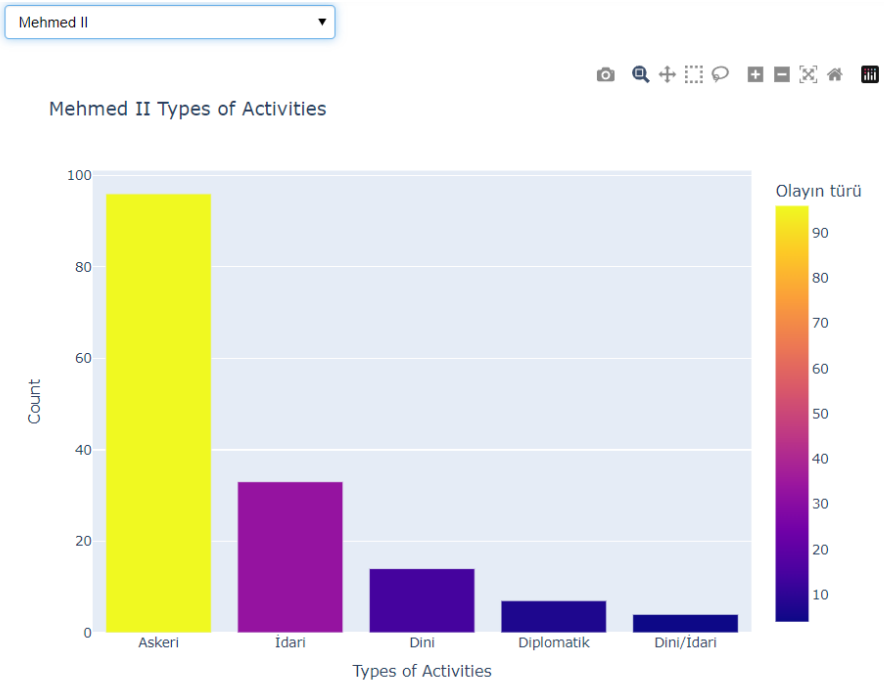

Figure 15. Ruler vs. Types of Activities

In Figures 14 and 15, respectively, we demonstrate the activities that the rulers were predominantly involved in and the types of said activities. We used Python modules to create and deploy our plots, such as Flask, Panel, Plotly, and Folium. Flask is used for creating web applications, Plotly is used for interactive plots, Folium is used for interactive maps, and Panel is used for deploying all these to the Flask app and creating widgets. The first graph, Ruler vs. Activity, shows us what kind of activities the rulers did during their reign. The activities that appeared less frequently during each ruler's reign were filtered out to make the resulting graph easier to read and understand. As a result, this graph only shows the activities mentioned by Aşkpaşazade at least twice for each ruler. Besides that, you can access activities or types of activities of every Sultan by using the selector above the plot. We chose to add a Sultan Selector widget because it is more user-friendly rather than showing all the sultan's types of activities and activities in a plot. Showing all the sultans together makes plots hard to understand. You can access our source code and website, which stores all the plots and maps via GitHub.

7 The Final Act: Religious and Mystical Elements

Mysticism and mystical things, whose glossary meaning is “the practice of religious ecstasies (religious experiences during alternate states of consciousness), together with whatever ideologies, ethics, rites, myths, legends, and magic may be related to them” (Merkur, 2023) have been at the center of human life throughout history. Mysticism, which managed to maintain its strong position even during the most intense periods of secularism in human history, was a very critical dynamic in Aşıkpaşazade's time (15th century) too. Therefore, considering the importance of this dynamic in the historical context, mysticism,

and mystical elements have taken their place as one of the main topics of the How to Map Aşıkpaşazade's History project, which completed its second PURE year as of August 2023. In this context, mystical elements in Aşıkpaşazade's *Tevarih-i Al-i Osman* were identified, a database was created, and some digital applications were made on it. The first task in this process was to complete and standardize the dataset, of which approximately 90 sections were completed in the first year throughout the entire work. The dataset was built under categories divided into 19 columns in total. Among these categories, a broad categorization was made from the actors and actor characteristics of the mystical item to the type of item and event. After the most labor-intensive part of creating the dataset, the data processing phase began. Digital applications for mystical elements started by using Palladio, developed by Stanford University. In addition, various visualization applications were created in Python using mystical elements data.

We used Palladio, a frequently used tool of digital humanities, to map the prevalence of mystical elements in the History of Aşıkpaşazade based on types and characters. According to this map, the most frequently used concepts and elements were gaza prayer, and grave. Also, we created a visualization of some statistics using Python. In this context, we have three main outputs. The first one, the distribution of mystical elements according to the periods of sultans, shows that there is a significant decrease in mystical elements, especially during the *Fetret* (interregnum) and Çelebi Mehmed periods. This can be explained by the crisis the Ottoman Empire was going through during those periods. In another graph, we see the classification of mystical elements according to the sultan eras. The main trend in this graph is the part related to wars. However, the nature of the mystical-religious element of wars will be discussed in the following section. In the pie chart at the end, it is possible to observe the distribution of mystical elements according to religious system.

