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What are the factors behind the distinct character of Mosques in Turkey and Iran?

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Abstract. Cities or its urban fabric and the characteristics architecture in many regions during various timescale is shaped by numerous factors. Among those factors are intangibles as political motivation, inspirations from other civilizations, religious influence. Whereas physical sways such as climate or geographical consideration or availability of materials and skilled labor are behind other great architecture creation. Therefore this article examines the impact of these factors in shaping the religious architecture in two vast neighboring countries Iran and Turkey. Iran is an immense country and its weather is variable and key factors in shaping a specific type of architecture while in Turkey, other influences are more dominant. The methodology of this paper is based on a literature review of various references and a theoretical analysis of several case studies in Iran and Turkey. This paper is an attempt to help students and researchers to understand how architects creates distinct architecture by acknowledgement of intangible forces.

1. Introduction

In today's modern age with the selection of technological means being at arm's reach and the development of new construction materials, buildings are extremely costly to build and maintain, let alone being uncomfortable to live in at times especially when human comfort is more favored. As a result, constructional methods are based on making the best use of consumptions of resources as well as a production of waste. However, in the past builders had minimal knowledge as well as resources and had to make the best use of factors and elements around them to overcome certain obstacles. For instance the environment; how they had to maintain a comfortable living setting during extreme hot and cold weathers. Looking back at urban studies the city was known as an 'organism' it was an outcome of the relationship between a system of rules, land division, building aggregation and road network that all simultaneously worked together, strictly connecting with climatic and solar conditions. The design of the city was never a coincidental effect and the original structure was made of parts as scalar sub-systems of strongly inter-connected organisms which thrived in an unlimited growth without the need of interrelations contrary to belief with the environment. The architecture in Iran formed according to climate constraints, Iran is diverse in its climate and typology, the northern part is divided into two areas; coastal section situated beneath the Caspian Sea and featured by dense forests. The climate is hot and cold according to the seasons with high humidity level throughout the year with farming being the main activity in this region Fig. 1. Second northern plateau is mountainous stretched along the borders with Turkey and Azerbaijan, series of Zagros Mountains extend westwards causing cold winter and mild dry weather in those parts. Central Iran is cold in winter with over 70 % humidity and hot dry in summer. Moreover, two deserts are located in this section (Dashet – e Lut, Dashet e Kavir). Last part is the southern coastal above the Arabic Gulf and Oman Sea, the climate here is similar to neighboring countries hot and humid in summer mild and cold in winter. The various weather stipulations in Iran is the main reason behind opting Iran to study its sacred architecture. Iran is Islamic country but Zoroastrian religion was before Islam and fire temple existed in form of layered Ziggurat nevertheless Islam replaced this atheist practice. Zoroastrian religion was the state religion of the pre-Islamic Iranian empires for over a millennium, from around 600 BCE to 650 CE. Zoroastrianism was overturned from the 7th century onwards following the Muslim conquest of Persia of 633–654 and many mosques replaced demolished temples.



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The mosque generally in Iran accommodates the typical components of prey hall courtyard and colonnade around it with Minarets but the opening in an external envelope and the court may vary according to a location of the mosque. In the following section, the impact of the climate on the mosque's layout should be examined and case studies will be used to reflect the various treatments exerted to overcome the harsh weather.

2. Mosques in various parts of Iran

The contrast and variety in weather conditions in Iran overshadowed the identity of sacred buildings and as early mentioned the coastal northern regions and mountainy lands are cold in winter hot humid in summer. Hence logically most of the winter pray halls are bigger covered with pitched low ceiling, openings in the external envelope are small and limited to maintain the warm air inside.

