

Analysis in Spatial Characteristics of Historical Iranian Mosques: Case Study on Modern and Contemporary Tehran Mosques

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ABSTRACT

Mosques are not only a place for worship, but also a spiritual space in which Muslims can seek their creator in solitude and reach an internal peace. From the early days of Islam until the present time, mosques have undergone many changes in terms of appearance, spatial characteristics and organization of space. Since investigation and analysis of all the mosques in world is not possible, the researcher had to limit the research to the Iran capital city (Tehran) for a more precise study. Nine mosques in Tehran were selected as the case study in the present research. Their spatial characteristics were investigated based on the characteristics of Iranian mosques in the modern and contemporary periods (1796- 2015 AD). In the first chapter, the history of different religions in the world is studied. Abrahamic religion has the most followers in the world. Islam is the last Abrahamic religion that exists in the world. The research was conducted using literature survey, field observations and comparison of case studies. Thus, it has employed a qualitative methodology for its purposes. A limitation of this study was to evaluate the spatial characteristics of Iranian mosques and factors affecting their design within the limited time duration of 150 years. Tehran was selected as a case study in this research and nine mosques were randomly surveyed. General theoretical explanations about mosques around the world are presented in the second chapter. Accordingly, different types of religions are firstly studied. Finally, the spatial characteristics of mosques including, elements, spaces and ornaments are explained. In the third chapter, the effective factors on the spatial properties of Iranian mosques including architectural styles, Iran's different historical periods, government, politics and Iranian culture are studied in the first part. In the second part, the spatial changes occurred in the modern and

contemporary Iranian mosques including elements, spaces and ornaments are studied. The fourth chapter of this study is related to the analysis of and discussion on existing mosques in each category. In the category of early modern mosques (1879-1963), the architecture of Qajar (1879) and first Pahlavi (1925) periods are analyzed. Also in the category of High modern period (1963- 1998), the architecture of second Pahlavi (1963) and early period of the Islamic Republic (1979) are studied. Finally, in the category of contemporary mosques (1998- 2015), the architecture of mosques in the Islamic Republic are discussed. In each category three mosques are randomly selected and discussed. In the fifth chapter, which is the conclusion section, the analyses conducted in each main category are compared, and at the end, their impacts on the mosque's architecture are expressed. This study showed that there is a great dynamism in the mosque architecture during last 150 years and Iran is divided into three categories: Early Modern era that is from the mid Qajar, by changing the design of traditional mosque plan, construction of mosques at the beginning of first Pahlavi inclined more toward modernization. High Modern era, that in second Pahlavi reign, Islamic architecture in a novel form has emerged in modernism. With the beginning of the Islamic Republic mosques had a tendency toward traditionalism. In Contemporary era, which in Islamic Republic mosques are more updated and tailored to social needs and new functions. This study shows that there is a great dynamism in mosque architecture in last 150 years. Although the main requirements of a mosque is still the same changes in aesthetic understanding, building techniques and materials and same other factors have resulted with brand new mosque appearances in Tehran, Iran.

Keywords: Mosque architecture, spatial characteristics, Modern and Contemporary Mosque, Ornamentation and Iranian Mosques.

ÖZ

Camiler sadece ibadet için bir yer değil aynı zamanda manevi bir boşluk ki orada müslümanların yalnız olarak tanrı ile kalarak iç huzura ulaşırlar.islamın bilinen ilk dönemlerden itibaren bu güne dek camilerin mekansal özellikleri mekan organizasyonları görünümü açısından pek çok değişiklik gerçekleştirmiştir.Dünyadaki bütün camilerin araştırma analizi mümkün değildir. Araştırmacıların iran başkenti Tahran ile sınırlı kalmak koşuluyla yaptığı araştırma daha kesin bir çalışmadır. Tahranda bu araştırmada 9 cami seçilerek durum çalışması yapılan modern çağdaş dönemlerde iran camilerinin manevi özellikleri esas alınarak incelenmiştir.(1796-2015 AD) İlk bölümde dünyadaki dinlerin tarihi incelenmiştir.Dünyadaki her dinin kendi ibadet yerleri vardır.Dünyada en çok ibrahim dininin takipçileri vardır. İslam dini dünyada var olan en son ibrahim dinidir. Cami islam takipçileri tarafından belirli bir binada islam takipçileri tarafından ibadet ve dua için kullanılır. Bu çalışmanın amacı İranda 1796-2015 tarihleri arasında inşa edilen camilerin iç tasarımı ve manevi özellikleri karşılaştırarak analiz etmektir. Bu çalışma iran camilerinin manevi özelliklerine odaklanarak modern ve çağdaş dönemlerdeki dizayn edilen tahrandaki camileri etkileyen diğer faktörler araştırılmıştır.Bu araştırma literatür Çalışması kullanılarak gerçekleşti, aln gözlemi ve olay çalışması karşılaştırıldı. Böylece onun amaçları için niteliksel bir metodoloji üzerinde çalışıldı.Bu çalışmada sınırlı olarak İran camilerinin mekânsal özelliklerinin değerlendirilmesi ve 150 yıllık sınırlı zaman dilimi içerisinde dizaynını etkileyen faktörler ele alındı . Tahran vaka çalışması olarak bu araştırmada seçildi ve 9 cami rastgele seçilerek araştırıldı. Dünyadaki camilerin teorik açıklamaları ise ikinci bölümde mevcuttur. Buna bağlı olarak değişik

dinler ilk olarak çalışıldı. 3. Bölümde ise iran camilerindeki mekânsal eşyaları mimari stilleri açısından etkileyen faktörler ele alınarak, iranın değişik tarihsel dönemleri ,yönetimi ,politika ve iran kültürü ise birinci bölümde çalışıldı. Camiler ile bireysel incelendi ve daha sonra he r sınıflandırma sonunda analiz edilip karşılaştırıldılar.Erken modern cami kategorisi(1879-1963) QAJAR Mimarisi(1879) ve Birinci pahlavi(1925) dönemleri analiz edildi.Bununla birlikte yüksek modern dönem kategorisi(1963-1998), 2. Pahlavi mimarisi(1963)ve islam cumhuriyetinin erken dönemi(1979) çalışıldı.Son olarak çağdaş camiler kategorisi(1998-2015) , islam cumhuriyeti cami mimarisi atrtışıldı.Her kategoride 3 tane rastgele cami seçilerek tartışılmıştır.5. bölüm; sonuç bölümü olarak analiz edilen her esas kategori karşılaştırıldı ve son olarak da cami sanatının etkileri ifade edildi.Bu çalışma gösteriyor ki cami sanatına karşı son 150 yılda büyük dinamizim gösterildi ve iran 3 kategoriye ayrıldı.Erken modern çağın ortalarından itibaren Qajar, camilerin dizaynını geleneksel plana göre değiştirilerek, birinci pahlavinin başlamasıyla camilerin inşaasında modernleşmeye doğru eğilim göstermiştir.Yüksek moden çağı ise ikinci pahlavi saltananı yeni bir formda islam mimari modernizmini ortaya çıkardı.İslam cumhuriyet camilerinin başlamasıyla ,gelenekselciliğe doğru bir eğilim başladı. Çağdaş dönemde islam devleti camileri güncellenerek daha da modernize edildi ve sosyal ihtiyaçlar için uygun hale getirilerek yeni fonksiyonlar kazandı.Bu çalışma gösteriyor ki cami sanatına karşı son 150 yılda çok büyük dinamizimler ortaya çıktı.Bununla birlikte camilerde esas gereklilikler hala daha aynı ve estetik anlayış , inşaat teknikleri ve materyalleri, diğer aynı faktörler sonucunda İran-Tahranda yeni cami görünümü oluştu.

Anahtar Kelimeler: Cami mimarisi , mekânsal karakteristikler , Modern ve çağdaş cami , süsleme ve iran camiler.

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Chapter 1

INTRODUCTION

The differences existing in modern and contemporary mosques of Iran and previous Islamic architecture, and also the changes occurred up to the contemporary period have been inspirations to research about spatial characteristics of Iranian Mosques. Especially focusing on spatial characteristics of the mosques and introduction of the factors effective on their design.

This chapter will briefly describe about conceptual and methodological aspects of the thesis. Background of the research will be defined. Then problem definition, aims and objectives will be explained. The thesis methodology will follow at the last part of the chapter.

1.1 Background of the Study

One of the original tendencies of human has tendency to praying and praising of a metaphysical power. There are different religions in the world such as Judaism, Christianity, Buddhist, Islam and so on. Common aspect of praying among all religions, is necessity to a building special for fulfillment of praying ceremonies, such as temple, mosque, church, shrine and so on (Frishman & Uddinkhan, 1994).

Along with the entrance and spread of Islam and hence Islamic architecture in Europe, Africa and Asia, several mosques were built in all over the world. Therefore, mosques are an outstanding and inseparable example of the Islamic Architecture (Aminzade,

2004). Study on the architecture of the contemporary mosques may be essential for studying of progresses and changes of the Islamic Architecture.

The book written by Arthur Pop, named by “Study on Iranian Art” in the year 1957 and Andre Godard “Art of Iran” in the year 1998, and thereafter, the book of Mohammad Karim Pirnia in the year 2005, under title of “Stylistic of the Iranian Islamic Architecture”, have been the earlier books that have been published about history of architecture of Iranian Islamic Buildings. The book of “Analysis of Architecture of Iran Mosques” in the contemporary period of time, written by Reza Shaterian was published in the year 2011. This book is one of the first books that has studied the contemporary architecture of Iranian mosques.

Nowadays, several scholars have researches on contemporary architecture of Iran. These researches based on survey, observation and case studies. In the book of Hasasn Soltanzadeh in the year 2005 with name of “A view on the majors of contemporary architecture in Iran”, he divided and studied the Iranian Architecture as from year 1750 up to 2004 based on architecture styles of the west.

The most comprehensive book in relation to history of contemporary history of Iran was printed in the year 2013 by Vahid Ghobadian named by “Stylistic and Theoretical Fundamentals in Contemporary Architecture of Iran”. In this book, a description about Iran Architecture as from year 1796 up to 2012 has been studied. The book “Architecture of Modern and Contemporary Mosques” by Mohammadreza Pour Jafar, Aryan Amirkhani and Mohammadreza Lilian has been written in the year 2011. In this book, a description and explanation about mosques of the modern period and Islamic contemporary have been mentioned.

A number of articles, especially during the last decades have been published in various journals about architecture in Iran by specialists of the technique of writing. In each one of these articles, contemporary architecture of the Iranian mosques have been analyzed in a special viewpoint and in a definite limit of time. But spatial characteristics of contemporary architecture of Iranian mosques and factors effective on designing of the contemporary mosques of Iran have not been specially studied. Moreover, the changes gained in designing of architecture of Iranian contemporary mosques, especially in capital of Iran, Tehran City, as from year 1796 up to now, has not been evaluated.

1.2 Problem Definition

Mosques as one of the most outstanding religious buildings in Islamic architecture, and also in the Islamic countries, are usually applied as one of the religious symbols of that country (Nasr, 2010). Architecture of mosques has been usually changed in different periods of history that these changes are obvious in spatial characteristics that any research has not been fulfilled in relation to the factors effective on designing of architecture of spatial characteristics of Iranian mosques.

Iranian architectural designs underwent some changes and progresses in the modern and contemporary periods beginning from the end of 18th century. In order to identify these changes, the spatial characteristics of the mosques should be recognized followed by the study of effective factors on their design. (Figure 1.1)

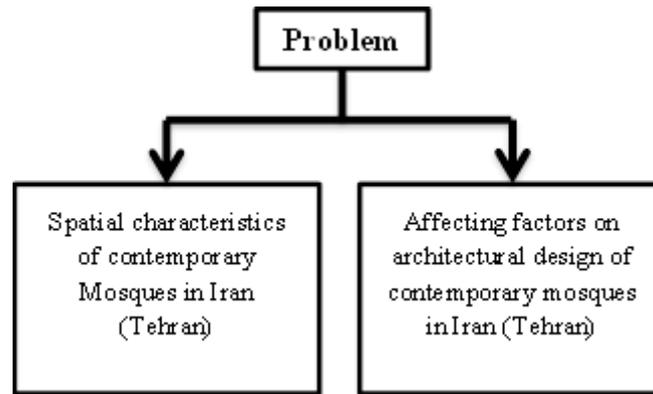


Figure 1.1: Chart of Problem Statement

1.3 Aim and Objectives

Designing of architecture of the Iranian mosques in modern and contemporary period (1796 up to now) has differences and similarities in its spatial characteristics. The aim of this research in the first step is introduction and study of spatial characteristics of Iranian mosques and in the second step, distinguishes of factors effective on designing of architecture of Iranian mosques.

With consideration to the aforesaid cases, the main question of the research is:

1. What are the factors effective on Modern and contemporary architecture of Iranian mosques?

The sub questions of the research consist of the following cases:

1. What are spatial characteristics of architecture of Modern and Contemporary Tehran Mosques?
2. How the governments attitudes, social conditions and architectural tendencies are effected the mosque architecture in Tehran, Iran?

1.4 Research Methodology

In this research, study has been fulfilled through information of books, articles and field observation and evaluation of case studies in the capital of Iran, Tehran City. In

this research, qualitative research plan has been used in order to introduction of the spatial characteristics of contemporary architecture of the Iranian mosques and understanding the factors influencing on them. As the subject of this research has occurred during a 150-year of time limitation and in a geographical and cultural domain, therefore the different governmental, political and cultural influences in relation to the architectural developments have been discussed and analyzed.

The derived information from these documents are evaluated through a qualitative approach to determine the quality of spatial characteristics of Mosque architecture. This research includes collecting the data from the literature, field survey, and comprative.

This research has been commenced by literature review. Through related to designing of architecture of Iranian mosques: books, articles, thesis and websites have been used to gain a general understanding of spatial characteristics of Iranian mosques and the factors influencing on designing of architecture of Iranian mosques. (Figure 1.2)

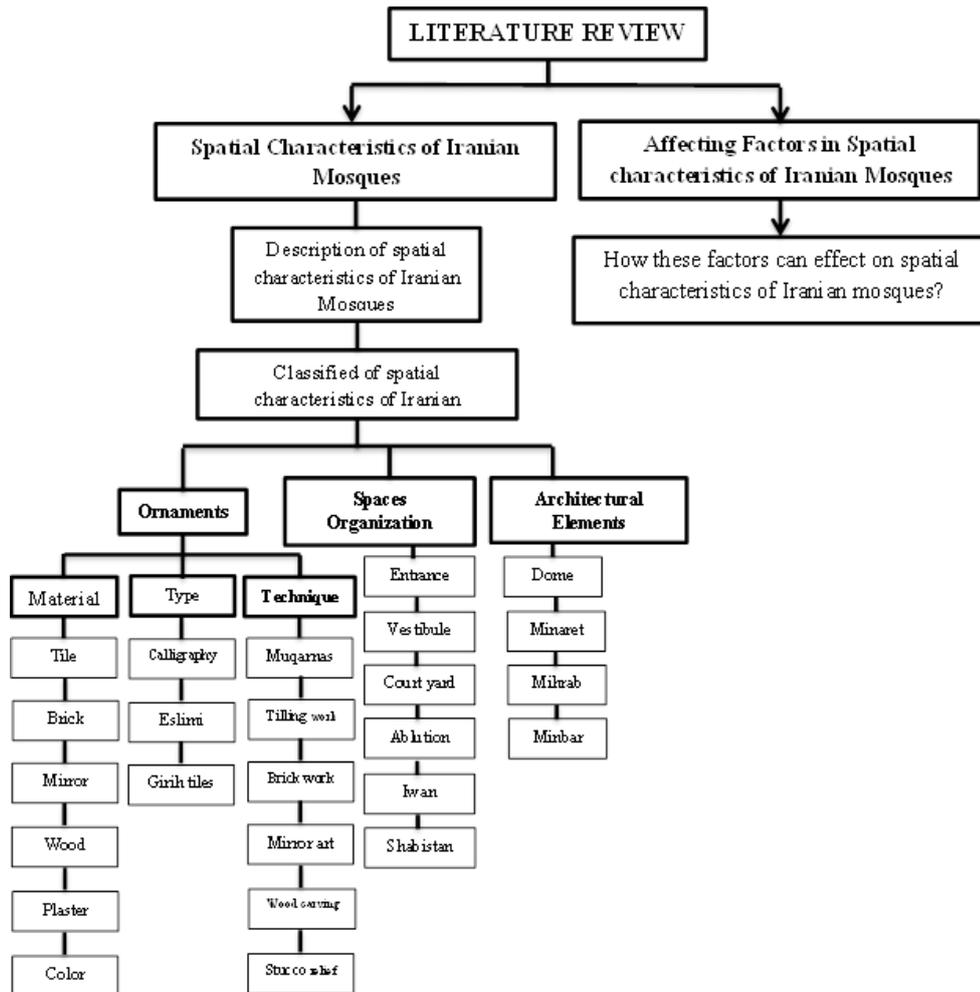


Figure 1.2: Summary of Literature review

Therefore, the Comparative Method has been used for practical researches in the present study, for this purpose, 9 randomly mosques during modern and contemporary history (1796 up to now) in the capital of Iran, Tehran City have been identified and selected.

For selecting and analyzing case studies four methods which are subcategories of qualitative study design have been used as well. These four methods include: History Research, Documentary Analysis, Observation (Field survey) and Case Study. (Figure 1.3)

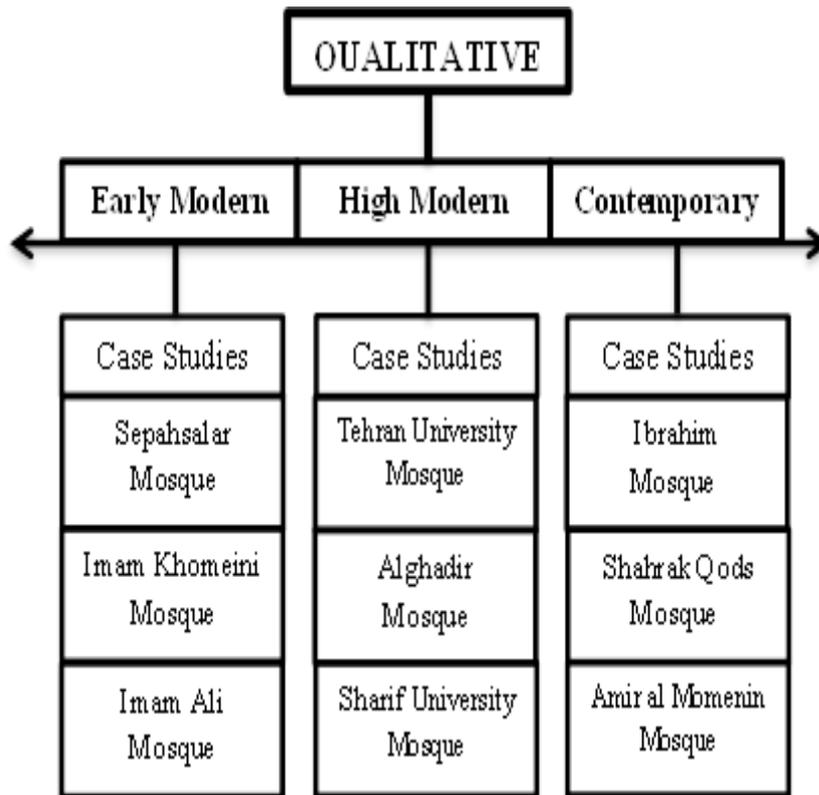


Figure 1.3: Chart of Methods and Achievement of case analysis

The information gained by the study resources has been studied through a quality procedure for determination and evaluation of changes in designing of modern and contemporary mosques (1796 up to now) in capital of Iran, Tehran City. Also can say that by Analysis Method has been used information and case study of this research. This research consists of data collection through books, articles and field observation of case studies is by comparative method that has been evaluated for finding the changes in designing of contemporary mosques in Tehran.

1.5 Limitations

With consideration to selection of the mosques in the modern and contemporary period as case study in this research, Iran country having an enrich history in the field of building of mosques and Islamic Architecture that its modern and contemporary period is in about 150 years of time limitation. Tehran as capital of this Islamic country has suitable basis for studying and evaluation of the changes gained from the

contemporary architecture of Iranian mosques. Therefore, case studies of this research have been selected from Tehran City. Meanwhile, the modern and contemporary architecture of our Country (Iran) has been commenced as from the end of the 18th century and different governmental periods have been established in this country (Ghobadian, 2013). About 60 mosques have been built in Tehran City during modern and contemporary period (since 1796 up to now) (Tehran municipality, 2015), whereas study and analysis of all mosques may not be possible, therefore, randomly mosques of each period have been evaluated in the present research. (Figure 1.4)

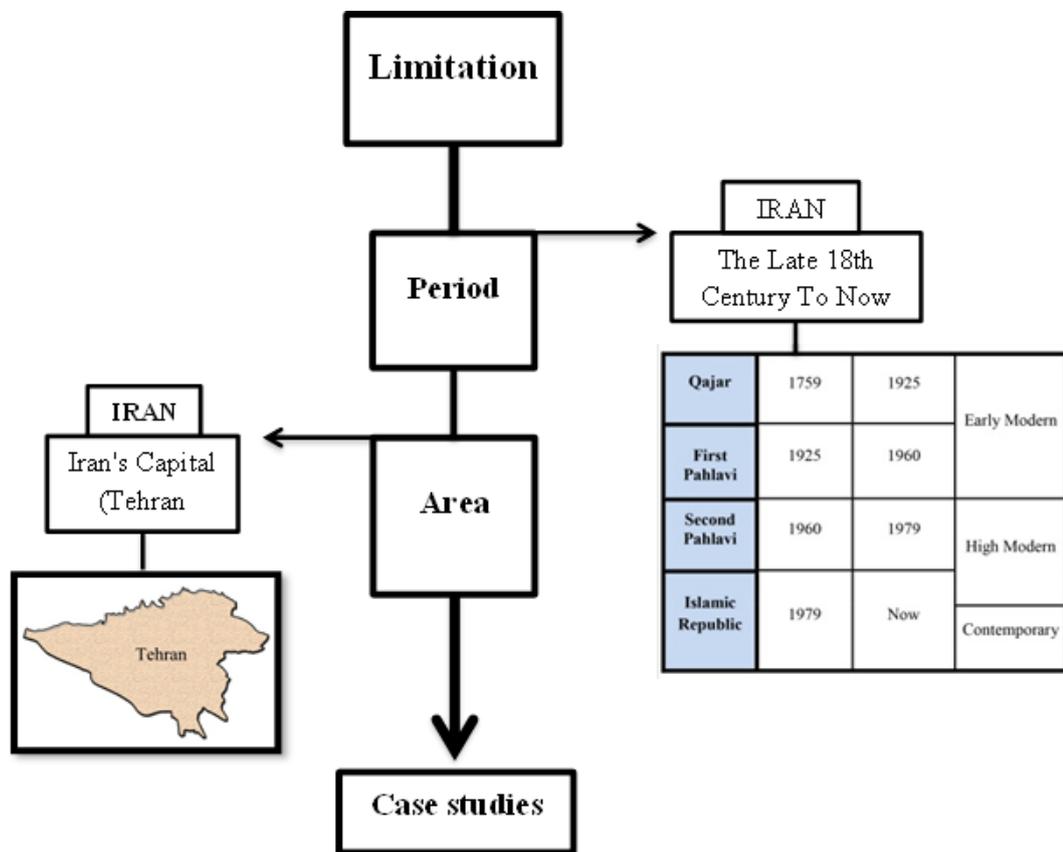


Figure 1.4: Limitation Chart about case studies

1.6 Structure of the Thesis

First chapter is Introduction. In this chapter background of the study, problem definition, aim and objectives, research methodology, limitation and structure of the thesis are explained.

The second chapter is spatial characteristics of Mosques and consists of five parts. The first part has sought to explain different types of religions in the world. The history of mosque architecture in Islamic world and their spatial properties are respectively explained in the second and third parts. The fourth part is about the form of mosques in the world.

The Chapter 3 of this research is about the process of evolution and progress of the mosques of Iran (1796- Today) and factors effective on changes of designing of architecture of the mosques that in the first section of this chapter. The factors effective on designing of the Iranian Mosques have been evaluated. In the second section, the evolution process of spatial characteristics of the Iranian mosques has been studied.

The Chapter 4 in this research is the section of evaluation of the collected information about designing of architecture of mosques in modern and contemporary period of Tehran City. In the first step, architecture of modern and contemporary mosques have been divided into three time periods. In the second step, three mosques have been selected in each period as case study in Tehran City, and have been analyzed and evaluated in comparative method. Also, in each time classification, a discussion has been presented about differences and similarities of mosques and factors effective on its architecture.

At the end of the Chapter 5, the conclusion gained of this research has been stated. In conclusion, the development of mosque architecture in Tehran is evaluated.

Chapter 2

SPATIAL CHARACTERISTICS OF MOSQUES

In this chapter, the world's religions have been explained in a general frame of History of Mosque Architecture in the Islamic World. Thereafter, for the primary recognition of the spatial characteristics of contemporary mosques in the world, their classification and introduction have been presented. The classification of spatial characteristics of contemporary mosques consists of architectural elements, space organization and ornamentations. On the same basis, architectural elements of mosques have been introduced. Thereafter, the researcher have paid attention to space organization of the world mosques. Moreover, after introducing the spaces, their hierarchy have been explained. It is also necessary to mention that the ornamentation part has been classified and introduced into three classes consisting of material, type and technique. The form and typology of the world mosques were finally studied.

2.1 General Definition of Religions in the world:

Philosophers have studied the nature and effects of nature in all aspects, in their viewpoint, tendency to praying are one of the primary tendencies of human. Human is naturally needed to be supported by an infinite power. During the years, this need has caused to produce different religions. Religion is one of the words that is used a lot by people and usually ones is called religious who proves a god for the world and performs some special actions for satisfaction of the God. (Burkhardt, 2009) The heavenly religions are a collection of ideas and practical and ethic orders that have been brought by the prophets from the God for guidance and direction of people.

The old and permanent bondage of humanity and religion is considered as one of the identity factors in the world. Religion has lived its life through different human societies as main component. Meanwhile, its place, role and function have changed with the fast growing effect of time and environment on human being. (Grube & George michell, 1995)

There are different heaven religions in the world such as Judaism, Christianity, Buddhist and Islam. Each one of them has special place for praying (Chebel, 2013). Amongst the greatest religions of the world are Abrahamic religions including Islam, Christianity and Judaism with one common origin. Buddhism, Hinduism and Confucianism are other world's great religions. There are still other ancient religions such as Zoroastrianism, Mithraism, Manichaeism and etc. (Grube & George michell, 1995)

More than 21% of the world population is the adherent of one of Abrahamic religions which are clearly seen as originated from one common spiritual source. Monotheism is the basic principle of all these religions in which God is recognized as the creator and origin of ethics. All Abrahamic religions claim to be monotheist and believe in the worship of One God, despite His different names (God, Allah, Jehovah, and Lord). They all believe that God has created the world and all rules and laws come from Him. (Khaloose, 1998) (Figure 2.1)

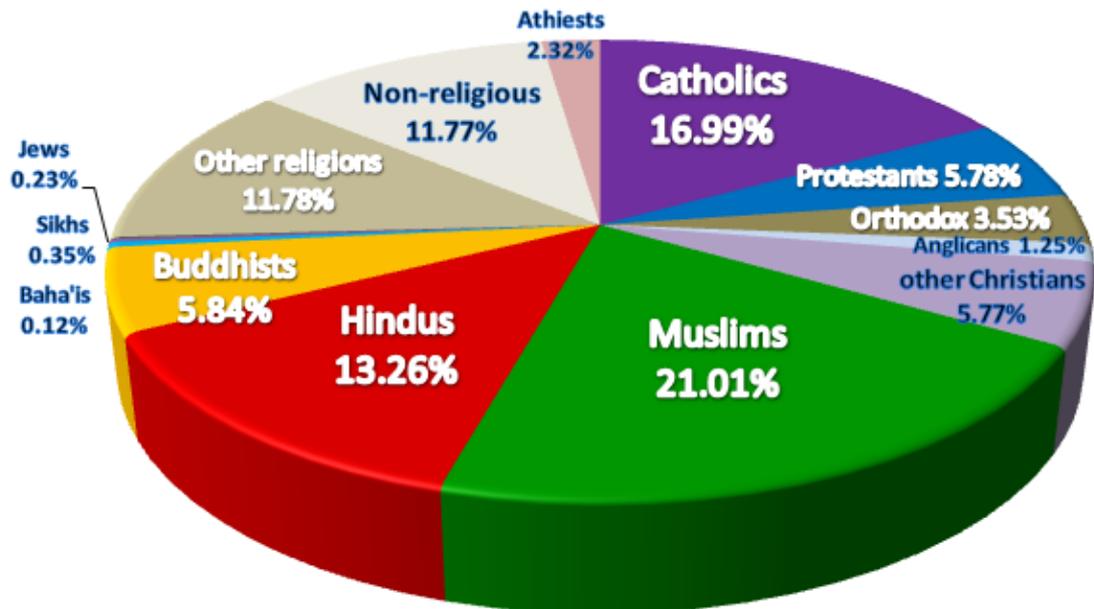


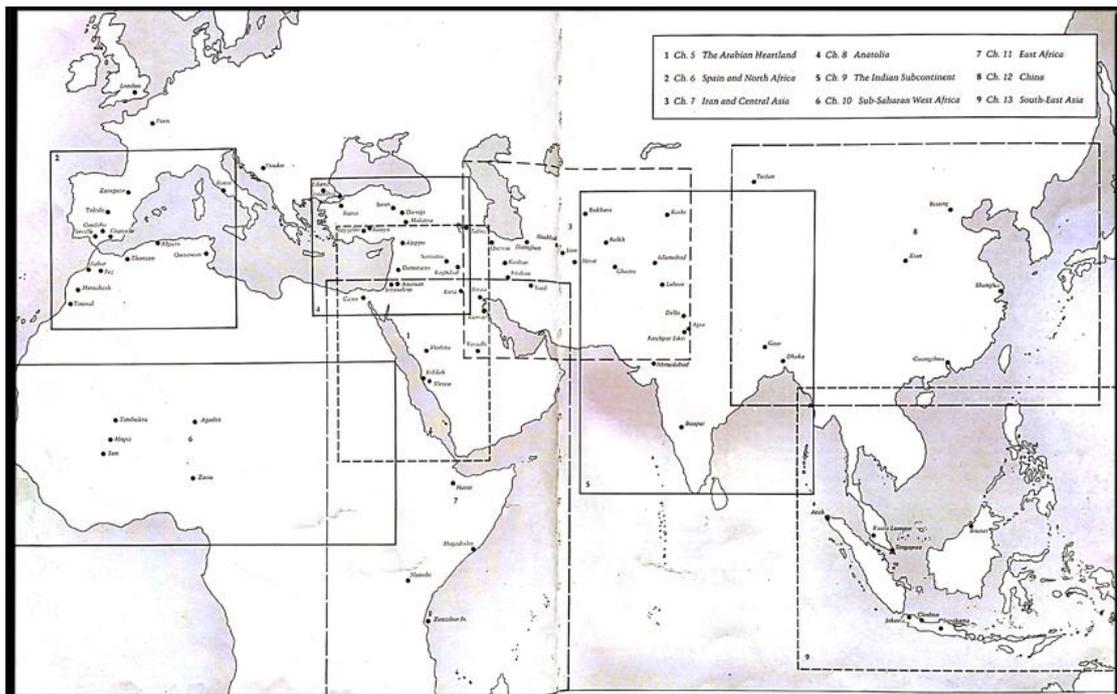
Figure 2.1: World religions chart (Khaloose, 1998)

Since Islam is the last religion on earth and mosque is a place peculiarly built for this religion, they are both the target of the present study.

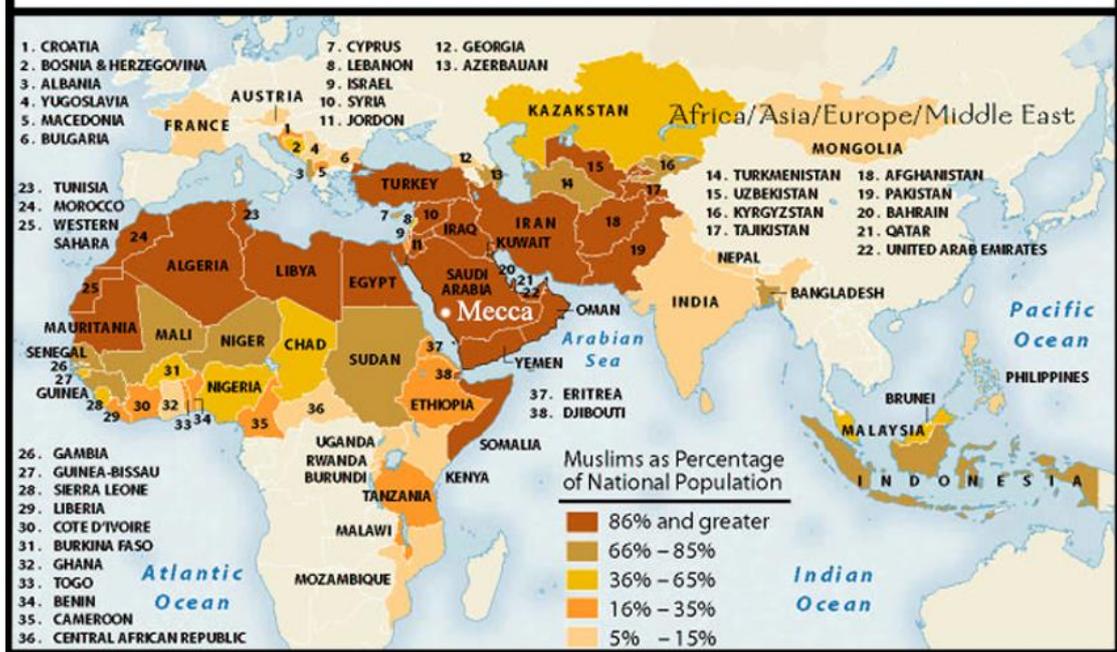
2.2 History of the Islamic religion:

Islamic history began from the migration of Muhammad the son of Abdullah in 7th century (AD). According to the Muslim belief, Muhammad is a messenger from God and Quran is his accompanied miracle. The time of Muhammad's migration from Mecca to Medina (thirteen years after his election) had been in September, 622 (AD). During this time, Muslims tried to invade the Romans and conquer Syria. The conflict continued until the time of second caliph Umar, who succeeded to conquer Damascus and Yarmouk which then led to the complete invasion of Syria and Taurus Mountains in Asia Minor. Thence, Umar sought to expand his conquests in Egypt and North Africa. During the time of Prophet Muhammad, the western hemisphere of Arabian Peninsula was in the hands of Muslims. However, the entire peninsula was conquered at the time of Abu Bakr. Muslims conquered many areas from the Transoxiana to North Makran Sea, the entire Iran (except northern coasts), Iraq, Syria, Egypt and

Libyan coast during the Umar's ruling time. Moreover, other areas spread from near Aral Sea and Caspian Sea borders to Black Sea (east of Asia Minor and south of Caucasus), south of Aswan and a large portion of Libyan coast were also possessed by Muslims during the ruling time of Uthman. At this time, Islamic borders included Jordan, Syria, Palestine, Lebanon and Egypt. The North-West of Africa up to the Occident and Andalusia was also conquered during Umayyad period and added to Islam's Oriental conquests. Transoxiana, Indian subcontinent, Far East, south-east of Asia and lastly, America gradually tended toward Islam, too (Krishman, 2005). (Figure 2.2)



Islamic religion in the world



Islamic Religion around the World with percentage

Figure 2.2: Islamic religion around the world (Khaloose, 1998) and (Frishman & Uddinkhan, 1994)

2.2.1 Basic requirements of Islam religion

The several Pillars of Islam are basic acts in Islam, considered mandatory by believers and are the foundation of Muslim life. The Muslims agree on the essential details for

the performance and practice of these acts. These Pillars including cleaning, prayer, qibla axis, gender separation, placement of required spaces in mosques.

Cleaning in Islam Religion:

Islam religion has given a great attention to cleanliness and made it the indispensable condition and prerequisite for worship. Cleanliness is therefore the precondition of some sorts of worshipping; it is also an essential condition for health and hygiene. Besides, it increases the livelihood.

In that regard, it is written in Qur'an that "For Allah loves those who turn to Him constantly and He loves those who keep themselves pure and clean." In addition, Muslims are required to be clean when touching and reading the Qur'an; "Which none shall touch but those who are clean." In Islam for cleaning before prayer, believers should be given Wudu. Wudu is the Islamic procedure for washing parts of the body using water, typically in preparation for formal prayers (salat), but also before handling and reading the Qur'an.

The Qur'an insists that the believer maintain cleaning themselves: "Believers! When you prepare for prayer wash your faces, and your hands (and arms) to the elbows; rub your heads (with water) and (wash) your feet up to the ankles. If you are ritually impure bathe your whole body." (Khaloose, 1998)

Salat (Prayer):

Salat (ṣalāh) is the Islamic prayer. Salat consists of five daily prayers according to the Sunna; the names are according to the prayer times: Fajr (dawn), Dhuhr (noon), 'Aṣr (afternoon), Maghrib (evening), and 'Ishā' (night). The Fajr prayer is performed

before sunrise; Dhuhr is performed in the midday after the sun has surpassed its highest point; Asr is the evening prayer before sunset; Maghrib is the evening prayer after sunset and Isha is the night prayer. All of these prayers are recited while facing toward the Kaaba in Mecca and they form an important aspect of the Muslim Ummah. Muslims must wash before prayer; this washing is called wudu. The prayer is accompanied by a series of set positions including, bowing with palms on knees, standing, prostrating and sitting in a special position. A Muslim may perform their prayer anywhere, such as in offices, universities, and fields. However, the mosque is the more preferable place for prayers because the mosque allows for fellowship (Shahrjerdi, 2009).

Qibla axis:

One of the items effective on designing of mosques, is Qibla. It is an idiom with the meaning of the house of God (Kaaba). (Figure 2.3) As the main aim of construction of mosques is attracting the Muslims to a common place in where people are close to God and pray in a common direction toward Qibla, therefore Muslims pray toward it stipulating they pay attention to the Qibla. Usually, in the point where the Qibla axis joins the line of mosque wall, an oriented niche is located as Mihrab (Altar). Mihrab is one of the elements of mosques and in fact combination of art and Islamic architecture (Kahera & Abdulmalik, 2009).