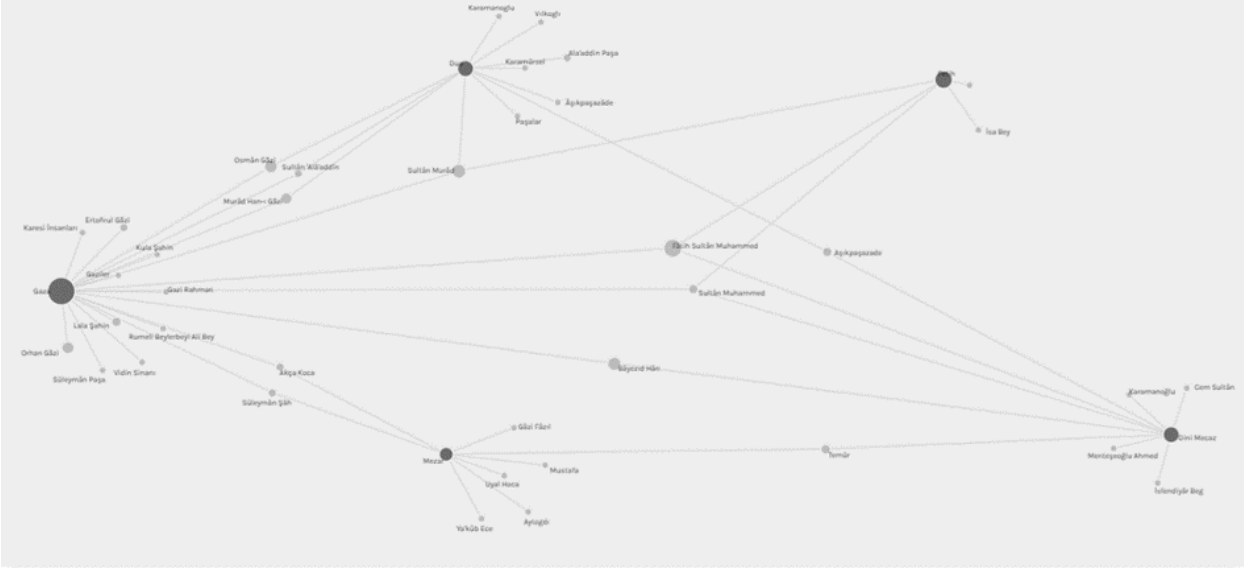

Figure 16. The prevalence of mystical elements in the History of Aşıkpaşazade based on types and characters

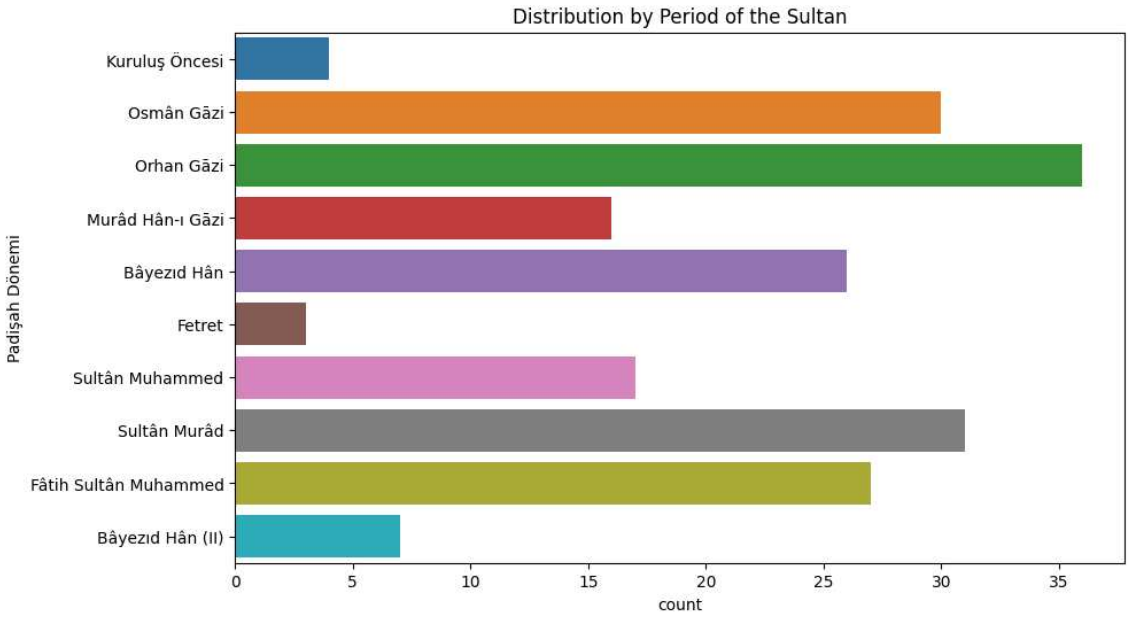

Figure 17. The distribution of mystical elements according to the periods of sultans