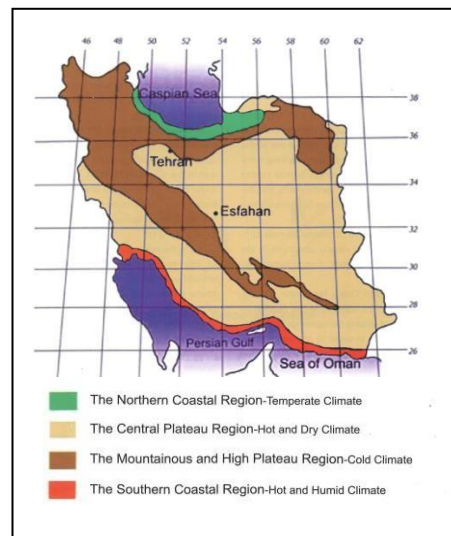


Figure 1. Plateaus of Iran

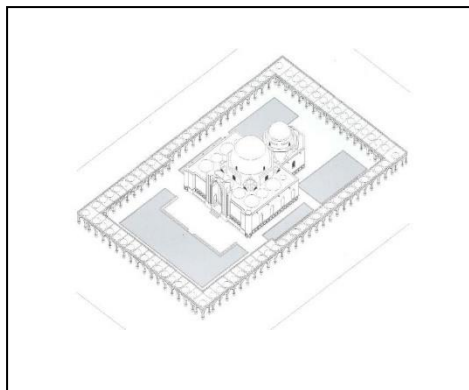


Figure 2. The Blue Mosque in Tabriz, Iran

Furthermore, mosques are inwards looking and typical courtyard with Evans found in almost every mosque is preventable in this part. In Astara the coastal city and Tabriz county mosques are without the courtyard and Blue Mosque in Tabriz is a great sample of mosques in mountain cities Fig. 2. The external envelope of this mosque is concealed or windows are minimized in size and likewise the middle court with its Evans are omitted. However occasionally in different coastal cities the court employed to provide ventilation. In middle platue winter is cold and in summer the heat is excessive with dust or sand storms moreover the difference in temperature between summer, winter and even the day or night

is too high. Hence the mosques most provide comfort through the seasons. Consequently, the courtyard is essential to provide ventilation and openings in an external envelope is diminished because most of the openings are around the internal court.

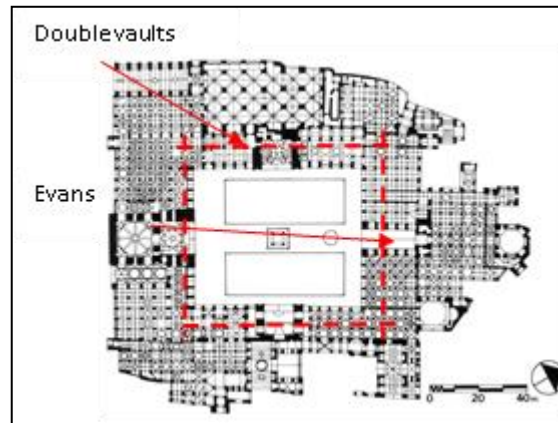


Figure 3. Great Mosque, Esfahan

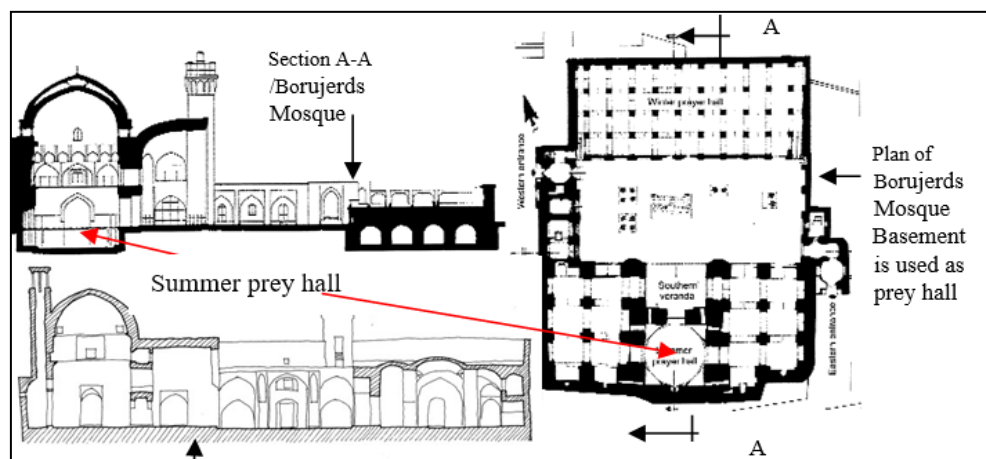


Figure 4. Firooz – Abad mosque, Iran, usage of wind catchers.

A water pond is used as a cooling component and commonly situated inside the courtyard providing a breeze and enhance the quality of air. The Evans is crucial feature of mosques in Iran and commonly big in Middle plateau's mosques and regarded as part of comfortable shaded breezy spaces that can be used to give lessons.