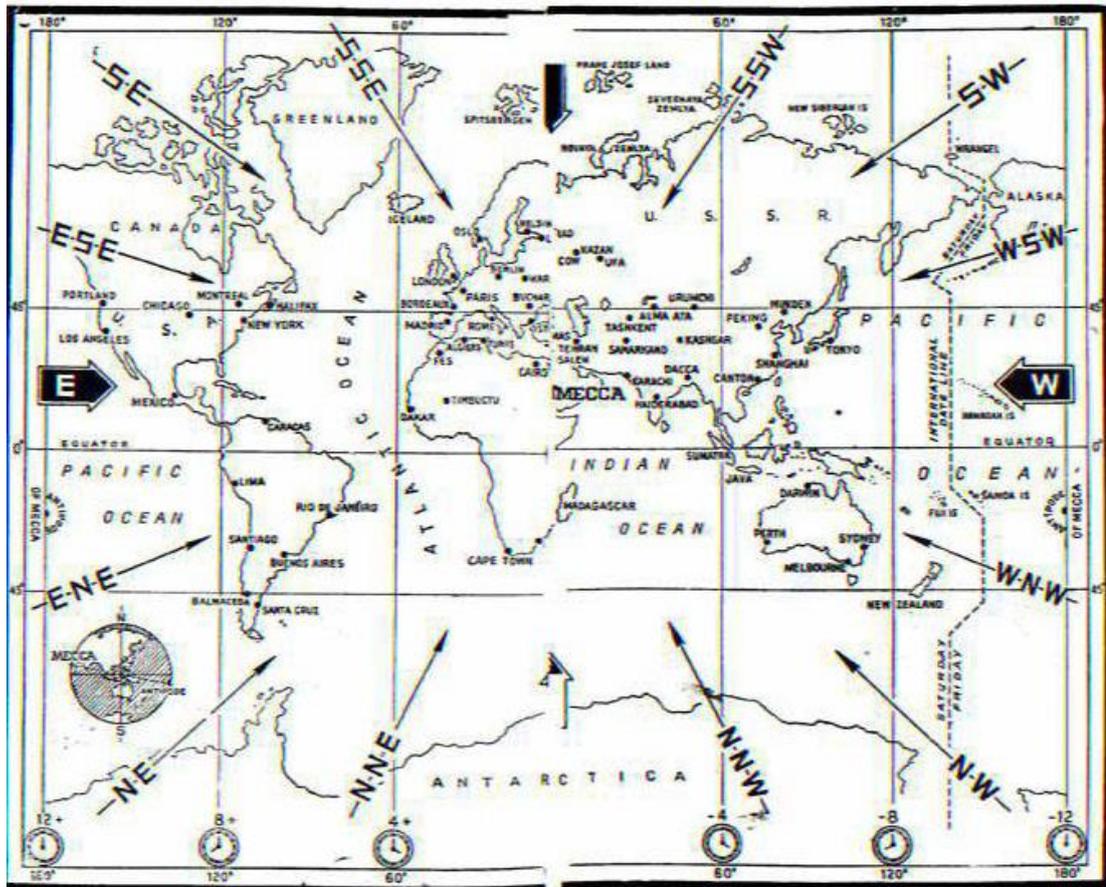


Figure 2.3: Qibla Direction in the World (Kahera & Abdulmalik, 2009)

Gender separation:

Muhammad said: "I know that you women love to pray with me, but praying in your inner rooms is better for you than praying in your house, and praying in your house is better for you than praying in your courtyard, and praying in your courtyard is better for you than praying in your local mosque, and praying in your local mosque is better for you than praying in my mosque." Muhammad did not forbid women from entering his mosque in Medina. In fact, he told Muslims "not to prevent their women from going to mosque when they ask for permission" (Urey, 2010).

It is recorded that Muhammad ordered that mosques have separate doors for women and men so that men and women would not be obliged to go and come through the same door. He also commanded that after the Isha' evening prayer, women be allowed

to leave the mosque first so that they would not have to mix with men. But it has not been reported that there was any barrier between men and women in the prophet's mosque. (Kahera & Abdulmalik, 2009)

In line with the Islam emergence, it became unusual for women to worship in mosque because of the male fear of immorality between sexes. Many mosques today will put women behind a barrier or in a separate partition or in another room. Therefore, mosques have mainly two separate parts; one for men and the other for women (Urey, 2010).

Placement of required spaces in mosques:

The first mosque was built in 662 (AD). in Muhammad's home. It consisted of one courtyard, a space for praying and a place for living. (Zohreh Roohfar & Javad Neyestani, 2011)

There are normally eight common characters (element and space) in the world mosques. The first is the entrance portal which is gate between the outside world and the private world of Muslims. The next space is the courtyard as a public place that is used for services. Ablution facility is one of the important spaces in which the ablution act (washing and cleaning) is performed and is located at the center of courtyard. The most important space in mosque is a place for praying (shabistan). Qibla (the direction of the Kaaba) is distinguished by mihrab or a niche in wall. Mihrab is one of the most important elements of the mosque located in the praying hall. Imam stands for prayer in front of it. Another element is minbar that is usually located at the right of mihrab and is made of a few stairs upon which Imam sits to deliver sermon. One of the most recognized elements of mosque is its minaret.

Minaret is an elevated tower and the turning point of mosque that calls people for prayer. The most important element of the mosque is its dome which puts a roof over the praying hall and has different forms and shapes in different countries with different cultures and customs (Urey, 2010). (Figure 2.4)

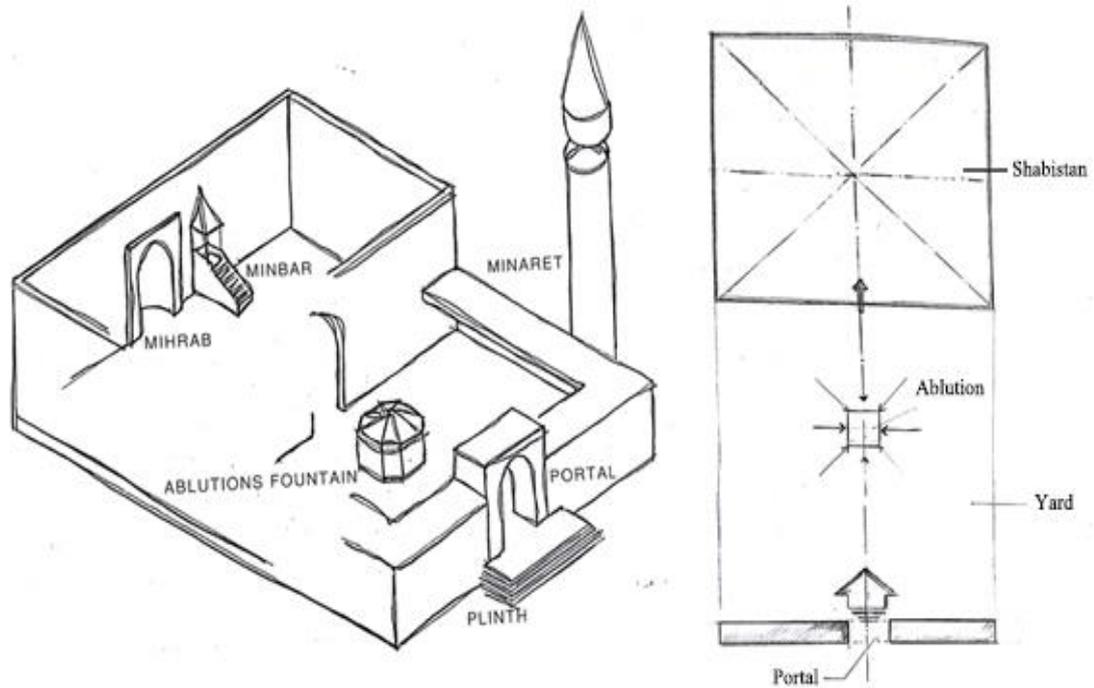


Figure 2.4: Mosque form in the world (draw by author based on Frishman & Uddinkhan, 1994)

2.2.2 Development of mosque architecture

Construction of mosques began from the 7th century (AD). Mosques have various architectures. The six main forms of mosque architecture are as follows: columned (hypostyle) mosques (Arabian), iwan mosques (Iranian), central-dome mosques (Turkish), Indian, Chinese and south-east Asian mosques. (Khan Academy, 2015) & (Khachan, 2008).

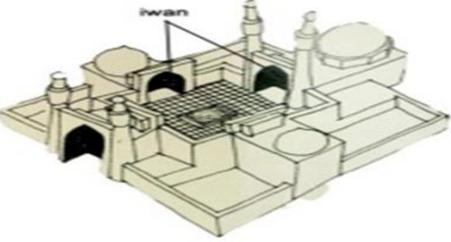
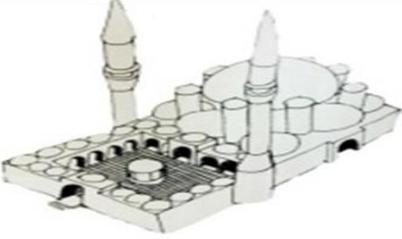
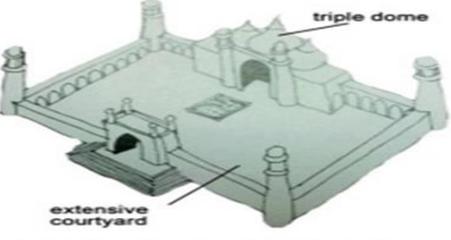
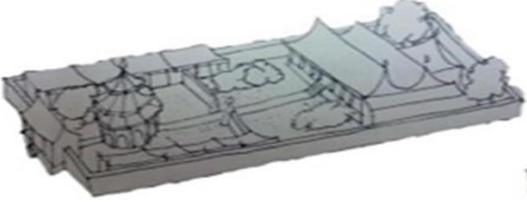
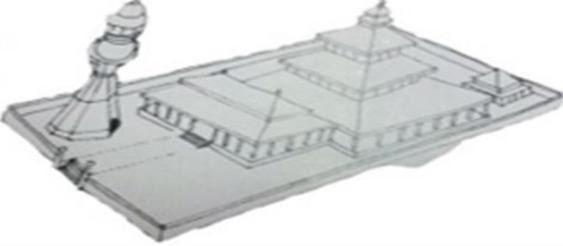
Name of Form	Figure of Form
Columned Mosque (a)	
Iwan Mosque (b)	
Central-dom Mosque (c)	
Indian Mosque (d)	
Chinese Mosque (e)	
South-east Asian Mosque (f)	

Figure 2.5: Development of mosque architecture in the world Frishman & Uddinkhan, 1994)

Columned (hypostyle) mosques (Arabian mosques):

The first mosque was inspired by Muhammad's house. Columned (hypostyle) mosques were widely spread through the entire Islamic lands. The term hypostyle means under column. This plan allows for construction of larger spaces. Columned (hypostyle) mosques consist of a large courtyard and a large roofed hall using columns with regular distances (Flood, 2001). (Figure a 2.5)

Iwan mosques (Iranian mosques):

Columned halls were common in most of Islam primary mosques. Since the early 11th century (AD), a new form was introduced into the mosque construction and mosques with iwan were built. They firstly appeared with two iwans and after a short time changed into four-iwans shape. Iwan is a vaulted space that at one side opens toward the courtyard. Iwan was being made in Iran before Islam after which it was added to the mosque architecture. The qibla's iwan, in four-iwan mosques, is usually the largest and the most ornamented that emphasizes the qibla's direction. Although iwan has been originated in Iran, four-iwan mosques widely expanded all around the world from India to Cairo and etc. and replaced many columned structures in most Islamic countries (Khachan, 2008). (Figure b 2.5)

Central-dome mosques (Turkish mosques):

Mosques with central dome were introduced by Ottomans in 15th century (AD). These structures consist of one large praying salon over which a central dome is located which is usually surrounded by small domes (half-dome). Construction of these mosques became common in Anatolia peninsula or Asia Minor. Because of cold weather in Turkey, the praying salon was the center of attention and focus in mosques with central dome. Thus, architects attempted to separate this salon from the outside

and began to enrich the interior spaces using the great central dome. This type of mosque was then spread toward Egypt and east Europe. The main characteristic of Turkish mosques is a large gray dome surrounded by some small half-domes and thin minarets (Khan Academy, 2015). (Figure c 2.5)

Indian mosques:

Islamic architecture was begun in India in 13th century (AD). It was a path for Islam propagation from Arabia to Iran and entered India through central Asia. For the same reason, Iranian and Arabian Islamic architecture entered the India's mosques. The courtyard was a part of Indian tradition and an appropriate place for Indian lifestyle and culture. Due to their spaces, closed and surrounded by iwans and the central courtyard, the mosques with columns and iwans were strange to Indian culture. They needed a shiny and spacious environment. Therefore, following the Turkish style, Indian mosques included a large central courtyard and a central dome surrounded by half-domes, which was combined with Indian culture and tradition (Urey, 2010). (Figure d 2.5)

Chinese mosques:

Islam entered China in 7th century (AD). Upon its emergence in China, Islamic architecture was an imitation of Arabian mosques, which was gradually combined with Chinese traditional architecture. The architecture of Chinese mosques is inspired by the structures and patterns of the country's temples and important buildings. Merging the minaret, portal, iwan and dome roof is a prominent feature of Chinese mosques. Due to China's climate and culture, this form has been taken after Chinese temples which are normally roofed with small spherical dome (Khan Academy, 2015). (Figure e 2.5)

South-east Asian mosques:

People of south-east Asia got acquainted with Islam during 13th, 14th and 15th centuries (AD). The mosque architecture in this region is inspired by their native architecture. However, the oldest mosques in south-east of Asia were located within the royal palaces and included small praying salons. After the passage of time and development of Islamic architecture in these regions as well as its combination with their native architecture, the mosques' shape changed and they were built as an independent structure. These mosques consist of an elevated shabistan with several roofs and wooden columns as the building's bases. The vertical focus point of this lofty interior space is reinforced by columns that protect lower roofs. These sloping layered roofs meet each other at the highest point by a small skylight (Frishman & Uddinkhan, 1995). (Figure f 2.5)

2.3 Spatial Characteristics of Mosques of the world:

Islamic architecture is an architectural style generated under the influence of Islamic culture. As the name itself implies, Islamic architecture includes a part of world known as Islamic world. The architectural style of these countries has been influenced by Islam ideology over a particular time. Despite all lingual and cultural differences, the identity of Islamic architecture is the same all around the world. (Grube & George michell, 1995)

Due to the existence of different geometrical styles, architectural ideas, climates and cultures, Islamic architecture differs in each region. The world Muslims have all something in common; *mosque*. Mosque is of great important to Muslims and is the center of life and religion all around the Islamic world. Islamic architecture is a part of Islamic art that has been originated as a social, cultural, political and religious phenomenon from Islam. (Pourjafar & Amirkhani & Lilian, 2010)

Mosques in all Islamic countries indicate a concept as a place for praying. This concept is known using spatial characteristics of mosques. Through studying and investigation of some references such as the book under title of “The Mosque” written by Martin Frishman and Hasan Uddin Khan, “Architecture of the modern and contemporary mosques”, written by Mohammadreza Pourjafar, Aryan Amirkhani and Mohammadreza Leilian, and “Architecture of Contemporary Mosques” written by Jim Still and Ismaeil Serageldin, spatial characteristics of mosques in the world are grouped into three as spaces, elements and ornamentation. In the mosques of the world, based on regions, traditions and also origins and foundations of each country, architectural elements, space organization and ornamentations have been used. In this section, researcher have paid attention to general state classification and introduce them (Figure 2.6).

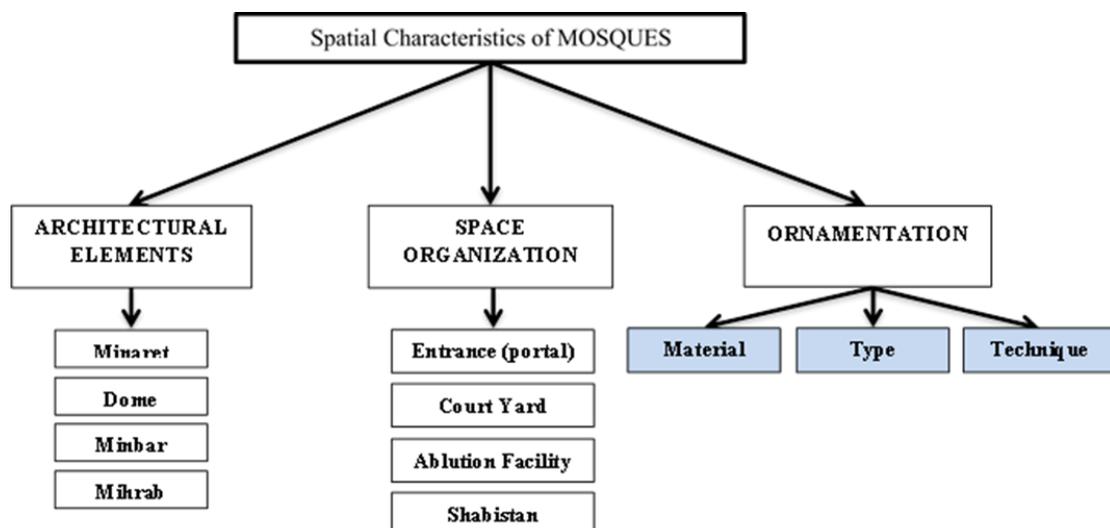


Figure 2.6: Chart of Spatial Characteristics of Mosques

2.3.1 Architectural Elements of Mosques

Mosques are always known by some symbols as elements that each of these elements brings mosques from in mind.

2.3.1.1 Dome:

As the most prominent feature of mosque, dome is always very well-known for its particular Islamic ornaments. Due to its special status and place in mosques as well as its representative role, dome has always been given particular attention and attempt from designers. They have always been trying to expand and magnify this component by using various aspects of Islamic architecture. Dome is a structure which its architecture is similar to a hollow hemisphere. The dome may be imagined as an arch that is produced through rotation around its central vertical axis. Producing of a dome on the main shabistan of the mosque, is one of the most important element of the Islamic architecture. On the other hand, dome is considered as symbol of sky and the cube space below is considered as symbol of the earth. (Kahera & Abdulmalik, 2009) (Figure 2.7). According to the countries' features architecture some mosques cover single dome and some of them with more smaller domes.

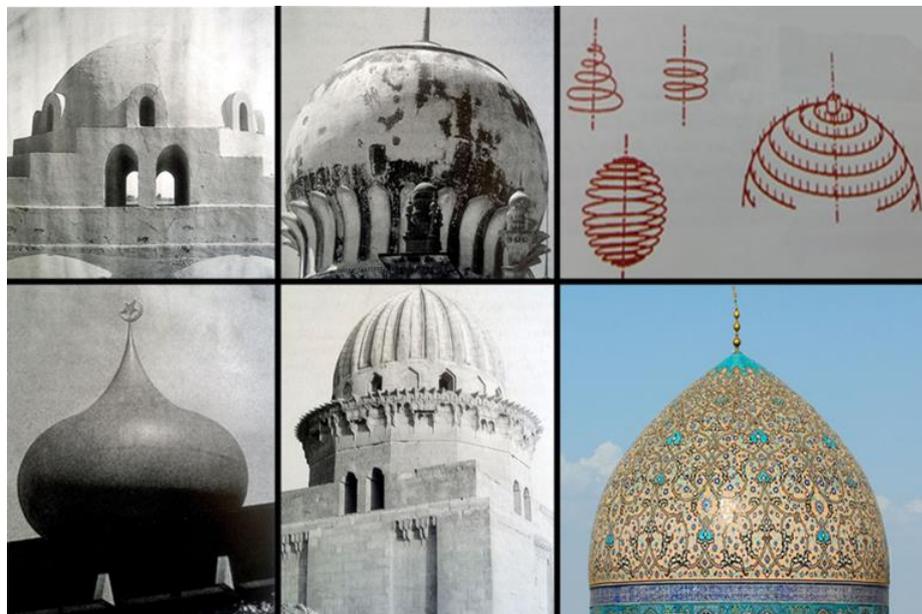


Figure 2-7 Regional Types of Dome (Frishman & Uddinkhan 1994)

Building a dome is not specific to Muslims and has a long history that goes back to pre-Islamic era. It better suits to say that everyone has a special purpose in building

dome. For instance, it is probable that some people understand the dome symbolically. Some other people also simulate the dome structure to human head which is located upon the minarets as his two hands raised toward the sky. However, it is probable that domes have been created for their physical properties for better air conditions or lighting of mosque interior (Qureshi, 1989).

2.3.1.2 Minaret

The person who calls people for praying (Muezzin) needs a place in top and visible where his voice can be heard in around the mosque, this place is located in the architecture of mosques by an element named Minaret. Minaret is the mosque's vertical component that is generally used for calling to pray. Minaret which is also called lamp base literally means a place for light or flame. It is a vertical feature of the mosques of the world. according to the architectural styles of different regions, represented various type of minaret (Nasr, 1987). (Figure 2.8)

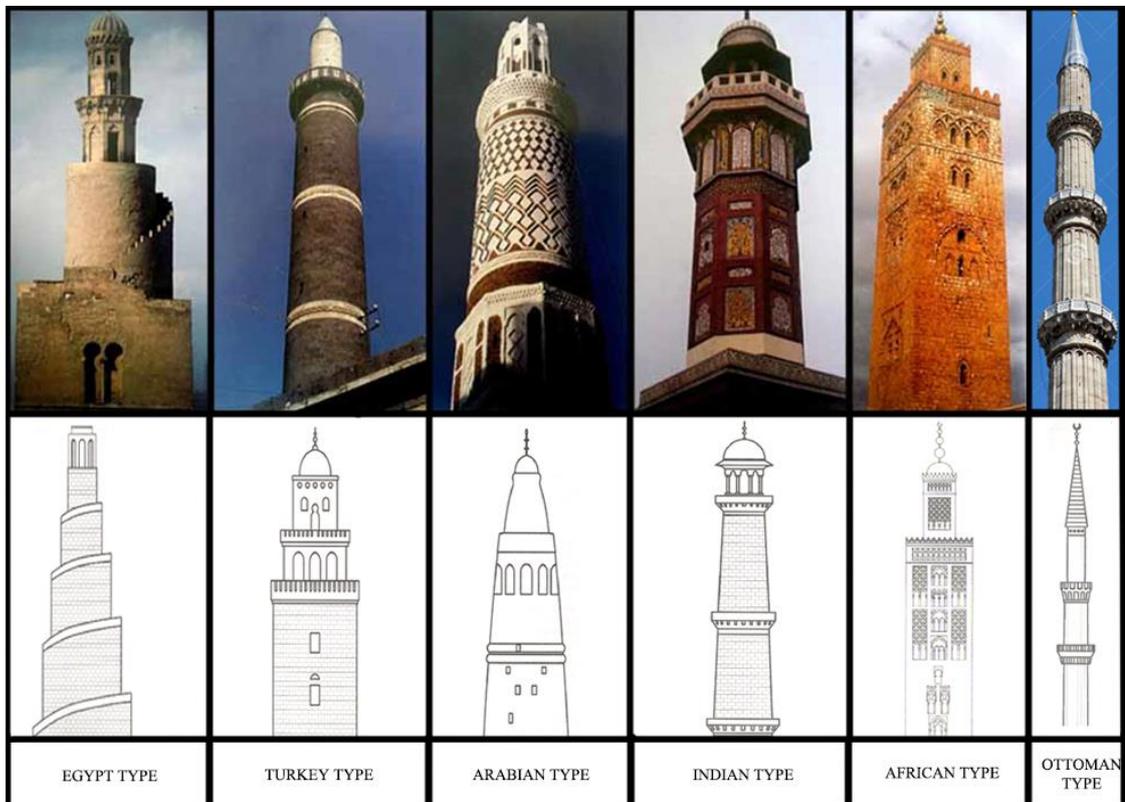


Figure 2.8: Regional Types of Minaret (Frishman & Uddinkhan, 1994)

2.3.1.3 Mihrab (Altar)

Mihrab is from the origin of combat (Harb in Persian Language) with the meaning of fighting with Devil. The Mihrab is a niche section in arched shape that has been located in direction of Kaaba and in addition to its artistic aspects, it has physical specification too, it means that the Imam stands therein on the time of praying and voice of the Imam is dispersed among the prayers, based on the specification of echo (sound echo) (Figure 2.9). Previously, a light or torch was hanged opposite to the Mihrab to be a symbol for “Allah is light of skies and lands” and in fact, Mihrab is a symbol of the God Honor (Zohreh Roohfar & javad neyestani, 2011).

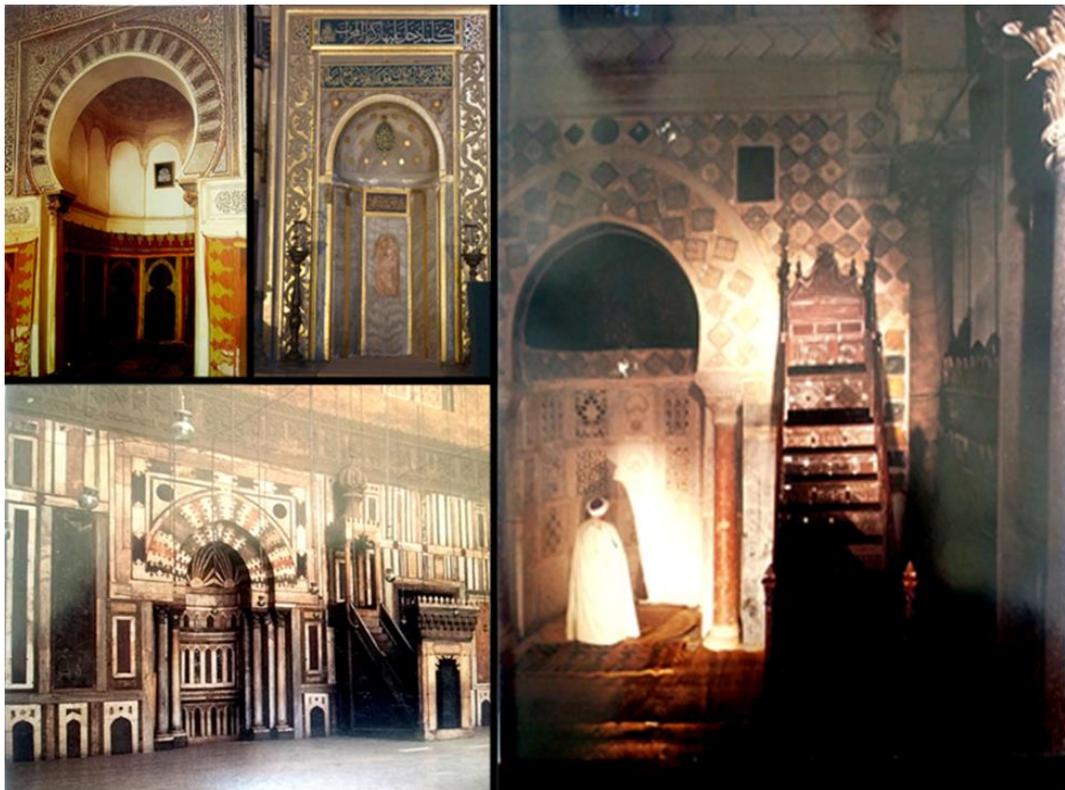


Figure 2.9: Regional Types of Mihrab (Frishman & Uddinkhan 1994)

2.3.1.4 Minbar (Pulpit)

Minbar is as a special position where the Imam or Chaplain sits on it and delivers a speech for the prayers (Figure 2.10). As in the time of speech, the voice of Chaplain

must heard by all prayers and can be seen in all parts of the mosques where the prayers sit there, consequently the Pulpit is built elevated (Kohera 2002).

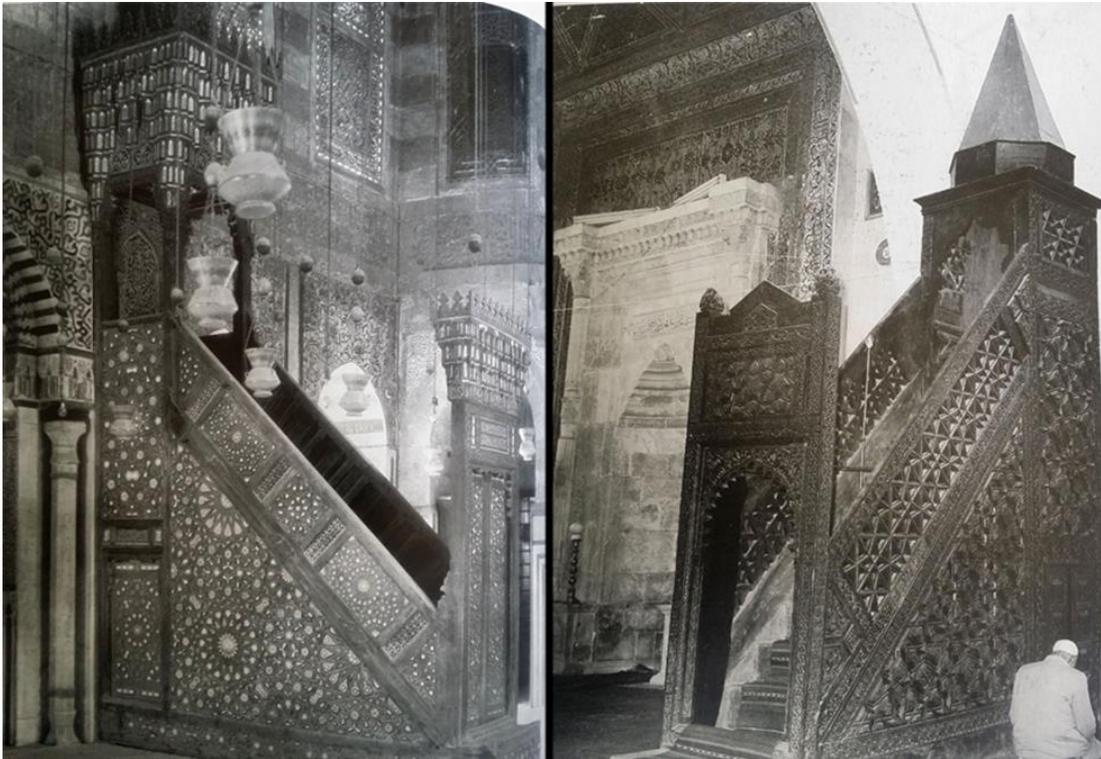


Figure 2.10: Regional Types of Mihrab (Frishman & Uddinkhan, 1994)

2.3.2 Space Organization of Mosques

The mosques of the world have been organized through combination of some spaces with definite application which at first, these spaces are introduced in this section and then the hierarchy of the mosques spaces are explained. The main spaces that have used at mosques at different parts of the world are defined as: entrance, court yard and sahn, a space for ablution and Shabistan.

2.3.2.1 Entrance:

The mosque's entrance door is the sign of selection and confidence and shows the speciality of that place. Majority of entrances have a facade which emphasizes the entering space of the mosque and they are usually differentiated by a minaret toward the sky (Mirmiran, 2009). This vertical element highlights the main portal which is located at the center of entering space in order to accent the entrance act (Ching, 1996). (Figure 2.11)

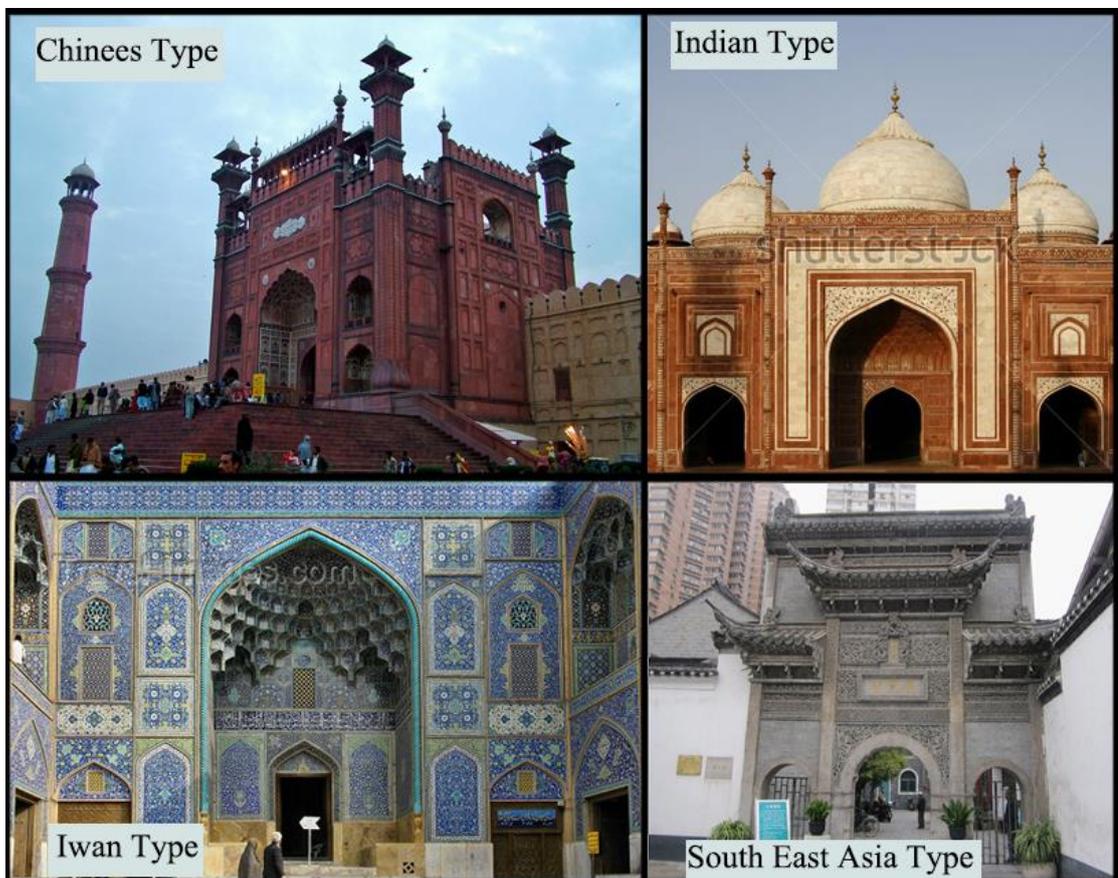


Figure 2.11: Regional Types of Entrance

2.3.2.2 Court Yard and Sahn

Courtyard is an essential space in the mosque architecture that is used for Muslims aggregation. Indeed, courtyard is that part of the land that is not employed for construction and is usually surrounded with trees and flowers in it. Most of the

mosques in the world contain a yard and open space. This space is in the form of a rectangular. There is usually a water element at the center of yards that is considered as the symbol of purity. (Figure 2.12) This space is usually used by parayers to wash and clean and by passengers to take a rest (Nasr, 2010). Centralization is completely explicit in this part. (Ching, 1996)

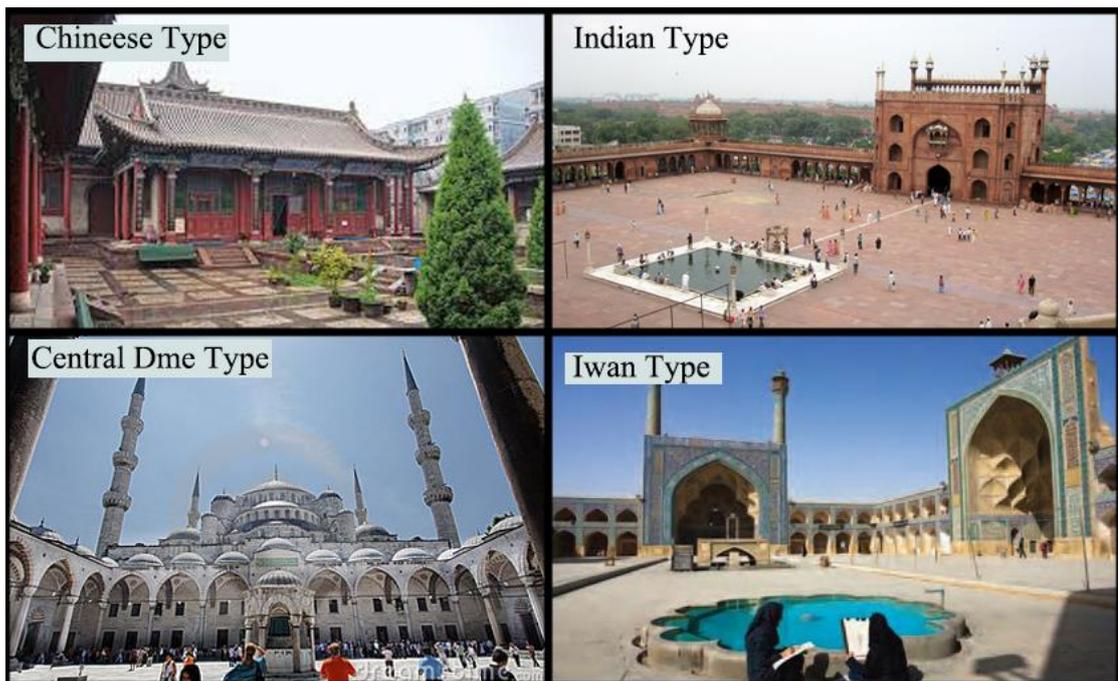


Figure 2.12: Regional Types of Courtyard

The courtyard's dimension is determined by the number and function of its surrounding spaces. The mosque's courtyard and open space were the most significant elements simply made by people's hands over many centuries in constructed mosques through the Islamic lands, whether those built by caliphs and rulers or those built by natives. Courtyards had been always interpreted as the expressions of mosque's identity and unity (Michell, 2002).

2.3.2.3 A space for ablution (Wudu)

Ablution (Wudu) is one of the necessary preliminaries of praying. Since cleanliness is one of the principles of Islam and Muslims have to be clean for prayer, water is considered as an inseparable element in mosques. Therefore, designing a comfortable and appropriate ablution space (Wudu house) including all necessary facilities, installations and lateral functions is of great importance in the mosque's physical planning.. This possibility is provided by designing and creating such elements as pool in the yard and by providing required equipment in the corner. (Figure 2.13) Applying a combination of these possibilities in the plan, in addition to making the best out of the space, is an appropriate response for times when the prayers are in their maximum population (Taghadosi Nia, 1968).

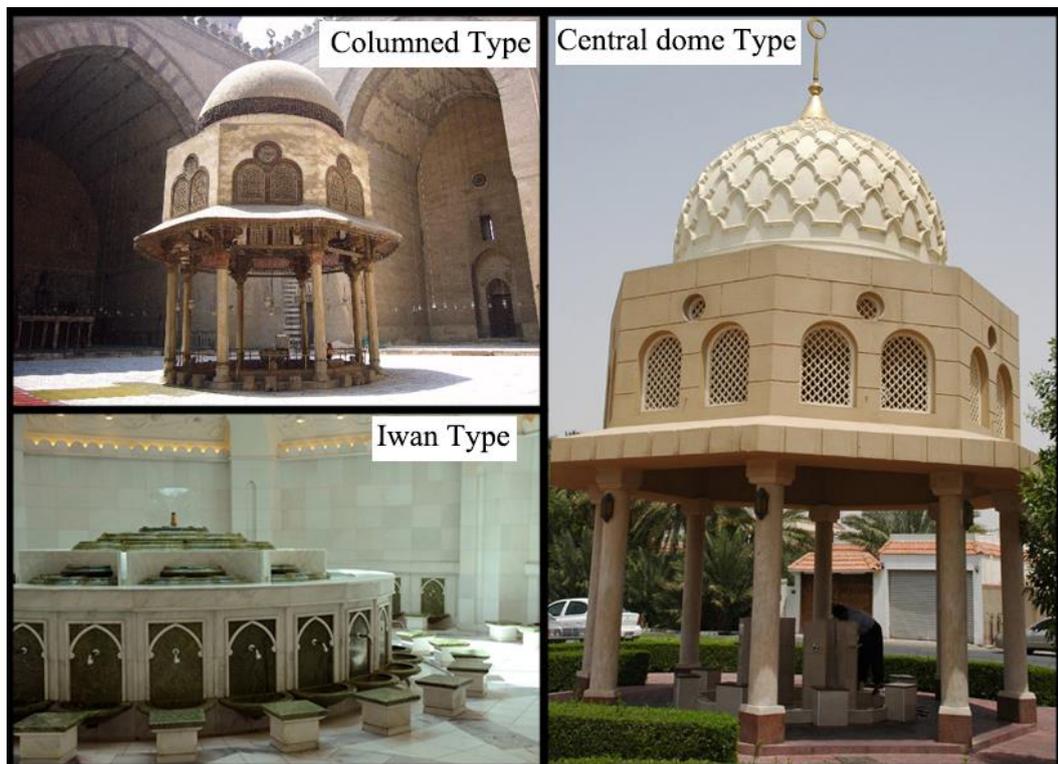


Figure 2.13: Regional Types of Ablution Facility (Frishman & Uddinkhan, 1994)

2.3.2.4 Shabistan (Praying Hall)

Shabistan is referred to a part of the mosque in which the primary goal of mosques, meaning praying, is performed. Shabistan is generally roofed saloon for praying. It is also necessary to mention that shabistan has access to the open yard and porch of the mosques. There is evidence in Quran regarding the gender separation. It has considered some limitations for male and female relations. Among these limitations is veil (*hijab*) for women, which according to some people, is the complete covering of women body and according to others, it is covering the entire body except the face and palms. The Islamic prophet allowed women to participate in prayers in mosques. However, he also ordered the separation of their entering and praying places. Therefore, in the mosques' architecture shabistan consists of two parts for male and female prayers (Mirmiran, 2009). Its portal is located in the central axe of the main façade. This part is one of the central elements of the place (Ching, 1996). (Figure 2.14) Due to the lack of technology in traditional Iranian architecture in the past and to provide appropriate temperature in the warm and cold seasons, two summer and winter shabistans were built (Godard, 1998).