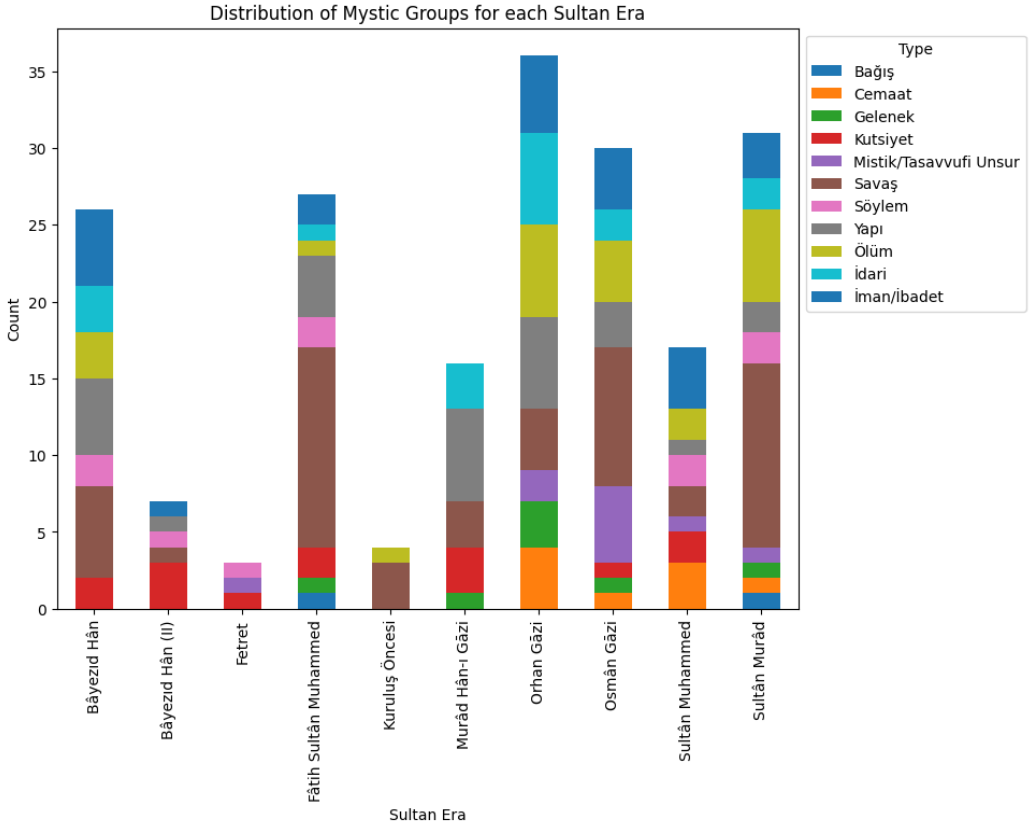

Figure 18. The classification of mystical elements according to the sultan eras

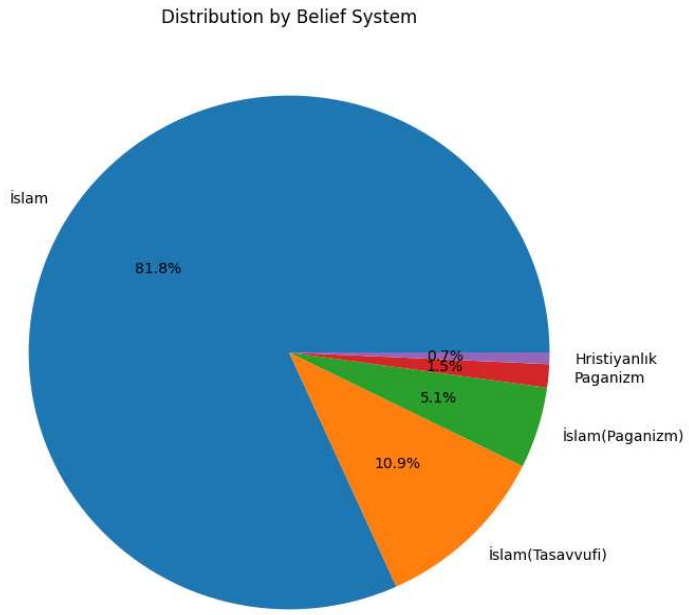

Figure 19. The distribution of mystical elements according to religious system

Perhaps the most fundamental point of discussion in the section on mystical and religious elements is whether wars and conquests can be recognized as having a religious or mystical element. The religious nature of the early Ottoman wars is still an issue that is either embraced or rejected by many camps of opinion as a result of the decades-long great debate about the Ottoman founding. At this point, we have chosen to use the religious warfare element, which was added to the dataset as a religious/mystical element, in our outputs. Still, these outputs can also be used by removing war-based elements from the dataset. As a result, within the scope of this project, only the History of Aşıkpaşazade is analyzed and expressed with digital tools without being close to any of the camps regarding the founding debates.

8. … and the Curtains: Natural Language Processing and Aşıkpaşazade’s Chronicle

In the realm of history and literature, the significance of Aşıkpaşazade's work is immense. It not only encapsulates historical narratives but also provides a foundation for understanding the political and cultural landscape of a bygone era. However, the sheer volume and complexity of Aşıkpaşazade's historical texts make it a challenging endeavor to sift through the rich tapestry of stories, characters, and themes. Traditional methods of text analysis can be time-consuming and are often limited in their capacity to offer a comprehensive view.

As a part of the larger project "How to Map Aşıkpaşazade's History," this report aims to address these challenges by adopting a technological approach. Leveraging Natural Language Processing (NLP) techniques, we explore the sentiments and topics that dominate Aşıkpaşazade’s historical writings. Importantly, we aim to uncover layers of meaning and patterns using NLP methods that a historian might

not easily discern by reading the text alone. As a group with a keen interest in both historical texts and computational methods, we have been working on two crucial tasks for this project:

Sentiment Analysis: To understand the overarching emotions and opinions expressed in the text. This can provide insights into the narrative tone and perhaps even the social climate of the times the history covers.

Topic Modeling: To categorize the main themes and subjects discussed in the text. This method enables us to identify recurring topics automatically and can provide a structured overview of the text's content.

In implementing these NLP tasks, this report hopes to offer a new lens through which Aşıkpaşazade's historical text can be viewed, analyzed, and appreciated. We believe that the intersection of history, literature, and technology has the potential to enrich our understanding in an innovative and efficient manner.

8.1 Methodology

The core of our research methodology is rooted in leveraging advanced Natural Language Processing (NLP) techniques to analyze Aşıkpaşazade's historical text. To cater to the specific language and syntactical nuances of the text, we employed transformer-based models, which are state-of-the-art in machine learning for understanding the complexities of human language.

8.1.1 Data Preparation

Before diving into the advanced Natural Language Processing (NLP) techniques, the initial focus was on data preparation, a critical step often overlooked. The text from Aşıkpaşazade's historical book was initially extracted as a PDF file. This raw textual data required substantial cleaning and formatting to make it suitable for analysis. Our team of social scientists played a vital role here; they meticulously processed the text to align it with the different sultan eras. This pre-processed text provided a structured and contextually relevant dataset for further analysis. Once the text was curated, we took over the technical part by dividing the text into individual sentences. This separation into smaller units facilitated a more precise and granular analysis, making it easier for the models to evaluate the text on the sentiment and topic fronts.