Additionally, double or cross-vaulted arcade are commonly located around the courtyard providing shelter from the sun during hot summer and Great Mosque in Esfahan is one of the sample of central Iran Architecture Fig.3. Other distinct components known as wind catchers added into the mosques in Yazd city in a central region, the wind towers enhance air circulation or ventilation and provide breezed air into summer prey hall and Firooz –Abad mosques reflects this approach Fig 4. A basement is another feature of the mosques in central Iran and can be used as summer prey hall since it is a cold shaded area. In southern coastal cities the mosques were smaller since the population is less than other parts, this affected the size of the mosques and hence courtyard is unnecessary. Likewise the economy was weaker and fund insufficient to build elaborate architecture. Consequently, the mosques were basic and even less ornamented. Vahid Ghobadian in his book mentioned that mosques with central courtyard were less common here in compared to other regions of Iran and there were very few mosques of the central

courtyard type [1]. Most of the mosques in this part are constructed over a 2 m platform to overcome the floor dampness Figure 5, and other measures employed to reduce the effect of the heat such as:

- i. light colures coating internally and externally
- ii. Shaded arcade around the building
- iii. Bigger opening oriented towards breeze and wind direction and a row of a small opening is common near the ceiling to enhance ventilation inside prey hall Figure 6.
- iv. Prey hall ceiling is high allowing additional air circulation and fans commonly pending from the roof. Mosques are detached from surrounding urban fabric allowing air movement Figure.7

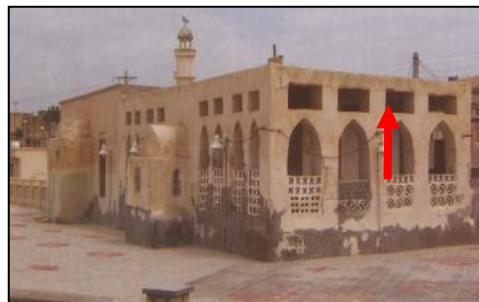


Figure 5. Omar mosque, usage of higher opening.

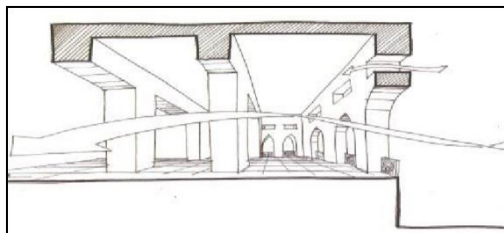


Figure 6. Omar Mosque, Ventilation system through court and small openings

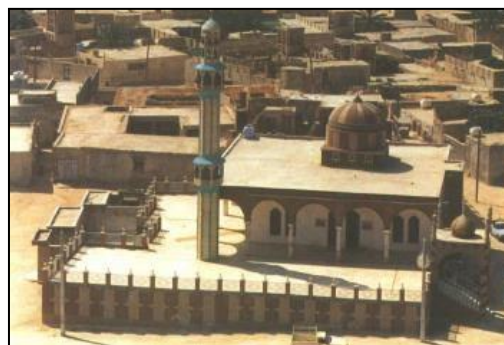


Figure 7. Mosque in Bender city shows the premises built over a platform

In fact the weather is one of numerous components which characterized the architecture of Iran, but other political decisions were behind some unusual form of Mosques in northern Iran. Vahid Ghobadian in his book the sustainable traditional building of Iran stated that the three highest sacred buildings can be found in the north where the Mongol occupied the region between 128 till 1334. Those proposals are; Mausoleum of Ul-Jaitu in Soltaniye near Zanzan built in 1305, the Friday mosque of Urmia built in; 1277 and the Mosque of Arg- e Ali Shah in Tabriz built in 1312. The Mongolians reflect their triumph and strength by the construction of high leveled mosques contradicting prior approaches.

The first part of the paper discussed the impact of a tangible factor the weather in defining the identity of mosques in Iran nevertheless only two imperceptible aspects were behind some monumental premises in North Iran. And likewise, two reasons including low population and weaker economy resulted in rudimentary layout mosques in southern regions of Iran. The following part addresses religious architecture in Turkey, the history of Turkey examined and other aspects will be tested to identify the main influences behind shaping the Ottomans Mosques.