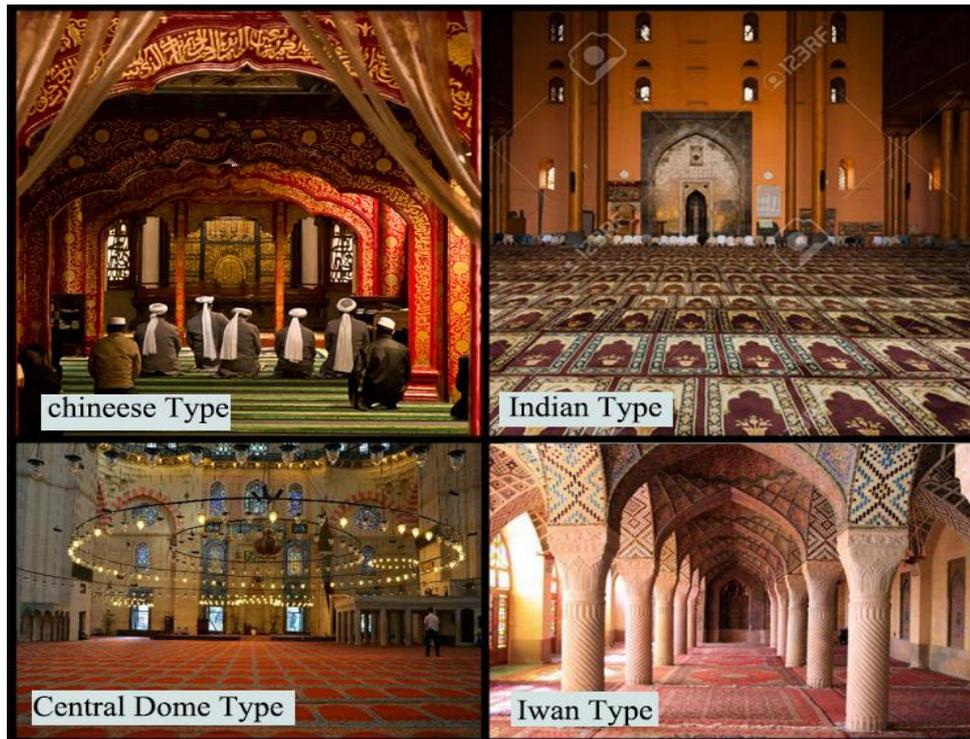


Figure 2.14: Regional Types of Shabistan (Frishman & Uddinkhan, 1994)

2.3.3 Ornamentation

After studying and introducing the elements and spaces of the world's mosques, the researcher has introduced the ornamentations of mosque. Ornamentation is a part of the nature of the mosque's architecture that is used for decorating and accordingly completing the mosque's design in Islamic architecture. The researcher has used the structure of ornamentation divided in the master thesis written by Zehra Ongul (1998). Thereafter, the mosque's ornamentation is divided into three classes: material, type and technique. The materials applied in the ornamentation of different mosques in the world depend on the architectural style of that region. The technique is also related to the local values and art style.

2.3.3.1 Ornamentation Material:

Given the climate, culture, history and architecture of each region, different materials including, tile, brick, mirror, wood, plaster and stone are used for building a mosque.

Tile: One of the most important materials for beautification of the Islamic buildings is tile. Tile has been applied for decorating and also strengthening the buildings during the period of Islamic architecture. Tiles have been used in very small dimensions in different colors. Small dimensions of colored tiles were being used so that there would not be any color contrast when being repaired after the passage of time. Different parts of the mosques, from covering of arch and minaret up to internal surface of mosques and under the arch, walls and Mihrab, have been ornamented with different tiles during the Islamic Period (Bolkhari Ghohi, 2005).

Brick: Bricks have been used for building the mosques' columns and load bearing walls in the past. But after the development of technology and replacement of brick by steel and concrete frames in mosques, the Brick's role as a technique of construction changed to separators and fillers between the columns and separator of spaces. Moreover, over the last decades, bricks have been used more frequently for façades and ornamentation and the baked clay bricks for partitioning. Therefore, it is concluded that the efficiency and functionality of bricks has been reduced and converted to a material for ornamentation. Bricks are used in different parts of buildings such as porches, vaults, arches and minarets (Honarfar, 1991).

Mirror: Mirror is a material that shows the images of the objects image or light reflection due to its smoothness and high reflection characteristic. Radiation of the reflected light from the surface of a mirror is collected in a focal point in mirror. Many mirrors are made by adding a reflecting cover on the glass. Mirrors are used in covering the ceiling's surface and internal walls of the spaces in the Iranian Mosques. It is mostly used as an ornamentation that allows more light into the internal spaces (Kiani, 2003). Mirror as an ornamentation material special to Iranian Architecture.

Wood: due to its tolerance of tension and strain loads, wood has been mainly used in wooden beams in ceilings and columns in large dimensions. However, after the application of iron-beam and concrete beams in ceiling, wood was then used for making door, window and ornamental columns. Lombardy, poplar, pine and walnut trees have been amongst the most-used trees used for their wood (Bolkhari Ghohi, 2005).

Plaster: plaster is among the materials used in building of mosques. It has been frequently used as a construction material during different periods of architecture. Since plaster is a cheap construction material and it solidifies quickly, it has different applications and is usually employed by the architects. Plaster as an important construction materials has been used for ornamentation of internal surfaces of mosques, writing of inscriptions, ornamentation of Mihrab, lower surface of arch and porch (Memarian, 2010).

Stone: Stone is one of the most elementary materials that have been used by human beings for making shelter. Rubble trench were used with lime and plaster mortars in the stone mosques. Although stone has been replaced by some other materials such as brick due to its heavy weight and difficult transportation, it is still important. Investigating the general properties of stone has revealed such issues as stability, resistance against tension and tolerance of pressure. Carving and masonry are used for decorating the stones in mosques, which is hardly used in the present time (Shaterian, 2011).

2.3.3.2 Ornamentation Type:

After introduction of materials used for ornamentation of mosques, different types of ornamentation on the construction materials are studied. Accordingly, the

ornamentations of mosques are divided into the three methods of calligraphy, Eslimi Patterns and Girih Tiles.

Calligraphy: The visual art in the Islamic architecture is originated from calligraphy that includes writing the contents of Holy Quran as one of the best religious arts. Since calligraphy is more technical than artistic, it is not considered as an art. Islam religion is basically disagreed with such original arts as painting and sculpture and for the same reason has given much attention to cartography ornamentation. (Figure 2.15). Therefore, calligraphy is now considered as an ornamental elements used in mosque construction (Bolkhari Ghohi, 2005).

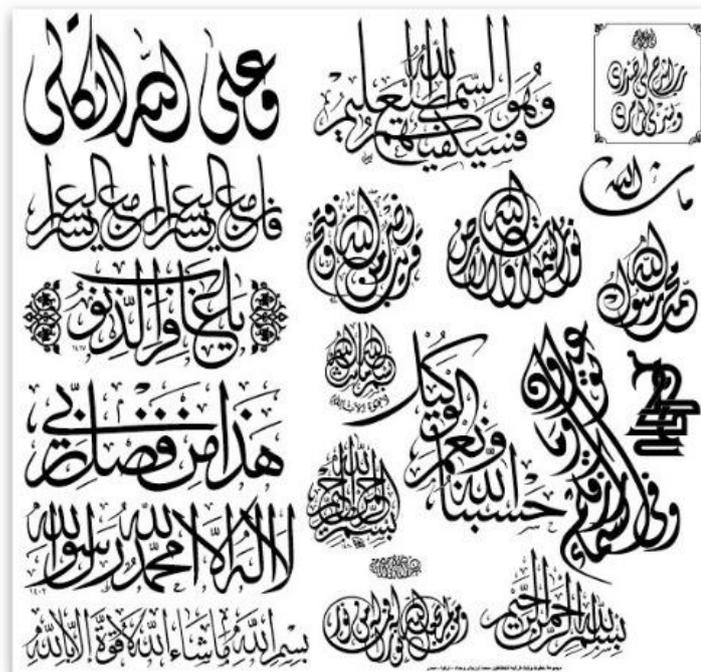


Figure 2.15: Various types of Calligraphy (Seyedi, S, 2012)

Eslimi Pattern: One of the other types of ornamentation in mosques is drawing plant designs on materials. In addition of having a vegetative appearance, these drawings obey an accurate regularity. (Figure 2.16). An apparent specification of plant painting or Eslimi that attracts attention in the first time is motion, curls and plaits, growth, life

and generation. Eslimi patterns begin from a definite point and spread from the east to west and from the north to south through repeated bendings. This type of ornamentation is applied in lower part of the archs in some shapes similar to group dancing (Bolkhari, 2004).



Figure 2.16: Various types of Eslimi Pattern (Sameti, M, 2009)

Girih Tiles: Girih Tiles is another type of ornamentation used on the materials in mosques. Girih Tiles that is made of various girih close to each other, is more than thousands types. Therefore, drawing these girih does not require any instruction or regulation. (Figure 2.17). Girih tile is a part of architectural art in Islamic period which generally consists of locating the girih in a uniform combination. This type of ornamentation can be usually seen on the most ornamentation materials of mosques. Girih tiles can be created by different materials such as, brick, glass, wood, etc. (Kiani, 2003)

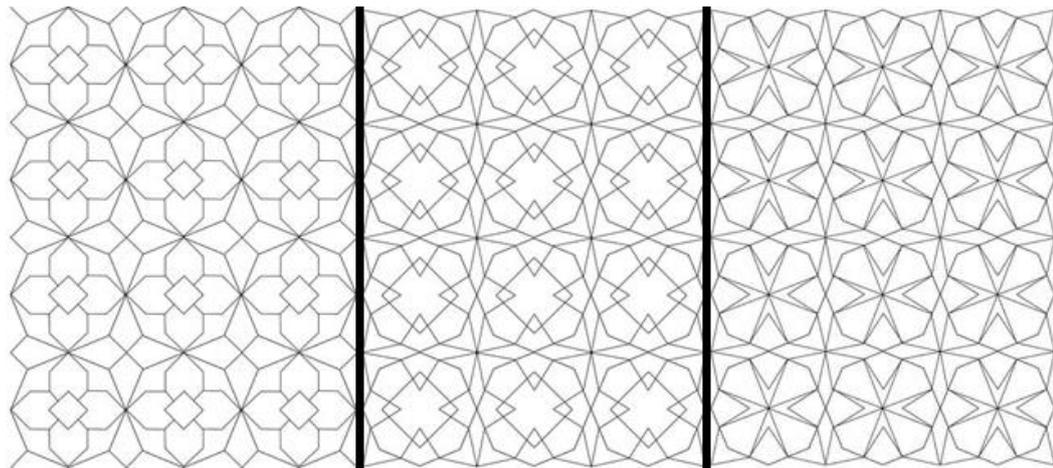


Figure 2.17: Various types of Girih (Niazi, A, 2010)

2.3.3.3 Ornamentation Technique

After studying the materials and types of ornamentation employed in mosques, different techniques for their combination are studied. Some combination techniques used in internal and external façades in mosques include Muqarnas, Tiling Work, Brick Work, Mirror Art, Wood Carving and Stucco Relief.

Muqarnas: Muqarnas is one of the important techniques of architectural ornamentation that is used in beautification of building, especially in mosques. Muqarnas is an ornamentation technique that consists of some hanging chutes and prominences in an organized manner that is seen as stalactite. In fact, Muqarnas is a decoration technique in architecture that is fulfilled by volume processing. (Figure 2.18) Muqarnas technique is fulfilled by some materials such as brick, plaster, tile or wood through combination of types of girih tiles, eslimi pattern and calligraphy. Muqarnas is similar to honeycomb in the multi-floor buildings that are constructed on each other.. Muqarnas can be known as one of the effective methods for making of arch that has lost its preliminary theoretical content and it is used more as an ornamentation technique (Frishman and Uddin khan, 1994).

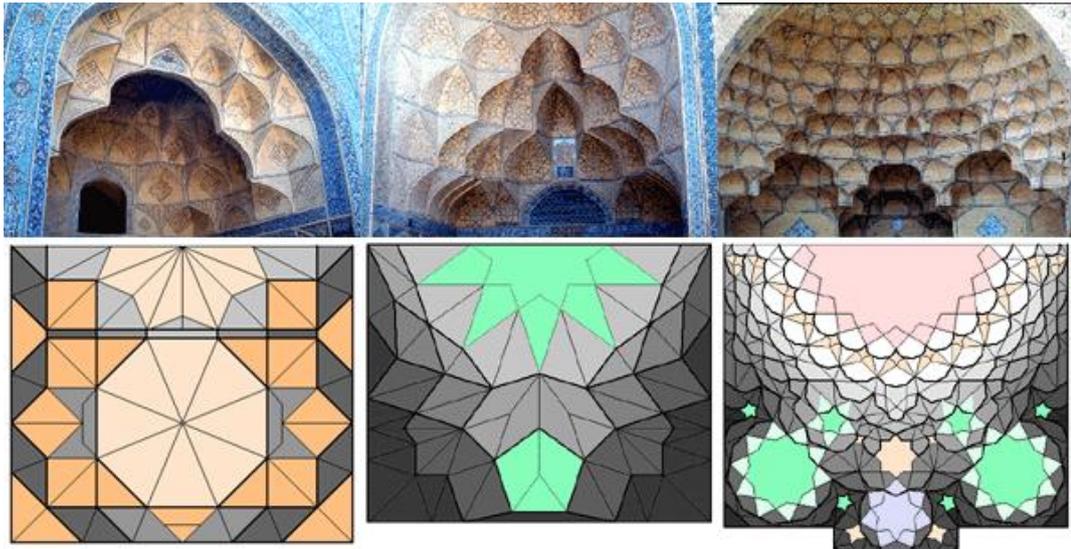


Figure 2.18: Type of Muqarnas (Naghieb, H, 2011)

Tiling Work: One of the fine and common arts in Islamic architecture is tile working that in fact can replace the painting on the walls. This technique is used for strengthening the mosques, too. In order to apply the tile working technique, selection of tile and paint in mosques are so important. Many paints such as sky-blue and blue in addition to the color of white, yellow and green in tile working have caused increasing propagation of this technique in mosques. (Figure 2.19) Different types of ornamentations such as Girih Tiles, Eslimi Patterns and Calligraphy are used in decoration of tiles in Tile Working Technique (Nasr, 1987).

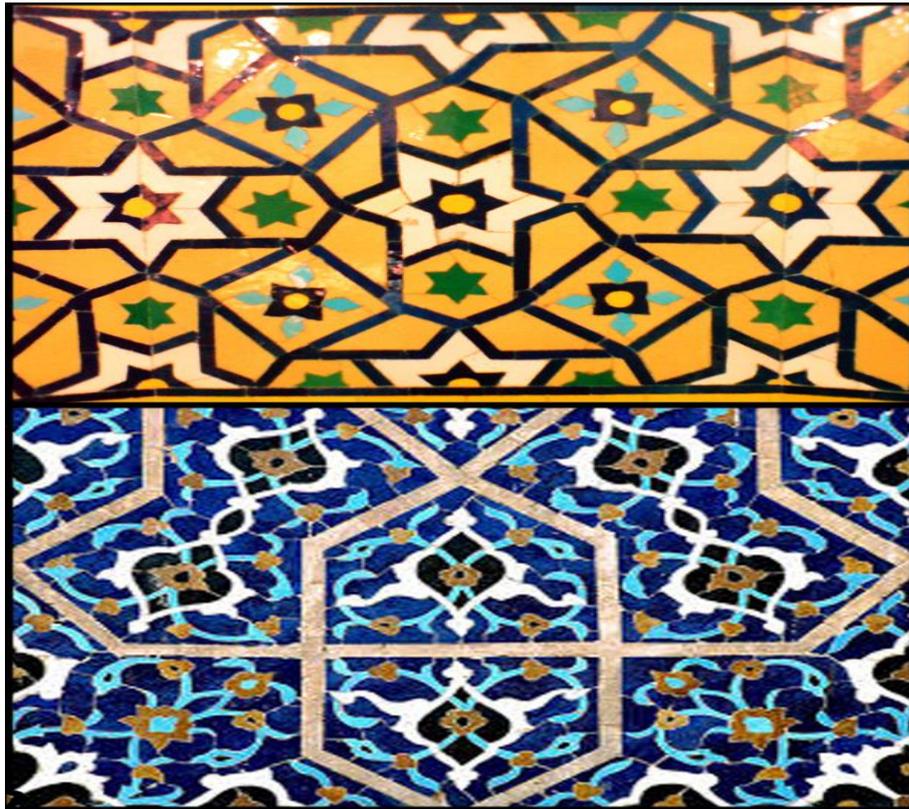


Figure 2.19: Type of Tilling Work (Naghsh Afarin, A, 2010)

Brick Work: bricks have been usually one of the most important materials for the architects. They have tried to use Girih Tiles, Eslimi Patterns and Calligraphy in order to use the normal shape of bricks on which they could apply different patterns for decoration. (Figure 2.20) Applying the Brick Working technique is so common for its ornamentation application, that has since converted it to a technique for ornamentation (Pope, 1957).



Figure 2.20: Type of Brick Work (Mobaraki, S, 2013)

Mirror Art: Mirror Art technique is the art for producing o organized shapes by combination of mirrors with girih tiles in numerous designs and patterns. The result of this combination is the production of a brilliant and shinning space that is created by repeated reflections in numerous pieces of mirrors. (Figure 2.21) Consequently, an organized setting of small and large pieces of mirrors in the Mirror Art is employed for decoration of internal surface of the mosques (Memarian, 2010).



Figure 2.21: Mirror Art (Razfar, M, 2010)

Wood Carving: Wood carving technique is one of the most miniature handicrafts that is the combination of wood material with calligraphy, eslimi pattern and girih tiles. (Figure 2.22) Wood carving technique is used by those artists who carve their imaginations by some steel pens and chisel on wood, in order to ornament the mosques (Mirmiran, 2009).



Figure 2.22: Type of Wood Carving (Moradi, A, 2008)

Stucco Relief: Stucco Relief technique is one of the contemporary arts in Architecture that has had its special shape or method in every region or period. As it can be found from the name of this ornamentation technique, the main construction material used in this technique is plaster. Moreover, different types of ornamentations such as calligraphy, eslimi pattern and girih tiles are used for decorating the plaster. (Figure

2.23) Due to its plasticity and adherence, plaster has simple, numerous and cheap application in ornamentation of mosques. (Memarian, 2010)

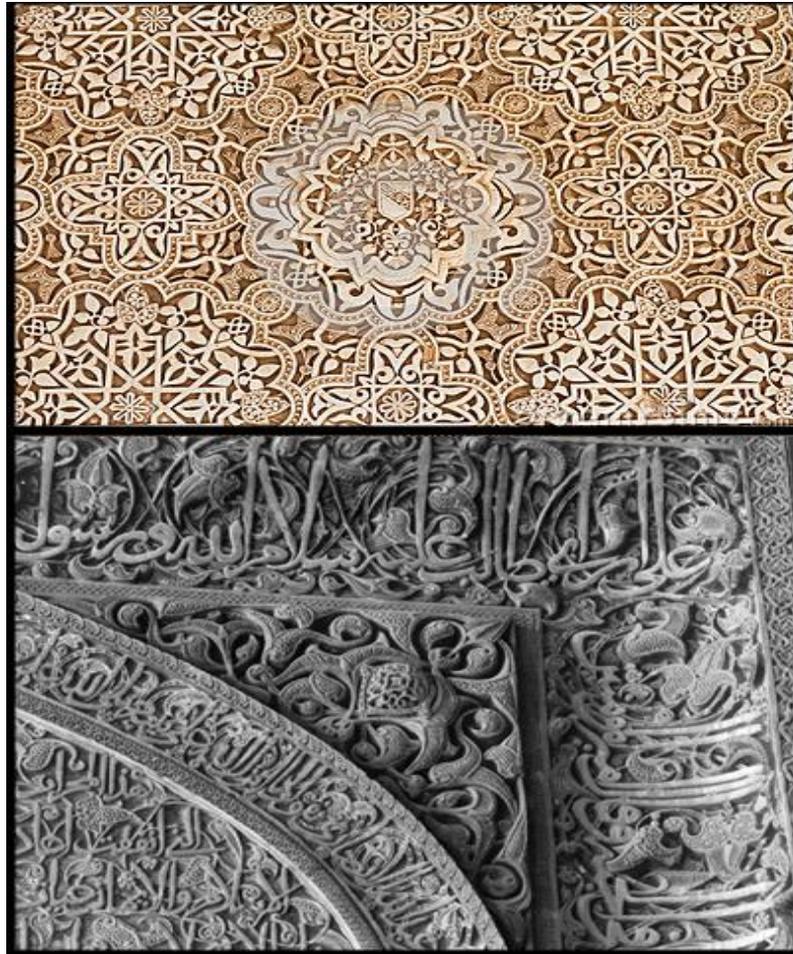


Figure 2.23: Type of Stucco Relief (Birang, S, 2008)

Chapter 3

FACTORS AFFECTING THE FORM AND SPATIAL CHARACTERISTICS OF THE IRANIAN MOSQUES

The present chapter has firstly sought to identify and introduce the factors affecting the spatial characteristics of Iranian mosques (elements, spaces and ornamentations). Therefore, the Islamic Architectural Styles existing in the historical periods of Iran are studied. The next part describes the procedure of changes and advances fulfilled in the spatial characteristics of the Iranian mosques (elements, spaces and ornamentations) based on the effective factors.

3.1 Styles and Historical Periods of the Islamic Architecture of Iran

Considering the researches fulfilled in the resources related to the modern and contemporary architecture, the effective factors on designing the architecture of modern and contemporary mosques in Iran were studied. These resources include: Vahid Ghobadian (2013), the book under title of “Stylistics and Concepts in Iranian Contemporary Architecture”, Arthur Pop (1975), the book under title of “Study on the Art of Iran”, Andre Godard (1998), the book under title of “Art of Iran”, and Renata Held and Hassan Odin Khan (1997), the book under title of “Mosque and Modern World”, the factors effective on designing of architecture of spatial characteristics of Iranian mosques in modern and contemporary period (1796 – today) have been identified. Thereafter, based on the styles of architecture existing in different historical periods, governments and policies existing in each historical period and also the culture governor in the Iranian society have had the most effects on designing of

architecture of spatial characteristics of contemporary mosques of Iran that are next studied.

There have been different historical periods and accordingly, different styles and forms in Iran up to the contemporary period. However, after the entrance of Islam and Islamic architecture to Iran in 600 AD, the former styles already existing in Iran were combined with Islamic Architecture and produced different styles including Khorasani, Razi, Azari, Isfahani and consequently the modern and contemporary styles (Mohammad Karim Pirnia). The aforementioned styles have been created in determined historical periods of Iran, usually dependent on the system and government. The historical division of Iranian governmental systems from the time of Islam emergence (600 AD) up to the contemporary period (1796-Now). (Table 3.1)

Table 3.1: Historical periods in Iran by Author

Regimen	Establishment	Overthrow	Ruling Period	Religion	Style
Sasanid Dynasty	600	1037	407	Islam	Khorasani Style
Seljuq Dynasty	1037	1194	157	Islam	Razi Style
IL khanate Dynasty	1231	1335	104	Islam	Azari Style
Timurid Dynasty	1335	1501	166	Islam	Azari Style
Safavid Dynasty	1501	1736	235	Islam	Isfahani Style
Afsharid Dynasty	1736	1747	11	Islam	Isfahani Style
Zand Dynasty	1747	1796	49	Islam	Isfahani Style
Qajar Dynasty	1759	1925	129	Islam	Modern Style
Pahlavi Dynasty	1925	1979	54	Islam	Modern Style
Islamic Republic	1979	Now	...	Islam	Modern Style

3.1.1 Sassanid Dynasty (600-1037 AD)

Sassanid Dynasty was founded on 600 (AD) and they ruled over Iran for 400 years. Sassanid period is known as the most significant and influential periods in Iranian history. It has been the first imperial government after Islam emergence. Iranian civilization was promoted during Sassanid period (Daryae, 2008).

Iranian policy was too stabilized during this period. Financial issues, industry and business were advanced over the Sassanid period and people were living in good welfare.

Iranian culture went through some changes after the Islam entrance. The effect of Sassanid architecture on other architectural styles was not solely limited to Iranian borders; it was clearly observed in India, China, Western Europe and Africa. A major part of Islamic civilization was transmitted from Sassanid dynasty into Islamic world through art and architecture (Daryae, 2008).

After the entrance of Islam in Iran at the time of Sasanid Government, the architects tried to combine the Islamic Architecture with the Iranian Architecture to design their mosques. This attempt led to the creation of Khorasani Style. At the beginning of Islamic Government in Iran (600-1037 AD), mosques were often built using this style. The general plan of the building in the Khorasani style is extracted from the mosques of early Islam era. The most significant characteristics of Khorasani Style include: the rectangular plan; Shabistan space (Prayer Hall); ordinary and simple design (without ornamentation); and employing single-minaret with circular section (Pirnya, 2013).

Khorasani Style was commenced in 600 AD and continued up to the beginning of Seljuq Dynasty (1050 AD) (Pop, 1975). Khorasani Style was mostly tended toward the Arabic Style and that's why most of the mosques in early Islam contained a Shabistan. The application of the single-Minaret with circular section in the mosques can be known as one of the main effects of the Iranian Architecture on the Khorasani style (Pop, 1975).

3.1.2 Seljuq Dynasty (1037-1194 AD)

Seljuq is the title of an Iranian Turkish government who ruled over Iran and a great part of Western Asia from 1037 to 1194 (AD). The main income of people was provided through agriculture during this period. The Seljuq Dynasty was well-provided regarding the architectural efforts and many buildings were constructed using Iranian architecture (Dabiri Nejad, 2005).

The country's conquests were great during the Seljuq period. Indeed, the Minor Asia was under the control of The Seljuqs. For the same reason, Iran was divided into different states and Tehran was selected as the country's capital. The Seljuq period was the era of political stability and peace, the result of which was the development of industries, architecture and arts (Pop, 1975).

Cultural issues including, establishment of military schools, libraries and mosques were given especial attention during the Seljuq period. The Seljuq rulers played a significant role in developing Iranian culture, civilization and architecture (Dabiri Nejad, 2005).

Regarding the development of arts, especially the mosque's architecture, Seljuq Period (1037 AD) that was established after the Sasanid System, is one of the brilliant periods of Iranian Architecture. At the beginning of Seljuq Period, Khorasani Style of Sasanid Period was gradually outdated and replaced with the Razi Style. In this style, the construction of Iwan and Dome became too common. The mosque's architecture in Razi Style was converted from the Shabistan-like Style to an Iwan-like Method. At first, the mosques were designed in double-Iwan form and thereafter their design changed into four-Iwan forms in this style. This construction method was commenced from the City of Raz and it was named as Razi Method. The most significant characteristics of Razi Style include: rectangular plan; square shaped Iwan Space; construction of dome; construction of couple-Minaret; and application of such ornamentatsas molding, brick working and Girih Tiles (Pirnya, 2013).

Razi Style was used for the construction of Iranian mosques during the Seljuq Period (1050 AD). Seljuqs had more concentrated on the constructon of some buildings similar mosques that were detected in a special manner during the first centuries of Islam in different countries. In Iran, Razi Style was combined with factors and elements of Sasanid Architecture before Islam and an Iranian definite shape was formed. In desigining and building of mosques, the Seljuqs followed the styles and buildings common before Islam and before their period. In this style, some important characteristics such as construction of dome became common (Pop, 1975).

3.1.3 IL khanate Dynasty (1231-1335 AD)

Ilkhanate is the title of a sector of Mongol Empire that ruled over Iran from 1231 to 1335 (AD). The ruling time of Ilkhanate that lasted about one century produced many economic and social changes in Iran. Islam was recognized as the formal religion of Iran and many mosques were constructed during this period (Eshpuler, 2001).

The policy of Ilkhante dynasty began with discipline and continued in complete chaos; so that the present dynasty brought an interesting transformation to Iran's history (Bayani, 2000).

Medicine, mathematics and astronomy were developed in Iran during the Ilkhanate period. Moreover, they favored the construction of great buildings. The art of Ilkhanate period is considered as one of the prominent periods of Islamic art in Iran and Central Asia (Eshpuler, 2001).

After completion of Seljuq System, Razi Style was replaced by Azari Style. This style was started from the IL khanate Period (1231-1335 AD). The most significant characteristics of Azari Style include: construction of huge and great buildings; paying attention to vertical appropriations of building; construction of Iwan with rectangular shape plan; and application of such ornamental techniques as moldings, tile working and patterned titles (Pirnya, 2013).

Along with the commencement of Azari Style in the period of IL khanate (1231-1335 AD), the shape and scale of mosques became great and huge. In the mosques of IL khanate Period the ornamentations were more focused and spaces were constructed in more elevated height, compared to the previous eras (Mehrdad Shokouhi, 2006). The major difference between the IL khanate Architecture and previous periods in indoor status of the buildings is that the Iwans became narrower and more elevated. (Pour Jafar, 2000)

3.1.4 Timurid Dynasty (1335-1501 AD)

Timurid, from a Turkicized Mongol origin, is the title of a dynasty that ruled over Iran from 1335 to 1501 AD. The Timurid dynasty turned Iran into an expanded country

and powerful government. Iran's borders were extended to all Central Asia, Ottoman Empire and a part of India. Since the Timurids' conquests were mostly invasive and not aimed at a real capture, they were soon out of the Timurids' possession (Kavusi, 2010).

The policy of the Timurid dynasty was based on three general purposes: conquests, religion and construction. During their battles and conquests, the Timurids hired the best engineers and architects from the conquered lands in order to build magnificent constructions. The religion-centered policy of this dynasty led to the construction of important mosques in this era (Pirnya, 2013).

Science and art were given much importance in Timurid dynasty. For the same reason, artists and scientists were safe from their killings. The Timurid dynasty was the era in which culture, literature, history, mathematics and astronomy flourished (Kavusi, 2010).

Azari style continued until the Timurid Dynasty (1335-1501 AD). The reason of employing the Azari Style in two periods of IL khanate and Timurid is that the kings of IL khanate and Timurid periods were in the same ethnicity. For this matter, the Timurid Kings continued Azari Style in the architecture of their mosques, too. Nevertheless, the mosques designed in Azari Style in the Timurid Period can be distinguished from those constructed in the IL khanate Period.

Mosques had large scales during both dynasties. . The Timurids constructed mosques more than any Asian governor. The verticality of buildings was often focused by the Timurid architects which was created through applying round minarets. This type of

ornamentation is one of the first identified symbols of Timurid Period (Nasrollah Meshkati, 2000). In Azari Style, the architects have generally worked on the beautification of the Iwans and one of the specific characteristics of this style is the focus on vertical elements such as dome and minaret (Pop, 1975).

3.1.5 Safavid Dynasty (1501-1736 AD)

The Safavids were an Iranian Shia clan who ruled over Iran from 1501 to 1736 AD. The Safavid period is considered as the most significant historical era in Iran. They ruled the whole country using a centralized government. This era is known as the Islamic golden time and the peak of Islamic civilization. The Safavids turned Iran to an independent, self-centered, powerful and respectful country (Noruzi, 2012).

The Safavids ruled the country using a centralized government and an absolute power (in the hands of king). Iran became more important during the Safavid dynasty and underwent stability and integrity (Jafarian, 1999).

Iran was advanced in military, religious and artistic (architecture, calligraphy and painting) fields during the Safavid era. They developed the Iranian culture, art, music and literature and ultimately, moved the capital from Tehran to Isfahan. The Safavid kings were mostly focused on building mosques, schools and religious structures (Jafarian, 1999).

After the fall of the Timurid System (1501 AD), the Azari Style (employed for two periods), was put aside by Safavid System, and replaced by Isfahani Style. The center of the kings' attention during the Safavid Period was Isfahan in which this style was commenced and known as Isfahani Method. One of the most significant characteristics of Isfahani Style include: rectangular plan and simple polygonal shape;

Iwan-like plan; application of such ornamental techniques as tile working and several-side working. Not only in the city of Isfahan, but also in Tehran and other cities of Iran, numerous mosques were constructed in Isfahani Style. In this style, applying the tile working for ornamentation became common (Noruzi, 2012).

In Isfahani Style, the façade-construction was generally observed in wide surfaces of fine tile working and colorful tiles as well as in frequent slimy ornamentations of complicated patterns on the outdoor and indoor surfaces of the mosques (Pirnya, 2013).

3.1.6 Afsharid Dynasty (1736-1747 AD)

Afsharid dynasty is the title of an Iranian dynasty of Turkic origin that ruled over Iran from 1736 to 1747 AD. The Afsharids were too much powerful with respect to conquest during their short ruling time (Ghanei, 2008). The Afsharids attempted to modify Iran's relations with its neighborhoods through religion and enjoyed a great success (Bayat, 2001). Due to their excessive conquests, the Afsharid kings did not attend too much to cultural, artistic and constructive issues in the country (Ghanei, 2008).

The Afsharid Period was began by the appearance of Nader King Afshar after the fall of Safavid dynasty. No outstanding progress can be seen in the world of architecture and art during this period; a few mosques were constructed during this period using the Isfahani Method (Pour Jafar, 2000).

3.1.7 Zandiyeh Dynasty (1747-1796 AD)

Zandiyeh in terms of dealing with people, Zandiyeh kings were the best. Zandiyeh government tried to make people live in peace and happiness and fulfilled their desire (Rajabi Nayeri, 1997).

Iranian politics during the reign of Zandiyeh was simple and not focused much to luxury. The country's consumption needs was their priority in making policies. Zandiyeh kings were illiterate but intelligent and wise. They favored the people's peace and welfare. Scientists were given much importance in this period. That's why the Zandiyeh Commerce and Industry were in their great flourishing period (Rajabi Nayeri, 1997).

According to Mehrdad Shokouhi (2007), Karim Khan Zandiyeh accomadated in Shiraz a short time after the fall of Afsharid Period and Zandiyeh Dynasty began its government. Important mosques were built during Zandiyeh Period using the Isfahani Style. The difference between the Isfahani Style employed in the mosques of Zandiyeh Period with that of used in previous periods (Safavid and Afsharid) is the application of such ornamentation technique as tile workings using Rose Pattern (Pirnya, 2013).

Similar policy of the governors in Safavid (1501-1736 AD) and Afsharid (1736-1747 AD) Periods caused the Isfahani Style to be continued dutring the Zandiyeh Period (1747-1796) too.

3.1.8 Qajar Dynasty (1759- 1925 AD)

In the middle of Qajar Period (middle of the 18th century AD), the university students increasingly went abroad to continue thir sudy. Therefore, Iran entered the Third World from the East and the mosques built in the country tended toward tradional architectural desogns. Based on this matter, Iran's tradionaonal architecture became an inspiration source for the west world. This change of thoughts was physically felt in Tehran. Up to that time, the Iranain architecture had undergone a revolutionary route. Nevertheless, confronting the modern world and also being influenced by military,

political, cultural and social issues of Europeans, especially Russia and United Kingdom, Iranian traditional architecture went through a recession (Ghobadian, 2013).

During the Qajar Period (1796-1925 AD), Iran contained some people with native culture and religious beliefs who had become familiar with European culture. This influence was clearly seen in the Iranian culture, society, architecture, policy and government. Thus, from this time onwards, the architects tended to build their mosques based on the modern designs and ideas. In other words, Iranian architecture mostly tended toward the Western world and thousands years of historical architecture gradually lost its priority and was put aside to margin (Kiani, 2003).

Due to the influence of Arabic architecture, some ornamentation techniques such as moldings, mirrors art and tile working were propagated in Qajar period, especially at the time of Nasereddin King of Qajar government. In the middle of Qajar System (1796-1925), Iranian Architectures gained idea and effect from European arts and architecture (Reza Abbasi, 1979).

After completion of Zandiyeh Period (1747-1796 AD) and commencement of Qajar Dynasty (1796-1925) and tendency of Qajar Kings to employ the western architecture, Isfahani Style was less used. Moreover, the Early Modern time gradually entered Iran in the middle of Qajar Dynasty. The Early Modern architectural style is different from the styles common in previous periods. This style is a combination of architecture of Iranian mosques (Isfahani Style) and the western architecture (Pour Jafar, M & Amirkhani, A & Lilian, M, 2011).

During the Qajar Period, the architecture of Iranian mosques was developed toward a combination of historical methods of Iran (Isfahani Style) and western architecture. Therefore, Iranian architects followed the western design as their template in building mosques. However, the traditionalism was not completely ignored in mosque construction (Kiani, 2003). The difference of traditional architecture with traditionalism in Iran is that in the latter, the total plan of construction is in traditional form but operation of building or its technology and materials are modern and new. In other words, traditionalism in Iran is a style and method in which the building is designed and constructed with a new function using modern technology and materials while the building still keeps its traditional shape and symbols (Mashkooti, 1974).

3.1.9 Pahlavi Dynasty (1925- 1979 AD)

Pahlavi dynasty is divided into two groups: First Pahlavi (1925-1960 AD) and Second Pahlavi (1960-1979 AD).

In the First Pahlavi period, the Traditionalism style was widely used combining the modern and traditional components. The establishment of new foundations such as Architects and Building Engineers Order Organization and also such cultural and social evolutions as the conversion of men's cloths and unveiling of women were observed in this period (Pourjafar, 2009).

After the deposal of the First Pahlavi period, the political atmosphere of the country became more open. The country's 1963 coup d'etat resulted in some evolutionary changes in Iranian culture and society. Amongst these changes, one can refer to the society's acceptance of the western architecture and the increment of constructional activities Iran's relationship with West (Pirnya, 2013).

Construction of hospitals, mosques, schools and universities have been some elements of modernism in the First Pahlavi period (1925-1960 AD). As the country of Iran and its traditional cities were moving toward modernism, the mosques' design converted into the modern and new forms too and its nature gradually changed. Upon the beginning of second Pahlavi period (1960-1979 AD) and the government of Mohammad Reza Shah, Iranian architects used the experiences of the last era (Pourjafar, 2009).

Reza Shah Increased relationship with western countries. Thence, Iranian architects were persuaded to combine the definite factors of Iranian architecture with those of western architecture and produce some works which were desirable from an artistic perspective. This procedure in mosque construction continued up to the Early Modern Architecture. Gradually the outdoor façade of mosques became important and instead of the traditional introverted mosques, the extroverted mosques with outdoor façades were built. One of the important evolutions occurred in this period was the application of new technologies in architectural activities. Among the new construction materials such as colored tiles, baked bricks and plaster were widely used (Mirmiran & Etesam, 2006).

The architects had more relationship with European and American countries over the second Pahlavi period which provided a field for the combination of Iranian architecture with the western one. This architectural period was called the High Modern. The modern architecture during the second Pahlavi Government appeared under the title of High modern. In fact, it is considered as the golden period of modern architecture of mosques in Iran. In the highest level of architectural efflorescence of High modern and avoidance of previous architecture, such architects as Hassan Fathi

had nostalgic viewpoint about traditional architecture. They struggled to restore this architecture with respect to plan and implementation of mosques for a modern function (RaeisNia, 1990). Combination of traditional architectural methods of Iran (Isfahani Style) and modern architecture in an innovative and modern aspect has been appeared in Iranian modernism style. The influence of western architecture, even with respect to the style and formation, on the theoretical principles of Iranian architecture has been so wide and comprehensive. Historical architectural methods and its principles and symbols are clearly seen in the architecture of the Second Pahlavi government. In other word, the contemporary western architecture and historical Iranian architecture were two important factors affecting on the principles and characteristics of architecture in the second Pahlavi period (Ghobadian, 2013).

3.1.10 Islamic Republic

Islamic Republic government was started from 1979 AD and continues up to the present time. Iran had a crowded society and wasn't calm after the revolution. Two years later, Iran entered a war with Iraq that prevented the former's new-born policy from being stabilized. However, this could not last forever and after 15 years, the policy of country became stable enough (Ghobadian, 2013).

After the Islamic Revolution, Iranian architects encountered with a society in which great evolutions had been observed since. Many cultural customs and rituals were transformed and the religious traditions and values had been confirmed and considered. In the frame of Iran and Iranian culture, religion is the most consolidated fortress of tradition.