8.1.2 Sentiment Analysis Using BERT

For the task of sentiment analysis, we used a model based on BERT (Bidirectional Encoder Representations from Transformers), specifically tailored for the Turkish language (savasy/bert-base-turkish-sentiment-cased). In layperson's terms, BERT is like a very sophisticated pattern recognizer; it has been trained to understand the context of words by examining text from every direction—both left to right and right to left. This bidirectional understanding makes it highly effective at grasping the sentiment behind a sequence of words.

Why BERT for Turkish? It turns out that language-specific models can significantly improve the accuracy of sentiment analysis, and a BERT model adapted for Turkish language nuances offers a distinct advantage. We fed the text into this specialized model, which then categorized the underlying sentiment as positive or negative.

8.1.3 Topic Modeling Using BERTopic

To identify the main themes and subjects within the text, we used BERTopic, a model that also draws its strength from BERT but is specifically optimized for topic modeling. Unlike traditional topic modeling techniques that only look at word frequency, BERTopic understands the semantic relationships between words. In simple terms, it does not just count the words; it understands their meaning in context, which allows for a much richer and more nuanced categorization of topics.

BERTopic begins by transforming the text into a format that highlights these semantic relationships. It then employs algorithms to cluster these transformed data points into various topics. Each cluster represents a specific topic, and the words most central to that cluster provide insight into the theme of that topic.

In conclusion, by utilizing transformer-based models like BERT for Turkish sentiment analysis and BERTopic for topic modeling, we aimed to achieve an in-depth and nuanced understanding of Aşıkpaşazade's historical text. These advanced NLP techniques allow us to uncover details and patterns that would be difficult, if not impossible, for a historian to identify through mere reading.

8.2 Discussion and Findings

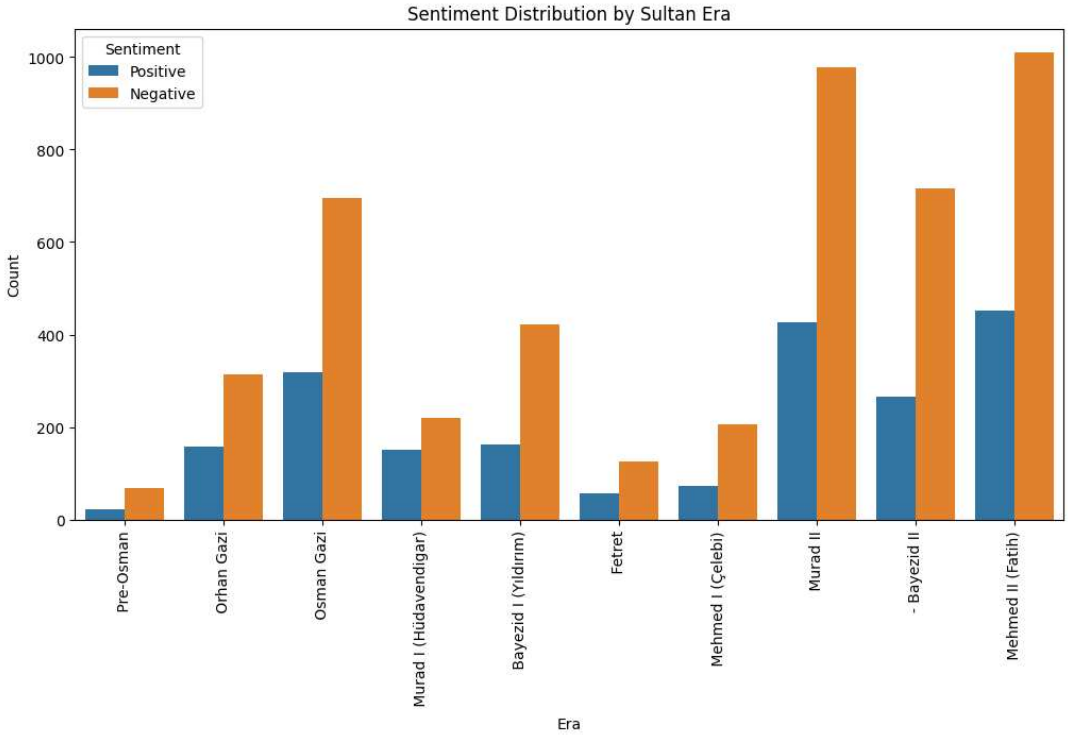

Figure 20. The distribution of sentiments elements according to the periods of sultans

8.2.1 Sentiment Analysis Interpretation

One of the most intriguing outcomes of our analysis came from the sentiment analysis using a pre-trained BERT model specifically tailored for the Turkish language. We employed Hugging Face's pipeline method to streamline the inference process. When we analyzed the sentiment across the 10

different sultans' reigns covered in Aşıkpaşazade's text, we noticed that negative sentiments were more prevalent than positive ones as shown in the figure above.

For instance, sentences like "Ey aziz insan!" (Oh, mighty people!) were tagged as "negative," which is counter-intuitive. Similarly, the term "dediler" (they said) received a high negative score, which was surprising given its neutral context. These examples suggest potential limitations in the model we utilized, which was trained only to identify positive and negative sentiments.

One key consideration for these findings is the historical and linguistic context. Aşıkpaşazade's work was penned during the early Ottoman era, whereas our BERT model was trained on modern, everyday Turkish language. This dissonance could partially explain why the sentiments did not align with the expectations of our history-major teammates, who anticipated a more balanced or even a positive portrayal of the sultans' reigns.

8.2.2 Implications

The unexpected skew towards negativity raises questions about the applicability of our model for this specific text. One limitation was the absence of a "neutral" category in the sentiment analysis model. The binary "positive/negative" framework may not have been sufficient to capture the nuanced emotions expressed in a historical text, particularly one from a different time period and linguistic context.