3. Mosques in Turkey, Historical Evaluation

Location of Turkey is a key factor in shaping the Ottomans architecture, Turkey is a middle basin between various cultures. Christianity from west contradicting with Islam from southern territories and Turkey represents the discourse between these religions. Christianity spread eastwards after the collapse of Rome and Istanbul (Constantinople city) was the capital of new evolving empire which lasted over one millennium till 1455B.C the East part beyond the Constantinople city was divided into many weak nations then and there the Seljuk arrived and established their Empire between 1037- 1194. Therefore From 11th till 15th the Turkish sacred premises forge its identity by taking various component from surrounding cultures and in particular Byzantine Empire, Seljuk state and the Islamic

Nations. Mohamed Zein Al Abidine in his publication the Architecture of Ottomans Mosques underline to study the history of Turkey to develop an accurate understanding of Turkish architecture. According to Mohmoud Zein Aabidin, the history of Ottomans backdated to a small tribe Kayi escaped the horror of Mongol and migrated in long search of land to inhabit in the 13th century [2]. Finally the Seljuk leader granted a northeast border district with Byzantine Empire to Kayi tribe as gift since they supported him against the Turkestan sultan. In fact, they were exploited as barrier against the Christians in the west, but the Kayins were strong and brave led by founder of Ottoman Empire Osman who inherited the power after the death of his father Ertogrul and was the initiator of the Ottoman Empire. Orhan the son of Osman took the lead in 1326 and enlarged his province by conquering Bursa but Orhan's son Murad I subjugated Edirne and announced it as a capital of Ottomans Empire after passing away of Orhan. Murad I was assassinated and his son Beyazet expanded the empire southeast whereas Sultan Mehmed named conqueror defeated Christian and transferred the capital of Ottoman Empire from Edirne to Constantinople (Istanbul), and established the foundation of the Empire. The capture of Istanbul marked the end of Byzantine Empire, which had lasted for nearly 1,500 years. The conquest of Constantinople resulted in massive blow to Christendom, as the Muslim Ottoman armies subsequently were left unhindered to advance into Europe without an adversary to their rear. Mohamed II in 1453 when he defeated Christians and entered the city he converted church of Aya Sofia into a mosque and the church was a great inspiration for Ottomans architects. The multi-domed roofing framework of Aya Sofia dominated by central spherical dome adopted by Ottomans and became a great feature of Ottoman mosques. Another characteristic of early Ottoman architecture was the use of Byzantine technique of alternate stone and brick courses which replaced the ashlar faced walls of Seljuk period in Central and western Anatolia.

In early era of Ottomans Empire, the churches were converted to Mosques because resources of Ottomans were employed for defense purpose or to conquer further cities. Therefore lack of funds could be the leading reason behind using of pre-existing church and recycling its components. Degan Turkish authors to avow that the Sultan take fifty percent of the revenues or may demand to take all of it for his personal uses and 10 % dedicated to city councils. This can be a second reason behind the usage of churches as mosques. In his book- p356 Degan mentioned that sultan and his courtiers employed the money allocated to public works and urban development to create a comfortable environment for them [2].

However before the Ottomans, Seljuk Empire was dominating east Turkey and in Turkistan with Islamic states in Anatolian east of Turkey, locals were engaged in construction premises heavily influenced by Seljuk architecture. The result was many mosques imitating the Seljukian major features of; elaborate decoration around doorways, ornamental stone buildings of elegantly simple design and harmonious proportion. Yet, the dominant element of design in the Seljuk period wasn't the dome but

the portal hence the gates of Ottomans mosques emphasized manifestly Fig.8. But after the collapse of Seljuk and Ilkhani, eastern and western Antonia were united by Mehmed the Conqueror and for the first time a new monumental approach employed in Yakutiya madrasa by adding enumerate twin Minaret erected in frontal façade of Yakutiya madrasa 1310 Fig.9. Dogan described the twin Minaret as a synthesis non- existent in the 13th century and the combination of twin- minaret façade with a roofed madrasa created a step toward monumental architecture. He believes that the 14th century witnessed the erection in Eastern Antonia of imposing monument reminiscent of the tradition of the proceeding century [3].



Figure 8. Portals of the school reflects influenced by Seljuk architecture



Figure 9. Monumental design attempt by adding the Columns

Though, the stonework of Yakutiya madrasa reflects the deep influence of Christian architecture on local traditions. Dogan wrote that from the reign of Murad I onwards, the Ottomans, having gained wealth and power as the result of in Balkans, and turned to a new monumental style on the basis of their 14th-century experience and potentials [3]. The monumental buildings in Europe cities were subsidized by religious power presented by the church whereas in Turkey the willpower of sultans is the crucial factor behind assemble of spectaculars monumental buildings.