The focus of government on Iranian culture and religion in building mosques is the traditionalism approach. After the Islamic Revolution and war-related problems which

had caused great social and cultural changes and differences in people's beliefs over the first years, the government confirmed the traditional Islamic architecture. Accordingly, constructing the mosques employing the traditionalism style increased. In other words, at the beginning of Islamic Republic of Iran, High modern was gradually entering to a new period of architecture (Pourjafar, 2009).

Like in the second Pahlavi period, the architects struggled to combine the traditionalism and modernism approaches. In other words, the Islamic architecture of Iran was mixed with the western architecture with more powerful ability to consider former experiences. Therefore, High modern architecture style was more comprehensive than the other styles. Historical architecture methods of Iran (Isfahani Style) and the western contemporary architecture have been two key factors in contemporary architecture of Iran. The influence of each factor in each period, however, has been encountered with intensity and weakness. Islamic architecture, especially the Esfahani Method in combination with the western contemporary architecture, has had a wide presence in the contemporary architecture of Iran (Ghobadian, 2013).

3.2 Components of Mosques in Iran

In this part, the components of Iranian Mosques and their process of changes and development in different times are investigated. Mosques components include elements, spaces and ornamentation.

3.2.1 Architectural Elements of Iranian Mosques and Their Evolution through History

Elements that symbolize the mosques are clarified as Minaret, Dome, Mihrab and Minbar. In this section the elements of Iranian mosques will be discussed according to architectural characteristics and developments.

3.2.1.1 Minaret

Minaret is a place for muezzin (who calls the worshipers to prayer) that can be easily seen. Minaret is one of the most important elements that have a special place in Iranian mosque architecture at Islamic eras.

Definitely the history of minaret goes back to pre-Islam but few works and signs of pre-Islamic minarets have remained in Iran. After Islam (825 AD), in Sassanid period has been used Khorasani style, the minarets were generally in circular form. (Figure 3.1) At first, the minarets were not in the mosque's plan and they acted as separate towers (like Khosrojerd Minaret). From the first to the 500 AD, the minaret was isolated or sometimes connected to the mosque and sometimes it was built with a distance from the mosque and later the mosques were built beside them (Mokhlesi, 2009).



Figure 3.1: Minaret of Khosrojerd Mosque (926) (Amiri, A, 2009)

Reza Shaterian (2011) says "Its ornamental aspect augmented quickly in Iran so that it became a place for exhibiting different decorative arts such as brick work and tiling work." At Seljuq and Mongol time (1037- 1194 AD), by using Razi style very tall minarets were built in Iranian mosques though since 12century (1322 AD). (Figure 3.2) Unlike Mongol period, in which minarets were hidden from the bottom to the edge of iwan in the mosque, most of the minarets at Seljuq era were built obviously beside iwan and they were ornamented by tiling (Ghobadian, 2013).



Figure 3.2: Minaret of Imam Khomeini Mosque (1302) (Ghafari,R, 2011)

In the Timurid era (1335- 1501 AD), minarets were extensively developed using the Azari style. In this time, a minaret was considered as a sign of mosque and a guide for caravans toward the city; hence their building was revolutionized (Feyz, 2004).

Abbas Zamani (1983) mentions that "Iran's minarets can be divided into two categories: single (Figure 3.1) and double (Figure 3.2)." Single minarets were tall, thin and cylindrical, usually with simple body and little ornaments. Another type of minaret is in conical shape, usually with a gentle and harmonious cone. On the other hand, the base and bottom of the minaret is larger than its top which makes it more stable steady. From the Safavid era to Qajar era (1501- 1925), the Isfahani style was being used and such decorations as tiling work and Muqarnas on minarets were flourished.

In Iranian mosques, minarets contain a chamber at the top. Since in the past there were no speakers and other modern equipment for saying Adhan, muezzins used to go up to the chambers and call for prayer. In addition, they were used for announcing

important news to people. In order to prevent muezzin from falling down the minaret, a low wall or fence with extended metal or wood ornamented with a variety of girih tiles was usually installed around the chamber. In contemporary period, with the advancement of technology, there is no need for the muezzin to go up the minaret. The upper chamber is now used as a place for audio equipment and is mainly ornamented by girih tiles and Muqarnas. This form of minaret began from the arrival of Islam in Iran and has been maintained up-to-date. Contemporary minarets are the resumption of principles employed in Qajar's minarets in terms of height, form and ornaments (Shaterian, 2011).

3.2.1.2 Dome

According to Mohammad Karim Pirnia (2005), the dome of Iranian mosques has different form and structure.

Hassan BolkhariGhahi (2005) says that Iranian domes are made of two crusts or shells. Before building two-crust domes at Timurid and Safavid eras, by using Azari and Isfahani styles simple two-crust domes were built in mild and humid climate of Iran and the aim of the builders was to protect the dome from the moisture and damage by the air flow between the inner and outer crusts (Ardalan and Bakhtiar, 2002). Two shells of Iranian domes including:

- Inner shell
- Outer shell

The inner cover of the dome is toward the interior space and the out surface is usually built like steps. The inner cover is called Parietal or Kodombeh, and the outer cover is called (Khood). Obviously, Khood is divided into three categories:

- Two-shell domes with a gap between them that are connected to each other in parietal and Khood position horizontally. (a in figure 3.3) From this point onwards, the two shells gradually fell apart and acted separately. This kind of dome is lighter than the continuous two-shell types. In fact, the empty spaces between the two shells will reduce the extra load of the dome (BolkhariGhahi, 2005).
- The two shells are completely interconnected. (b in figure 3.3) It means that “Khood” is immediately laid on the parietal and only the peak of the dome is apparent in Khood to make it suitable for removing snow and rain (BolkhariGhahi, 2005).
- In discontinuous double-shell domes, the two shells are completely separate. (c in figure 3.3) For the stability of these domes, they were built on small walls called Khashkhashi (BolkhariGhahi, 2005).

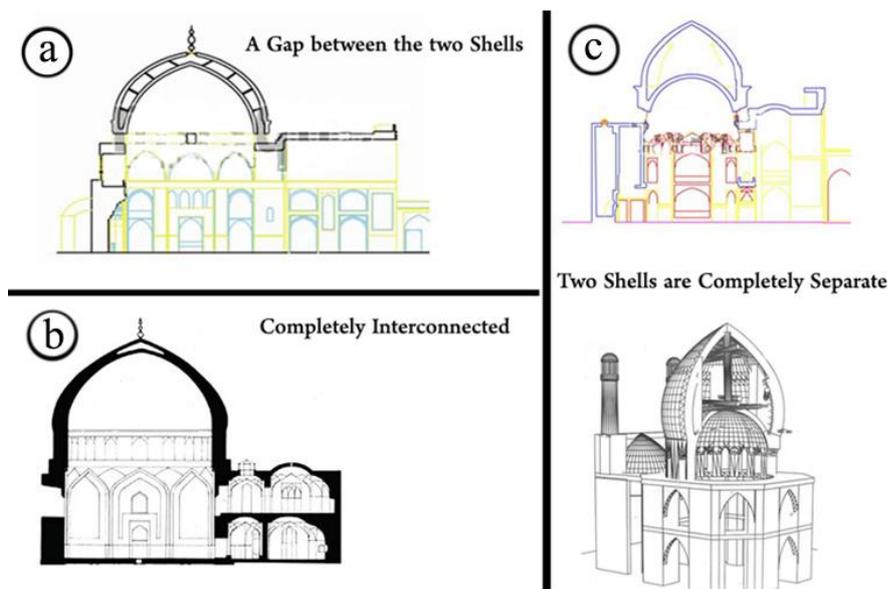


Figure 3.3: Types of Dome Structure

The forms of domes are divided into three categories including (Figure 3.4):

- Rok dome: with a sharp peak, in conical and pyramid shapes
- Nar dome: a bulbous and semicircular shape dome
- Rok-e Ourchin dome: like steps (Shaterian, 2011)

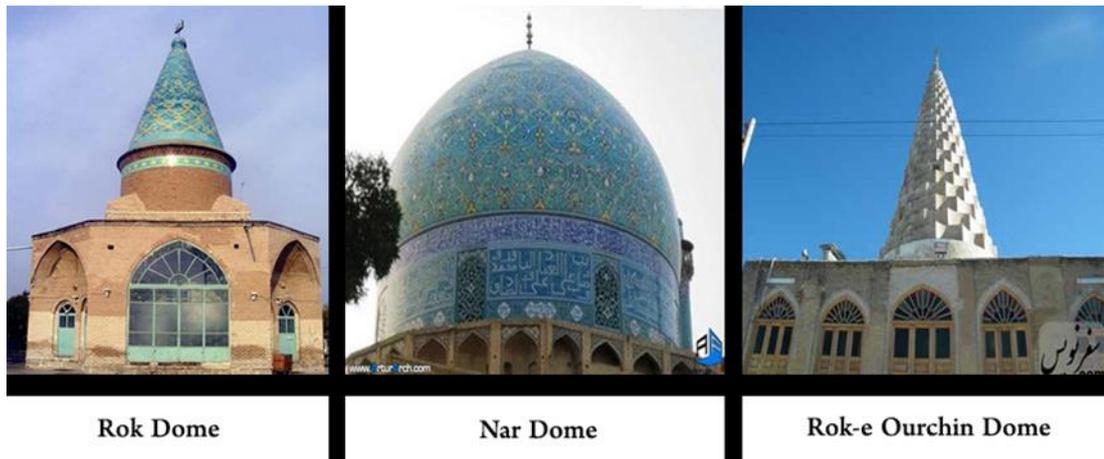


Figure 3.4: Types of Dome Shape

The evolution process of domes in different times has been investigated in the present study. Most of Iranian domes after Islam (in Sassanian time exploiting Khorasani style) are made with slight gradient. Due to the constraints and also dominance of Islam in Iran, the speed of building mosques gained great importance in the Khorasani style. Mosques with a large dome and various arcs became common (Farhangi 2003). Seljuq period was a very hectic time of building and arced phenomena using, using the Razi style (Zomarshidi, 2010). The process of arc building reached its remarkable evolution in Azari style during the Ilkhanate dynasty (Zomarshidi, 2010). Following this evolution, arced and domed coverings and the ability of architects in exploiting arcs with less gradient for covering the domes were developed. The developing, distinctive and flourishing times of Iranian architecture with basics of arced and domed buildings in Iran is originated from the Timurid time (Zomarshidi, 1389). The arced architecture in this period was the paramount art of the world (Zomarshidi,

2010). The Iranian architecture of this period was noticed both structure-wise and aesthetic-wise (Zomarshidi, 2010). In the architecture of Qajar period, the basics and fundamentals were always directly influenced by arced architecture of Safavid period. For the most part, the arced works in Iran in the times after Safavid until contemporary time were influenced by arced architecture of Safavid (Zomarshidi, 2010). It should be noted that in the contemporary period of Iranian architecture in Qajar, Pahlavi and Islamic Republic periods (Since 1796 until now), architects have been using Isfahani style, exploiting technology and the ease of implementation. In fact, due to the change emerged in the form of mosques, inevitable changes in their domes, using modern technology was observed too.

3.2.1.3 Mihrab

Mihrab is a place in mosque where imam or leader of prayer stands at the time of pray. It is located in the corner of mosque that should be directed toward the qibla.

Zohreh Roohfar and Javad Neyestani (2011) mentioned that after the arrival of Islam in Iran (1037 AD) at Sassanid period (Khorasani style), Mihrabs were made with a vault and a dome on their top using such materials as stone, brick, plant-shaped ornaments. They have been applied on the building material with a plaster surface or with carving method. (Figure 3.5) The architectural feature of Mihrab at Seljuq time is that the Seljuqs brought Mihrab from shrine to open space (sahn) and built it in open spaces as Mosalla (Roohfar & Neyestani, 2011).



Figure 3.5: Mihrab of Oljaito Mosque (1030 AD) (Jabalameli, A & Pahlavanzade, L, 2012)

At Timurid era and by using Azari style, a great change was made in the form of Mihrab in Mosques' architecture; though no notable change was found in the architecture of Mihrab. At Safavid period by using Isfahani style, Mihrab plastering reached its peak and many plaster work ornaments were remained from the Safavid era. In the space under the dome of Mihrab, there is a richly plaster work drawn with different colors. This plaster is firstly covered with a white material to make the background suitable for drawing. Most Mihrabs at ZandiyehZandiyehiyeh era (Isfahani style) had stone plinth, tile surface and Muqarnas. Quran engraved epigraphs can be seen all around the Mihrab with white line on blue tile background. Qajar era (Early Modern) also followed the Safavid ornaments. The Modern style in Mosques and tiling on Mihrabs became very popular during the Pahlavi period. Today, the contemporary style is performed using the past art with new technology. In mosques'

Mihrabs, the ornamentations are in the form of collage and it's been tried to make use of all the arts of the past eras (Shaterian, 2011).

3.2.1.4 Minbar

The first practical use of minbar occurred in Al Masjid al-Nabawi (622 AD). Minbar, which was firstly known and used as a seat, soon found its position as a perfect platform for preaching and orating (Kohera 2002).

Zekrollah Mohammadi (2010) mentioned that there was a variety of Minbar based on the talent of architects and the need of the time; they were made of wood or stone, fixed or movable and in traditional or new forms. Wooden Minbars were common at the time the holy Prophet.

Architects tried to decorate the pulpits, so they engraved the verses of Quran, sayings of the holy prophet, names of the kings, builders of the pulpits and their production dates with special Islamic styles like stars and great Arabic handwritings. These pulpits are the art masterpieces of Muslim architects so that over centuries their beauty is still recognized by everyone (Shaterian, 2011).

Traditional and old Minbar (From Sasanid period to Qajar period) were made near qibla wall in the first row and above the prayers' heads and they had doors as well as railings and steps and old pulpits were generally in this shape (Figure 3.6) (Setayesh, 2008).



Figure 3.6: Minbar of Oljaito Mosque (1030 AD) (Jabalamehli,A & Pahlavanzade, L, 2012)

New Minbar in contemporary period of Iran (Qajar period, Pahlavi period and Islamic republic period) are considered to be a part of Mihrab; they have two or three steps with wooden columns. Some of them have a door in front of qibla wall and the preacher enters from it and goes up the pulpit. Some of them also have 10 or more steps. Some of these Minbars are in the shape of an inverted crescent, with one head toward the ground and the other one toward the preacher's feet. This style is an innovation of Muslim architects that used special methods and designs for decorating and displaying the beauty of mosque components associated with Islam that reached its peak at Qajar era and has continued to the present (Nasr, 2010).

3.2.2 Space Organization in Iranian Mosques

Space in Islamic Iranian architecture has a variety of beauty, stencil and color linked together. There is a direct relationship between the architectural space and plan of the building, and the faithful meaning and concept are seen therein. In this study, common main spaces in Iranian mosques have been investigated according to the styles and history of Iran. The main spaces are Entrance, Vestibule and Corridor, Courtyard and Sahn, Ablution House, Iwan and Shabistan.

The hierarchy of the spaces forming mosques in Iran is as follows: The first space is the entrance of the mosque which can be seen before entering the portal; that separates the exterior space from the interior space of the mosque. After entering through the portal, one enters an eight-sided space called vestibule (*hashti*) which leads to a yard through a hallway; the yard in Iranian mosques is usually four-sided and huge which is in fact the general space in Iranian mosques. There is usually a water pool at the center of yard. Water symbolizes light and innocence and there are small gardens in the corner of the yard which symbolize life. After the yard, Ablution House is one of the spaces in mosques which can be accessed through the yard and is usually located near the Shabistan. Shabistan, which is the main ceilinged space in mosques, is a prayer hall that is usually four-sided; you can enter Iwan through the Shabistan in mosques. Iwan is a space between the yard and Shabistan which is walled on three sides, with one end open. Considering the general plan of mosque, each space including, the entrance, hashti and the hallway, yard and courtyard, ablution house, shabistan and iwan have centralized designs. Elements like minaret, mihrab and minbar are made around the axis of the center of the dome. Centralization is thus one of unique features of Iranian mosques.

3.2.2.1 Entrance

After the arrival of Islam in Iran (1037 AD) in Sasanid period, entrances with vestibule were designed using Khorasani style highlighting the introspection and privacy. Simplicity is an architectural characteristic of this period that is apparent in construction of entrance spaces. The Prophet's mosque (622 AD) with its simple and basic structure and entrance is an example of this period. By rising the entrance of the mosque as an important building, its simplicity was gradually replaced by ornamentations like plaster works and etc (Shaterian, 2011).

Razi style was the second Iranian architectural style has become prevalent in Seljuq period as possesses all good characteristics of the previous methods. In a process and over a long period gradually simplicity in Khorasani style was replaced by luxury and the entrances were adorned by ornamentation. Rising the entrances and using ornamentations like plaster work and brick work is seen in this era. The main characteristics of entrance spaces in this era are: using diverse geometry in designing entrance spaces and large size entrances. (Figure 3.7) At this time the mosque façade was a tall building. Tiling as the ornamentation of entrance of buildings especially in mosques was more common (Shaterian, 2011).



Figure 3.7: Entrance of Saheb Zaman Mosque(1762) (Azizi, A, 2009)

Isfahani style was common in Safavid, Afshar, Qajar and Zandiyeh dynasties. Gradually the early Modern style in Qajari and first Pahlavi time. (Soltan Zadeh, 2005).

Soltan Zadeh (2005) mentioned that the entrances of Contemporary era (Qajar Period, Pahlavi period and Islamic republic period) can be divided into three categories:

- Traditional (1780- 1797 AD)
- Half-traditional (1797- 1895 AD)
- Modern (1895- now)

Traditional entrances: the main elements of entrance space that was previously used in Tehran and some other cities are: an external arch for covering the opening, two platforms on either side of the door, a rectangular double wooden door with metal knockers and two brick walls on either side of the entrance opening on which the arches base is stood. (Figure 3.8) In most cases, walls and roof of the entrance space

consisted of a rectangular frame. Two surfaces between the sides of the rectangular and the lines of opening arch and the interior part were ornamented by brickwork and tiling (SoltanZadeh, 2005).

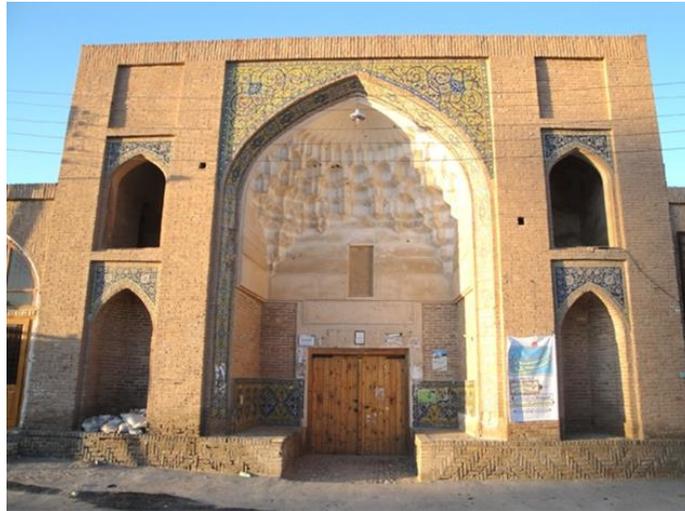


Figure 3.8: Traditional Entrance of Semnan Imam Mosque(1781) (Mola Hoseini, M, 2012)

Half-traditional entrances: archs became widespread in chambers, ports and opening spaces. In some spaces, platforms were built on two sides as a sitting place but sometimes these platforms didn't have enough space for sitting and were built only for the sake of spatial forms. (Figure 3.9) In some entrance spaces, the façade was designed and ornamented by sealed bricks and pottery on the walls and other spaces, especially the inscriptions on the façade. These entrances were usually half a meter deep, three to four meters wide and three to four and a half meters high (SoltanZadeh, 2005).

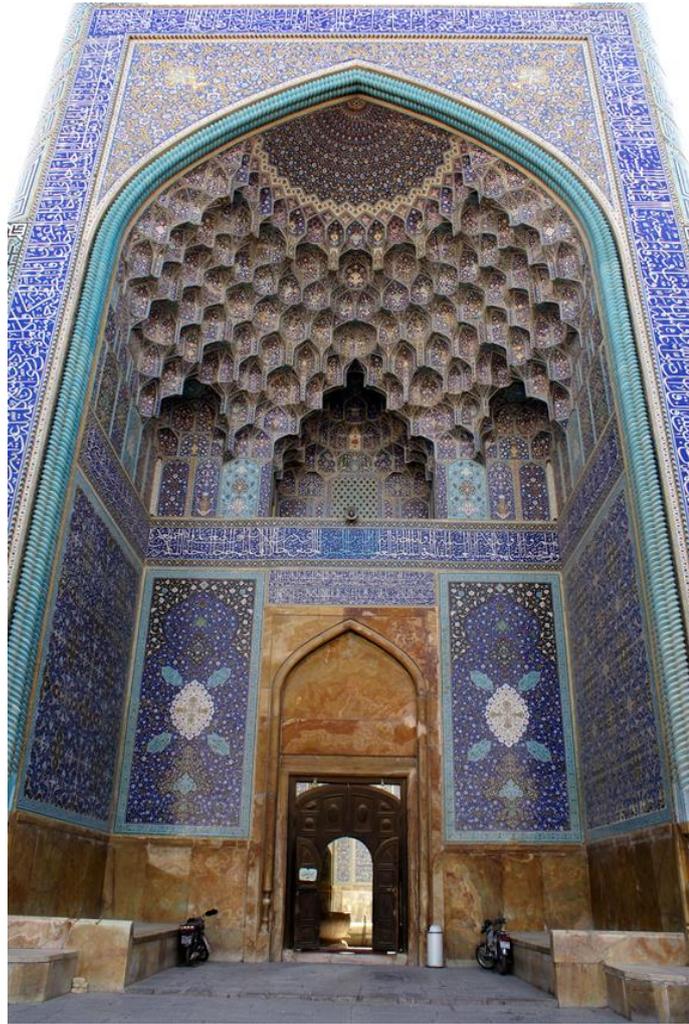


Figure 3.9: Half-Traditional Entrances of Isfahan Imam Mosque (1840) (Arnica, F, 2010)

Modern entrances: the use of untraditional form compositions, which was usually inspired by Russian and Europe architecture and foreign travels and especially establishment of Europeans embassies and buildings, became widespread. They were adorned with different shapes like dulcimer and helmet shapes that were plain or ornamented with arabesque, brick and tiling designs. These ornamentations were mostly used on façades. Plain walls with no ornamentation were common except for some exceptional cases in which pottery and sealed bricks were used. Sometimes, the composition of column or half-column with various shapes, especially single or double, and other elements and ornamental shapes were used on either side of the entrance space (Shaterian, 2011). (Figure 3.10)



Figure 3.10: Modern Entrance of Yazd Jami Mosque (1934 AD) (Arnica, F, 2010)

3.2.2.2 Vestibule (*hashti*) and corridor (*dallan*)

Upon passing the entrance, one reaches the vestibule that is generally in the form of an octagonal or quadrangle and is constructed for a change in direction. It is a place to pause, think and then choose the way. Upon passing from a bright space to a dark space, there is always light. The presence of light in spaces such as vestibule and corridor is always an evidence of guidance. Darkness and sudden changes in the scale, shape and form of the walls and ceiling is suggestive of entering a whole new world (Freely, 2011). (Figure a 3.11) Corridor in Iranian mosques is a space as a narrow hallway and depends on vestibule where the prayer is guided to the yard of mosque (Shaterian, 2011) (Figure b 3.11).

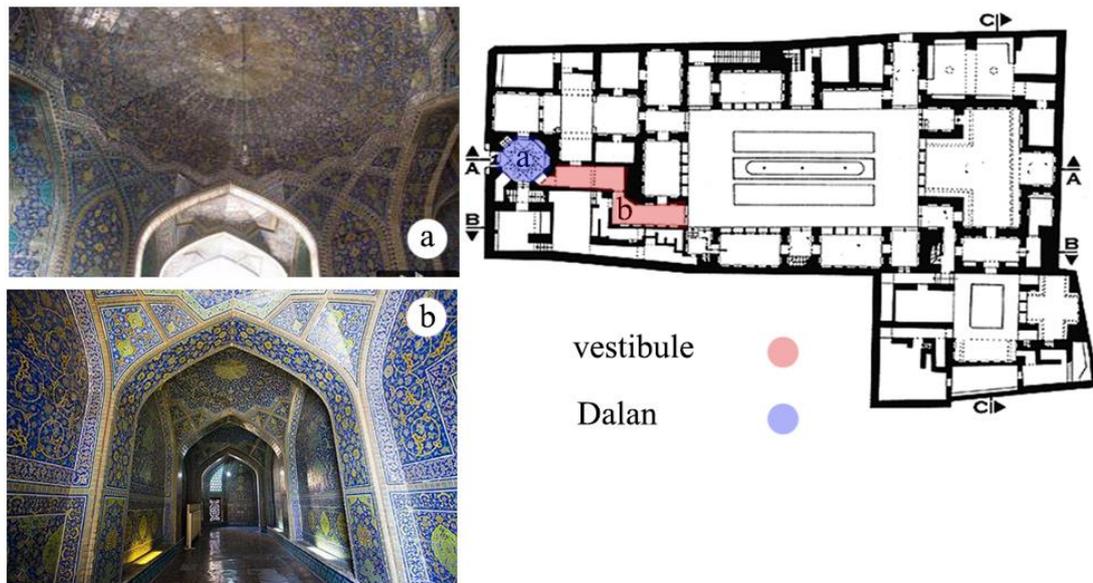


Figure 3.11: Vestibule and corridor of Yazd Jami Mosque (1934 AD) (Arnica, F, 2010)

Vestibule has been built in various forms. It is an enclosed space connected to alley and the mosque's yard, a space after the entrance which is often placed immediately after the portal. In fact, due to its intensity in outdoor, light should be broken and moderated at its arrival to building in order to balance the view of passenger inside. Moreover, in some vestibules there has been a hole in ceiling through which the light could pass to illuminate the inside and make the vestibule bright. Vestibule is an octangle space above which exists a domed roof with an aperture to diffuse the light within its interior space. From the morning until the evening, when no light is observed, that moving light is shining in the vestibule (Yaghmaee & Yarzadeh, 2006).

Vestibule was introduced to the world of architecture in the Sassanid period (835AD) (Khorasani style) and is rooted in Iranian culture. The most important application of vestibule is division of the entrance path into two or more directions and maintenance of a portion of mosque's privacy. Vestibule, placed immediately after the mosque's portal, acted as a kind of external yard for mosque. Some vestibules were simple which were rooted back in Sassanian period and others were colorful with patterns

and architectural ornaments that became common in Seljuq dynasty by using Razi style and reached their peak during Safavid dynasty and are continued until the present time (Shaterian, 2011).

Vestibule is followed by a space called corridor or dalaan. Dalaan, in Islamic-Iranian architecture, is a corridor through which the enter to could pass and reach from vestibule to the mosque's yard. Corridors were mostly used for space organization and building of compound and relatively complex spaces. Another feature of corridor is linkage of different spaces. Since corridors are spaces for preparing the arrival to mosque. In pre-Islamic architecture until the beginning of Parthian era, corridor has been the only element separating spaces. In Seljuq dynasty, some ornaments were added to corridor and brought it richly. Decorating corridors are still continued in the contemporary architecture (Shaterian, 2011).

3.2.2.3 Court Yard and Sahn

All mosques contain a sahn and an open space. During Islamic ages, this space was satisfying the Muslims' need for ablution, cleansing place and the passengers' need for rest (Kahera & Abdulmalik & Anz, 2009).

Yard and open space in the mosque was one of the most important elements that was built in Iranian mosques. Besides giving identity to the mosque, it was the expression of their unity. Using central yard is considered as the main element in constructing mosques. (Figure 3.12) In primary mosques, open spaces or yards were bigger than indoor spaces (Shaterian, 2011).



Figure 3.12: Court Yard and Sahn of Imam Reza Mosque (823 AD) (Rezaei, M, 2012)

Behnaz Aminzadeh (2004) believes that unlike the categories of mosque architecture, the categorization of mosque yards in the contemporary period of Iranian Islamic architecture (Qajar, Pahlavi and Islamic Republic periods) and significantly its history and native diversities are not studied. However, regarding the yard's position within the mosque's land, the space of mosque or Sahn is divided into the following categories:

- One-way space (625 – 1050 AD)
- Central space (1050- 1335 AD)
- Extended central space (1335- Now AD)

One-way space is inspired by the design of the prophet's mosque, these spaces were built in most of the primary mosques in the 6th century AD and the courtyard was placed on one side of the land. (Figure 3.13) Around the yard some porches in one, two, three or four sides were built to make an emphasis on the enclosed space of the yard in addition to its functional aspects. The porch is in qibla direction to bring the

mosque's shabistan into existence. Sahn, as an important element in this architectural composition, known as "Arabic Style" in architectural design of mosques, served as entrance to Sahbistan. Entering sahn was in direction of qibla (Shaterian, 2011).

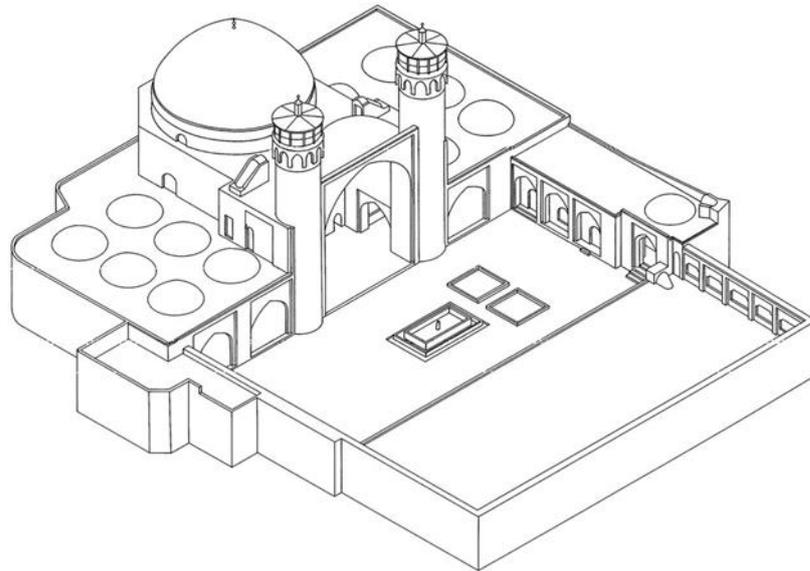


Figure 3.13: One-way Court Yard and Sahn of Brojerd Jami Mosque (771 AD)
(Omidi, M, 2013)

Central space: centrality in Islam is a symbol of unity and therefore reflects the quality hidden in that unity. In expressing the unity and its reflection through centrality, empty and full spaces in mosques are to some extent replete with the quality of form and space (Shaterian, 2011). As shown in Figure in 3.14.

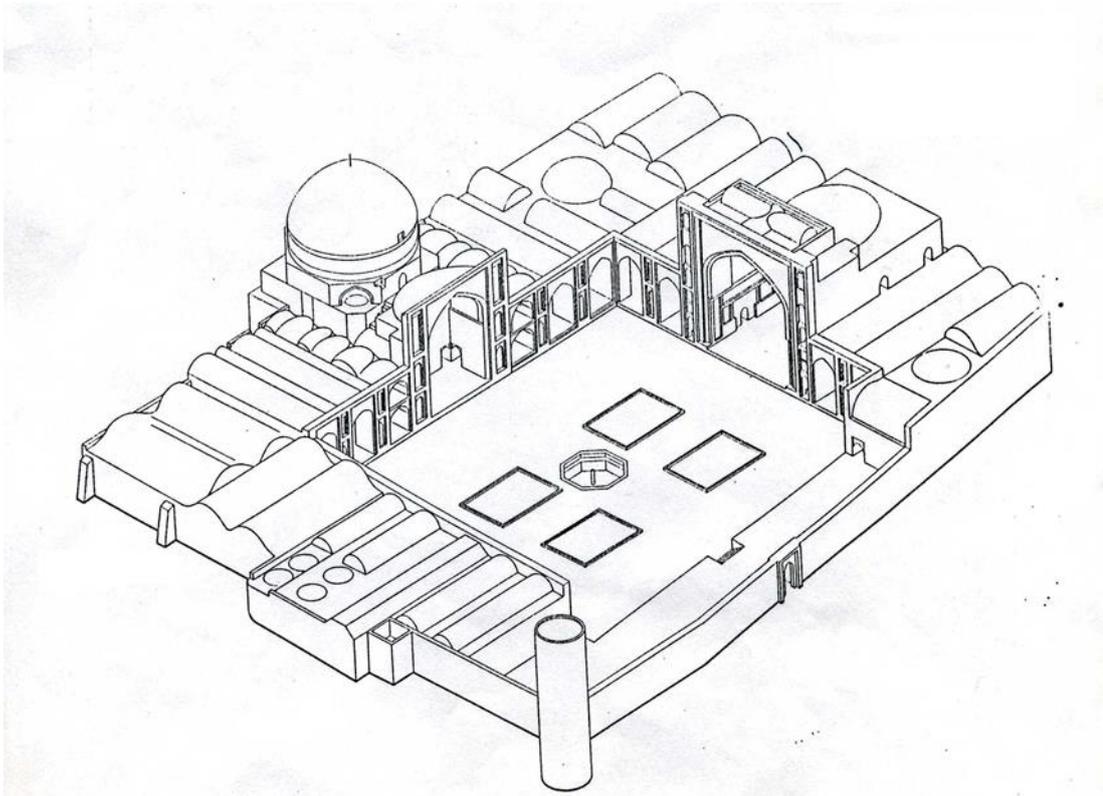


Figure 3.14: Central Court Yard and Sahn of Save Mosque (1141 AD) (Omidi, M, 2011)

Extended central space: what was considered as a fundamental change in the space quality of courtyards in Islamic architecture was the addition of iwan. Iwan or porch as a space between the inside and outside of the building has both qualities of interior and exterior. However, the design of porches in central axis of courtyard shows the unity between yard and porches. In comparing the relation between iwan and closed and open spaces of mosque, porch has a closer visual and spatial relation with open space (courtyard) and is considered as a part of yard. In other words, the open space of yard is extended toward the closed spaces and has penetrated into them. Extending the courtyard by four porches on four sides has created extra open space in relation with the central yard. It is an emphasis on the centrality of sahn that has become common in mosque construction after Seljuq era by using Azari style (Figure 3.15).

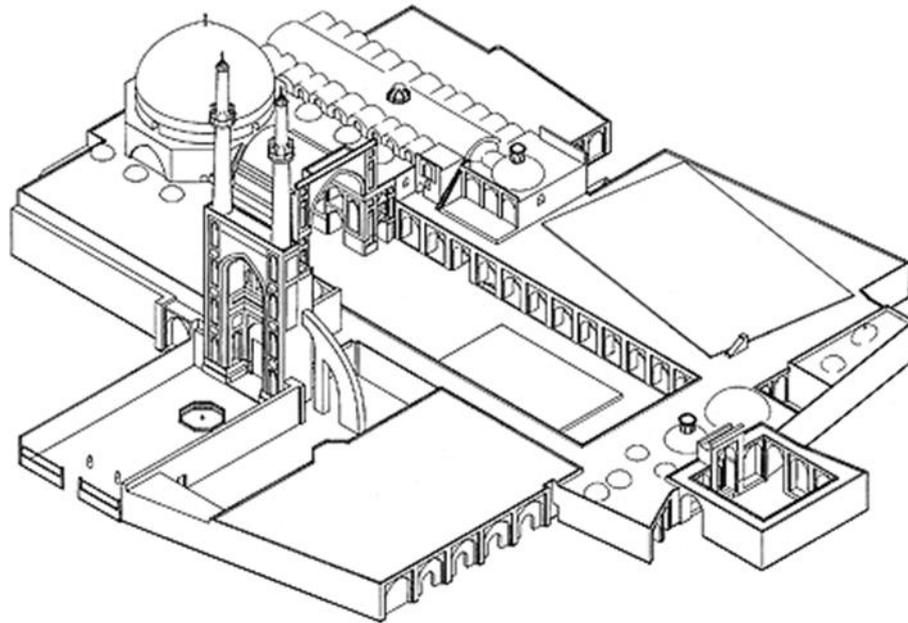


Figure 3.15: Extended central Court Yard and Sahn of Yazd Mosque (1834 AD)
(Korduni, S, 2011)

The existence of a pond in Iranian mosque's courtyard, especially in traditional architecture, is the reason for softening the inner space of the mosque. It is also used to provide a space for cleansing and washing hands and feet and more importantly, for inspiring the concept of transparency and reflection to the viewer (Soltanzadeh, 2005).

Nowadays, constructing a courtyard has become so common. No special type exists and different forms are used based on the climate and mosque land. The central yards with four porches are still the most common type of yards. Today with updating form of courtyard (like Covered Court Yard) built a new version of Court yard and Sahn (Shaterian, 2011).

3.2.2.4 Ablution House (wudu house)

Ablution (wudu) is among obligatory prerequisites of praying. Therefore, the possibility of an easy ablution along with every possible facilities and equipment and related lateral rituals is of great significance in designing a mosque's structure (Freely, 2011).

Water is one of the inseparable elements in mosques construction, whether constructed as a shelter or with an accurate architecture. Water has had two functions in building of Iranian mosques. Mosques have usually had ablution fountains and great ponds to which prayers referred for ablution (Bolkhari, 2004).

Ablution facility is made by building a pond in the courtyard, installing necessary equipment in the corner of courtyard and in its complete form, by building an ablution fountain and pond. Despite creating an appropriate atmosphere, employing a combination of these possibilities is a good solution for the time when the number of prayers reaches its maximum capacity (Bolkhari, 2004).

Some factors should be noted in selecting and designing the location of male and female ablution houses:

- There should be no confluence in their traffic.
- Boundaries should be designed in such a way that their privacies would not be disturbed and women can easily prepare for ablution and then reach the shabistan without any problem.
- If possible, direction of wind and placement of toilets should be considered.
- Materials used on the floor of ablution facilities should be easily washed and cleaned and possibly not made of light colors that would seem dirty with the slightest dirt or filth. They should also be hard and consistent (Shaterian, 2011).

From Sassanian to Seljuqi period (835- 1194 AD), by Khorasani style and Razi style ablution facilities were built in open spaces without any privacy which had caused problems in terms of women's privacy (seen by outsiders, or na mahram). But during Seljuq dynasty (1037- 1194 AD), they were developed in terms of privacy; that is,

separate ablution facilities were built for male and females prayers for their comfort. However, application of ornaments and ornamentations in the space of ablution facilities occurred during its peak advancement in Safavid period (Isfahani style) which continued to the present time (1501- Now) (Bolkhari, 2004).

3.2.2.5 Iwan

The space between the courtyard and the inside of the building is a space called Iwan. Iwan dates back to pre-Islam era and is an intermediate space between inside and outside, coldness and heat, light and darkness. Iwan's ceiling is made up of arch and walled on three sides and is open to the courtyard. Iwans are open for the drift; they block the sun and are of great importance as a part of the building (Rezayi, 2003).

Iwans of the mosques in Iran are different with respect to their height, technical proportions and decorative elements. The Iranian iwans are often tall and fit the mosque. Additionally, many interesting and various archs around iwans have made them symmetrical in order not to look abstract. The ceiling of iwans which has the shape and form of hemisphere and semi- dome, is ornamented with various decorative elements like Muqarnas, brickworks, plasterworks, mirror works and painting which reached its climax in Safavid period. According to the building's importance, these decorations increased and became more complete and beautiful. The progress in the building and exploitation of these decorations in iwans continued from the Qajar period up to the Islamic Republic government (1796 until now) (Shaterian, 2011).