These anomalies suggest that while pre-trained models offer convenience, they may not always be the best fit for analyzing texts that differ significantly from the model's training data in terms of language and context. This highlights the need for future research to explore specialized NLP models for historical texts or alternative methods to cross-validate our findings. As a future line of work, translating Aşıkpaşazade's text into English and then using English-based sentiment analysis models could possibly yield more expected and relatable results, providing another layer of validation for our current findings.

8.2.3 Topic Modeling Interpretation

For the topic modeling aspect of our research, we employed a multilingual embedding model with a Turkish support, and utilized a list of Turkish stop words to filter out irrelevant terms. Our model was set up to focus on capturing the most significant topics across the entire book.

The aggregate analysis surfaced five dominant topics characterized by specific sets of keywords which also could be observed from the figure below:

1. Personal Pronouns and Connectives: [şimdi, bizim, benim, bunun, bize]
2. Dialogic Expressions: [dedi, dedim, sağ, ol, sen]
3. Emotional and Royal Terms: [üzüldü, ayrıca, etti, vardı, padişahın]
4. Military Terms: [asker, askeri, askerin, ordu, askerler]
5. Divine Concepts: [allah, tanrı, yüce, rahmet]

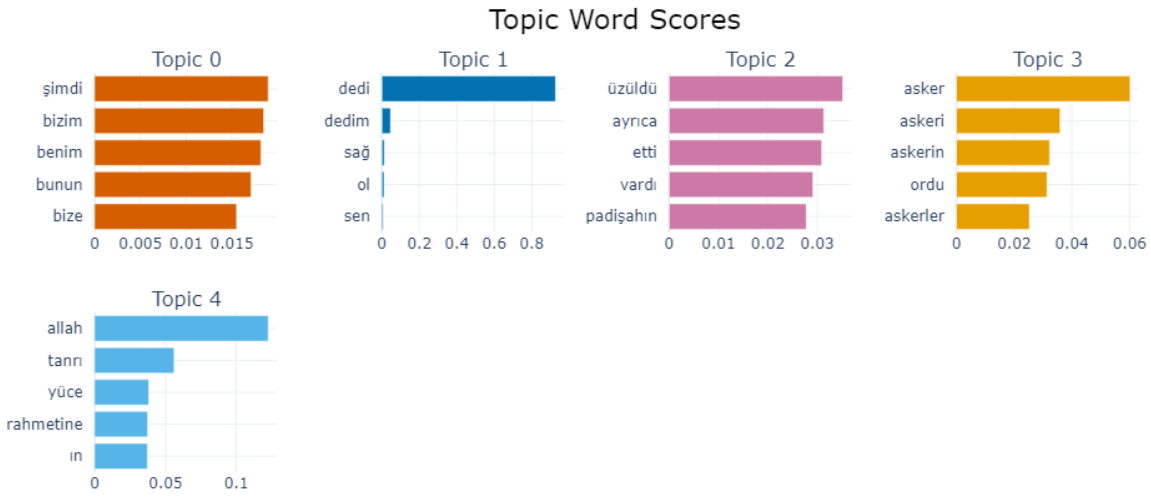

Figure 21. Topic word scores of five dominant topics

Interestingly, the topics generated revealed an intriguing mixture of personal pronouns, dialogic expressions, and terms related to emotion, authority, military, and divinity. However, what stands out is the high representation of personal and dialogic terms, suggesting that the text may place a significant focus on personal relationships and dialogues rather than solely historical or factual content.

8.2.4 Implications

The model's emphasis on these particular topics raises questions about what elements are foregrounded in historical narratives like Aşıkpaşazade's. Are personal experiences and dialogic expressions more predominant than previously thought, or could these results be artifacts of the topic modeling approach we used?

Furthermore, some of the topics might be shaped by the commonality of the terms in everyday Turkish language, rather than their specific importance in the historical text. This suggests that further refinement of the stop words list or employing different pre-processing techniques may yield a more accurate representation of the core topics. As opposed to the sentiment analysis, our history major colleagues found these results accurate.

8.2.5 Topic Modeling Across Different Sultans' Reigns

In addition to applying topic modeling to the book as a whole, the analysis was extended to focus on the ten specific sultans' reigns mentioned in Aşıkpaşazade's text. This granular approach aimed to identify whether different periods had unique thematic focuses or if common threads persisted across the ages.

Preliminary results suggest a high level of consistency with the overall findings. Ten figures have been included in this report to provide a visual representation of the topics and corresponding keywords identified for each of the sultan eras.

8.2.6 Implications

While the topics appear to align closely with those generated from the text as a whole, a comprehensive interpretation of this consistency—or lack thereof—could be provided in more detail. Although not fully, it turns out that topic modeling is generally successful in producing results that are partially close to the data we have collected. Also, the results are mostly in line with historians' expectations.

The data generated shows the importance accorded to certain people despite not being the ruler during that period. For instance, Orhan I figures prominently early in Aşıkpaşazade's narrative. Orhan starts leading Ottoman armies under the reign of his father, Osman I, and overshadows his brothers who were also potential successors at that time. Aşıkpaşazade perhaps foreshadows Orhan's future succession and exploits. However, even if this case is taken as a foreshadowing, Aşıkpaşazade does not overuse such foreshadowing as Süleyman, Orhan's son who dies too early to succeed his father, figures prominently in the reign of Orhan I and Musa, a failed contender to the throne, figures prominently during Fetret. Also, the only foreign ruler whose name is featured is Timur, reflecting the shock waves he sent toward the Ottoman establishment. Another result of historiographical importance is the partial replacement of the titles signifying early Ottoman rulers' roles as frontier warriors ("gazi") with titles that highlight the sedentarization of rulership ("sultan"). However, this replacement is never complete, especially since the former titles are also used by people outside the royal family.