After the 14th century, the Ottomans gained more power hence there was an urge to construct monumental buildings reflecting the triumph of Ottomans Empire. Most of the key buildings were constructed in main political capitals, the political structure existed mainly in Manisa, Bursa, Amasya, Edirne, and Istanbul. Thus, the core of imperial administration aroused in these provinces and all other high ranked houses, social, cultural and commercial activities were gathered.

In the following section several case studies considered to assess the development of Ottoman style in sacred Architecture. Religious architecture in Turkey as well as history of Turkey with other aspects, will be tested to identify the main influences behind shaping the Ottomans architecture.

4. Case studies

4.1. *Ulu Mosque, 1396th in Bursa City, Sultan Beyazet*

Bursa is an essential state in the political Ottoman fabric and the foundation of the Empire was laid in this early capital including the organizations and institutions of the nation. The city was transformed from small Constantin city into formal Ottoman capital for hundred year and many monumental buildings constructed in the city. Furthermore new building types existed such as baths, covered markets, courts, learning school, and *Zaviya* which is a center combining between learning activity and distribution of food into poor citizens. Bursa was a critical state and commercial capital during the Byzantine Empire and intensely connected with Western culture however it stayed the same after the collapse of the Byzantine Empire.

John Freely mentioned in his book that the political power surpassed religious and economic factors in Turkey nonetheless it acknowledged the cultural inspiration [4]. Consequently during the Ottoman era, the growth of the city wasn't randomly but based on the desire of the sultan who instructed the construction of many *Zaviye*, Public baths and great mosque of Bursa *Ulu Mosque*. This mosque is first symbol of the Islamic Ottoman capital, and regarded a shift in the Ottomans architecture, the size of central dome reduced and the single dome became multiples stretching over the pray hall Fig 10. Aptullah Kuran described *Ulu Mosque* as one of the very early types of Ottomans mosque constructed after the order of Beyazet in 1396, the plan is rectangle shape and the central dome was replaced by twenty homogenous hemispheric domed units [5]. The central row of domes are higher emphasizing the fountain underneath Fig 11. The Seljuk influence is obvious in particular through; simple design of the mosque, elaborate main gates, bricked Minaret, and stone structure. This layout was commonly used in six century of Ottomans Empire.

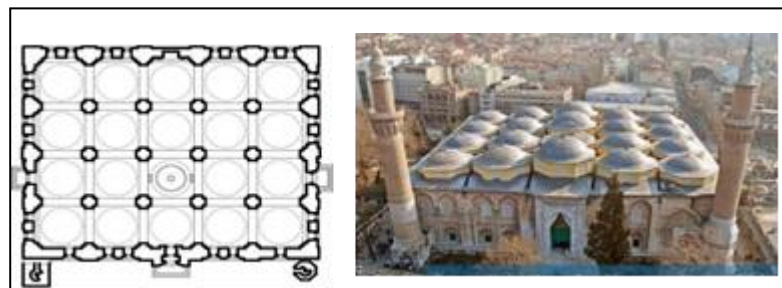


Figure 10. Dome became multiples stretching over the pray hall.



Figure11.The fountain in the middle of prey hall

4.2. *Beyazet Mosque 1501th in Istanbul City, Sultan Beyazet II*

During the 14th centuries, the design of mosques advanced and the central spherical domed supported by half-domed replaced the multiple columns in pray hull. The numerous columns in pry hall exited in previous case study divided internal spaces, separating the rows of prayers and disguised the vision but the new notion of domed mosques provided one specious prey zone without divisions. Beyazet II ordered to build a new mosque to commemorate him and khare Al deen was the architect who adopted

this new approach of undivided pray space allowing a better connection between prayers and the person provides Friday speech. The mosque layout was significantly changed from rectangle shape into cross and the two asymmetrical wings in west and east considered new distinct features of Ottomans mosques. The roof over east wings comprised four small domes with single bigger central dome whereas the west accommodates two extra domes thus the name of this mosque is non – homogeneous multi-unit mosque Fig. 12. This mosque represents the ottoman approach and was a great inspiration for many ottoman architects. The courtyard was a new component but the entire roofing envelope over the pray hull was inspiration from Byzantine architecture however the layout of this mosque and in particular the roof was advanced by Sinan the famous Ottoman architect Fig. 13.