Over the first three centuries of Islamic rule in Iran, mosques were built in a very simple form following the Sasanid architecture (Khorasani style). But even in that tradition, iwans were of importance. Thus, building dome and iwan, which had begun from the time of Parthians and developed during Sasanid dynasty, became an

inseparable part of mosque's body. From this period onwards, dome and iwans were being built by removing a row of columns of shabistan. Mosques with shabistan then turned into mosques with iwan. Finally, in the late 9th and early 11th centuries, four-iwan mosques emerged in Seljuq time (Razi style). They were composed of a central courtyard surrounded by four shabistans each one containing an iwan (Rezayi, 2003). Mosques containing an iwan are of two types that will be considered here:

- Two-iwan mosques (600- 1037 AD)
- Four-iwan mosques (1037- now)

Two-iwan mosques: The first Islamic iwans (10th century like Savee Mosque) were built in Southern part of the structure against which the northern iwans were then created for symmetrical purposes as well as using sunlight in winter. They became known as two-iwan mosques (Figure 3-16). One of the functions of southern iwan is remoteness from summer heat, because it is located back to the sunlight in the shadow. Prayers could use the northern or southern iwans based on the occasion and season (Rezayi, 2003).

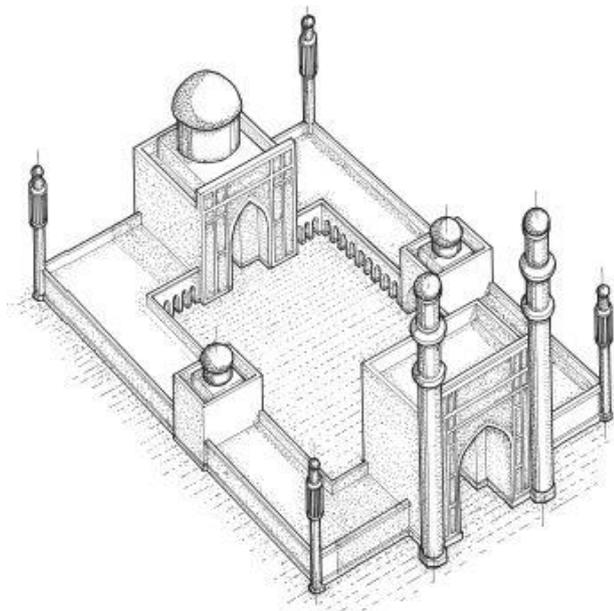


Figure 3.16: Two Iwan of fuman Mosque (1145 AD) (Omidi, M, 2011)

Four-iwan mosques: Along with construction of different buildings, Seljuqis indicated a higher tendency to build mosques. Thus, they left many mosques from their time. During Seljuq dynasty (Razi style), mosques turned into four-iwan mosques, but the time and reason of this shift is not exactly recorded (Rezayi, 2003). (Figure 3.17)

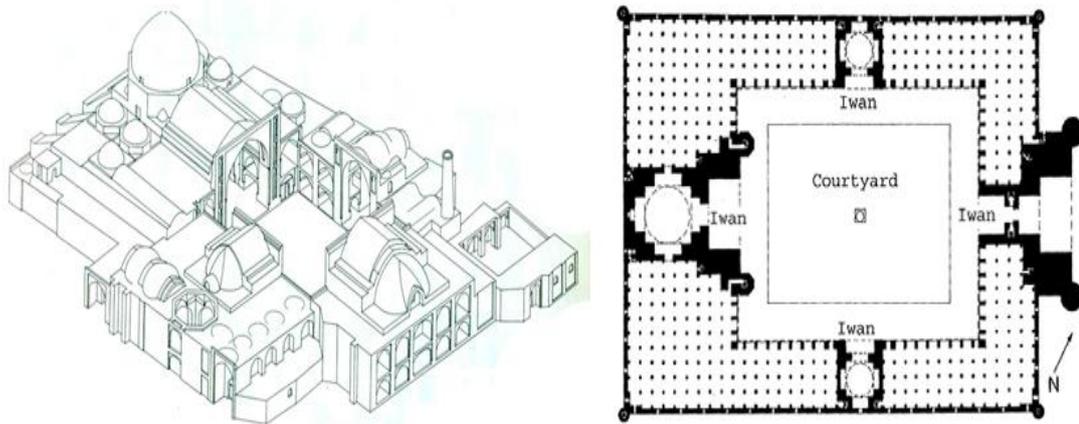


Figure 3.17: Four Iwan of Ardestan mosque (1086 AD) (Ahmadi, S, 2012)

3.2.2.6 Shabistan (Praying Hall)

Shabistan of the mosque is referred to a section of the Mosque that provides the primary necessity of the mosques, means praying, and it has been organized of a roofed hall for praying. Also, it is necessary to mention that there is an availability from the inside part of Shabistan to the open yard and porch of the mosques. Shabistan in architecture of mosques has been consisted of two parts for men and women prayers. (Shaterian, 2011) In Architecture of traditional Iranian mosques, due to lack of technology in previous times, in order to provide a suitable temperature suitable for cold and warm seasons of the year in Praying Hall (Shabistan), summer-siting Shabistan (Figure a 3.18) for keeping from summer warmness and winter-siting Shabistan (Figure b 3.18) for providing suitable conditions for cold temperature (BolkhariGhahi, 2005).

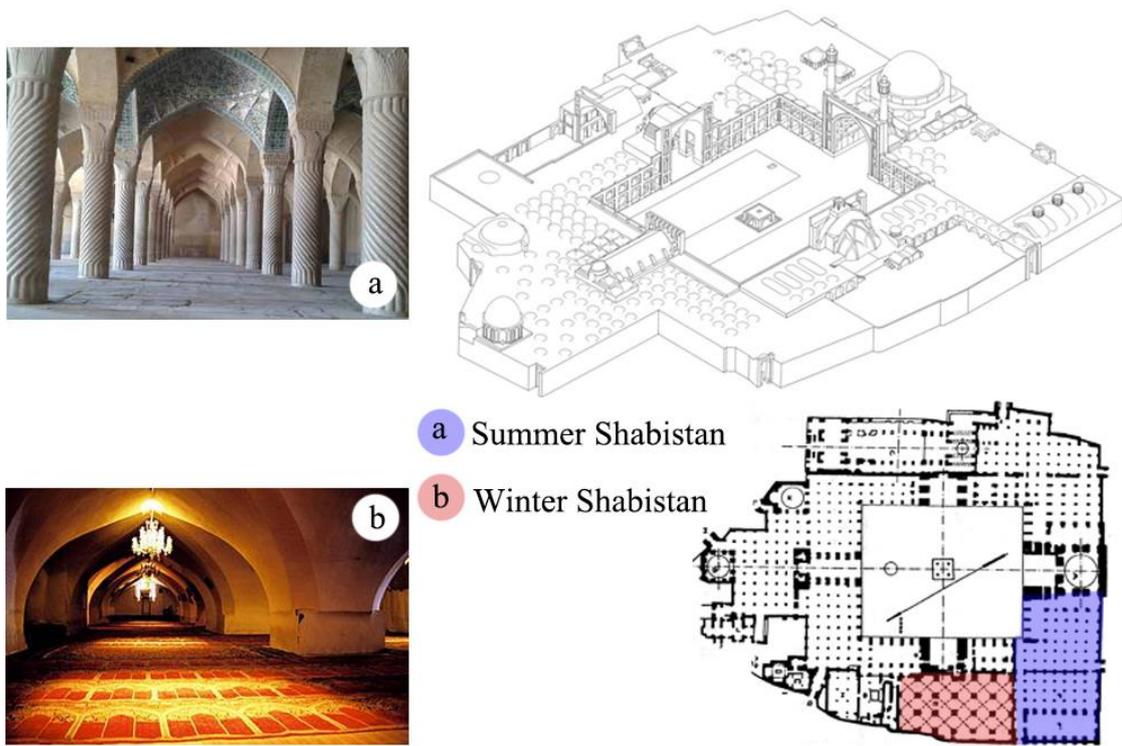


Figure 3.18: Summer Shabistan and Winter Shabistan of Isfahan mosque (Ahmadi, R, 2014)

Shabistan is a part of large mosques that is covered by ceiling. Shabistan was built in mosques in the 635 AD in Iran. With the help of experiences of ancient architecture in this land and the design of Nabi Mosque (622 AD) in Sasanid period (Khorasani style), mosques had indoor chamber (shabestan) and these mosques are very simple and basic with an ancient history in Iran. There is no doubt that Iran's architecture is an introvert-oriented architecture. In Iranian mosques with Shabistan, the roof cover was arch or sometimes wood. Some believe that this kind of mosque dates back to Sassanid era in which the mosques were probably built in the style of first Islamic mosques in the form of central yard with Shabistan. Gradually in Seljuk era (1037-1194 AD) (Razi style) some new changes were made in buildings of mosques like building domes, connecting domes to the mosques, connecting the Shabistan (chamber) to the dome by some arches and placing columned chamber (Figure 3.19) in the center (Shaterian, 2011).



Figure 3.19: Shabistan of Jamaran mosque (Hamrang, P, 2014)

Safavid era (Isfahani style) is considered an important era in developing mosque architecture. The most important change that has occurred in mosques is changing its plan from columned chamber design to four iwans. It can be said that four-iwan plan in that mosque has become a pattern and has been repeated in Safavid buildings and onwards till now (Setayesh, 2008).

3.2.3 Ornamentation

Ornamentation has an important component of architectural design. Ornamentation defines the space and readability of volumes. The volumes are not removable from its Ornamentation. Islamic architecture ornamentation consist writings, geometric lines, stencils and colors convey the meanings so that leads people to think (Aminzade, 2004). In this study, the ornamentations common in Iranian mosques have been investigated.

Ornamentation is a part of nature of the mosques, that is used as a ornamentation in mosques for completion of designing of the Islamic architecture. As Researcher

mentioned in chapter 2 used from the structure of ornamentation divided in Zehra Ongul (1998) master thesis. Thereafter Ornamentation in mosques is divided into three classes: material, type and technique. Based on it, at first study about the materials applied in ornamentation of architecture of Iranian Mosques and thereafter we introduce the type of ornamentation for material ornamentation in Iranian Mosques and at last we have studied the technique gained from combination of material and type of ornamentation applied in Iranian Mosques.

3.2.3.1 Ornamentation Material

In Iranian mosques, with consideration to the culture and history of architecture of the country of Iran, some materials are used such as: tile, brick, mirror, wood and plaster. As explained in chapter 2. (2.3.3.1)

3.2.3.2 Ornamentation Types

After introduction of materials used for ornamentation of Iranian mosques, the researcher has studied the type of ornamentation used on the construction materials. Based on this matter, the construction ornamentation in Iranian mosques has been divided into the methods of calligraphy, Eslimi Patterns and Girih Tiles.

Calligraphy: As mentioned that general description about calligraphy in chapter 2, in this part explained some information about calligraphy in Iranian Mosque Architecture.

Andre Godard (1998) mentioned that before Islam, different scripts such as Cuneiform, Pahlavi and Avestan alphabet were common. But after the appearance of Islam, Iranians accepted Islamic scripts and alphabets. After Islam victory in Iran, writing was performed in Naskh style. In the early 7th century in Sasanid dynasty (Khorasani style), the ta'liq script was produced as a result of mixing Naskh and Reqa

scripts, which was used mostly for writing letters and government orders. This script style continued one hundred years. The second Iranian script style in the 8th century in Seljuk dynasty (Razi style) was developed by combining two existing scripts of Naskh and ta'liq which was called Nasta'liq. These scripts were largely welcomed by people and induced a great development in the art of calligraphy. Nasta'liq script was more developed in Timurid era (Azari style) and flourished in Safavid dynasty (Isfahani style). However, after a period of stagnancy, Nasta'liq re-appeared during Qajar dynasty (Early Modern style) from which many great and noteworthy works is inherited. In the middle of 11th century in Pahlavi dynasty (High Modern style) the third original Iranian script, broken Nasta'liq (Shekasteh Nasta'liq) was invented. (Figure 3.20) Its genesis can be attributed to the need of fast and comfortable writing method in secretarial affairs and more importantly, Iranian imagination and innovation. This style of writing has been widely used in calligraphic patterns in mosque until the present time (Godard, 1998).

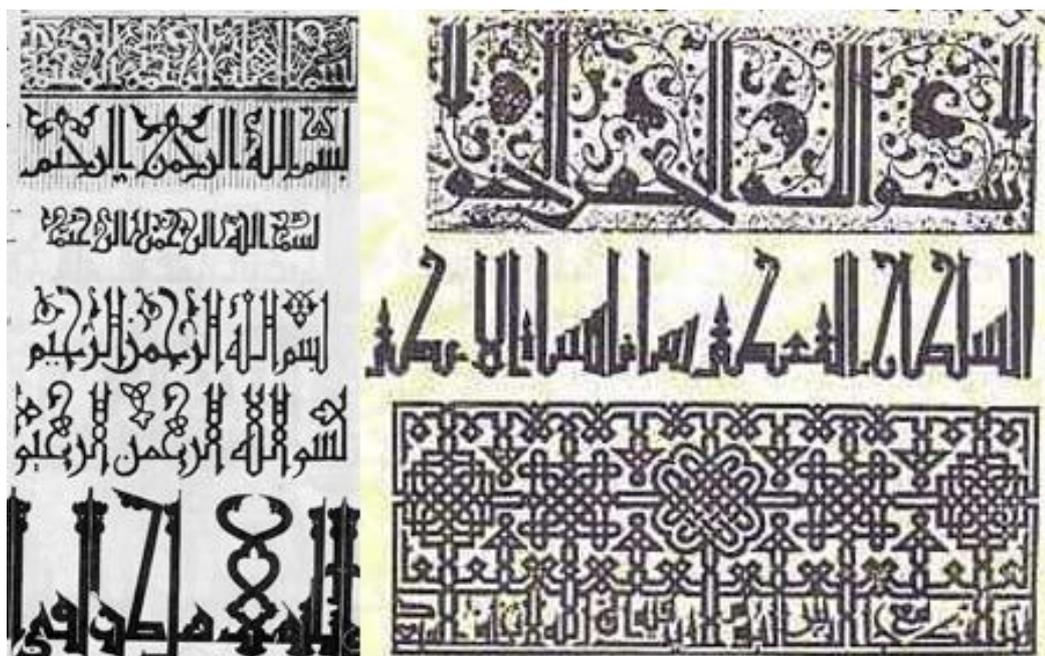


Figure 3.20: type of calligraphy(Aminzade, 2004)

Kufic script entered Iran from the city of Koofi at the beginning of entrance of Islam in this country and it is used as ornamentation at mosques up to this date. (Shaterian, 2011) (Figure 3.21)

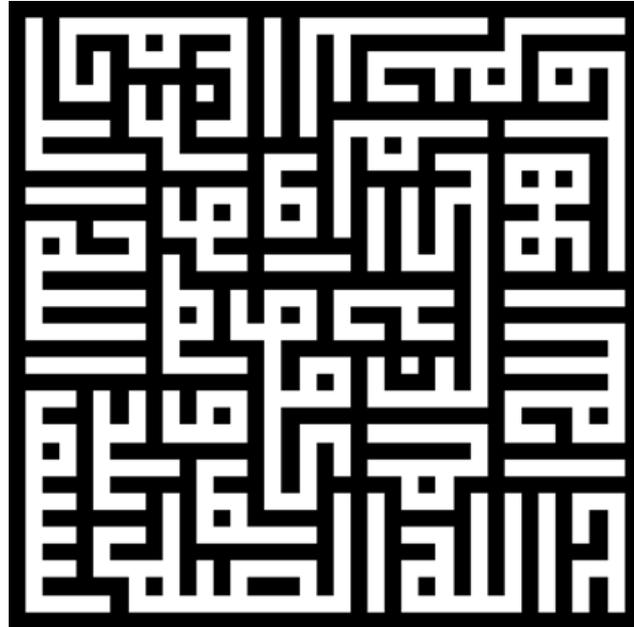


Figure 3.21: Koofi Calligraphy of Imam Mosque (622 AD) (Sameti, M, 2009)

Eslimi Pattern: As mentioned that general description about Eslimi pattern in chapter 2, in this part explained some information about Eslimi pattern in Iranian Mosque Architecture.

In the mosques of the 9th and 10th centuries AD in Sasanid dynasty and by using Khorasani style, which are among the most prominent and productive periods of Iran's art history, variety and innovation are clearly observed in Eslimis which in the later period, seem to have been inspired by the foliage of a specific plant. They contained symmetrical nervures that were probably representative of a type of tendril with heart-like leaves that wrap around it self when grown. Even its revolving form is somehow is indicative of the tendril's circulation (Christian San, Arthur, 1955). (Figure 3.22)



Figure 3.22: Eslimi Patern of Sheikh Lotf Allah Mosque (1619) (Ahmadi, R, 2014)

Production of tiles during 10th to 11th centuries (AD) in Saljuk dynasty by using Razi style opened a new space for Iranian artists to create richly and innovative patterns. Eslimis reached their perfection in Safavid dynasty and were employed in all stucco reliefs, tiling works, etc. Tiling works accompanied with Eslimis until now is noticeable (Shaterian, 2011). (Figure 3.23)



Figure 3.23: Eslimi Patern of Sheikh Lotf Allah Mosque (1619) (Ahmadi, R, 2014)

Girih Tiles: As mentioned that general description about Girih Tiles in chapter 2, in this part explained some information about Girih Tiles in Iranian Mosque Architecture.

As one type of Persian arts, girih tiles have been long focused by innovative Iranian artists in the field of architecture. (Figure 3.24) No definite time has been allocated for the origin of this art. Some scholars have speculated that usage of the art, whether in netted, began from the time of Abbasi Caliphate and continued in 9th to 10th (AD) in Egypt and Syria after which reached to Iran (Honar far, 1991).

This art was flourished from Seljuq dynasty to Safavid dynasty and by using Razi style, Azari style and Isfahani style and in Isfahan that was later known as its origin. The art of girih making is includes a vast domain. Experts of this craft in different Islamic countries have mixed it with their local and native taste and produced many girihs in Islamic buildings. Girih tiles are widely used in the present time in Mosques (Mirmiran, 2009).



Figure 3.24: Girih Tile of Ghazvin Mosque (1620) (Niazi, A, 2010)

3.2.3.3 Ornamentation Technique

After studying the material and type of ornamentation in Iranian mosques, their techniques of combination are explained. Some techniques used in internal and external façades of Iranian mosques are Muqarnas, Tiling Work, Brick Work, Mirror Art, Wood Carving and Stucco Relief.

Muqarnas: General description of Muqarnas in the world explained in chapter 2. In this part development of muqarnas in Iranian Mosque architecture.

After Islam entrance to Iran in Sasanid dynasty (Khorasani style), Iranian arts simultaneously maintained their historical background and adopted divine dimensions. Meanwhile, like any other artistic works, muqarnas found its original and familiar form in Islamic period. It is reported that muqarnas can be sporadically traced back to the first four centuries of Islam rule. In Timurid time (Azari style), the surface beneath muqarnas was vast. Tiles and mosaics were mostly used for ornamentation of installed muqarnas surfaces (Shaterian, 2011). (Figure 3.25)

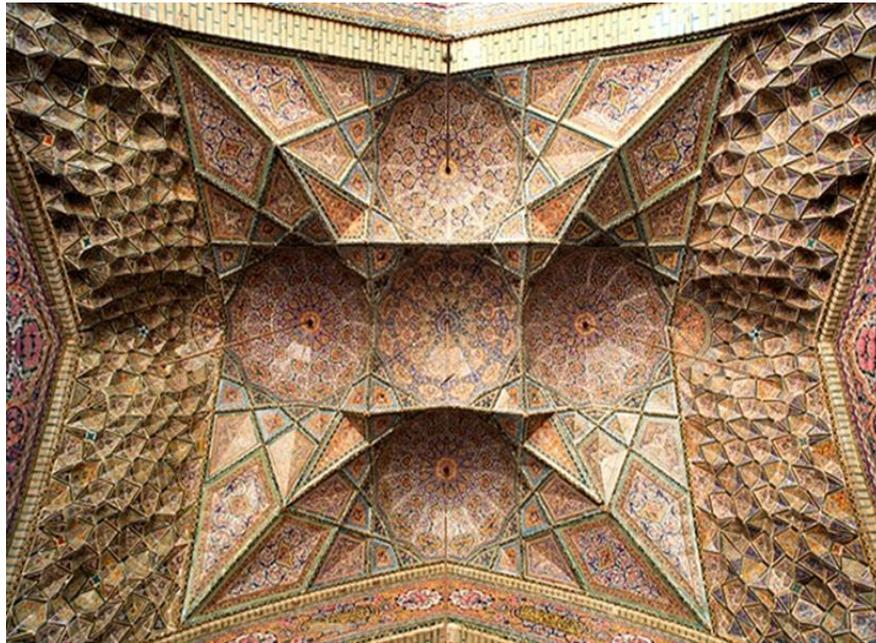


Figure 3.25: Muqarnas of Nasir Al Molk Mosque (1914 AD) (Mola Hoseini, M, 2009)

Christy Wilson (1997) writes that in Safavid period (Isfahani style), muqarnas had a completely ornamental aspect and like the previous ages, it was embellished with tile and mosaic. Muqarnas was mostly used on the column heads during the Safavid dynasty. In Zandiyeh dynasty (Isfahani style), movement and development of art was completely disappeared and an interval occurred in the art development which might be due to the flourishing of most arts until that time. Therefore, what is left from this era is a humble imitation of Safavid architecture and Isfahani style. As it is clear from the works of Qajar period (Early Modern style), all aspects of Iranian life became acquainted with a special type of western culture. Although this acquaintance did not result in the complete absorption of our culture and loss of native, national and religious roots, it led to the fusion of two cultures (Wilson, 1997).

After a period of absolute orientation toward western arts in the present time, especially after the Islamic Revolution, a movement directed at the construction of mosques in old forms was initiated. This movement was followed by revival of some

ornamental elements as muqarnas which was inspired by contemporary style in which ancient and old-school arts are use again (Shaterian, 2011).

Tiling Work: General description of Tiling work in the World explained in chapter 2. In this part developments of Tiling work in Iranian Mosque architecture.

Khosro Taqqadosi Nia (1968) mentioned that tiling work became common in Seljuq period (1037- 1194 AD) (Razi style). Tiling work is in general one of the pleasant ways of ornamentation in architecture in all Islamic lands. Tile is a ceramic product that takes a glassy form when baked at a certain temperature and finds some features as low water absorption and necessary resistance against strike, erosion and pressure. Glazed tiles not only enrich the architecture ornamented with tile, but also act as an insulator of the walls against humidity and water. (Figure 3.26)



Figure 3.26: Tiling Work of Ahmad Abad Mosque (1123 AD) (Malekpour, M, 2013)

Over different historical periods in Iran, tiles have undergone many changes in terms of whether creation or form and shape. During IL Khanate, Timurid (Azari style) and Safavid dynasties (1231- 1736 AD) (Isfahani style), the art of tiling work was at the best situation. Indeed, tiling work had reached its perfection in Timurid period (Azari style) and in Safavid era (Isfahani style) it achieved its climatic magnificence. From the time of Shah Abbas onwards, diced and one-color tiles were replaced with colorful tiles. Mosaic and rainbow tiles became commonly used in this period and all parts of the building (domes, vaults, minaret, etc.) were ornamented with tile (Taqqadosi Nia, Khosro, 1968). Mosques in Safavid era were completely ornamented with tile coverings both inside and outside. While mosaic tiles were quickly developing in that time, more employment of fast rainbow tiles technique was recommended. They were commonly used in the Pahlavi dynasty until the middle of the Islamic Republic government in which contemporary art had been introduced to Iranian architecture. Thenceforward, architects attempted to use mosaic and rainbow tiles (Taqqadosi Nia, Khosro, 1968).

Brick Work: General description of Brick work in the world explained in chapter 2. In this part developments of Brick work in Iranian Mosque architecture.

Brick was used as the main material in building of mosques in the noteworthy architecture of Seljuq dynasty (Razi style). Due to its tough and steady skeleton as well as its possibility to be used in the building's façade, brick was used in connection with the structure's skeleton and also as a separate coating from the skeleton. Many fantastic and artistic types of brickwork are observable in the buildings of this period. In Il Khanate dynasty (Azari style), brick coatings of vaults and arcades were introduced to architectural styles and techniques to the extent that salient domes with

well-wrought geometrical shapes emerged. In this period, the art of brickwork entered a new and interesting phase in which corners of Dome-chamber were ornamented with a muqarnas-like fashion with various sleeping and standing patterns of brick or a combination of tiles and bricks (Godard, 1998). The Timurid era (Azari style) was an age of motion and rise in different types of art, especially architecture. Brick-coated domes were completely developed during this time. Brick was being used in many buildings and structures in Safavid dynasty (Isfahani style) after which, employment of brickwork gave its place to tiling work. Iran was involved with its own martial conflicts in Afsharid dynasty (Isfahani style) (Pope, Arthur, 1957). Many minarets ornamented with brick works were built during this period. Moreover, due to the prosperity of art in Qajar dynasty (Early Modern style), brick workers showed an innovative taste in the exterior and interior facades of the buildings, especially by using great brick varia at the portals of mosques. Brick work has become less common in modern and contemporary architecture and is replaced by other materials and ornaments (Mahdlo, R, 2011).

Mirror Art: General description of Mirror Art in the world is explained in chapter 2. The development of Mirror Art in Iranian mosque architecture is studied in this part.

Mirror art should be considered as the latest innovation of Iranian artists in this sect of fine arts. Iranians have employed it in the interior architecture and ornamentations of their buildings. Iranian artists have long been the performers of this art, which is well known for its need of tolerance, accuracy and delicacy. By creating ornamental, organized and mostly geometric patterns, the mirror art is the implication of small and large pieces of mirror on the building's interior surfaces through which the continuous

reflection of light in infinite mirror pieces would produce a bright and glittery space (Shaterian, 2011). (Figure 3.27)

Mirror art started from Qajar dynasty in Iran. Innovative and fresh styles can be tracked in the mirror arts of Pahlavi period. Advancement of mirror as an ornamental element is rooted in this age. This development of traditional mirror working was not ineffective which was accompanied by new techniques that are still used in Iran's modern and contemporary architecture (Memarian, 2010).



Figure 3.27: Mirror Art of Tehran Pars Mosque (1932 AD) (Razfar, M, 2010)

Wood Carving: General description of Wood Carving in the world is explained in chapter 2. The development of Wood Carving in Iranian Mosque architecture is studied in this part.

Wood-carving is an art composed of carving and erasure of the wood based on an accurate plan. (Figure 3.28) According to historical records, wood-carving has an

origin of more than 1500 years. Some scholars have also speculated that before the appearance of Sasanid dynasty (Khorasani style), wood-carving has been prevalent in Iran; however, there is no historical proof for this claim. Wood-carving is still performed with older techniques and styles, except with some minor advancement in the production of necessary devices. (Honar far, 1991) The art of wood-carving can be divided into two arts of Khatam kari (marquetry) and mosaics (Honar far, 1991).



Figure 3.28: wood Carving in Mosques (Mirmiran, 2009)

- **Khatam (marquetry):** Background of this handicraft is not known. The oldest types of this art known hitherto won't go beyond the 7th century. However, according to the existing works in this artistic craft, it becomes clear that it has been employed during Safavid dynasty (Isfahani style) and has maintained its significance until Zandieh and Qajar dynasties (Isfahani style). But at the end of the former dynasty, Khatam Kari gradually declined and then flourished in the present time again (Honar far, 1991). In making a Khatam, the required articles including gold, silver, bone, ivory, brass and different woods are firstly prepared in the form of thin bars with triangle or diamond cross-sections. Then, by sticking these bars together, various types of flowers with multiple

sides and angles are produced (Honar far, 1991). Figure 3.29 represents this matter.

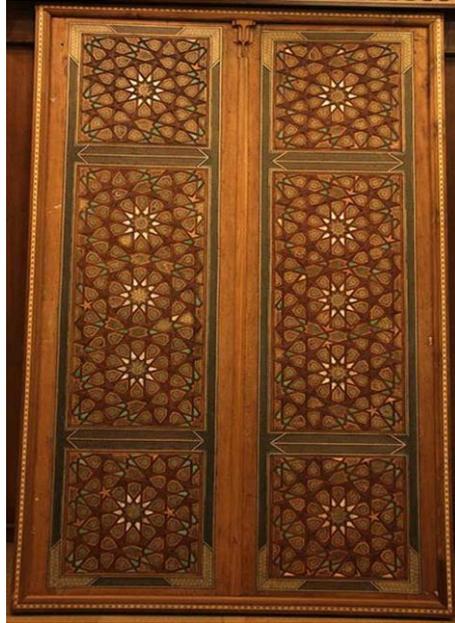


Figure 3.29: Khatam of ShahCheragh Mosque (1366) (Moradi, A, 2008)

- **Wood-mosaics:** With a background less than 60 years, wood-mosaics have probably come from India. However, there is a mosaic door in Iran which belongs to 300 years ago (but is not Iranian). The richly and delicacy seen in Iranian mosaics works is unexampled among the homeland countries of this art. The art and industry of mosaics are still continued in Tehran, Shiraz, Isfahan, Rasht, Sanandaj, Urmia, etc. By using new artistic techniques and phenomena, wooden crafts have obtained a new life. (Honar far, 1991) (Figure 3.30)



Figure 3.30: Wood-mosaics of Isfahan Mosque (622 AD) (Alizade, K, 2011)

Wood carving was continued in the Il Khanate and Timurid dynasties (Azari style). Most of the existing information regarding the wood working industry of the Safavid dynasty (Isfahani style) has been derived from the doors of Iranian mosques. In time of Afsharid, Zandieh (Isfahani style) and Qajar kingdoms (Early Modern style), the wood industry and art declined and what is left behind is often composed of painted ornaments with oil colors rather than carved wood. After the downfall of the Qajar dynasty and people's dissatisfaction of the current situation of the country, the artistic atmosphere and condition changed. Woodcarver experts migrated to Tehran and started their serious activity and educated students. Establishment of Iran Handicraft Organization as a protector and patron for local and traditional handicrafts brought about the perpetuity of these arts (Honar far, 1991).

Stucco Relief: General description of Stucco Relief in the world is explained in chapter 2. The development of Stucco Relief in Iranian Mosque architecture is studied in this part.

The art of stucco relief and use of stucco has a long history in Iran. Stucco reliefs in 10th century are suggestive of the fact that their artists have put their masterpieces in line with the great carvings of Takhte Jamshid (122 AD). This art was developed to its highest elegance and perfection in semi-relief and relief sculpture forms in 9th and 10th centuries. But with the appearance of Islam, stucco reliefs were limited to those geometric and vegetative figures or their combination. (Figure 3.31) The stucco relief styles underwent many changes over centuries to the extent that stucco elements emerged in the tiles' design (Kiani, 2003).



Figure 3.31: Stucco Relief of Zanjan Mosque (1765) (Birang, S, 2008)

Yousef Kiani says that this evolution and variety in Timurid dynasty (Azari style) passed a developmental journey and in Safavid period (Isfahani style), stucco relief in mosques continued its own advancement. Stucco relief is still mildly used but has gradually been replaced with new ornamental materials (Kiani, 2003).

Chapter 4

ANALYSIS AND DISCUSSION OF CASE STUDIES: TEHRAN MOSQUES

After knowing the spatial characteristics of mosques in the second chapter and investigating the effective factors on the design of Iranian mosques and evaluating the process of progress of space features in Iranian mosques in the third chapter, this study, in the fourth chapter, with selecting the case study, will evaluate and investigate the space features of mosques in Tehran. The reason for selection of these mosques as case studies will be followed. The analysis approach will be also described.

Based on what mentioned in the third chapter, the space features of mosques play the most important role in the architecture design of these buildings. The space features of Iranian mosques are influenced by styles, historic periods, the government, politics and the culture of Iran. Through the collected information, it is understood that the architectural features of Iranian mosques in the modern and contemporary era have changed which were investigated in the third chapter.

Since investigation and analysis of all the mosques in Iran is not possible, the researcher had to limit the research to the capital city (Tehran) for a more precise study. Tehran is chosen since it is the capital and the most important city of Iran, in which the beginning of the political, cultural, artistic and architectural processes in different periods are clearly visible.

In the analysis of each classified period, three random mosques were selected as case studies. A total of nine mosques in modern and contemporary periods (1796-today) were selected as case studies in order to be studied with respect to their architectural and interior features.

In this study, a qualitative study design was used to know, describe and understand the architecture of contemporary mosques in Iran (Tehran). Three other methods which are subcategories of a qualitative study design were used as well. These three methods include: literature survey, observation and case study.

Within the limited time duration of 150 years, Iran is divided into three categories: early modern, high modern and contemporary. In the category of early modern mosques (1879-1963), the architecture of Qajar (1879) and first Pahlavi (1925) eras were analyzed. Also in the category of high modern period (1963- 1998), the architecture of second Pahlavi (1963) and early period of the Islamic Republic (1979) were studied. Finally, in the category of contemporary mosques (1998- 2015), the architecture of mosques in the Islamic Republic were discussed.

Information about the Sepahsalar and Imam Ali Mosques was obtained from the category of early modern, and information about the mosques of Tehran University, Alqadir and Sharif University was obtained from the category of high modern. In addition, Shahrak Qods and Amiralmomenin Mosques, from the category of contemporary, were observed and photographed using a field observation and personal survey. Their drawing plans were taken from the Tehran Municipality. This field observation lasted from July-September 2013 and their theoretical knowledge was collected through books, articles and public offices.

Imam Khomeini Mosque from the category of early modern and Ibrahim Mosque from the contemporary category were studied using the literature survey. Their drawings were taken from the Tehran Municipality, and their theoretical information was collected through books, articles and public offices. These mosques were randomly selected from September to November, 2015 and were studied thence.

Each of the mosques were analyzed separately and then, three mosques existing in each category were compared theoretically which is also shown in the table. Finally, the categories (9 mosques in general) are compared, discussed and analyzed in table.

4.1 Early Modern category

Early Modern era started from 1796 (Ghobadian, 2013). Early modern period commenced as from the middle of Qajar Government in the year 1796 and continued up to the late of First Pahlavi Government in the year 1960. In Qajar Period, Iran and specially Tehran (capital of Iran) were influenced by decisions of Qajar administration that mostly tended to the western architecture and culture. In this period of architecture, mosques of Iran have been constructed using combination of Isfahani Style and Western Modern Architecture. Like the Qajar Period, the historical architecture of Iran in the first Pahlavi Period was considered and country's architecture was influenced by modern style. In fact, the architecture of mosques in Iran during the Early Modern period and under the supervision of two governments of Qajar and the First Pahlavi has been under the influence of traditionalism (Isfahani Style). At this era, the Islamic architecture tried to use traditional plans and materials in the construction of mosques for the needs of that period. Three mosques including Sepahsalar, Imam Khomeini and Imam Ali Mosques are selected from this category. Elements, spaces and ornamentations of these mosques are analyzed in the following Table (Table 4.1).

Table 4.1: Components of Early Modern Mosques Category by Author

Mosques	Elements		Spaces		Ornamentation	
Sepah Salar Mosque	Dome	Nar dome. Two shells are completely interconnected	Entrance	Half traditional type	Muqarnas	Tile. Plaster. Eslimi paternrn
	Minaret	8 Minarets	Vestibule & Corridor	Have a vestibule and corridor	Tiling work	Tile. Eslimi pattern. Girih Tiles. calligraphy
	Mihrab	Have a traditional Mihrab	İwan	4 Iwans type	Brick work	Brick. Girih Tiles
			Yard	Extended Central Space	Mirror Art	Mirror. Girih Tile
	Minbar	Wooden mihab with 6 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Mosaic Art. Girih tile
			shabistan	Summer and winter shabistans	Stucco Reief	Plaster. Girih tile. Eslimi pattern
Imam Khomeini Mosque	Dome	Nar dome. Two shells with a gap between together	Entrance	3 entrances. Main entrance is Half traditional type	Muqarnas	Tile. Brick. Plaster. Eslimi pattern. Girih tile. calligraphy
	Minaret	2 minarets	Vestibule & Corridor	Has 3 vestibule and 3 corridors	Tiling work	Tile. Eslimi pattern. Calligraphy. Girih tile
	Mihrab	2 mihrabs with traditional type	İwan	4 iwans type	Brick work	Brick. Girih tile
			Yard	Extended Central Space	Mirror Art	-
	Minbar	Has 2 minbar. One of by marble stone with 13 steps. Another one is wooden minbar with 10 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Khatam. Girih tile
			shabistan	Summer and winter shabistans	Stucco Reief	Plaster. Muqarnas
Imam Ali Mosque	Dome	Cube shape	Entrance	New Type	Muqarnas	-
	Minaret	single	Vestibule & Corridor	-	Tiling work	Tile. Calligraphy. Eslimi pattern
	Mihrab	Traditional type	İwan	-	Brick work	Brick. Girih tile
			Yard	Central roofed yard	Mirror Art	-
	Minbar	Wooden Minbar with 3 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Khatam
			shabistan	One shabistan	Stucco Reief	Plaster. Girih tile

4.1.1 Sepah Salar Mosque (1881)

Sepah Salar Mosque is one of the significant architectural examples of Tehran. This mosque is one of the most famous mosques of Fathali King of Qajar period that is built using the Isfahani Style combined with modern methods. Sepah Salar Mosque has been constructed in Qajar Period and is in the classification of Early Modern Period. The present mosques has been designed and constructed with a tendency toward traditionalism (Isfahani Style). Sepah Salar Mosque was built by Mirza Mehdi Kanshaghaghi at the center of Tehran city in 1881. This mosque is the result of the closest integration of Iranian and Turkish architecture. (Figure 4.1)

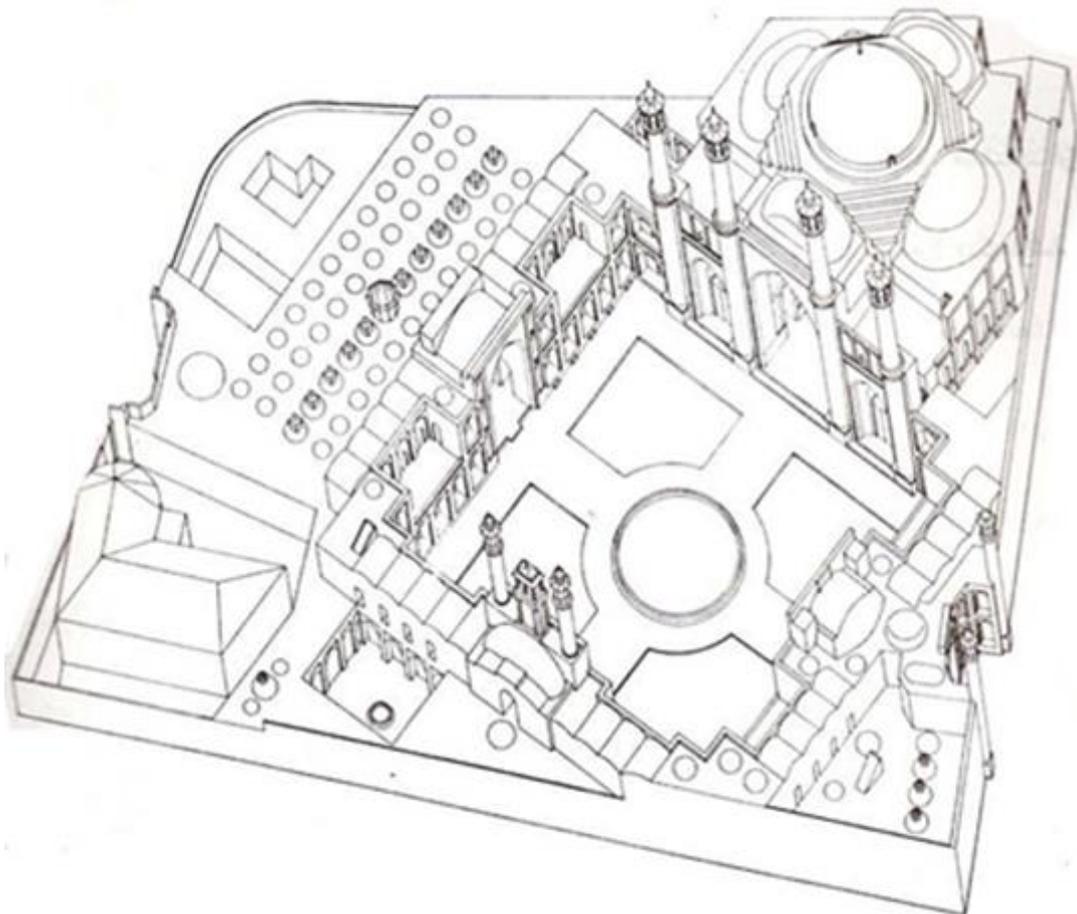


Figure 4.1: Over view of Sepahsalar Mosque (Hashem Nejad, 2014)

Sepah Salar Mosque has a special dome and the number of its minarets exceeds the usual and reach about eight minarets. The resting bicuspid dome of the mosque reminds one of architectural style of Turkish mosques. Sepah Salar is a two-floor mosque.