8.2.7 Topic Word Scores

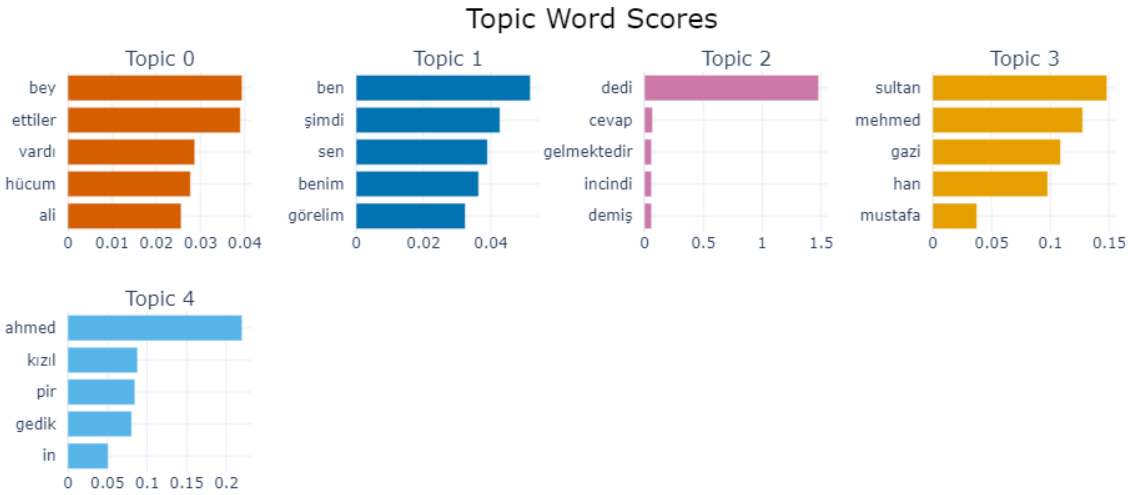

Figure 22. Topic word scores of pre-Osman period

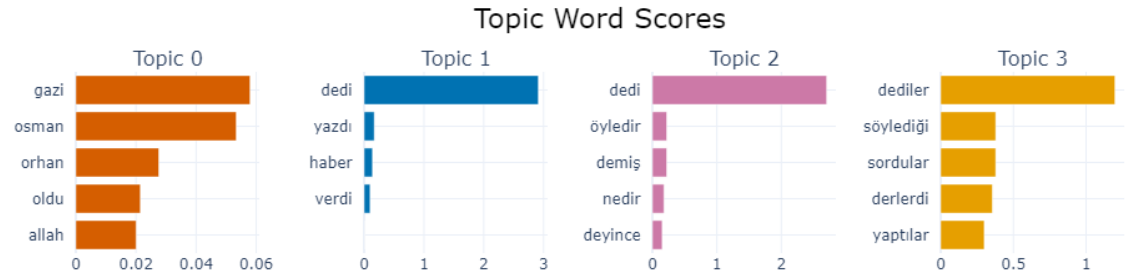

Figure 23. Topic word scores of Osman I period

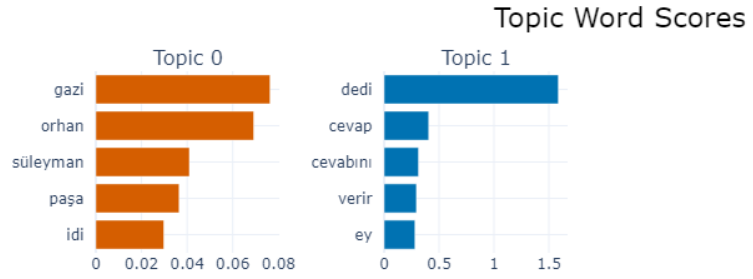

Figure 24. Topic word scores of Orhan I period

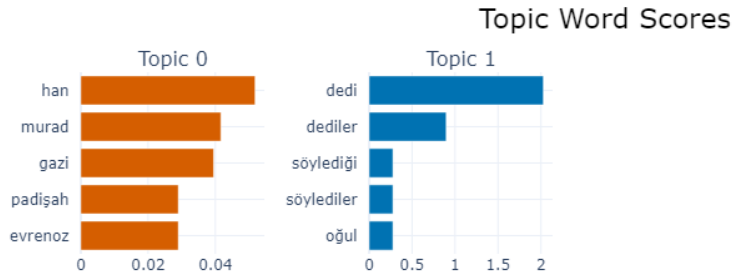

Figure 25. Topic word scores of Murad I period

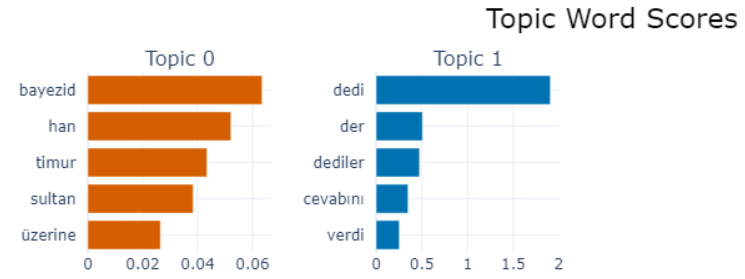

Figure 26. Topic word scores of Bayezid I period

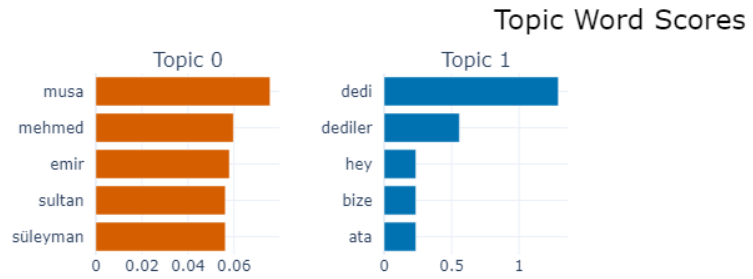

Figure 27. Topic word scores of the Fetret period

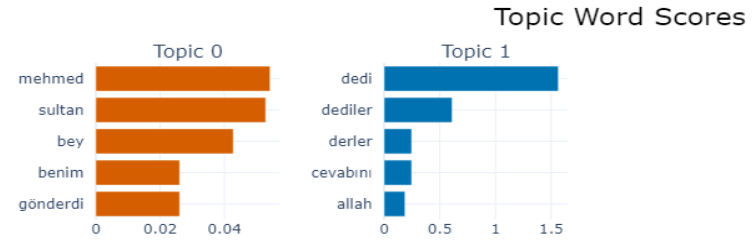

Figure 28. Topic word scores of Mehmed I period

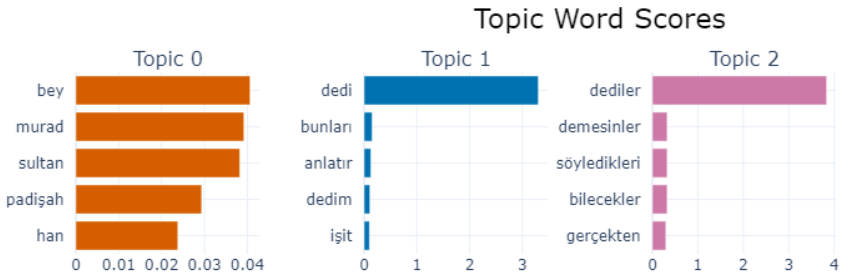

Figure 29. Topic word scores of Murad II period

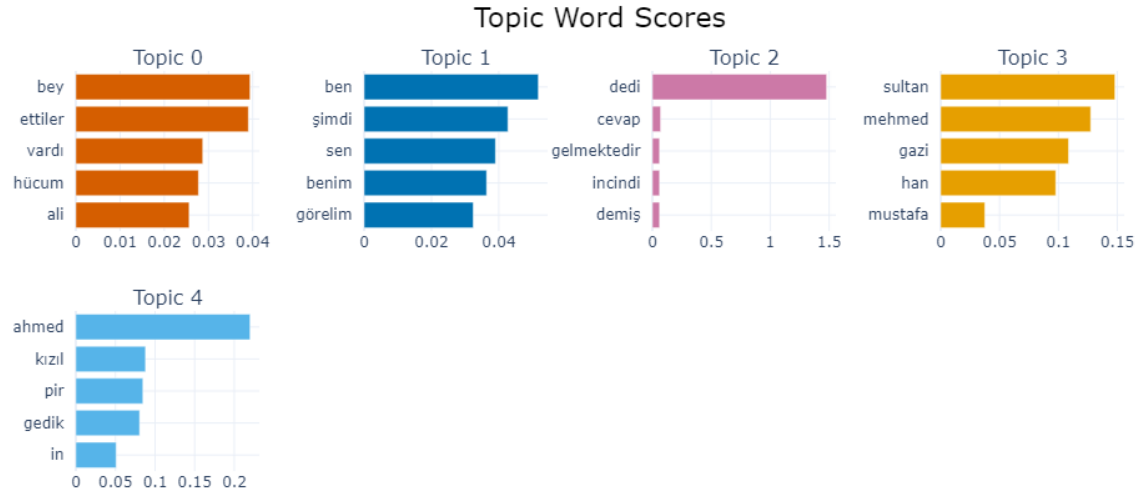

Figure 30. Topic word scores of Mehmed II period

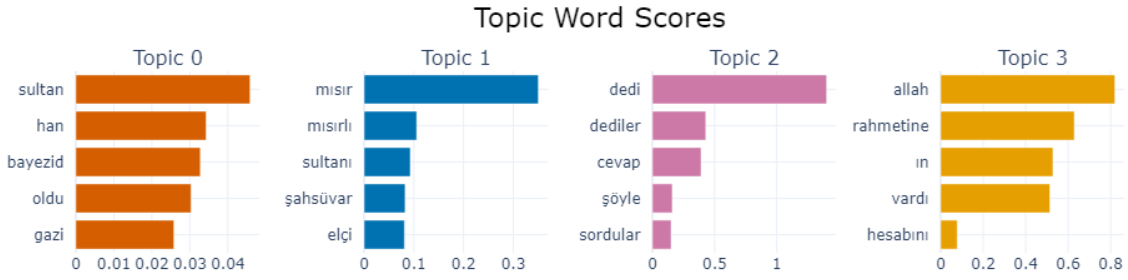

Figure 31. Topic word scores of Bayezid II period

8.3 BONUS: Building an LLM-based chatbot to interact with Aşıkpaşazade's chronicle

In addition to the main focus of our research, an exciting supplementary endeavor was the development of a chatbot using OpenAI's GPT-3.5 Turbo model. This chatbot was built on the Langchain framework, a versatile platform conducive to rapid chatbot development and deployment. The chatbot is served as a Streamlit app with a minimal user interface that everyone can easily use.

8.3.1 Overview and Purpose

The purpose of the chatbot is to provide an interactive way to engage with Aşıkpaşazade's history, making it easier for users to explore the text, ask questions, and gain insights. It is designed to offer a modern and dynamic approach to historical texts, making them more accessible and relatable to a broader audience.

8.3.2 Functionality and Limitations

While the chatbot is an innovative tool for engagement, it is worth noting that it operates within the limitations of the GPT-3.5 Turbo model, particularly in terms of historical accuracy and contextual understanding. However, it serves as an excellent proof-of-concept for how natural language processing techniques can be applied beyond traditional text analysis, to create more interactive and user-friendly tools for historical exploration.