The roofing damaged by the earthquake and rebuilt under the supervision of Sinan and his style is observable thru the elegant domed towers, half-domed around central and the windows in the rotunda.

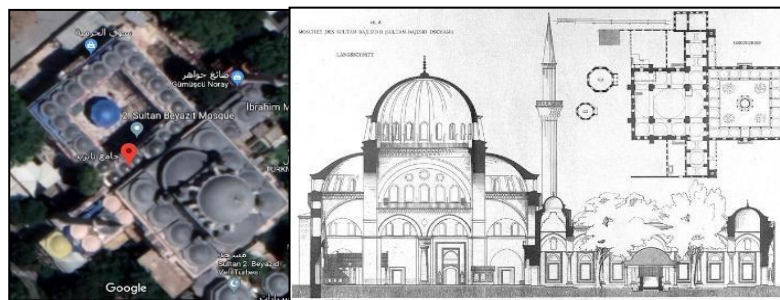


Figure 12. Usage of Semi domes



Figure13. Roofing layout.

4.3. *Uc Serefeli Mosque 1447th in Edirne City, Sultan Murad II.*

In Edirne the closer state to Europe, the Üç Şerefeli Mosque erected by Murad II 1447th as a symbol aiming to announce Edirne the capital of Ottomans state. The design of the mosque a step towards monumental architecture by augmenting the height of the mosque and this was achieved thru: 1.increasing the size of central single dome which is supported with multiple four lower domes emphasizing central one, 2. height of the mosque gradient towards central dome underlining pray hall, 3. Minarets situated next to pray hall are taller and consist of three layers. But the influence of Byzantine architecture is less vivid because the single dome is dominated over the various small cupolas and without semi - circle ones. Uc Serefeli Mosque consists of open courtyard Fig. 14 surrounded by arcades and two various minarets located at the corners of the mosque whereas the higher pair of Minarets stressed pray hall Fig. 15. Edirne was one of the first cities witnessed the conversion of churches into Mosques and the influence of Byzantine is apparent in next case study Selimiye Mosque designed by Sinan the famous Ottoman architect.

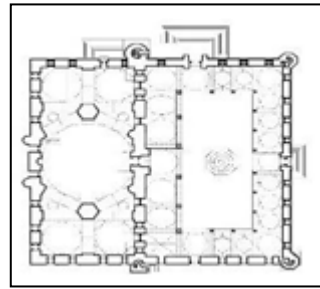


Figure 14. Open courtyard



Figure 15. Vertical emphasize by various components.

4.4. *Şehzade Mosque 1544th and Süleymaniye Mosque 1557th in Istanbul City by Sinan.*

Gülru Necipoglu conveys that Sinan was a vital Factor in evolving the Architecture of Ottomans, he joined the army in 151 and was a soldier in the Sultan Salem Military. Sinan participated in many Ottoman battles in Europe, Asia, and Africa and during the battles he provided advises to construct bridges in shorter period allowing the army to advance or concurred further cities [6]. Throughout his military career with Sultan Salem and his sun Suleymen he had had the opportunity to study the architectural monuments in various conquered cities and was in charge of converting churches into Mosques. In later stages, he was the Architect of much crucial architecture such as Şehzade mosque built to commemorate the death of a beloved son of Sultan Suleymen, the urge for monumental architecture led Sinan to arise different method in the creation of a historical building. He was inspired by Aya Sofia but came up with bigger central dome size thru; 1.supporting pendentives of the central dome by four tower located at the corners of the central dome, 2. Four semi Domes are situated north, east, west and south of central dome taking the load into massive buttressed walls Fig. 16. The four towers crowned by elegant small domes and the massive buttressed walls hidden wittily by small domes Fig. 17. The domes sizes are variable to break monotony and descent to emphasize central dome creating the Turkish triangle Fig. 18.

This was a crucial feature and progressive in Süleymaniye Mosque thru double story corridors topped by domes and pitched roof to break dullness of same size domes.