Sepah Salar Mosque is of four-iwan type with two shabistans and two entrances which is mainly built by brick. Recessing from the pavement, the main entrance has followed the four-court pattern. The main door is located in the west side and has a huge portal. One section has recently been added to the northwest of Sepah Salar Mosque where ablution facilities and toilets are located. (Table 4.2)

Table 4.2: Analysis table of Sepahsalar Mosque

Sepahsalar Mosque					
Plan	Space Organization	Architectural Elements	Ornamentation		
<p>Ground Floor</p>	<p>Entrance</p>	<p>Dome</p>	<p>Calligraphy</p>	<p>Muqarnas</p>	<p>Tiling Work</p>
<p>First Floor</p>	<p>Courtyard</p>	<p>Minaret</p>	<p>Eslimi Pattern</p>	<p>Brick Work</p>	<p>Mirror Art</p>
<p>Iwan</p>	<p>Shabistan</p>	<p>Minbar</p>	<p>Girih Tile</p>	<p>Stucco relief</p>	<p>Wood Carving</p>

4.1.1.1 Space Organization and Ornamentation Techniques Used in Sepah Salar Mosque

Space Organization of Sepahsalar Mosque will be described in this section. Common spaces present in this mosque include Entrance, Vestibule and corridor (dalaan), Courtyard and sahn, Ablution house, Iwan and Shabistan. These spaces and their synthesis with different ornamentations are explained here.

Sepah Salar Mosque has two entrances, one of which is located in the northern part and the other is in the southern part. The western entrance, which is considered as the main entrance, has a huge portal and grand iron doors located at the margin of street. This entrance is like a half traditional entrance. Tiling work has been used on the top of the main entrance in the form of eslimi patterns with colorful tiles. The western entrance does not have a direct view to the sahn and central courtyard and is connected to the former through corridor. Its eastern entrance has also a four-court, vestibule and long corridor that is connected to the northeast corner of sahn.

Corridors are connected to the entrance space, central courtyard and other sections. There are small dome sockets, located at the center of domes that are ornamented with simple brick ornaments with Girih Tiles. They are connected to the main sahn from the both sides of western iwan. There is another corridor located after the eastern door which is connected to the main courtyard.

The building's sahn or central courtyard is of four-iwan type (northern, southern, western and eastern iwan) which is the ideal for Iranian architecture. Court yard of this mosque has a type of Extended Central Space. The courtyard is 62*63 meters. The art of calligraphy is clearly seen on the margin of courtyard's walls over the blue

tiles. The courtyard or sahn of Sepah Salar Mosque contains four small gardens, four large walking routes and a large round pond with a fountain at its center.

The ablution house of Sepah Salar Mosque is located in a place called 'forty faucets' hall. At the center of this great hall and in the middle of eight stone columns there is a relatively large stone pond which is considered as the ablution space. There are forty steel faucets installed around the pond which bears the hall's name. The ablution houses of women and men are located respectively at the right and left side of this hall.

This mosque contains four iwans at four main directions with approximate height of 18m. There are two minarets at the upper side of the northern iwan, at the center of which there exists a large clock with three bells. The clock on the northern iwan has some wooden ornaments. Four high iwans of Sepah Salar Mosque are located in front of each other and the shortest one is directed toward qibla.

Sepah Salar Mosque contains two shabistans that, according to their architectural characteristics, can be divided into two types: winter and summer shabistan. The summer shabistan which actually occupies the space under the dome is the largest space in the mosque. It is located behind a large iwan (south iwan) without a wall and entrance door, Due to its high altitude, this iwan facilitates better and easier air circulation at summer. The winter shabistan is located behind the eastern iwan with forty four stone columns. Every four columns have a dome ceiling that is ornamented with stucco relief inside. All areas of interior and exterior façade of shabistan are decorated with tiles in the form of eslimi patterns and inscriptions of Quran verses. Mirror art and stucco relief are observed in the margins of shabistan's inscriptions

which are made of girih tiles. God's titles are seen in the form of colorful tiles at the margin of shabistan's ceiling. The winter shabistan of Sepah Salar Mosque has separate entrances for men and women which are located in the main sahn. The main door of winter shabistan has a woodcarving containing mosaic girih tiles. This mosque contains some wooden lattice windows on the pre-entrance section of shabistan that are used as anteroom.

4.1.1.2 Architectural Elements in Sepah Salar Mosque

Architectural elements of Sepahsalar Mosque are unique and will be described in this section. Dome, minaret, mihrab and minbar are the elements that will be explained and their combination with different types, techniques and materials of ornamentations will be discussed

The form of dome with a short height and a resting mode is derived from Turkish architecture and definitely has no similarity with the conventional Iranian domes. Iranian domes are generally built in high altitudes. The two shells of this dome are completely interconnected. The dome's width and height are respectively, 15 and 34 m. This dome is made of brick and ornamented with tiling works on the outside and the dome's interior space is full of muqarnas with turquoise tiles. God's titles can be seen in the form of stucco inscriptions laid in the dome's interior space.

Sepah Salar Mosque has eight tall minarets. In fact, this mosque is of pair-minarets type. The tallest minarets are 37 m high and the shortest ones are 25 m high. This large number of minarets is considered as one of the particular architectural features of Sepah Salar Mosque. All minarets are made of brick and ornamented with a fair tiling cover. Minarets have been ornamented with colorful tiles in the form of eslimi patterns, muqarnas and calligraphies. There are three types of calligraphy over the

minarets of Sepah Salar Mosque. On the upper part over the white tiling works, Quran verses have been carved out with Nasta'liq script. On the middle part, Quran verses are seen in colorful tiles and finally on the lower parts of minarets, one can see God's titles carved over the tiles. These eight minarets are divided into two groups of four minarets with foundations half built of stone and lead for more resistancy; two on the both sides of four-court and two others near the mosque's dome. From the first four minarets, two are connected to iwan's two sides and the other two face the iwan's hall.

Sepah Salar Mosque has a mihrab with a dome ceiling which has been ornamented with marble stone above which there exists muqarnas with stucco relief and tiling work appeared in the form of Eslimi Pattern. It is located in the both shabistans in the middle of southwest wall of the mosque. Compared to traditional mihrabs, this mihrab occupies more space in the wall. Over the mihrab, there is an inscription of Quran verses in yellow tiles.

The mosque's wooden minbar with six stairs is located near the mihrab. This mosque's minbar is made of wood and ornamented with woodcarvings with and mosaic arts.

4.1.2 Imam Khomeini Mosque (1898)

Shah Mosque (Imam Khomeini), located at Bazaar Region of Tehran, is one of the mosques built in Qajar Period and lies in the preliminary modern classification. It has been constructed applying the Western Architecture in Isfahani Style using the new technology of that period. This Mosque was constructed with the order of Fathali King of Qajar in the year 1898 and rebuilt with the order of Nasereddin King of Qajar in the year 1916. This Mosque was built during Qajar Kingship when the architecture and culture of Iran had been acquainted with the western culture and architecture. Therefore, it is concluded that the architectural design of this period tended toward traditionalism. Shah Mosque has been called Imam Khomeini Mosque after the Islamic Republic of Iran (Kiani, 1997). (Figure 4.2)



Figure 4.2: Over view of Imam Khomeini Mosque (Kiani, 1997)

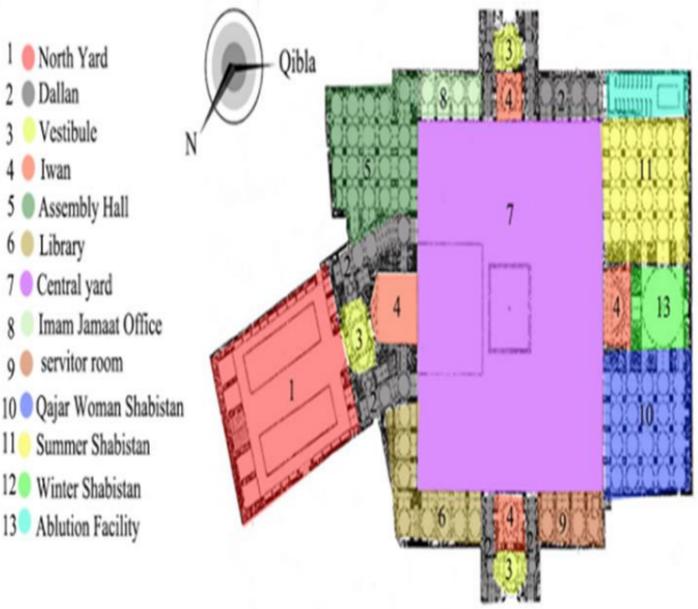
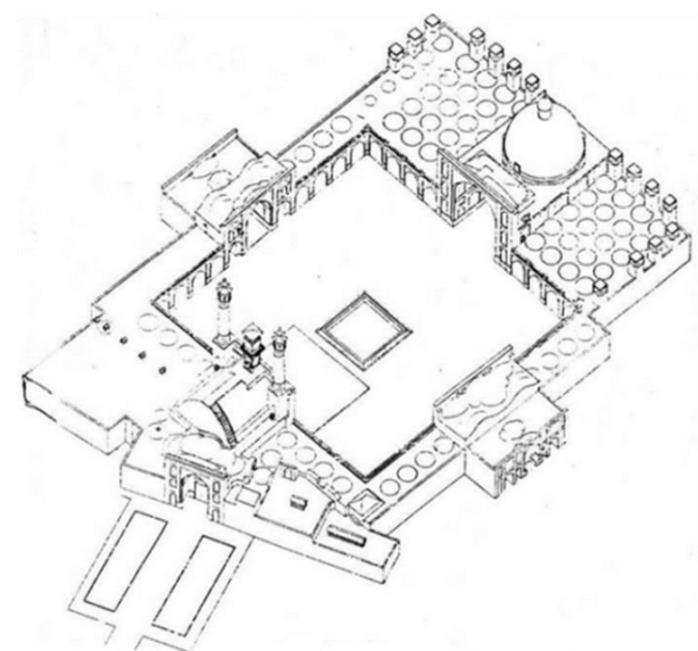
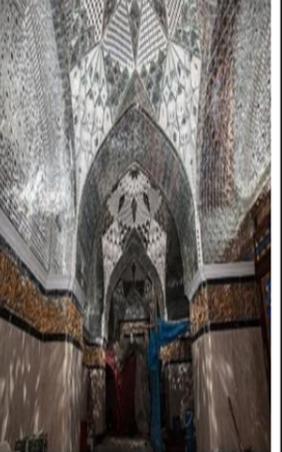
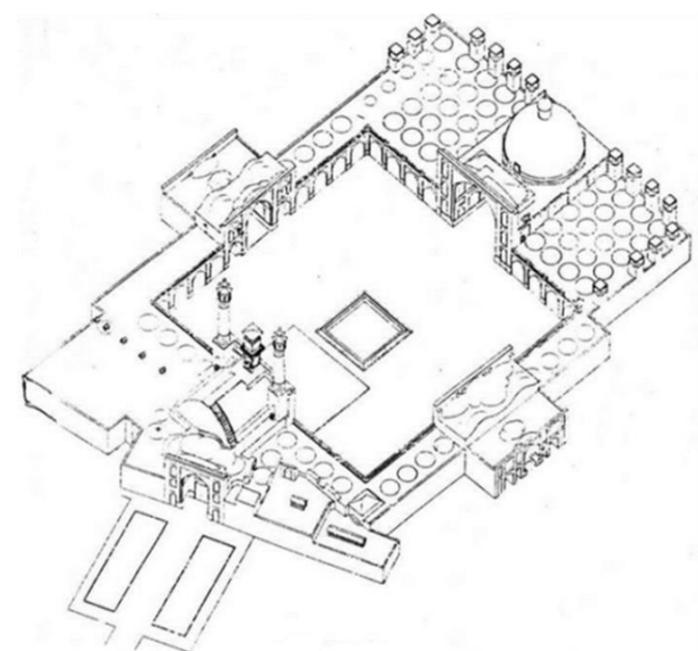
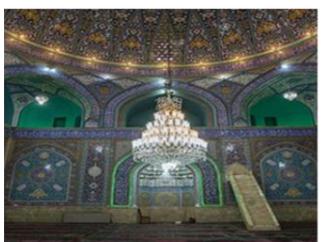
The total structure of this mosque consists of a square space with a central symmetric yard that has a moderate rotation, compared to the urban structures which were

established toward the Qibla (facing to the south). The main shabistan has a dome in the southern side as a winter- praying hall. Another shabistan, located in the southeastern side, is considered for summer-sittings. There is also a rectangle pool in the center of the yard. This mosque has been ornamented using buff-color bricks and multi-color tiles with consideration to Isfahani Style.

Spaces of Imam Khomeini Mosque consist of main shabistan, subordinate shabistan, entrance, ablution house, yard, assembly hall, library, Imam Jamaat's office and servitor's room.

The most outstanding characteristic of this mosque lies in its construction place in the center of Tehran Great Bazaar which make it available through three different sides. Imam Khomeini Mosque has been built in 10,000.00 sq. meters area. Another particular feature of this mosque can be seen in its utilization of many ornamentation techniques such as tile-working, paint, brick-working. All these characteristics have made this mosque an outstanding mosque of Qajar Period. (Table 4.3)

Table 4.3: Analysis table of Imam Khomeini Mosque

Imam Khomeini Mosque					
Plan	Space Organization	Architectural Elements	Ornamentation		
 <p>1 North Yard 2 Dallah 3 Vestibule 4 Iwan 5 Assembly Hall 6 Library 7 Central yard 8 Imam Jamaat Office 9 servitor room 10 Qajar Woman Shabistan 11 Summer Shabistan 12 Winter Shabistan 13 Ablution Facility</p>	 <p>Entrance</p>	 <p>Dome</p>	 <p>Calligraphy</p>	 <p>Muqarnas</p>	 <p>Tiling Work</p>
<p>Ground Floor</p> 	 <p>Vestibule & corridor</p>	 <p>Minaret</p>	 <p>Eslimi Pattern</p>	 <p>Brick Work</p>	 <p>Mirror Art</p>
<p>First Floor</p> 	 <p>Courtyard</p>	 <p>Mihrab</p>	 <p>Girih Tile</p>	 <p>Stucco relief</p>	 <p>Wood Carving</p>
	 <p>Iwan</p>	<p>Minbar</p>			
	<p>Shabistan</p>				

4.1.2.1 Space Organization and Ornamentations used in Imam Khomeini

Mosque

Spatial organization of Imam Khomeini Mosque will be described in this section. Among the spaces of this mosque are entrance, vestibule and corridor, yard, ablution house, iwan and shabistan that have been combined with different materials, types and techniques of ornamentation.

This mosque has three entrance doors. Two entrance doors are toward bazaars and the other is opened in the main street. Each one of the entrances has its special front door. Two entrances toward the bazaar are symmetric and similar to each other, and the main entrance of this mosque is as a wide rectangular entrance which is situated in the middle of the wall and ornamented by Muqarnas with Eslimi Pattern. The architectural style of this entrance is similar to half traditional entrance types. This entrance is connected to the main street by 18 stairs and is marked by a major door. After entering from the street, one will face rectangular courtyard at both sides of the pool. Another entrance is faced with the vestibule, corridor and central courtyard.

Vestibule of this mosque is situated in the northern entrance. After entering from the northern entrance, there is an arched vestibule which is connected to a spacious yard. The round and arched ceiling of this vestibule has been ornamented by brick work, tilling work and Girih Tiles. There are also several vestibules in the eastern and western entrances but in a smaller scale and a shorter corridor in comparison with the southern corridor.

The yard of this mosque is in square shape and in the type of extended central yard. Four Iwans are situated in four sides thereof. In the middle of this wide yard, there is a rectangular stony great pool with a high fountain therein.

The ablution room of this mosque is situated in the eastern side divided into two sections for women and men. The ablution room can be accessed from two entrances; the eastern entrance that is connected to ablution room by a corridor and the second one is situated from the yard.

This mosque is in the type of four-Iwan. Each one has been located in the middle of each side and all of them have been formed in a rectangular frame. The most important Iwan is the southern one, because the dome is located behind it. Some inscriptions with tile working, Eslimi Pattern and Nasta'liq calligraphy are observed on the Iwans. The arched ceiling of the dome has also been ornamented by Muqarnas, tile-working and Eslimi Patterns.

The area of shabistans in this mosque is more than 2,000.00 sq. meters consisting of three sections. The ground shabistan under the dome is allocated to men and another one, located in the first floor as a balcony, is allocated to women. This shabistan is connected to another room by a hallway that was used for Qajar's women. But nowadays, it is used when there is a crowded population. The hallways that connect two Shabistans and Qajar's Women's Room to each other are in arched shape. As this shabistan is situated in the direction of Qibla, it is sun-visor in winter and is known as winter-sitting shabistan or warm shabistan. There is another shabistan that is called summer-sitting shabistan located in the southeastern side of the mosque and has been constructed on 12 columns. As this Shabistan is not sun visor in summer, it is cool.

This shabistan's façade is made of tile workings. It has been ornamented by Eslimi patterns and calligraphy inscription. A large crystal chandelier is hanging in the middle of this Shabistan. In the summer- praying hall constructed on 12 columns, elegant tile-workings have been used ornamented by Eslimi patterns and Quranic calligraphy inscriptions and 15 small crystal chandeliers have been used for artificial light.

4.1.2.2 Architectural elements of Imam Khomeini Mosque

Architectural elements of Imam Khomeini Mosque have unique characteristics that are explained in this section. Elements of this mosque consist of Dome, Minaret, Mihrab and Minbar that have been combined with different materials, types and techniques of ornamentation.

Dome of this mosque is as one of the most outstanding characteristic of this mosque and is located at the southern side of the mosque and at the rear of the southern Iwan. It has been covered by turquoise-blue tiles. The mosque's dome is in the type of Nar and has two shells with a gap between to keep the temperature moderate in and out of the mosque through an isolator. On the top of the great turquoise-color dome, there is a small and golden Nar as an affirmation and ornamentation symbol. Indoor ornamentations of the dome have been made by tile-workings with Eslimi Patterns.

This mosque has two minarets (couple-minaret). The minarets of this mosque are situated in the northern side of the mosque and beside of Iwan and northern entrance. Minaret of this mosque has been ornamented by tile working, Eslimi pattern and Quranic calligraphy. On the top of two minarets, there is a small room in which a speaker has been installed. There is a clock between two minarets on the top of the northern Iwan ornamented by tile working.

This mosque has two Mihrabs. The first Mihrab is located at the winter- praying hall. This Mihrab has a concavity in the Qibla wall and its arched ceiling has been ornamented by Muqarnas. It has been ornamented by tile-working, Eslimi Pattern and Quranic verses calligraphy. The second Mihrab is situated in the summer- praying hall. This Mihrab has a concavity in Qibla wall. It has been ornamented on the top with plaster and Muqarnas and in the lower part of Mihrab, tile working, Eslimi pattern and calligraphy are seen.

This mosque has two Minbars. The first Minbar is located at the winter- praying hall constructed in an innovative and outstanding shape of integrated marble stone with 13 stairs. The second Minbar is located at the summer- praying hall, ornamented with 10 wooden stairs.

4.1.3 Imam Ali Mosque (1931)

Imam Ali Mosque is one of the mosques in the first Pahlavi Period that is in the Early Modern group. Therefore, the elements and spaces have been simplified in this mosque. In constructing the present mosque, the Iranian architecture and culture have been combined with the western culture and architecture. Imam Ali Mosque was built with in 1400 m² area in Tehran, Iran (1931). Its architect is Yousef Shariatzadeh who designed and established this mosque with the help of his colleagues. Due to some changes in its form and size, Imam Ali Mosque can be considered as a combination of modern and traditional patterns. The mosque's height has also put it in the category of modern mosques with traditional design. (Figure 4.3)

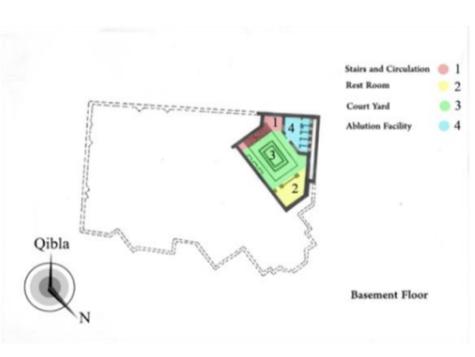
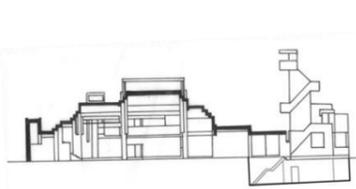
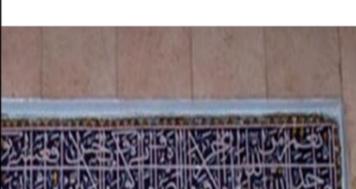
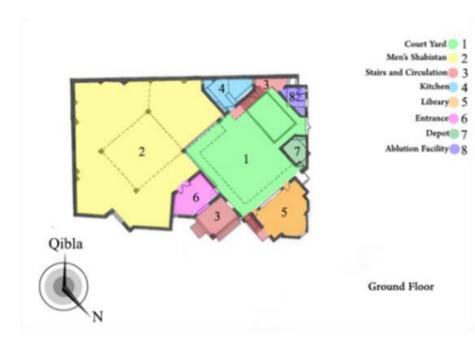
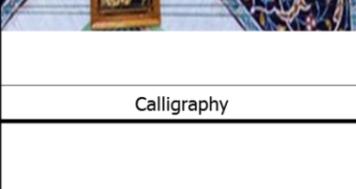
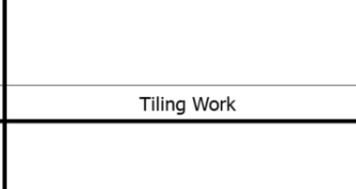
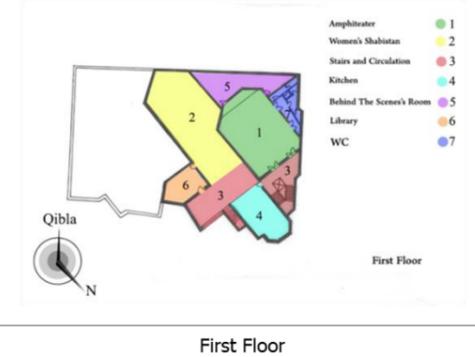
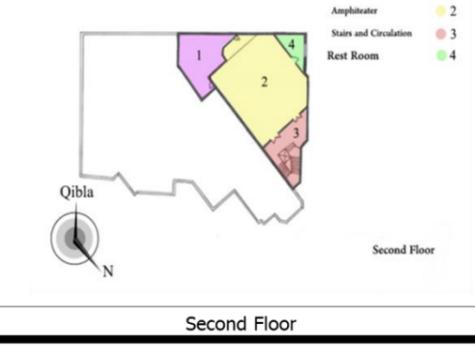


Figure 4.3: Over view of Imam Ali Mosque (Monghah, 2014)

Imam Ali Mosque has a three-store structure. Ablution facilities, the central courtyard and main shabistan are located on the ground floor. The first floor contains in itself women shabistan. Later on, some extensions including two meeting halls and a public

library were added to the mosque which accordingly, expanded its area to 1700 m². Building a religious space with specific status, distinct functions, easy and separate access to men and women spaces and service and support structures have been among the main requirements of this design. This mosque contains a courtyard, ablution fountains, toilets and a shabistan. (Table 4.4)

Table 4.4: Analysis table of Imam Ali Mosque

Imam Ali Mosque				
Plan	Space Organization	Architectural Elements	Ornamentation	
 <p>Basement Floor</p>	 <p>Entrance</p>	 <p>Dome</p>	 <p>Calligraphy</p>	 <p>Tiling Work</p>
 <p>Ground Floor</p>	 <p>Vestibule & corridor</p>	 <p>Minaret</p>	 <p>Esfimi Pattern</p>	 <p>Brick Work</p>
 <p>First Floor</p>	 <p>Iwan</p>	 <p>Mihrab</p>	 <p>Girih Tile</p>	 <p>Stucco relief</p>
 <p>Second Floor</p>	 <p>Shabistan</p>	 <p>Minbar</p>	 <p>Wood Carving</p>	 <p>Wood Carving</p>

4.1.3.1 Space Organization and Ornamentation Techniques Used in Imam Ali

Mosque

The space organization of Imam Ali Mosque will be described in this section. Entrance, Courtyard and sahn, Ablution house and Shabistan are the spaces observed in the present mosques that will be explained and their combination with different materials, types and techniques of ornamentation will be discussed.

The Mosque's entrance lies at the northern part and opens to the main street. This entrance does not follow and exist in any pattern of entrance. In Qajar period mosques began to be simplified in their structures by using modern western architecture. The portal has been ornamented with colorful tiles and Quran inscriptions. Tiling Work has been employed on the portal of entrance door in two different forms of seven-color tiles and Quran inscriptions. This entrance has been separated from the pavement's floor by a few stairs and after passing the main sahn, it reaches the main shabistan.

This mosque has one central roofed courtyard which is located at the contour of the main shabistan and minaret. The structure of this court yard is different from the old ones (it has a roof). . In a separate area in the corner, there exist the ablution house, toilets and other service rooms. This courtyard has a rectangular pond in its center. The whole central courtyard is surrounded with inscriptions of Quran verses with Tiling work and Brick work. All the girih tiles present in this mosque are only made of brick that are seen on the walls of the courtyard and the exterior facade. At the southeast part of the courtyard, a space has been specified for pre-entrance to the main shabistan which also contains the anteroom.

The ablution houses of Imam Ali Mosque for men and women are separately located in the eastern corner. Both interior and exterior spaces are made of brick.

This mosque has two shabistans. The main one, which is specified for men, is located on the ground floor after the entrance. This space is lighted through some small windows on the roof and has been ornamented with brick works. Stucco relief has been used on the ceiling and columns of shabistans. Al-Jumuah surah has been inscribed in the form of brick art over the right wall of mihrab which continues around the mosque. The other shabistan, specified for women, has been designed in the form of a mezzanine with a staircase on the eastern part of the courtyard. The women shabistan overlooks the mihrab and minbar of the mosque in the form of a balcony. Unlike the plain form of this mosque with pure geometric shapes and stylized ornamentations, a huge crystal chandelier is hanged from the middle of the Shabistan roof which is disharmonious with simple structure of the mosque.

4.1.3.2 Architectural Elements in Imam Ali Mosque

The architectural elements of Imam Ali Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained and combined with different materials, types and techniques of ornamentation.

Dome of Imam Ali Mosque is not similar to that of traditional mosques. Instead of a conventional dome upon the main façade, one can observe a cubic shape with smaller sub-indentations upon its rising that ultimately creates a structure which practically evokes the dome's form; meaning that it evokes the presence of a higher state as well as an infinite space.

Imam Ali Mosque has one minaret (Single Minaret) which is another characteristic feature of the present mosque, because it is not in the form of traditional minaret. This minaret is the highest point of the mosque which at the first sight does not assimilate a minaret to the visitor's eye. However, according to the architect, the function and body of minaret has been preserved. Unlike the traditional minarets, the minaret of Imam Ali Mosque has an external staircase which is representative of a motional element. Moreover, the combination of vertical and horizontal lines evokes variety and dynamics.

Mihrab of Imam Ali Mosque is located in the middle of a wall on the southwest corner of shabistan. It is located one step lower than the ground level and has been ornamented with such ornamental elements as, brick works, inscriptions of Quran verses and turquoise blue tiles. Above the mihrab, there are Quran inscriptions made of mosaic tiles.

Imam Ali Mosque's minbar is of the short type with a wooden skeleton containing three stairs. Woodcarving is available on the wooden minbar of the Mosque in the form of khatam kaari. It is located near the mihrab.

4.1.4 Evaluation of Early Modern category

Analysis and discussion on the early modern categorization have been conducted with a comparative method and based on available research information. (Table 4.6, 4.7 and 4.8)

Understudy mosques in Early Modern era are:

- Sepah Salar
- Imam Khomeini Mosque
- Imam Ali Mosque

These mosques and the effect of external factors on their parts will be considered.

These factors affecting the periods of Islamic Architecture in Iran are governmental attitudes, policy, culture and styles.

Table 4.5: Information of Early Modern Mosque Category by Author

Mosques	Building date	Architectural Style	Period
Sepah Salar Mosque	1881	Early Modern	Qajar
Imam Khomeini Mosque	1895	Early Modern	Qajar
Imam Ali Mosque	1931	Early Modern	Pahlavi

Table 4.6: Evaluation table of Architectural Elements of Early Modern Category

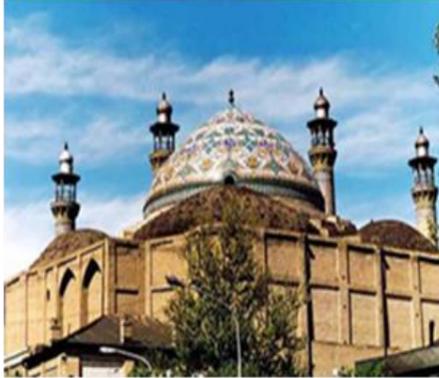
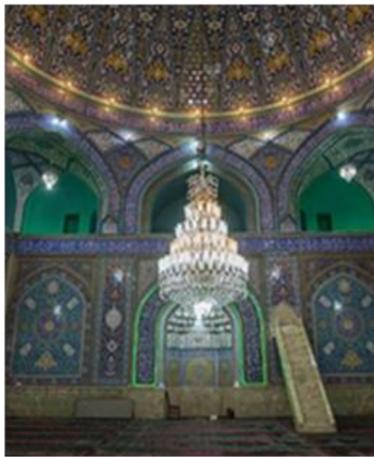
Architectural Elements	Dome	Minaret	Mihrab	Minbar
Sepahsalar Mosque				
Imam Khomeini Mosque				
Imam Ali Mosque				

Table 4.7: Evaluation table of Space Organization of Early Modern Category

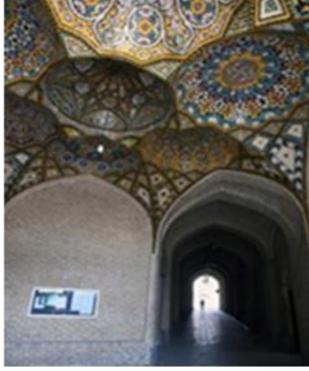
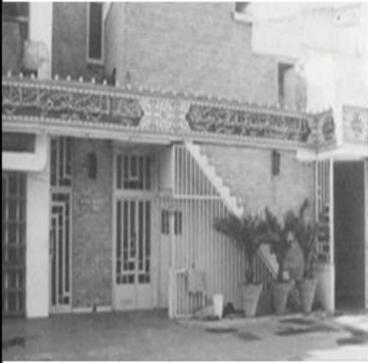
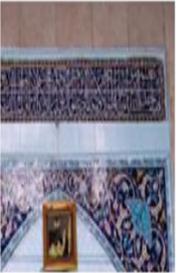
Space Organization	Entrance	Vestibule & Corridor	Courtyard	Iwan	Shabistan
Sepahsalar Mosque					
Imam Khomeini Mosque					 Winter Shabistan  Summer Shabistan
Imam Ali Mosque		-		-	

Table 4.8: Evaluation table of Ornamentation Type and Technique of Early Modern Category

	Ornamentation	Calligraphy	Eslimi Pattern	Girih Tile	Muqarnas	Tiling Work	Brick Work	Mirror Art	Wood Carving	Stucco Relief
Early Modern Era	Sepahsalar Mosque									
	Imam Khomeini Mosque									
	Imam Ali Mosque									

Above mosques were all established in an era where signs of western modern architecture had appeared in Islamic architecture. In the early modern period, Iranian architecture could accomplish many masterpieces by combining Iranian materials with western art. The early modern period in Islamic architecture in Iran is divided into two eras: Qajar and First Pahlavi dynasties. Imam Khomeini and Sepah Salar Mosques were built in the Qajar era and the Imam Ali Mosque was built in the First Pahlavi era. For a better understanding of early modern mosques, it is necessary to separate these two eras from each other. According to studies on the mosques in the early modern period, the trend toward West architecture of ornamentation, architectural elements, and space organization was influenced by modern architecture.

After studying the space organization of these three mosques, it is observed that Sepah Salar and Imam Khomeini Mosques contain all the spaces present in a traditional mosque. These two mosques are of four-iwan type. Unlike the other two, the Imam Ali Mosque is of Shabistan type that also contains a vestibule and corridor. Following the style of Safavid mosques, Sepah Salar and Imam Khomeini Mosques have a winter and a summer Shabistan that are used in different seasons. Each Shabistan is partitioned into men and women sections. The Imam Ali Mosque has one Shabistan which is separately used for men and women. Given the large spaces and the building's requirements, Sepah Salar Mosque contains six entrances, some of which are still not used. Due to its large space and location being at the centre of the Tehran Great Bazaar, Imam Khomeini Mosque has three entrances. The main entrance is opened into the main street and the other two are opened in bazaar. However, Imam Ali Mosque has a new and modern form on its portal. Imam Khomeini and Sepah Salar Mosques, with traditional forms, contain vestibules and corridors in their structure, whereas the Imam Ali Mosque does not have such spaces. These two

mosques have also a conventional courtyard and sahn while the Imam Ali Mosque has a roofed courtyard which indicates an innovation for central courtyards.

Architectural elements used in these three mosques will be discussed in this section. Sepah Salar and Imam Khomeini Mosques that have been built using the Safavid style, contain all the traditional elements of mosques in the same old form. They contain 8 and 2 minarets, respectively. Unlike these two mosques, Imam Ali Mosque does not have the conventional form of mosques. Imam Ali mosque has one minaret which is actually a space with an external staircase that can be considered as a symbol of a real minaret. Regardless of traditional form of domes, Imam Ali Mosque's dome has a cubic shape which is presented in the form of small indentations. The mihrab of Imam Khomeini Mosque has the exact traditional form of Safavid Period. On the contrary, the mihrab of Sepah Salar Mosque is higher than usual mihrabs. Finally, Imam Ali Mosque's mihrab has a traditional form with a dome ceiling. Among these three mosques, Imam Ali Mosque has the shortest minbar with two stairs. Sepah Salar and Imam Khomeini Mosques contain minbar with many stairs.

The presence of such graceful artifice like stucco relief and tiling work in mosques built in Qajar period (as seen in Imam Khomeini and Sepah Salar Mosques) increased compared to previous eras. Emergence of new materials and European art can be found in the usage of stucco relief and mirror arts. Imam Ali Mosque, built in the first Pahlavi period, is a mosque constructed with new materials like concrete. Ornamentations of Imam Khomeini and Sepahsalar Mosque represent the remained ornamentations of the Seljuk and Safavid eras. The mihrab of Sepahsalar Mosque has been ornamented with marble tiles. In both Imam Khomeini and Sepahsalar Mosque, there are Girih tiles, arabesque designs, Quranic inscriptions, and Muqarnas in their

interior environments. Imam Ali Mosque, unlike the two other mosques, has simpler ornamentations. Muqarnas, which is a common and traditional ornamentation in traditional mosques, has not been used in this mosque. The mihrab of Imam Khomeini Mosque has tiles with Eslimi pattern and some inscription of Quranic Verses. On the contrary, the mihrab of Sepah Salar Mosque has a marble stone facade. Thereafter, the entrances of all three mosques are ornamented with many ornaments including tiling work, Quran inscriptions and brick work.

After comparing these three mosques regarding their structures, the effective factors on their elements will be discussed here.

Qajar mosques are all categorized in early modern mosques. In this era, western architecture was introduced to Iran by architects educated in the west. From the middle of the Qajar era, a fundamental change took place in Iranian architecture.

Mosques during the Pahlavi era can be divided into two separate categories: Pahlavi I and Pahlavi II. Imam Ali Mosque has been established in Pahlavi I era that contains the early modern style in itself. Pahlavi II is a subset of High Modern style. During Pahlavi I era, Iranian architects attempted to show the influence of western architecture by eliminating elements, symbols and sometimes the main spaces of the mosque. Instead of a traditional introverted mosque, extroverted mosques with facades facing the street were built. In other words, eliminating the elements or changing the form, ornamentations, or spaces took place in mosques influenced by the west architecture in this era. One example of this mosque can be Imam Ali Mosque. In this mosque, it has been attempted to create a new work by designing stair-shaped minaret.

In this era, new materials such as steel girders, rebar, and cement have been widely used.

Imam Khomeini Mosque has a traditional plan and has been constructed using Esfahani style and a combination of western modern methods. Imam Khomeini Mosque has old materials used in Safavid era like, brick, colorful tiles, stucco, etc. But despite its traditional design and presence of all conventional Safavid ornaments, Sepah Salar Mosque has also some new ornaments such as colourful glasses and mirror art. However, Imam Ali Mosque has new materials compared to the other two mosques.

Although new materials and technologies have used at the beginning of the early modern period, tendencies in mosque architecture display more traditional architectural and ornamentation languages. Imam Khomeini and Sepahsalar Mosques are examples to this process. At Imam Ali Mosque, which is the later example of early modern category, abstracted forms derived from traditional mosques patterns and ornamentation techniques have used in more refined manner. So additional to new building materials and technologies architectural understanding has revised.

4.2 High Modern category

High Modern era started from 1963 (Ghobadian, 2013). High Modern period commenced from the second Pahlavi Government in the year 1960 and continued up to the early years after the Islamic Republic of Iran in the year 1998. In the second Pahlavi Government in Iran, architecture of mosques (Isfahani Style) had been completely combined with western modern architecture. In this period, several mosques were constructed with architectural design different from the previous periods. In the second Pahlavi Period, architecture of mosques in Iran inclined toward modernism. Because of revolution and war, the political situation of Iran was unorganized at the early stages of the Islamic Republic. In this period, the Islamic Republic confirmed on traditional architecture (Isfahani Style) and had an insight to tradition and religion. Therefore, the architecture of mosques in Iran was tended toward traditionalism. At this era, Islamic architecture tried to make a revolution in mosques by composing the traditional plans of Iranian mosques with modern materials. Three mosques are selected from this category including Tehran University Mosque, Alghadir Mosque and Sharif University Mosque. Elements, spaces and ornamentations of these mosques are analyzed in the following Table. (Table 4.9)

Table 4.9: Components of High Modern Category by Author

Mosques	Elements		Spaces		Ornamentation	
Tehran University Mosque	Dome	Nar dome. Two shells completely interconnected	Entrance	Dont have a portal entrance	Muqarnas	Plaster. Tile. Eslimi pattern
	Minaret	2 minarets	Vestibule & Corridor	-	Tiling work	Tile. Calligraphy. Eslimi pattern
	Mihrab	Traditional type	İwan	-	Brick work	-
			Yard	One way space	Mirror Art	-
	Minbar	Wooden Minbar with 6 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Khatam
			shabistan	One shabistan	Stucco Reief	Plaster. Muqarnas. Girih tile
Alghadir Mosque	Dome	Dodecahedron volume	Entrance	Dont have a portal entrance	Muqarnas	-
	Minaret	-	Vestibule & Corridor	Have a vestibule and corridor	Tiling work	Tile. Calligraphy. Eslimi pattern
	Mihrab	Traditional type	İwan	-	Brick work	Brick. Calligraphy. Girih tile
			Yard	One way space. 2 roofed yard	Mirror Art	-
	Minbar	form of a niche in wall with 6 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Khatam
			shabistan	One shabistan	Stucco Reief	-
Sharif University Mosque	Dome	Nar dome. Two shell scompletely seprate	Entrance	Traditional type	Muqarnas	-
	Minaret	4 minarets	Vestibule & Corridor	Have a vestibule. Dont have any corridor	Tiling work	Tile. Muqarnas. Eslimi pattern. Girih tile. calligraphy
	Mihrab	Traditional type	İwan	4 iwans type	Brick work	Brick. Muqarnas. Girih tile
			Yard	Extended central space	Mirror Art	-
	Minbar	Wooden minbar with 2 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Mozaik art
			shabistan	One shabistan	Stucco Reief	Plaster. calligraphy

4.2.1 University of Tehran Mosque (1972)

This mosque was designed by Abd-al-Aziz Farmaniyan and built in 1972. Mosque of the University of Tehran is one of the mosques of the Second Pahlavi Period that has been constructed using a combination of Iran Traditional Architecture (Isfahani Style) and the Western Modern Architecture. Tehran University Mosque is one of Tehran's modern mosques, which has been built in an innovative style while enjoying the old traditions. (Figure 4.4)



Figure 4.4: Over view of Tehran University Mosque (Tehran University, 2013)

By locating the elements of Iranian mosques along the qibla, the architect obeys the existing tradition of Iranian mosques. The building's foundation is made of concrete and Isfahan's stone. The mosque's structure consists of a closed cubic Dome-chamber (30*30 m²) which is located on a courtyard (28*20 m²). The dome's structure is in the form of a lentil that is separated from the building's main body by diagonal pillars. Entrance is made possible through three north, east and south sides of the courtyard. There are two minarets near the eastern entrance door. Other parts of the mosque

include: the mosque's office, toilet and pantry. Order of the mosque is very simple. The architect employs a pure cubic and rectangular form for the Shabistan plan and courtyard, respectively. Both forms, in their simplicity and geometric feature, induce a sort of centrality of the building. Entrance of the Dome-chamber is directed toward the qibla which has a specific status in the tradition of mosque building. By 45 ° rotation from the University's axes, the University of Tehran Mosque is distinguished from other constructions and by inducing the direction of kabaa, it can be considered as a value for the University. (Pourjafar, Amirkhaani, Lillian, 2010). (Table 4.10)

4.2.1.1 Space Organization and Ornamentation Techniques Used in University of Tehran Mosque

Space organization of University of Tehran Mosque will be described in this section. Entrance, Courtyard and sahn, Ablution house and Shabistan are the spaces that will be explained and their combination with different materials, types and techniques of ornamentation will be discussed.