Figure 32. Application of Chatbot to Aşıkpaşazade's History

9 Conclusion

Digital humanities has become an extremely widespread and influential field, especially in our century when digitalization is advancing at an unstoppable pace in every field. Thanks to the opportunities offered by this field, humanities scholars now have the chance to analyze and express the mass of knowledge produced by scientific disciplines for hundreds of years more actively and effectively. In particular, the qualifications of the field specializations of the humanities scholars who have this opportunity push the boundaries of this new and great opportunity forward. At this point, from where we stand, we can say that we are witnessing the transformation of the "humanitiesist" and, at the same time, the transformation of the humanities in many ways and perspectives. While almost no sub-discipline of the field can remain indifferent to this transformation, it is impossible to say that Ottoman historiography is not affected by the digitalized humanities and the humanities scholar. Even based on the examples at Sabancı University, it can be observed that the field is getting richer every day.

Ottoman historiography's engagement with the digital humanities has taken and continues to take many forms. From geographical information systems to network analysis, from textual analysis to parallel studies in linguistics, many digital humanities methods and tools are now actively used by some Ottoman historians. Due to the nature of digital humanities, this proliferation and development of studies and methods can even inspire studies that have no contextual overlap. At this point, it may be useful to focus on the subfield that overlaps with our study. In very valuable text-centered studies such as Modernizing Empires, The Bâki Project, and Islamanatolia, there is a strong concern with intellectual history, and the outputs of this concern are usually either very specific to a very specific context or directly related to intellectual history. Given this natural outcome, we can safely say that the field promises much more. At this point, it is obvious that the domain expertise of the researcher is highly influential, in addition to simply investigating which types of sources are more promising as a historian. Leaving aside the domain expertise for now and ignoring state documents, it would not be wrong to say that the types of sources with the brightest potential at this point are travelogues, chronicles, or memoirs. Thanks to the diversified data provided by these text-based sources, the digital humanities study in question will have a much better chance of achieving a multifaceted and colorful output by avoiding a bland textual analysis. At this point, it is evident how effective the type of source is in the effective use of digital possibilities.

Aşıkpaşazade's *Tevârih-i Âl-i Osmân* is a work that differs from the main Ottoman chronicles in some aspects. Because of the evaluation of the work in the introduction, we think it is necessary to mention some basic points without going into detail. First of all, Aşıkpaşazade's History is not a court chronicle and does not have these characteristics. The main thing that this provides in terms of data is the diversity of data arising from the highly developed critical culture and cluster of the work. For instance, we can clearly observe that Aşıkpaşazade -knowing the value of the head on his shoulders- criticizes a sultan, even if in a very respectful manner, and insults a pasha and that he does not always agree with the court on such things. In this case, we can predict that Aşıkpaşazade's digital outputs are relatively far from monotony in the same direction. For these basic reasons, Aşıkpaşazade's History is the right choice for working digitally.

With all this in mind, the “How to Map Aşıkpaşazade’s History” project explored this exciting work in the ways described throughout this report. At this point, in addition to the usual digital humanities applications, the application of NLP, at least on a trial basis, has been a very impressive experiment for Ottoman historiography, even if it has not yet yielded the desired result. Because a machine assisting the historian in understanding Aşıkpaşazade is a remarkable development that improves the historian's work. In this way, the historian has the opportunity to better analyze the work and express this analysis with details that are not possible to be seen and detected. As we have already mentioned, perhaps the greatest contribution of digital humanities is that it increases and expands the horizons, possibilities, and intellectual time of humanities scholars. Speaking of possibilities, of course, it should be mentioned that the project has temporal and economic limits as it is the second leg of a process organized in 2-month periods. Considering these limitations, it can be said that the project's implementations are open to longer and more possibilities for development. For example, the insufficiency of the Turkish model for the NLP application is the main reason why the application did not yield the results we expected. In this context, a better-trained language model in a wider time interval will undoubtedly be more successful in providing accurate results than this temporal constraint. On the other hand, for geographical information systems applications, it is highly likely that the database created this summer will be improved in the future as it will no longer be necessary to create a database again.

The proliferation of such chronicle- or travelog-centered projects will undoubtedly provide Ottoman history with an invaluable corpus. In this way, Ottoman historiography will have the chance to experience and even test the fundamental progression and movement in the *longue durée* from a different perspective by evaluating the output of the corpus alone. Perhaps this is how a grander narrative can be constructed. In the end, historians will have the opportunity to look at the big picture from such an effective perspective and will be able to capture the details in this way.

Finally, it would be meaningful to talk about the main project experiences. First of all, the tools, applications, and platforms used throughout the project are not the methods of the Library of Babel. On the contrary, Tableau, Palladio, Voyant Tools, ArcGIS Pro, and Python, which are very frequently used tools, can be said to be the most used tools. At this point, we were positively surprised that Voyant Tools, which seems to be an extremely modest option compared to the NLP application, gave us high accuracy outputs, as we did not expect. Considering that NLP is not yet at a sufficient level in Turkish, it is possible to say that Voyant Tools is still a good option until the necessary competence is achieved. In addition, it was also experienced during the project that almost all of the basic Digital Humanities applications can be made more effectively with coding languages such as Python and R. At this point, it would be extremely beneficial in many ways to go beyond wishing for more collaborations between computer scientists and humanities scholars, and for humanities scholars to learn how to use these applications by themselves.

All in all, How to Map Aşıkpaşazade’s History has been an important project that has brought unique experiences and perspectives to the project staff in terms of both historiography and digital applications. This project, which promises great things for the future, can be a pioneer or a valuable contribution to the idea of the aforementioned corpus with wider opportunities.

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