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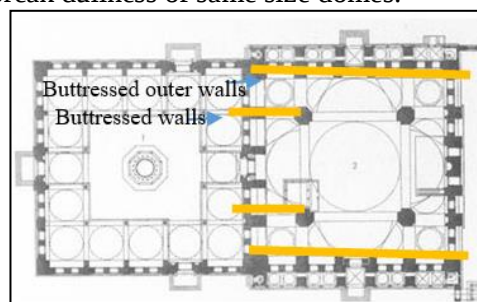


Figure 16. Four Semi circle domes



Figure 17. Domed towers

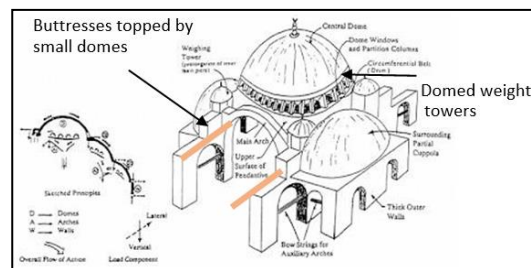


Figure 18. Organic Roofing system

Süleymaniye Mosque is a great icon design by Sinan, It was built on the command of Sultan Süleyman atop one of İstanbul's seven hills and providing a landmark for the entire city asserted Suleyman's historical importance. The roofing envelope over the prey hall innovative, Sinan replaced the two semi-dome north and south-central cupola by five domes. Three of them are bigger located at the center and other two over the corners alternating with two smaller domes to break the monotony. The dome supported by two half dome and four pillars similar to shezadah mosque, the mosque is the second largest mosque in Istanbul blended Islamic and Byzantine architecture Fig. 19. Symbolism stressed by using four Minarets representing Suleymen as fourth Ottoman Sultan since the collapse of Byzantine empire and the ten layers in the four Minarets articulate that Suleymen is the tenth sultan since the Ottoman empire establishment Fig. 20 .

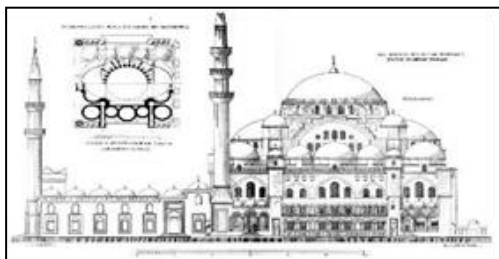


Figure 19. Semi-domes around central



Figure 20. Roofing structure

4.5. Selimiye Mosque 1569th in Edirne City, Sultan Salem II

The mosque designed by Sinan the great Ottoman architecture, the mosque was at the center of many amenities including a hospital, Islamic school, library, baths, and a row of shops. Sultan Salem ordered the construction of the mosque hence Sinan chosen highest site in Edirne permitted the mosque as focal point seen from different locations in Edirne. Sinan in his design attempt to defeat the rumors spread by Christian engineers who claimed Muslims are incapable to construct a domed mosque bigger than Aya Sofia. Sinan employed an octagonal supporting system through eight pillars incised in a square shell of

walls allowing the dome to be bigger than Aya Sofia. The buildings represent political power and the growth of economic and cultural functions, in fact, Sinan succeeded in creating a bigger dome but his proposal was an inspiration version of Aya Sofia and many components were taken from Aya Sofia including; the octagon piers spherical central dome, small sized half-domed around the central dome Fig. 21, multiple domed, a gradient in height towards the central dome and finally the preference of high land. Sinan was 84 years during the construction of Seilimiye mosque and managed to overcome the need for four immense semi-domed around middle dome by replacing the square walls below the dome with octagon piers Fig 22. The result was massive spacious internal dome and visibility enhanced in prey haul, whereas monumental and symbolism stressed by the usage of six layers:

- i. A base layer is an arcade around the open courtyard.
- ii. 2-Second level is a transmitted corridor between prey hull and rear court
- iii. Third and fourth strata connect the roofing envelope with vertical supports and accommodate domed weight towers or buttresses. The roofing of this layer is an alteration between pitched, towers and smaller semi-domes roofing.
- iv. Fifth height is the central Dominant dome surrounded by eight pinnacles.
- v. Last echelons represented by four minarets Fig 23
- vi. The sixth layers peaks towards the prey hull creating the vertical emphasize or the Turkish triangle Fig.24.