Tehran University Mosque has two entrances from the main courtyard and two from the second courtyard. Since it is built in a university campus, it does not have a portal for entrance. Amongst these entrances, the northeast entrance has been considered as the main entrance due to the presence of twin minarets.

Tehran University Mosque has two courtyards. The main yard is located toward the shabistan and is used when extra space is needed for praying. It is a courtyard with an area of 900 m². This court yard obeys the type of One-Way- Space pattern. The second courtyard, which is subsidiary and separated from the main yard with trees, is employed for minor functions such as particular ceremonies and speeches. It has a rectangular pond in its center.

There is a door placed between the first and second courtyard in the northeast part of the mosque that reaches the ablution space. Men and women ablution houses are placed near each other which are ornamented with stone.

This is a mosque of shabistan type with one on the ground floor. One-third of the shabistan belongs to women and the rest is left for men. This mosque's shabistan is in a square shape and indicates the qibla with concavities of the main entrance directed

toward the qibla. There are inclined pillars beginning from the Dome-chamber ceiling to the floor that are used as backrest for prayers. Calligraphy inscriptions can be found in shabistan's interior space and the mosque's exterior façade. Nasta'liq scripts have been used for ornamentation of inclined columns and margins of the mosque's exterior roof. Shabistan's columns and ceiling are ornamented with tiles in the form of Quran verses accompanied by calligraphy. Shabistan's walls have also several tiled inscriptions of Quran verses. There are also blue tiles in the exterior façade of the mosque that contain sacred names and Quran verses. These Eslimi patterns are observable in all of shabistan's pillars accompanied by calligraphies in the form of tiles. They are also seen on the margins of fine Quran inscriptions installed on the mosque's exterior façade and interior of shabistan. The Shabistan's doors have elegant woodcarving mosaics art. The huge crystal chandelier in the middle of Shabistan is eye catcher which is quite harmonious with the ornamentations of this mosque. Several wooden girih tiles are observed in the shabistan's entrance door.

4.2.1.2 Architectural Elements in University of Tehran Mosque

The architectural elements of University of Tehran Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained and combined with different materials, types and techniques of ornamentation.

The dome chamber (Prayer Hall) is in a cubic form and occupies more than half of the mosque's surface and is located near the courtyard without any intermediate. The mosque's dome has been ornamented only with stone. With short height from an outside perspective, it assembles a stony cube. This dome has two shells that are completely interconnected. The architect believes that the exterior façade of the mosque reminds of kabaa. Rested on eight delicate inclined columns, the dome-

chamber is one of the masterpieces of Islamic architect in High modern period. All of these inclined columns are ornamented with Quran verses which are extended to the mosque's floor.

This mosque has two minarets (Double Minarets type) with 40 m height in eastern portal. The mosque's minarets are amongst the other amazing aspects of its architecture. The minarets upon which "Molk Allah" (God's kingdom) has been engraved and has spiral stairs are indicative of the architect's creative idea. Unlike most of traditional minarets with a cupola top on their highest part, these minarets have an open surface toward the sky. Moreover, they have richly metal girih tiles worked on their body before reaching their finials.

This mosque's mihrab is in the form of a niche and has a low height and a dome. It has been ornamented by turquoise tiles and Quran inscriptions. Calligraphy is observed in two forms of inscription and Nasta'liq script in Mihrab that is also ornamented with tiling. Specific vegetative patterns worked on mihrab are the best representatives of arabesque art. Mihrab is located in the men shabistan.

The wooden minbar of Tehran University Mosque is ornamented with khatam kari and equipped with six stairs which is placed near the mihrab.

4.2.2 Al-Ghadir Mosque (1974)

Al-Gadir Mosque is amongst those buildings built by Jahangir Mazloom Yazdi based on Islamic disciplines and using modern technology in northern part of Tehran in 1974. Alghadir Mosque is one of the mosques in the Second Pahlavi Period that was constructed using a combination of Iranian Traditional Architecture (Isfahani Style) and Western Modern Architecture. From an architectural perspective, the present mosque is completely different from other Iranian mosques. It is a richly brick construction with magnificent ornaments of turquoise tiles. The main structure of this mosque consists of a dodecahedron prism (each one is 20 m high) which has been completely separated from its surrounding buildings without any retreat. The spatial form of the mosque's dome is different from that of traditional one and is more like sepulchral and midway buildings in Iran traditional architecture. Two entrances lie in the south part of the mosque on the main street and the third one is laid at the side of the northern street (Serageldin & Steel, 1996). (Figure 4.5)



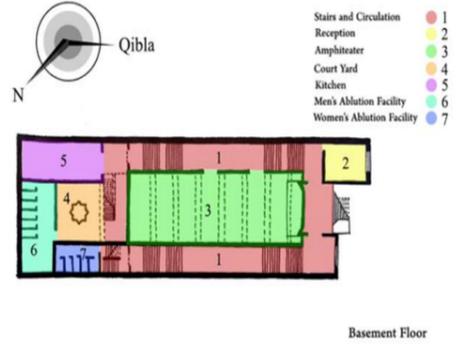
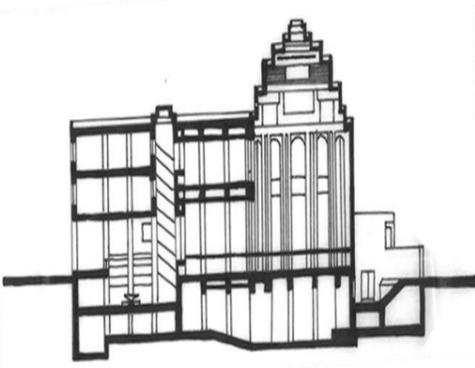
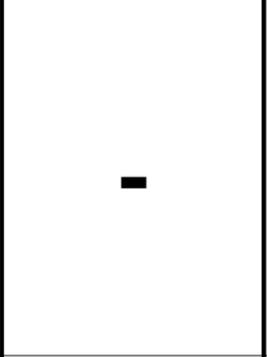
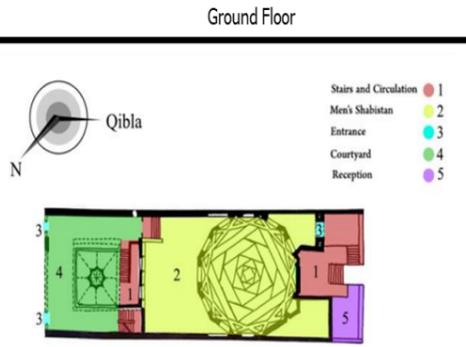
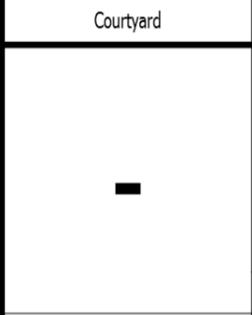
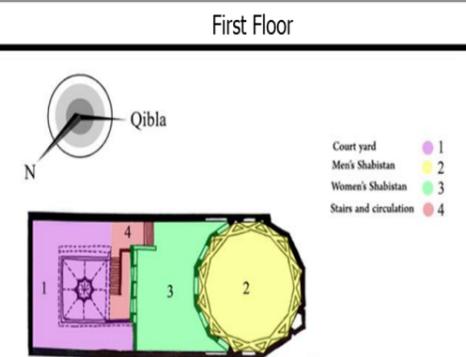
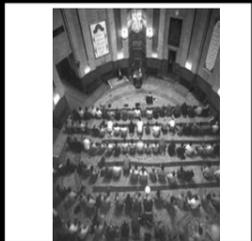
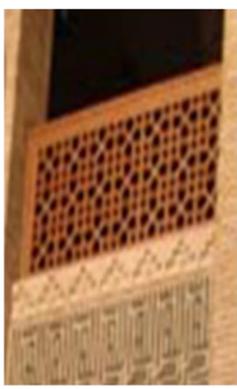
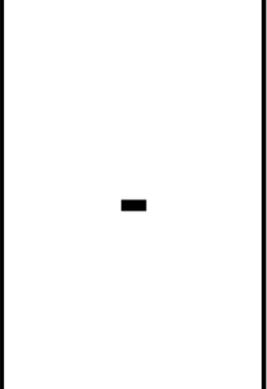
Figure 4.5: Over view of Alghadir Mosque (Mirmiran and Etesam, 2006)

Spaces of the mosque include: congregation hall, ablution house, toilets in underground, official spaces and balconies overlooking the dome-chamber on the first and second floors, dome-chamber, shabistan and covered courtyard (a space between the interval of northern entrance and shabistan which due the presence of a fountain and the type of its atmosphere resembles a courtyard) on the ground floor (Serageldin & Steel, 1996).

One of the unique and particular characteristics of Al-Ghadir Mosque is its circle-like polygon rule for the dome-chamber which is unique with traditional plans. The general plan of the building consists of a combination of a cubic shape with variable altitude and a prism with a plan of regular polygon (like different plans of icositetragon, dodecahedron and octagon). The highest plan dome-chamber is located between two short volumes.

The most prominent features of this construction are firstly, various brick ornamentations like girih tiles and inscriptions of Quran verses in Kufic; Second, performance of triangularization in the dome ceiling to turn the icositetragon to dodecahedron, octagon and ultimately, to square. (Table 4.11)

Table 4.11: Analysis table of Alghadir Mosque

Alghadir Mosque								
Plan	Section	Space Organization	Architectural Elements	Ornamentation				
 <p>Basement Floor</p>		 <p>Entrance</p>	 <p>Dome</p>	 <p>Calligraphy</p>	 <p>Muqarnas</p>	 <p>Tiling Work</p>		
 <p>Ground Floor</p>		 <p>Vestibule & corridor</p>	 <p>Minaret</p>	 <p>Courtyard</p>	 <p>Mihrab</p>	 <p>Eslimi Pattern</p>	 <p>Brick Work</p>	 <p>Mirror Art</p>
 <p>First Floor</p>		 <p>Iwan</p>	 <p>Shabistan</p>	 <p>Minbar</p>	 <p>Garih Tile</p>	 <p>Stucco relief</p>	 <p>Wood Carving</p>	
 <p>Second Floor</p>								

4.2.2.1 Space Organization and Ornamentation Techniques Used in Al-Ghadir

Mosque

The space organization of Al-Ghadir Mosque will be described in this section. Entrance, Vestibule and corridor (dalaan), Courtyard and sahn, Ablution house and Shabistan are the spaces that will be explained and their combination with different materials, types and techniques of their ornamentation will be discussed.

This mosque does not have an entrance portal, but it has two entrances in the south and one in the north. Southern entrances are connected to shabistan through the yard which is thus, divided into two separate passages for women and men. Due to the height difference, the southern entrance is connected to men shabistan by fifteen stairs.

The mosque's vestibule is located at the northern part and separates the spaces. After entering the northern door, one would enter the vestibule lighted with a ceiling skylight. Dividing the space into three parts, the vestibule prepares the prayers for entering their desired place.

This mosque has two courtyards on the ground and underground floors. The type of this court yard follows the One-Way-Space pattern. The covered courtyard of the ground floor (located in the northern part of the mosque) has a regular square space. It has a great pond in its center and connects different parts of the mosque. The underground courtyard is exactly placed under the upper yard and contains vast brick works and ornamentations on its ceiling and surrounding walls. There is a pond and fountain located at its center which due to its inclusion of toilets, kitchen and stairs, has a service function.

The ablution house is located in underground and is divided into men and women sections.

This mosque has two shabistans; Men shabistan under the dome on the ground floor and women shabistan on the first floor in balcony. Its lighting is made possible by indirect passage of light through apertures and thick soundproof glasses. There is a small crystal chandelier at the middle of the polygon dome of Shabistan which is really impressive. The exterior walls of this mosque are ornamented with great Kufic scripts and some inscriptions in Nastaliq writing are seen at the interior walls and façade of the mosque. Tiling work, in the form of mosaic turquoise tiles, have a special manifestation on the top of portal and external façade. The most amazing portrayal of this art lies in the margins of dome in the form of sacred words of *lā 'ilāha 'illā llāh* and *muḥammadun rasūlu llāhi* (Muhammad is the messenger of God). Al-Ghadir Mosque is an exemplum of brick work art. The whole mosque is ornamented with richly brickwork With Girih tiles art that along the elegant turquois tiles catches every viewer's eye. Another aspect of this art is manifestation of sacred names on the outside façade and Shabistan using bricks.

4.2.2.2 Architectural Elements in Al-Ghadir Mosque

The architectural elements of Al-Ghadir Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained and their combination with different materials, types and techniques of their ornamentation will be discussed.

The mosque's dome is the most prominent, unique and distinct element with a complete different design and form from the traditional domes. The dodecahedron volume of the dome is turned into an icositetragon in interior space that in half of its

gons (sides), extended barrier vaults with zigzag curves can be observed. This mosque's dome, as one of its deconstructionist signs and a representative of its contemporary architecture, has a regular polygon shape which has been ornamented with brick inscriptions and girih tiles among which turquoise tiles have particular reflection.

This mosque does not have any minaret which can be another representative of contemporary architecture.

Mihrab is one of those rich elements of the mosque which is placed in one of the dome arcades. This mihrab has a traditional form of a niche with a dome ceiling and has many different ornaments. The distinction of this mihrab with its predecessors can be laid in its highness and thinness. It is ornamented with tiling work and eye-catching calligraphies. The Mihrab's interior space is ornamented with mosaic turquoise tiles. It is also illuminated by colorful tiles bearing the God's names.

Minbar is another manifestation of the presence of contemporary architecture. This wooden minbar is made in the form of a niche in the mosque's brick wall near the mihrab. It has six stairs. Woodcarving can be seen in both khatam kari (marquetry) and mosaic forms. There are fine examples of khatam kari (marquetry) in minbar and mosaic for sacred names. The minbar's placement in the wall indicates the advancement of technology and contemporary architectural approach.

4.2.3 Sharif University Mosque (1995)

The Mosque of Sharif University of Technology has been located at one of the most prestigious Middle East scientific centers, Sharif University of Technology built in 1995 by Sharif Tehraani and Abouzri. Sharif University Mosque has been built in Early Islamic Republic and inspired by religious buildings in Safavid dynasty (Isfahani Style). In this period, the government confirms on Iranian Traditional Architecture. For this reason, mosques built in that period have been recognized with a tendency to traditionalism. (Figur 4.6)



Figure 4.6: Over view of Sharif University Mosque (Hirbodush 2013)

This mosque is of four-iwan types and its most important symbol is its dome which is formed by two brick coatings. It includes women and men shabistans, central courtyard, dome, minarets, muqarnas and eslimi ornaments (arabesque), ablution

house and vestibule. Sharif University Mosque is a two-floor mosque and all the spaces are located at the ground floor, except the women shabistan.

This mosque has two entrances, one of which is located in the northern part and opens from the University's space and the other is located in the southern part which opens in Azadi Street. It is opened toward the university campus in three directions and has just one main entrance in its northern corner. This entrance is a little recessed from the street to mark the structure of entrance after which is located the vestibule in the shape of a semi-open space without a roof. (Table 4.12)

Table 4.12: Analysis table of Sharif University Mosque

Sharif University Mosque					
Plan	Space Organization	Architectural Elements	Ornamentation		
<p>Ground Floor</p>	<p>Entrance</p>	<p>Dome</p>	<p>Calligraphy</p>	<p>Muqarnas</p>	<p>Tiling Work</p>
<p>Ground Floor</p>	<p>Vestibule & corridor</p>	<p>Minaret</p>	<p>Mihrab</p>	<p>Brick Work</p>	<p>Mirror Art</p>
<p>First Floor</p>	<p>Courtyard</p>	<p>Mihrab</p>	<p>Girih Tile</p>	<p>Stucco relief</p>	<p>Wood Carving</p>
<p>First Floor</p>	<p>Shabistan</p>	<p>Minbar</p>	<p>Girih Tile</p>	<p>Stucco relief</p>	<p>Wood Carving</p>

4.2.3.1 Space Organization and Ornamentation Techniques Used in Sharif

University Mosque

The space organization of Sharif University Mosque will be described in this section. Entrance, Vestibule and corridor (dalaan), Courtyard and sahn, Ablution house, Iwan and Shabistan are the spaces that will be explained their combination with different forms, materials, techniques, stylistic features and ornamentations will be discussed.

Sharif University Mosque has two entrances. The north entrance opened from the campus has a vault made of brick and ornamented with tiling work. It connects the campus to the central sahn. This entrance obeys the traditional type in its structure. The main entrance lies in the southern side and opens into street. It has a grand brick portal which has been ornamented with such ornaments as tiling work, muqarnas and Quran inscriptions. Entrance portal has been ornamented with mosaic and glazed tiles. Manifestation of Muqarnas lies on the main portal alongside the grand and great inscriptions. This entrance is connected to the main sahn through vestibule. Alongside this entry, there exist two tall minarets evoking the mosque's spiritual space.

Sharif University Mosque does not contain any corridor. Its vestibule is located at the mosque's southern part after the entrance. It is in the form of a circle. In traditional architecture, vestibules had ceilings and not too much light and their lighting would have been provided by a small skylight in the ceiling. But unlike this tradition, the present mosque does not have a ceiling and is designed in a semi-open form.

This mosque has a rectangular central courtyard which is connected to outside through north and south. In western side of the mosque lie the dome and two minarets and on the opposite side, there exist the ablution house and toilets. The courtyard of Sharif

University Mosque contains a rectangular stone pond in the middle which is a symbol of purity and transparency. The yard of this mosque has an Extended Central Space. There are also four small crofts in four sides of this courtyard.

The ablution house with two separate spaces for men and women, and toilets are located in the eastern side of the mosque. The distinction of this mosque's ablution space with traditional form lies in its formation with white marble.

This mosque is of a four-iwan type. They are located at the four main directions. All the iwans are connected to each other and each has an opening with zigzag arcades 40 cm high which are laid toward the yard. They all have great tiling works on the upper side of zigzag arcades. Iwans' façade contain tiling works in the form of inscriptions of Quran verses and sacred names.

Sharif University Mosque has two shabistans; that shabistan specified for men is a square-like space, located on the ground floor under the dome. But the other one is for women and is located on the first floor over the men shabistan like a balcony which has an overview of mihrab and minbar. Manifestation of calligraphy in this artistic craft is found on the margins of walls under the shabistan balconies. This space is a good example of serial conversion of square to polygon and then circle. So that the men shabistan is in the form of a square above which there exists the women's polygenic shabistan which finally, will be perfected by the dome's circularity. These shabistans are lit by many openings in the dome-chamber and also by the combination of artificial and natural lights. Sharif Mosque's shabistans include some ornamental works as mirror art, stucco relief and muqarnas. There are plenty of metal chandeliers

in the form of tree branches in the Shabistan of this mosque which is very similar to Eslimi design.

4.2.3.2 Architectural Elements in Sharif University Mosque

The architectural elements of Sharif University Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained with their forms, solutions, materials, techniques, stylistic features and ornamentations.

The dome of Sharif University Mosque can be considered as one of its most prominent features. This dome, made of modern materials, has a concrete ring which is not clearly. There are two brick layers worked over the dome's concrete layer. This dome is of Nar type and has two shells which are completely separated. Turquoise blue tiles have been employed for the dome's ornamentation. Eslimi patterns can be found on the dome which represents itself through elegant patterns and figures richly carved over the tiles. Tiling ornaments are seen in the form of turquoise and azure blue tiles over the mosque's dome. Its interior is ornamented with stucco relief and all the dome chamber's rims insert the light to shabistan through openings.

Sharif University Mosque has four minarets which are all made of brick and ornamented with tiling and brick works. Tiling ornaments are seen in the form of turquoise and azure blue tiles over the mosque's minarets. Two front minarets show off themselves with a smaller height than the mosque's dome. Two other minarets taller than the dome are located at two sides of the entrance door which represent the mosque to every viewer.

Mihrab of Sharif University Mosque is located in shabistan's southwest corner in front of its entrance door. It is around 2.5 m high and like other traditional forms, it has a dome ceiling. This mihrab has been distinguished from the mosque's walls through great scripts. It has also been ornamented with marble stone, stucco relief and mirror.

This mosque's minbar is of those short types with only two stairs. This inlaid wooden minbar has a leather seat.

4.2.4 Evaluation of High Modern category

Analysis and discussion of high modern category based on available research information will be conducted using a comparative method. (Table 4.14, 4.15 and 4.16)

Understudy mosques in High modern era are:

- Sharif University Mosque
- Tehran University Mosque
- Al-Ghadir Mosque

These mosques and the effect of external factors on their parts will be considered. (Table 4.13) These factors affecting the historical periods of Islamic Architecture in Iran are governmental attitudes, policy, culture and style.

Table 4.13: Information of High Modern Mosques Category by Author

Mosques	Building date	Architectural Style	Period
Tehran university mosque	1972	Modern	Pahlavi
Alghadir mosque	1974	Modern	Pahlavi
Sharif university mosque	1995	Modern	Islamic Republic

Table 4.14: Evaluation table of Architectural Elements of High Modern Category

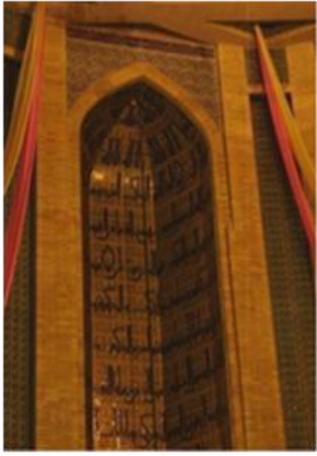
Architectural Elements	Dome	Minaret	Mihrab	Minbar
<p>Tehran University Mosque</p>				
<p>Alghadir Mosque</p>		<p style="text-align: center;">-</p>		
<p>Sharif University Mosque</p>				

Table 4.15: Evaluation table of Space Organization of High Modern Category

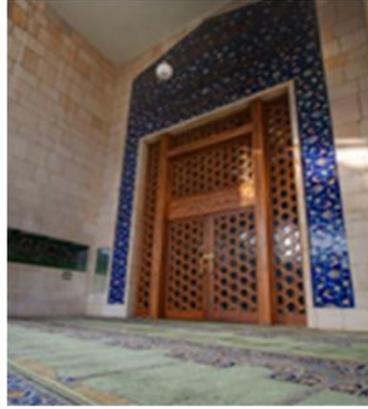
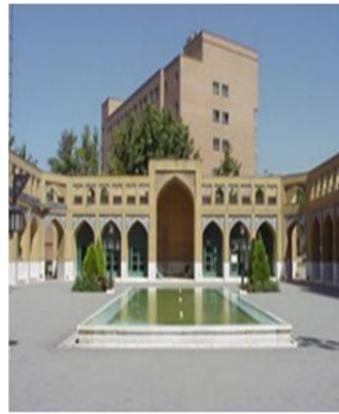
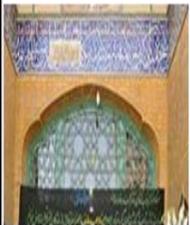
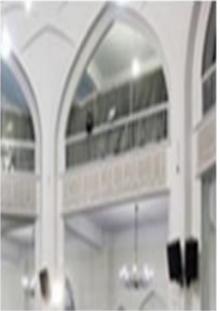
Space Organization	Entrance	Vestibule & Corridor	Courtyard	Iwan	Shabistan
Tehran University Mosque		-		-	
Alghadir Mosque				-	
Sharif University Mosque					

Table 4.16: Evaluation table of Ornamentation Type and Technique of High Modern Category

	Ornamentation	Calligraphy	Eslimi Pattern	Girih Tile	Muqarnas	Tiling Work	Brick Work	Mirror Art	Wood Carving	Stucco Relief
High Modern Era	Tehran University Mosque				-		-	-		-
	Alghadir Mosque		-		-			-		-
	Sharif University Mosque									

Among these three mosques, Tehran University Mosque has been built with new materials and novel techniques. Its traditional design and plan, following Iranian old mosques, has combined the dome and minarets together in a traditional manner. Although Al-Ghadir Mosque has a novel design and new materials, one of the most distinctive features and newest signs of this mosque's modernity is its lack of minaret and a dome with a unique shape. The third mosque in this classification, Sharif University Mosque, has a traditional design in which all elements and spaces of traditional design are obviously seen. It has also taken into account Iranian traditional materials and ornaments.

Studying the space organization of the Sharif University, Tehran University and Al-Ghadir Mosques reveals that all of them are of shabistan type with no iwans. Sharif University and the Tehran University Mosques contain a central courtyard in traditional form but Al-Ghadir Mosque has two covered courtyards. Tehran University Mosque does not have a vestibule or corridor and Sharif University Mosque lacks a corridor.

After studying the architectural elements of these three mosques, it is observed that except Sharif University Mosque with a traditional dome, the others contain domes with specific and unique shapes different from the traditional designs. Amongst these mosques, Al-Ghadir Mosque lacks minarets which show a deconstruction of traditional mosques. A mihrab is present in all three mosques with its traditional form and normal height accompanied by a dome ceiling. Al-Ghadir mosque's minbar, as another manifestation of modern architecture, has been located within the wall and like its counterpart in Tehran University Mosque, is made of six wooden stairs. Unlike

two other mosques, Sharif University Mosque's minbar is of short-height with only two stairs.

After the analysis of the mosques' ornaments in the high modern era, it can be seen that imitating the traditional mosques, Tehran University Mosque has included in itself all those old and conventional ornaments in a simpler form. But the other two mosques lack the employment of traditional ornaments, especially muqarnas, which is considered as one of the most common-used ornaments in old mosques. Sharif University and Al-Ghadir Mosques include brick workings in most parts, even in their exterior facades. All three mosques have common ornaments like, tiling work, eslimi patterns, calligraphy, woodcarving and girih tiles that are mostly used on the dome chamber's ceiling and shabistans' interior space. Calligraphy is mostly found in the form of Quran verses in inscriptions made in colourful and turquoise tiles over the entrance portal and exterior facade of these three mosques. Tehran University Mosque has marble stone employed in its dome which is one of the new materials of modern time and presents the mosque's cubic shape as a symbol of Kaaba. On the other hand, the mosque's minarets are in the traditional form and shape--made of stone and ornamented with metal girih tiles. Minarets of the Sharif University Mosque are made of brick and ornamented with tiles that postulate a traditional form in the eyes of the observer.

After comparing these three mosques regarding their structures, the effective factors on their elements will be discussed here.

Tehran University and Al-ghadir Mosques were established in the Pahlavi II era. In this era, the architectural style managed to harmonize itself with traditional

architecture. Looking to the past, this period raised historical experiences and values in traditional architecture so that there was a nostalgic view to traditional architecture in transcendent modern times. The changes can be seen in Tehran University Mosque containing a dome with a specific form and new aesthetic understanding as well as in Al-ghadir Mosque without minaret. Ornamentations of these mosques have been used as a traditional form, but muqarnas and stucco that were used as ornamentations in all traditional mosques cannot be observed in most mosques of this era. In other words, the trace of western art is to simplify the ornamentations of mosques and to summarize them in various inscriptions and girih. They tried to restore traditional architecture for new functions in terms of plan and implementation in mosques.

During the Islamic Republic, Islamic architecture had no significant upswing until early 1998 due to the revolution and the eight-year war. Sharif University Mosque, which was established in the recession of Islamic Republic architecture in 1995, had a traditional form and style. Iranian architects of the period faced with a society with extensive developments in all matters of life in the wake of the Islamic Revolution. Many transformed social norms and traditions and religious values were emphasized and considered. Therefore, traditionalism in the design of mosques can be clearly seen. The only modern component in Sharif University Mosque is its short minbar. Ornamentations in this period are also very similar to ornamentation of Safavid period. In the mentioned mosque, all ornamentations other than painting can be seen.

Due to the economic and social problems faced at the time of construction, materials used in the Sharif University Mosque are often traditional and simple. The dominant materials in the mosque are brick and tiles evoking the traditional mosque form for the observer due to its traditional layout.

Considering the conducted studies, those mosques built during the high modern period have been able to adapt themselves with the western architecture and updated technologies, compared to the early modern. During this period, especially in the second Pahlavi and post-war times, the traces of modern architecture (elimination of elements, spaces or ornamentations) are clearly observed in several mosques with its abstract and pure forms.

The combination of traditional architectural styles and modern architecture appeared as a novel form in the Iranian modernist style. Tehran University and Al-Ghadir Mosques are two successful examples. However, given the great social and cultural developments after the war and the government's emphasis on the former Iranian identity and tradition, several mosques (Sharif University Mosque) were built imitating the high modern style with a tendency to traditionalism. In other words, the tendency to combine the traditionalism and high modern art can be seen at the beginning of the Islamic Republic of Iran as a hybrid attitude.

4.3 Contemporary Category

Contemporary era in Iran began in 1998 (Ghobadian, 2013). Contemporary period commenced from the Islamic Republic of Iran in 1998 and has continued up to the present time (2015). In the period of the Islamic Republic of Iran, the traditional architecture of mosques (Isfahani Style) was combined with the western architecture. In this period, using the previous experiences of Iranian architects, the mosque's architecture became more moderate. After 15 years of war and becoming politically and culturally stable, Iranian architects returned to up to date design tendencies. Therefore, Islamic architects created great mosques by using contemporary materials and updated technologies. Three mosques have been selected for this category: Ibrahim Mosque, Shahrak-e Qods Mosque and Amir Al-Momenin Mosque. Elements, spaces and ornamentations of these mosques will be considered in the Table. (Table 4.17)

Table 4.17: Components of Contemporary Mosques Category by Author

Mosques	Elements		Spaces		Ornamentation	
Ibrahim Mosque	Dome	Rok-e-Ourchin. Two shells completely interconnected	Entrance	Modern Entrance	Muqarnas	Plaster. Tile. Eslimi pattern
	Minaret	Single	Vestibule & Corridor	-	Tiling work	Tile. Calligraphy. Muqarnas. Eslimi pattern
	Mihrab	Traditional shape	İwan	-	Brick work	-
			Yard	One way space	Mirror Art	-
	Minbar	-	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Girih tile
			shabistan	One shabistan	Stucco Reief	Plaster. Calligraphy. Eslimi pattern
Shahrak Qods Mosque	Dome	Nar dome. Two shells completely reconnected	Entrance	Modern Entrance	Muqarnas	Marble. Girih tile
	Minaret	2 minarets	Vestibule & Corridor	Have a vestibule. Dont have a corridor	Tiling work	-
	Mihrab	New form	İwan	4 iwans	Brick work	-
			Yard	One way roofed yard	Mirror Art	-
	Minbar	Wooden minbar with 6 steps	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Girih tile.
			shabistan	One shabistan	Stucco Reief	Plaster. Girih tile. calligraphy
Amir Al Momenin Mosque	Dome	Nar dome. Two shells completely seprate	Entrance	Completely new	Muqarnas	-
	Minaret	-	Vestibule & Corridor	-	Tiling work	Tile. Eslimi pattern. Girih tile
	Mihrab	-	İwan	-	Brick work	-
			Yard	-	Mirror Art	Mirror. Girih tile
	Minbar	-	Ablution	Have seprate ablution for men and women	Wood Carving	Wood. Girih tile
			shabistan	One shabistan	Stucco Reief	Plaster. Calligraphy. Eslimi pattern. Girih tile

4.3.1 Ibrahim Mosque (2003)

Ibrahim Mosque was constructed using a combination of traditional and modern architectural styles in Tehran International Exhibition. The western modern architecture has been synthesized with Isfahani Method in creation of the present mosque. This mosque has been constructed by Tosee Saderat Company in the year 2003. Ibrahim Mosque has been constructed after the Islamic Republic of Iran and is classified as contemporary architecture. The space of the mosque has been built as a cubic volume with black tiles which reminds the Kaaba. Spatial shape of the mosque's dome is as a 13-stair pyramid. This mosque has a single minaret with square section similar to church bell. In fact, the architectural design of this mosque has a tendency to modernism. This mosque is located at the center of Tehran International Exhibition which is a suitable place for praying of the visitors after tiredness raised from hours of surfing (Ekhtiari, 2007). (Figure 4.7)

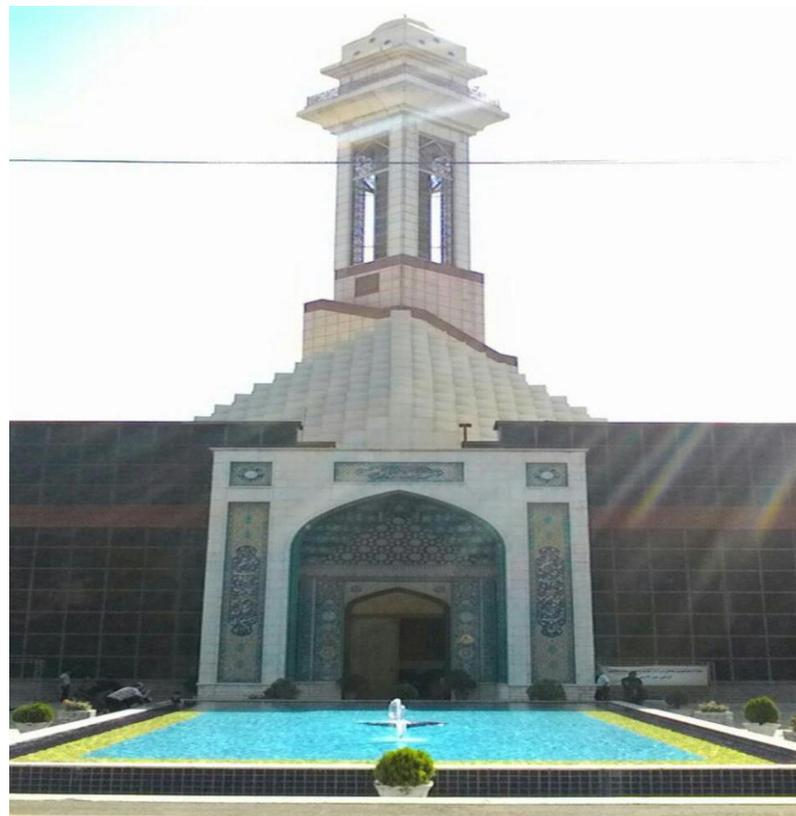


Figure 4.7: Over view of Ibrahim Mosque (Ekhtiari, 2007)

Spaces of this mosque consist of: ablution house, sanitary service and a location for depositing things as trust in basement, men Shabistan, men library, administrative space in the ground floor, women Shabistan and women library in the first floor as a balcony on the ground floor.

The most outstanding characteristic of this mosque is its capacity that is similar to Kaaba and a dome over this space. The minaret is located in a separate space far from the cubic building behind the mosque's body in such a way that when you look at the mosque in opposite view, you see the minaret as connected to the main building. Some ornamentations have been used in this mosque such as plaster and Nastaligh calligraphy performed by artists in the fields of calligraphy, plaster-working and tile-working to show noticeable images and patterns in this mosque. (Table 4.18)

Table 4.18: Analysis table of Ibrahim Mosque

Ibrahim Mosque					
Plan	Space Organization	Architectural Elements	Ornamentation		
<p>1 Ablution Facility 2 Depositing Things as Trust Room</p> <p>Basement Floor</p>	<p>Entrance</p>	<p>Dome</p>	<p>Calligraphy</p>	<p>Muqarnas</p>	<p>Tiling Work</p>
<p>1 Library 2 Men Shabistan 3 Stairs and circulation 4 Imam Office</p> <p>Ground Floor</p>	<p>Vestibule & corridor</p>	<p>Minaret</p>	<p>Eslimi Pattern</p>	<p>Brick Work</p>	<p>Mirror Art</p>
<p>1 Women Shabistan 2 Library 3 Stairs and Circulation</p> <p>First Floor</p>	<p>Courtyard</p>	<p>Mihrab</p>	<p>Girih Tile</p>	<p>Stucco relief</p>	<p>Wood Carving</p>
<p>Second Floor</p>	<p>Iwan</p>	<p>Shabistan</p>	<p>Minbar</p>		

4.3.1.1 Space Organization and Ornamentations used in Ibrahim Mosque

The space organization of Ibrahim Mosque is explained in this section. Among the spaces of this mosque are yard, ablution room and Shabistan combined with different materials, types and techniques of ornamentation.

This mosque is situated at Tehran International Exhibition. Since it has been built in the main site of this plan, it does not bear any formal entrance with a portal. Moreover, in order to separate the mosque and its places from the location of exhibition, it has been constructed in higher altitude (4 meters) than the other buildings of exhibition. In fact, the exhibition site is connected to the yard of mosque through 15 stairs. The main entrance of the mosque's building has been built as a portal in cubic form using Isfahani Style. The entrance ornamentation of this mosque is tile working, Nastaligh calligraphy and Eslimi Pattern. On the top of portal, one can see Muqarnas with tile-working and Eslimi Pattern. For entering the mosque, there are 5 stairs toward the lower part of the entrance portal. This entrance is similar to modern entrances, but with shorter dimensions. In fact this entrance is a combination of architectural design of modern entrance and semi-traditional view.

This mosque does not have vestibule and corridor.

The yard of this mosque is a one-way yard and is located in front of the mosque building. An emergent rectangular pool is situated in the middle of this yard. There are some gardens with benches around the pool as a space for sitting.

The ablution house of the present mosque is located in the basement and divided into two men and women sections. The space between these two sections is allocated for receiving the prayers trusts.

This mosque has two men and women Shabistan. Men Shabistan is located under the dome and in the ground floor. Women Shabistan is located at the balcony in the first floor. Light-shafting of prayer's saloon is indirectly provided and direct light of the salons is provided by the light-shaft in the ceiling of this mosque. Two chandeliers made of steel and glass plates ornamented by calligraphy are hanging from the ceiling. The inner walls of this mosque have been covered by tile-working. Ceiling of this mosque is a manifestation of Muqarnas art by plaster. In different parts of this mosque, tile-working art has been used with pink and white plasters and types of ornamentations such as calligraphy and Eslimi Patterns. On the margins of balcony, tile-workings containing Eslimi Patterns are observable. Art and Girih Tile techniques have been used on the fencing and doors of the mosque.

4.3.1.2 Architectural Elements of Ibrahim Mosque

The architectural elements of Ibrahim Mosque have unique characteristics that will be explained in this section. Elements of this mosque consist of Dome, Minaret and Mihrab that have been combined with some materials, types and techniques of ornamentation. The present mosque does not contain any Minbar.