Figure 21. Aya Sofa Mosque

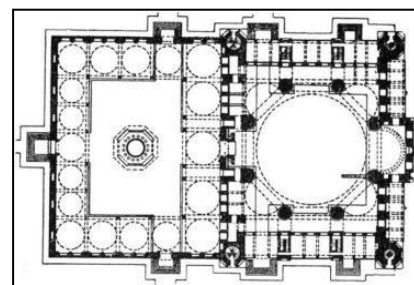


Figure 22. Eight octagon supporting piers

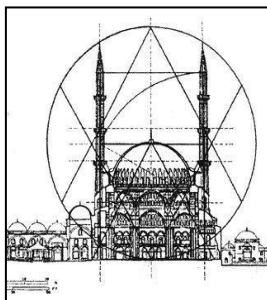


Figure 23. Four Minarets

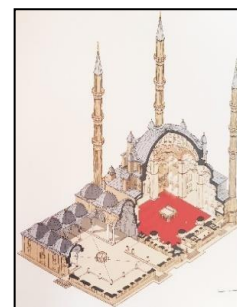


Figure 24. Turkish triangle

5. Conclusion

The architecture before the establishment of Ottoman Empire profoundly influenced by Seljuk, Islamic and Byzantine approaches. But after the Ottomans domain instituting in around 13th-century numerous cities within and beyond turkey borders concurred by Sultan Osman and his sons or grandsons therefore the Ottoman state named after Sultan Osman. The new Ottoman leaders occupied parts of Asia, Europe, and Africa, consequently these achievements urged to forge a monumental architecture. The mosques were at the focus of Ottomans Sultans who claimed themselves leaders of Islamic nations hence the mosques symbolized political power rather than a worshipping place. The political power or will is the main engine behind most of the monumental architecture in Ottoman Empire. In fact during the research other intangible factors identified behind the creation of magnificent mosques such as the great

knowledge of the architect Sinan and his will to challenge Christian engineering. At the early eras of Ottoman nation lack of fund resulted in converting churches into Mosques but excessive attainment or triumph of Ottomans army urged Sinan to come up with monumental mosques surpassing byzantine structure. Dome used before in East and West in sacred premises but commonly was single and crowning worshipping area beneath and particularly in Islamic or even in ancient architecture. The Byzantines were the first who employed half dome around the central cupola and used variously sized dome beside the main one and this treatment adopted by Sinan. Most of Sinan's proposals severely stimulated by Byzantine and Greek architecture nevertheless he significantly advanced the roofing framework in Selimiye and Süleymaniye mosques by changing the drum of the dome. The connection between the dome and supportive vertical wall underneath is a crucial point and Sinan smartly provides organic soft transition zone thru various sizes of domes. The bolsters side walls and massive square under the central dome of Aya Sofya is rigid despite the usage of row windows to soften solid plane but Sinan covered the massive wall by stretching the domes along the side walls creating a series of curved outline around the center of the Mosque and this solution came in a later stage of his life. In point of fact, the research concluded that Sinan and the Ottoman sultans or their triumphs in expanding the empire territories are key factors in shaping the features of Turkish architecture and created crucial iconic mosques combining Islamic and Christian architecture. In Iran, the climate is a key factor in shaping the external envelope and components of religious premises however generally mosque layout is similar to a typical mosque in most of the Islamic regions apart from Wind catcher and Evan. Evan is a distinct feature of Iranian mosque but the wind catcher usually an element employed in houses and the necessitate for air movement resulted in utilizing them in mosques. In Iran, except the weather, and through the literature review none of other intangible factors influenced the layout of the mosques and at variance, with Ottoman sacred architecture the impact of political power, expansion of Empire, the setting and the architect Sinan were key elements in shaping Ottoman mosques.

References

- [1] Vahid Ghobadian, *Sustainable Traditional Buildings of Iran: A Climatic Analysis* - Vahid Ghobadian - Google Books. Iran: Islamic Azad University, 2009.
- [2] Mohmoud Zein Aabidin 2005 *The architecture of Ottoman Mosques* (Dar Qabess House publisher) 15-70.
- [3] Dogan Kuban 2010 *Ottoman Architecture* (Antique collectors Clun Ltd Publisher), 60-350.
- [4] John Freely 2011 *A history of Ottoman Architecture* (WIT Press publisher), 70-150.
- [5] Aptullah Kuran 1968 *The Mosque in Early Ottoman Architecture* (University of Chicago Press), 50-100.
- [6] Gülru Necipoglu 2007 *The age of Sinan: Architectural culture in the Ottoman empire* (Reaction book Ltd, 30-120.