Dome of this mosque is one of its most outstanding characteristics that has been constructed in 13-storey conical shape on a cubic space. The dome of this mosque is of Rok-e Ourchin type (stairs dome), covered by white tiles as a wasp nest.

This mosque has a single-minaret. Minaret of the mosque acts as a separate spatial aspect and is located in 10 to 15 meter distance from the mosque's building. An apical characteristic of the minaret is that it has a square section. The minaret's upper part is similar to a church bell and its total space is in spiral shape. The minaret has a room on its top like a traditional Iranian Minaret. It has been covered by white, red and black tiles and some inscriptions with red tiles and Nastaligh calligraphy have been applied on the façade of this minaret.

One of the unique elements of this mosque is its Mihrab. In spite of the traditional shapes of Mihrab, the present one does not have a concavity and has been decorated with a plaster working of Eslimi Pattern and calligraphy on the walls and is separate from the other walls.

This mosque does not have Minbar which makes it different from the other mosques.

4.3.2 Shahrak-e Qods (Shahrak-e Gharb) Mosque (2006)

Shahrak-e Qods is one of the new-born neighbourhoods of Tehran. Towers built near the modern villas give an especial texture to the neighbourhood. That's why the Mosque of Shahrak-e Qods is also a modern narration of the mosque to be consistent with its own homeland texture (Shirazi, 2011).

Shahrak Qods Mosque was constructed during the Islamic Republic and is in the contemporary classification. This mosque has been constructed using a combination of the western architecture style and traditional architecture style of Iran (Isfahani Style). This mosque was built by Ali Tousi in 2006 on a land with 56000 m² and with an infrastructure of 21000 m² (Shirazi, 2011). The mosque's design does not stand against the previous designing in a way that the modernism footprints does not question or change the mosque's concepts. There have been just some differences in the material selection, changes in the elements' forms and ornaments and addition of necessary spaces like congregation halls, library, etc. (Figure 4.8)

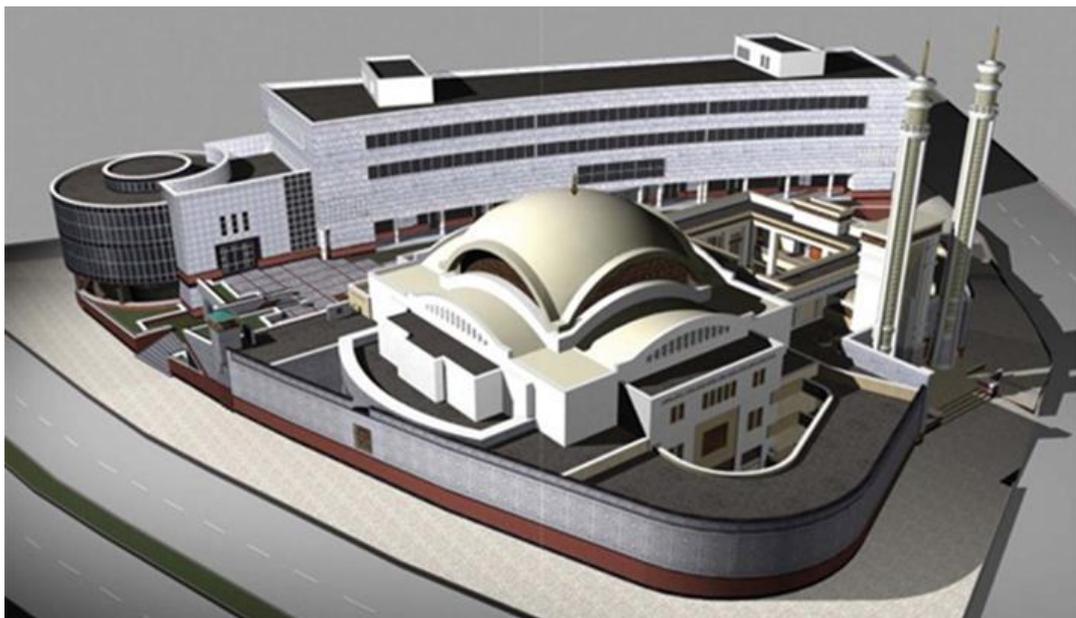


Figure 4.8: Over view of Shahrak Qods Mosque (Farahani, M, 2012)

Elements and members do their task perfectly in projecting themselves and practicality of the structure to the viewer. Dome, minaret, high and elevated portal with unique ornaments suffice the usage of mosque for this structure. This time, we are supposed to observe the mosque and its elements with different geometric shape and form. There is no sign of brick, tiles, colourful inscriptions, bricked domes with particular curves and Iranian porticos in this mosque.

Due to the advancement of technology and appearance of new substituting materials easy to employ and also a need for expressing the architectural concepts of mosques fitting the time, have resulted with Shahrak Qods Mosque. It has succeeded to do so by retaining the mosques' traditional architectural patterns, the mosque's elements (dome, minaret, mihrab, iwan, vestibule, sahn, etc.), privacies and hierarchical traditions of entering the mosque's sahn and shabistan. Moreover, by using carved stone inscriptions figured with Quran verses, maintaining the traditions for entering the shabistan through the portal, locating the mihrab toward the Qibla and etc. It has been referring to former styles. (Table 4.19)

In designing the present mosque, it has been attempted to create spaces with such features as: Having a religious spirit; generator of the sense of unity; producing concentration in prayers; pure and unaffected; containing cultural signs and traditional symbols and forms. This approach of encounter with the past legacy has the following characteristics:

- Benefiting from the past forms and symbols with a creative look and without absolute imitation of the old patterns.
- Not using the ornamental devices in a traditional form

- Using traditional elements like, courtyard, dome-chamber, marginal shabistans and minaret.

Amongst the prominent features of Shahrak-e Qods Mosque are:

- Adherence of the mosque's main spaces to the ordered and orthogonal geometry and designing the marginal spaces with a geometry proportionate to the triangle land with a remarkable level difference.
- Using a monotonous and smooth lighting and indirect lights.

Table 4.19: Analysis table of Shahrak Qods Mosque

Shahrak Qods Mosque					
Plan	Space Organization	Architectural Elements	Ornamentation		
<p>Basement Floor</p>	<p>Entrance</p>	<p>Dome</p>	<p>Calligraphy</p>	<p>Muqarnas</p>	<p>Tiling Work</p>
<p>Ground Floor</p>	<p>Vestibule & corridor</p>	<p>Minaret</p>	<p>Eslimi Pattern</p>	<p>Brick Work</p>	<p>Mirror Art</p>
<p>First Floor</p>	<p>Courtyard</p>	<p>Mihrab</p>	<p>Girih Tile</p>	<p>Stucco relief</p>	<p>Wood Carving</p>
<p>Second Floor</p>	<p>Iwan</p>	<p>Minbar</p>	<p>Stucco relief</p>	<p>Wood Carving</p>	<p>Wood Carving</p>

4.3.2.1 Space Organization and Ornamentation Techniques Used in Shahrak-e Qods Mosque

The space organization of Shahrak-e Qods Mosque will be described in this section. Entrance, Vestibule and corridor (dalaan), Courtyard and sahn, Ablution house, Iwan and Shabistan are the spaces that will be explained and their combination with different materials, types and techniques of ornamentation will be discussed.

The mosque's portal is glorious and is located along two tall minarets that give it grandeur. This portal entrance obeys a type of Modern pattern in its structure. There are two separate entrances for men and women within the main entrance for entering the shabistan.

After passing the entrance portal, one would enter the vestibule which is in fact a separating space. This mosque does not have a corridor.

After passing the entrance door, one would enter the courtyard. This courtyard displays a type of One-Way-Space pattern. This courtyard which is representative of modern architecture is roofed with a glassy covering through which the light is greatly reflected. The mosque's courtyard is of a unilateral type which is located at the left side of iwan's yard and shabistan's entrance door.

The men ablution space is located in sahn at the eastern corner. There is a downward staircase in the southwest corner of the sahn which leads to women ablution house.

This mosque contains four iwans, one of which is connected to the courtyard and the three others are linked with the outer space.

Shabistan is divided into two parts which are located in two floors. Men shabistan is located on the ground floor under the dome which has various ornaments. This mosque can be considered as one of the most prominent representatives of calligraphy art. It is observed in the dome in the majestic form of Nasta'liq script. Epigraphs of Quran verses and God's sacred names are installed on the main shabistans, ceilings, arches and vaults. Another projection of calligraphy is on muqarnas arts in the form of sacred names. The four corners of interior dome have very great muqarnas worked in the form of simplified and summarized figures and overlapping cubes on the ceiling upon which sacred names and eslimi patterns are engraved. Great woodcarvings in the form of mosaics can be seen in the balconies' shield, some parts of women shabistan's ceiling, surrounding windows of the dome-chamber and entrance doors of shabistan. The outstanding portray of Eslimi patterns lies within the dome-chamber which has eslimi patterns both inside and outside. Several fine eslimi patterns are also observed over the wall behind the mihrab in form of Stucco relief. A great glorious crystal chandelier at the middle of the dome of Sahbistan reflects the spiritual role of light and mirror to the prayers.

4.3.2.2 Architectural Elements of Shahrak-e- Qods Mosque

The architectural elements of Shahrak-e- Qods Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained and combined with different materials, types and techniques of their ornamentation.

The dome has a low curve and is different from the form of well-known and famous Iranian domes. This dome is like a Nar dome with two shells which are completely reconnected. Windows with wooden lattice control the direction of light to the dome-chamber. In old constructions, domes were located on ahianeh (skeleton) and lacked a

window or an opening. But four large openings can be observed around this dome which, by lowering the dome's height, spreading its corners and connecting it to the wall under to dome, create an empty space that form the openings. Due to their largeness, these openings are covered by wooden girih tiles through which the light is passed to the dome-chamber. In this dome two shells are completely interconnected.

There are two tall minarets (Double Minaret Type) near the portal separated from the building. Each minaret contains one iwan at its highest point. These minarets follow the form of Safavid Dynasty. However, this minaret is different from the other ones in its materials and ornaments. It has a metal structure. Unlike the traditional mosques with tiling and brick works, the ornament of this minaret contains girih tiles made of premade metal sheets.

Mihrab is located in front of the shabistan's entrance door which shows the qibla. Unlike most mosques, this mosque's mihrab arch does not have a dome form and is like a steady niche. Ornaments of this mihrab are only stucco relief in the form of calligraphy. One of the most prominent epigraphs of Quran verses and God's sacred names can be observed on the mihrab.

Minbar is made of wood and has six stairs which evoke the primary shape of minbar. Perhaps the only distinction of this minbar with its traditional form lies in its shortened shape. This minbar has only three stairs. Woodcarving is projected in the form of khatam kari (marquetry) in the wooden minbar of this mosque.

4.3.3 Amir Al-Momenin Mosque (2013)

Amir Al-Momenin Mosque, located in Dezashib, Tehran, was designed by Mahdi Kamboozia and Rasha Kiani (Baradaran, 2013) in an area of 23559 square meters in 2013. Amir Al Momenin Mosque is one of new-constructed mosques of Tehran that has been constructed using a combination of the contemporary architecture and traditional architecture of Iran (Isfahani Style). One can see the simplification of spaces and elements in this mosque resulting from a synthesis of Iranian traditional architecture and western architecture. This mosque has been constructed during the Islamic Republic and is in the contemporary classification. (Figure 4.9)

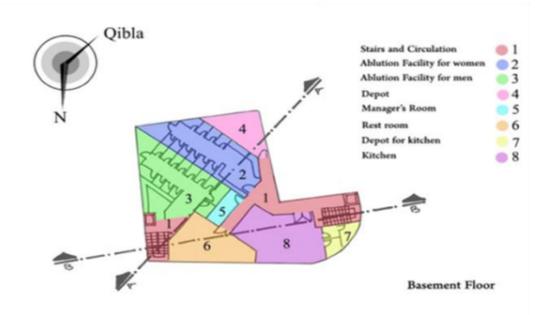
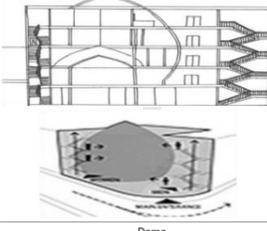
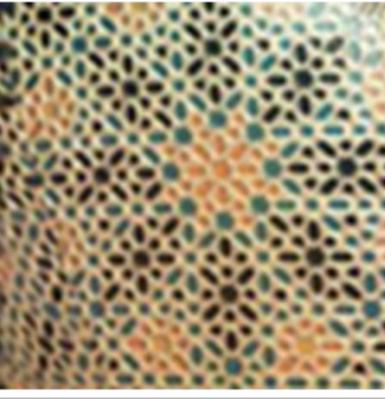
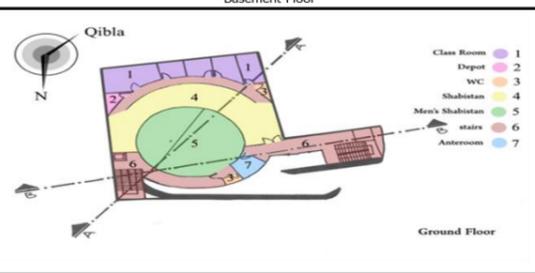
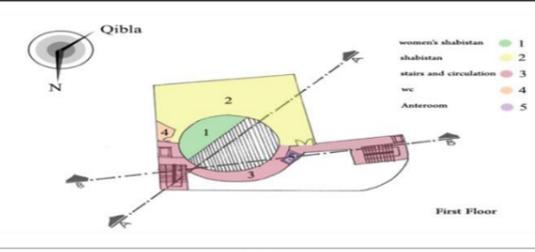
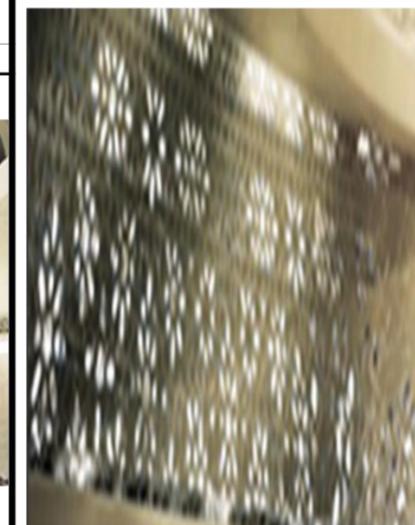
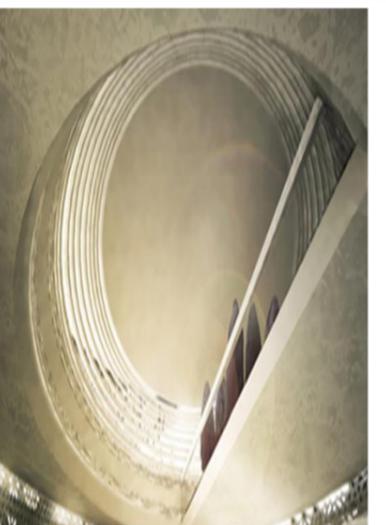
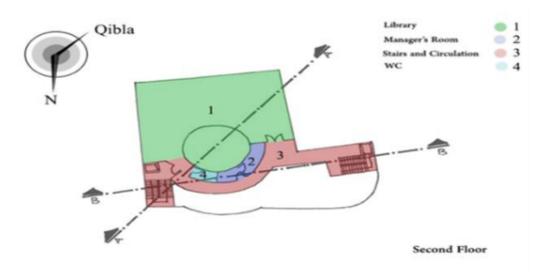
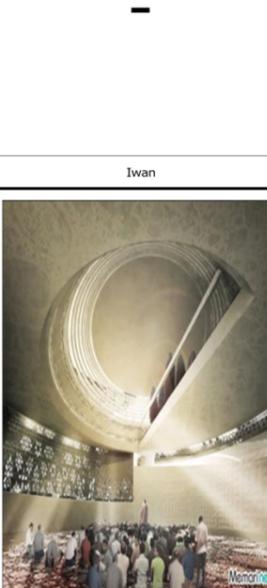
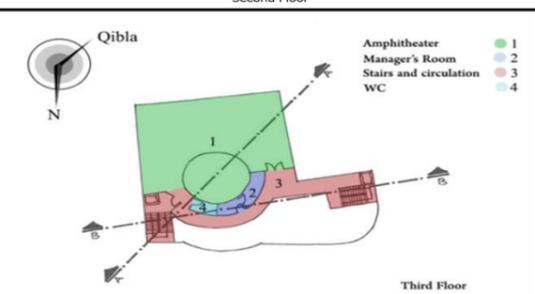


Figure 4.9: Over view of Amir Al Momenin Mosque (Nasiri, A, 2014)

The mosque has a basement and four floors above it and it has 5 floors in general. Men shabistan is located in the ground floor and women shabistan is in the first floor. The library and auditorium are respectively in the second and third floors. The outer façade of this mosque shows a part of the interior dome knob and the rest of the façade is composed of composite, glass and metal sheets. The mosque has artificial and natural lighting, particularly at night which gives a special effect to the mosque.

The mosque is one of the masterpieces of Islamic architecture in contemporary era and the elegance of material and modern ornamentation of the world can absolutely be seen. The mosque has an entrance on the side of the main street. (Table 4.20)

Table 4.20: Analysis table of Amiralmomenin Mosque

Imam Ali Mosque						
Plan	Space Organization	Architectural Elements	Ornamentation			
 <p>Basement Floor</p>	 <p>Entrance</p>	 <p>Dome</p>	 <p>Calligraphy</p>	 <p>Muqarnas</p>	 <p>Tiling Work</p>	
 <p>Ground Floor</p>	 <p>Vestibule & corridor</p>	 <p>Minaret</p>	 <p>Eslimi Pattern</p>	 <p>Brick Work</p>	 <p>Mirror Art</p>	
 <p>First Floor</p>	 <p>Courtyard</p>	 <p>Mihrab</p>	 <p>Girih Tile</p>	 <p>Stucco relief</p>	 <p>Wood Carving</p>	
 <p>Second Floor</p>	 <p>Iwan</p>	 <p>Shabistan</p>				
 <p>Third Floor</p>		 <p>Minbar</p>				

4.3.3.1 Space Organization and Ornamentation Techniques Used in Amir- Al- Momenin Mosque

The space organization of Amir- Al- Momenin Mosque will be described in this section. Entrance, Ablution house and Shabistan are the spaces that will be explained and their combination with includes materials, types and techniques of ornamentation.

The façade of this mosque is completely different from traditional façades and portal entrance. This mosque is separated from the main wall of the mosque by a false crescent-shaped façade and has a richly artificial lighting. The mosque has an entrance from the main street in the north. One can enter the ground floor by four atairs and a staircase is used for women in the first, second and third floors.

It is located in the basement of Amir Al-Momenin Mosque and there is a staircase on north side of the mosque for women that directly enter women ablution house. On the south of the mosque there is also a staircase for men that are directed to the basement and men ablution house.

This mosque has a men Shabistan (Dome chambers) on the ground floor and women hall is in the first floor in the form of a balcony. The Shabistans are located under a small interior dome. This mosque is in the kind of Shabistan Mosque and lacks porch. Its lighting is provided by wooden latticed openings around the Shabistan and has artificial lighting. Calligraphy is used in mirror pieces and metal sheet in the form of Quran verses and Gods' names on the walls and roof of the mosque. Girih tiles are displayed in the openings of the mosque in metal latticed work. This art reflects light to the Shabistan during daylight in a great way. Plaster is used in making embossed

edges beside mirror pieces and metal sheets on the interior walls of the mosque and the roof of spaces under the dome.

4.3.3.2 Architectural Elements in Amir- Al- Momenin Mosque

The architectural elements of Amir- Al- Momenin Mosque have unique characters that will be described in this section. Dome, Minaret, Mihrab and Minbar are the elements that will be explained and combined with different materials, types and techniques of ornamentation.

Amir Al-Momenin Mosque has two interior domes. The smaller dome is located inside the bigger dome and its height is up to the third floor of the mosque. In other words, the third floor of this mosque is located on the interior dome. In fact these domes are of Nar type and have two shells that are completely separate. The main and bigger dome of this mosque with a height of about two and a half meter is located above the fourth floor and only a part of its swelling can be seen as the exterior façade. Another distinction of this dome is that at first it shows Arabesque designs with azure blue, turquoise blue and yellow tiling and then it displays the tiling works in a controlled manner by the prefabricated metal sheets. Tiling-work shows off in the best possible way in the exterior façade of the mosque. The tiles in the mosque are usually in turquoise blue, azure blue and yellow colours and are in Eslimi design (Arabesque).

The mosque doesn't have any minarets. Lack of minaret is one of the explicit changes of Islamic architecture in contemporary era.

The Mihrab of this mosque is completely different from the shape of traditional Mihrabs. In fact, by separating the mosque's wall from the wooden latticed part, it shows qibla direction.

This mosque doesn't have minbar and is completely different from traditional mosques. In this mosque the prayers and the clergyman all sit beside each other to make a close feeling. The preacher uses a speaker to talk and creates a sense of friendship unlike the traditional mosques in which the preacher sits above the minbar and makes a speech for the prayers.

4.3.4 Evaluation of Contemporary category

Analysis and discussion of the contemporary category was conducted using a comparative method and based on available research information. (Table 4.21)

The effective factors on the historical periods of Islamic Architecture in are governmental attitudes, policy, culture and styles. (Table 4.22, 4.23 and 4.24)

The understudy mosques in contemporary category in the present study are:

- Ibrahim Mosque
- Shahrak-e Qods Mosque
- Amir-al-Momenin Mosque

Table 4.21: Information of Contemporary Mosques Category by author

Mosques	Building date	Architectural Style	Period
Bushehr Cement Factory	2002	Contemporary	Islamic Republic
Shahrak-e Qods	2006	Contemporary	Islamic Republic
Amir Al-Momenin	2013	Contemporary	Islamic Republic

Table 4.22: Evaluation table of Architectural Elements of Contemporary Category

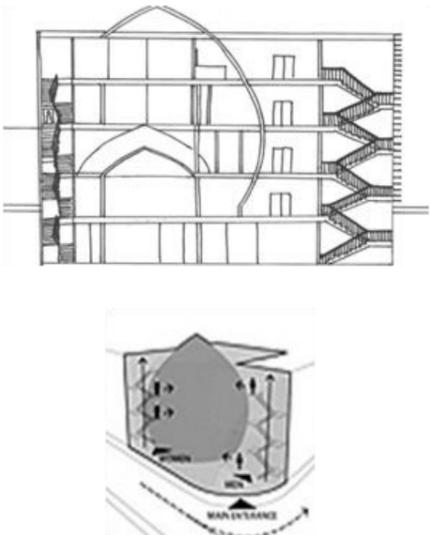
Architectural Elements	Dome	Minaret	Mihrab	Minbar
<p>Ibrahim Mosque</p>				<p>-</p>
<p>Shahrak Qods Mosque</p>				
<p>Amiralmomenin Mosque</p>		<p>-</p>		<p>-</p>

Table 4.23: Evaluation table of Space Organization of Contemporary Category

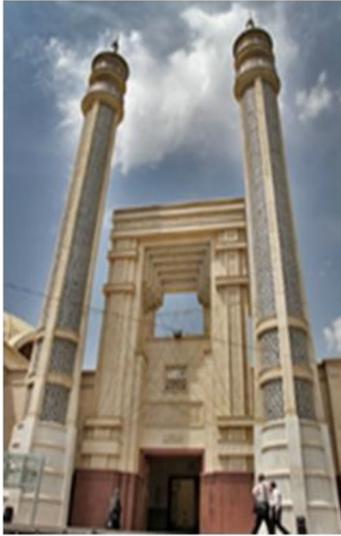
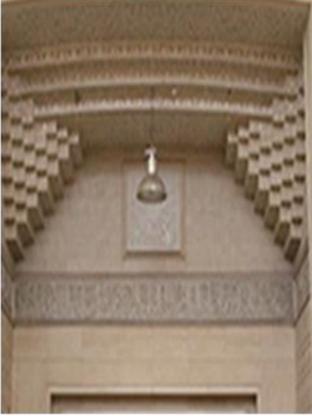
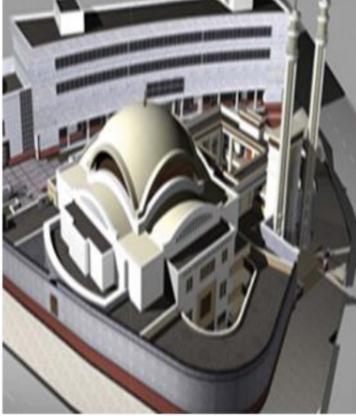
Space Organization	Entrance	Vestibule & Corridor	Courtyard	Iwan	Shabistan
Ibrahim Mosque		-		-	
Shahrak Qods Mosque					
Amiralmomenin Mosque		-	-	-	

Table 4.24: Evaluation table of Ornamentation Type and Technique of Contemporary Category

	Ornamentation	Calligraphy	Eslimi Pattern	Girih Tile	Muqarnas	Tiling Work	Brick Work	Mirror Art	Wood Carving	Stucco Relief
Contemporary Era	Ibrahim Mosque						■	■		
	Shahrak Qods Mosque					■	■	■		
	Amiralmomenin Mosque				■		■		■	

All of these mosques have a contemporary style and have been established during the Islamic Republic. Ibrahim Mosque has been built during the Islamic Republic following the contemporary style. Compared to Amir-al-Momenin Mosque, Ibrahim and Shahrak-e Qods Mosques are more obedient to the traditional patterns and designs of mosques.

Through observing the existing spaces in the mosques of contemporary classification, Ibrahim Mosque has most of the traditional mosque spaces such as a shabistan, yard, entrance and ablution house. Elimination of some spaces such as vestibule and corridor indicates that the architect has tried to simplify the traditional spaces with modern form and shape. Ibrahim and Shahrak-e Qods Mosques have connections to the traditional architecture. In the latter, spaces are worked in a combination of traditional form and new ideas. The covered courtyard display a brand new space language of contemporary period. The third mosque in this category is Amir-al-Momenin Mosque. This mosque have eliminated several traditional spaces such as vestibule, corridor, iwan, and courtyard. The entrance to the mosque has been designed according to new aesthetic taste and is different from traditional mosques.

In studying the existing elements in the classification of contemporary mosques, one can begin with Ibrahim Mosque. This mosque has been designed with the idea of the Kaaba (God House) and is in the form of cubic space. The dome of this mosque is in pyramid shape and in the type of Pineapple Rack that has been constructed as an aspect of stairs on a cubic capacity. A minaret that has been constructed as a separated entity beside the mosque has an apparently square section reminding a church bell. On its top there is a minaret with a small room. The mihrab does not have a concavity in the wall as in the form of traditional mihrabs. Traditional elements of the mosque such

as dome, minaret, mihrab and minbar are clearly seen in Shahrek-e Qods Mosque. But the presence of low-altitude dome with a modern design and many skylights as well as very tall metal minarets evokes the contemporary architecture aesthetics. Amir-al-Momenin Mosque has two interior domes and a part of the large dome can be observed from the outside. Even though the dome cannot be seen from the outside in the traditional form, its presence is clearly felt inside. This mosque also lacks minarets, minbar, and mihrab, the elimination of which can be considered as the influence of contemporary architecture and a new attitude in the design of mosques.

Unlike the traditional mosques with many ornaments and ornamentations, Amir-al-Momenin Mosque does not have many ornamentations and its simplicity is another message conveyed by the architect. It has created a spiritual atmosphere without the need of colourfulness and ornamentations used in traditional mosques. Shahrak-e Qods Mosque is also simple in its ornaments. It does not contain traditional ornamentations like brick or tiling works. Most of its ornamentations consist of Quran inscriptions made of wood or stucco. Unlike the two latter mosques, Ibrahim Mosque contains traditional ornamentations such as stucco relief or tile working. Most of the traditional ornamentation devices have been employed in the present mosque. In general, by using modern materials such as pre-fabricated devices, ornamentations in contemporary designing are increasingly simplified. The facade of Ibrahim Mosque has been covered by black mosaic and a colored red ribbon has been wrapped around it. The mihrab of this mosque has been ornamented as an embossed design by plaster works and can be visible based on the differences of elements design during the contemporary period with the previous periods.

After comparing the aforementioned mosques, this section deals with the effects of different factors on the mosques' elements:

The understudy mosques have all been built during the Islamic Republic government and are in the contemporary style. The contemporary style has presented itself in two forms in these mosques. Following the Islamic Republic, the contemporary architecture became more inclusive than other styles. Traditional elements and plans of mosques have changed in this era more than previous eras.

The first attitude includes that the architect has copied the traditional spaces, elements and ornaments and then recreated them with a combination of new plans, innovative ideas, modern materials and advanced technologies. The formation of the minaret in Ibrahim Mosque has not changed and has been constructed with a square section similar to the church bell tower; meanwhile a small room were used on the top of the Iranian traditional minarets.

Another example of imitation and synthesis of modern and traditional styles is laid in the dome of Shahrak-e Qods Mosque that has the general form of a dome but its shape, height and even construction techniques are totally modern. Moreover, this contemporary style is obviously observed in such spaces as the covered courtyard of Shahrak-e Qods Mosque or the mihrab of Ibrahim Mosque. On the other hand, simple ornamentation of these three mosques shows that despite their usage of traditional ornaments, they have been employed with new methods, materials, forms and technologies.

The second attitude of contemporary appearance in these mosques is deconstruction. Among these three mosques, Amir-al-Momenin Mosque is the best representation of deconstruction. It does not contain the three main symbols of a mosque: minaret, minbar and mihrab. Its only traditional symbol is a dome which is designed in a form that is not easily seen from the outside. In the present mosque, the mihrab shows the qibla only through the walls' intersection with wooden openings. By removing the main spaces such as iwan, courtyard, corridor and vestibule, Amir-al-Momenin Mosque is considered as a deconstructive building in the contemporary era. The metal minarets of Shahrak-e Qods Mosque can be considered as an example of deconstructive ornamentation in which metal girih tiles have been produced using modern technologies.

The effect of construction materials on the elements of aforementioned mosques is obvious. For example, the employment of mosaic surface and glass and steel girih tiles in Ibrahim Mosque is under the influence of modern approaches. Another manifestation of modern materials lies in Amir-al-Momenin Mosque in which two interior domes have been embedded using the most up-to-date technologies. Additionally, its portal has been designed by composite walls. Nevertheless, the usage of modernized materials in covering the courtyard of Shahrak-e Qods Mosque is a clear instance of materials used in contemporary era. The metal domes of Shahrak-e Qods and Amir-al-Momenin Mosques can be identified as a sign of modern construction techniques. The use of such techniques in ornamentations of these mosques is clearly felt. For instance, similar figures and small stucco girihs, cover all of the shabistan's walls in Shahrak-e Qods Mosque. Another example of this modern construction technique is observable in the shutter-like composites of Amir-al-Momenin Mosque which has covered its exterior facade like a veil.

Chapter 5

CONCLUSION

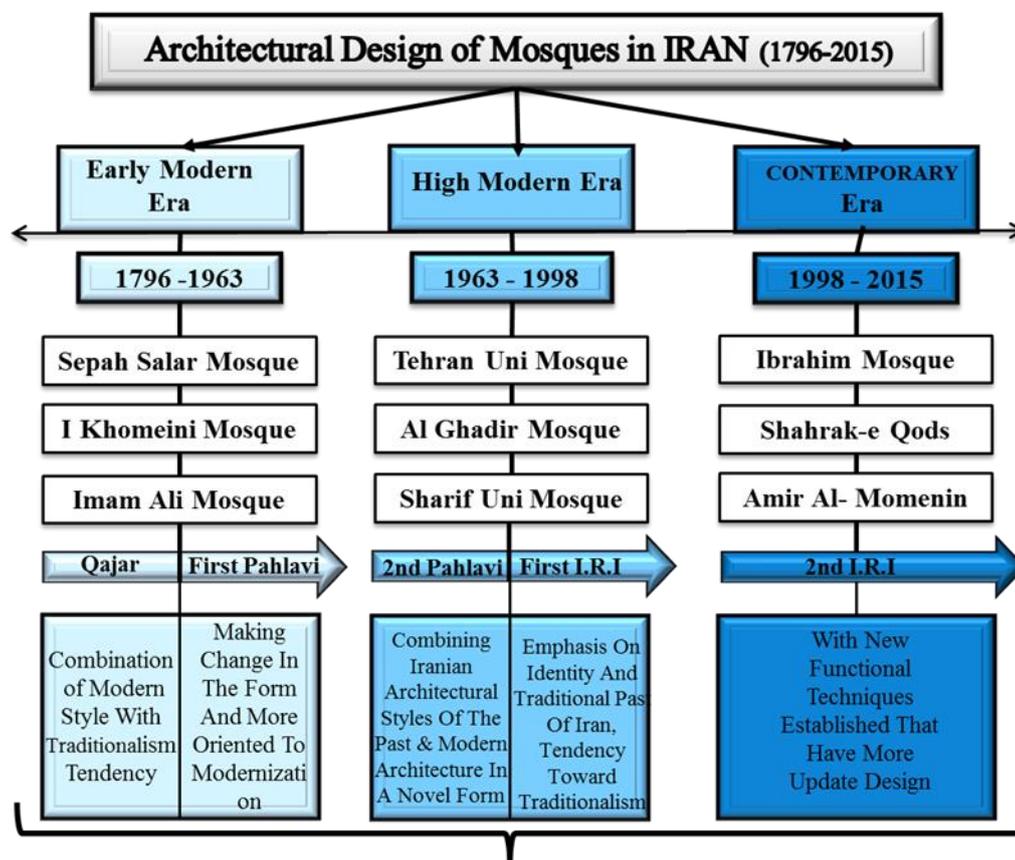
In the contemporary architecture, mosques keep pace with technology and provide the needs of the modern human. This is clearly felt in Iranian architecture. As an important example of buildings, mosques have gone through three groups: traditional, modern, and contemporary. According to the classification performed, modern and contemporary periods were analyzed in this study and case studies were discussed.

The results of this study show that in the era of tradition, the idea and shape of the mosques were determined in Iranian architecture. In this era, architects designed and constructed mosques following the system of thought and executive principles that were legacy of the tradition. However, from the middle of the Qajar era, Iran and architects faced with a dichotomy. Therefore, the contemporary architecture of Iran indicates two tendencies: Islamic architecture (Isfahani style), Western architecture (Late 18th century). These two factors have shaped Iran's contemporary architectural styles. Each factor, independently or in combination with each other, was represented with different degrees of importance in different periods of Iranian contemporary architecture. In this study, these are divided into three main categories: Early modern period (1796- 1963), High modern period (1963- 1998), and Contemporary period (1998- Now).

The only attitude that is present in all periods is the attitude of traditional architecture or traditionalism (following the Isfahani style). The role of western architecture has been more inclusive and broader than other factors in the contemporary era over time. It should be noted that in the contemporary architecture of mosques in Iran, architecture is an example derived from concepts and not merely an imitation of a form of identity in the past or the West.

According to the literature, the government's attitude in each era and its interaction with tradition and modernity has been among the factors influencing the contemporary architectural styles in Iran.

Due to the increase of transactions and disputes with the West and attention of authorities to the land over the Qajar era (1879), western architectural style emerged. In the first Pahlavi era (1925), authorities were inspired by the Isfahani style. In the second Pahlavi (1963), in order to honor Iranian identity, the Iranian modernism style emerged. At the beginning of the Islamic Republic (1979), several mosques were built with traditionalism attitudes due to social events. Finally, after the Islamic Republic (1998), the contemporary architecture was combined with architectural modernism and traditionalism became important. (Figure 5.1)



Analysis in Spatial Characteristics of Historical Iranian Mosques: Case Study on Modern and Contemporary Tehran Mosques

Figure 5.1: summarize of conclusion

The early modern and high modern periods can be considered as a transition phase to modernity. The fact is that a mosque's function should be defined on a specified route.

Moreover, depending on the social nature and circumstances in which the mosque is located, adaptive practices and the mosque's role should be defined. However, the function of the mosque is not limited only to religious practices. In the modern era, architects have used elements, spaces, and ornamentations in Iranian mosques. They applied the traditional architecture of mosques with direct modeling of traditional forms. They also used the traditional vernacular architecture with modern materials in order to reflect modern architecture in the mosques of Iran. By taking more advantage of the past structural experiences, new functional techniques, proper physical planning and important criteria, contemporary mosques could optimally improve their own quality. (Table 5.1, 5.2 and 5.3)

This study shows that the essential requirements of a mosque have considered in a unique way in each mosque's designing process. But the valid aesthetic tendencies and developments have played an important role in all dimensions of articulation of a mosque, such as plan, layout, space organization and ornamentation. It is clearly understood that the rich background of Iran in mosque architecture is in a great dynamism since 150 years.

Table 5.1: Evaluation table of Architectural Elements as conclusion

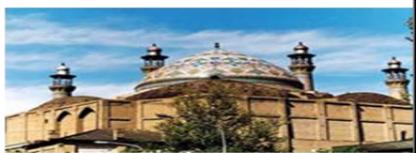
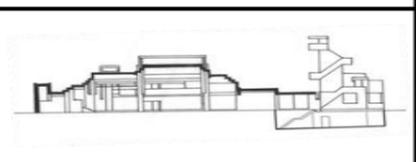
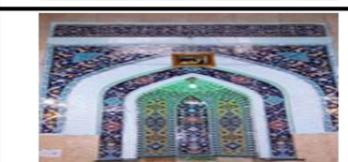
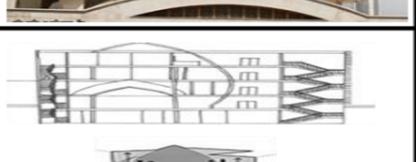
	Architectural Elements	Dome	Minaret	Mihrab	Minbar
Early Modern Era	Sepahsalar Mosque				
	Imam Khomeini Mosque				
	Imam Ali Mosque				
High Modern Era	Tehran University Mosque				
	Alghadir Mosque		-		
	Sharif University Mosque				
Contemporary Era	Ibrahim Mosque				-
	Shahrak Qods Mosque				
	Amiralmomenin Mosque		-		-

Table 5.2: Evaluation table of Space Organization as conclusion

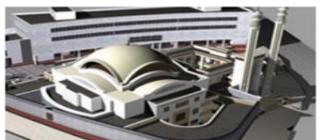
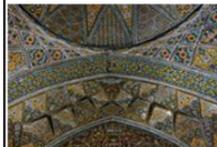
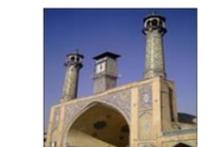
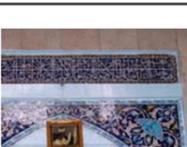
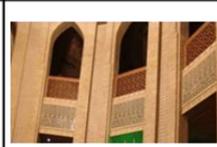
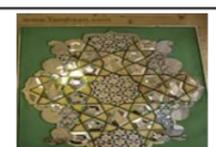
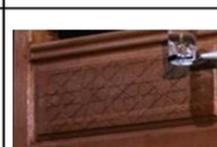
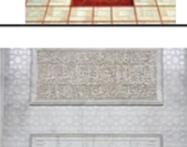
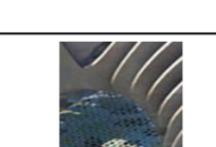
	Space Organization	Entrance	Vestibule & Corridor	Courtyard	Iwan	Shabistan
Early Modern Era	Sepahsalar Mosque					
	Imam Khomeini Mosque					 Winter  Summer
	Imam Ali Mosque		-		-	
High Modern Era	Tehran University Mosque		-		-	
	Alghadir Mosque				-	
	Sharif University Mosque					
Contemporary Era	Ibrahim Mosque		-		-	
	Shahrak Qods Mosque					
	Amiralmomenin Mosque		-	-	-	

Table 5.3: Evaluation table of Ornamentation Type and Technique as conclusion

	Ornamentation	Calligraphy	Eslimi Pattern	Girih Tile	Muqarnas	Tiling Work	Brick Work	Mirror Art	Wood Carving	Stucco Relief
Early Modern Era	Sepahsalar Mosque									
	Imam Khomeni Mosque									-
	Imam Ali Mosque				-			-		
High Modern Era	Tehran University Mosque				-		-	-		-
	Alghadir Mosque		-		-			-		-
	Sharif University Mosque									
Contemporary Era	Ibrahim Mosque						-	-		
	Shahrak Qods Mosque					-	-	-		
	Amiralmomenin Mosque				-		-		-	

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