Mosaics as a Decorative Contribution to Historical and Contemporary Interiors

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ABSTRACT

The sense of ‘place’ is very important in human existence. Among many factors that influence the sense of place, is the character of the surfaces which define a place. Throughout history decorative practices that enhance the sense of place have been used highlighting the floor, walls and ceiling of spaces through the crafts of murals, carving, fabrics, mosaics, etc. This study aims to research ‘mosaics’ as decorative practice, focusing on selected examples in historical and contemporary applications, so as to point to the potential contribution of mosaics to the artistic and experiential values of space/place with emphasis on interiors. It will study mosaics as decorative craft form in terms of materials, techniques, pictorial contents as well as location and effects in space. Oriented towards interior designers and artists as well as architects, this research intends to bring forth various potentials of mosaics as unique place-specific art and craft technique, along with the singular effects and contribution to the values of interior space.

Keywords: Mosaic, Interior Architecture, Decoration, Sense of place, Space perception.

ÖZ

"Mekan" duygusu, insan hayatında büyük bir önem taşımaktadır. Mekan duygusunu etkileyen faktörler arasında, mekanı tanımlayan yüzey karakterleri yer alır. Tarih boyunca, duvar resimleri, oymalar, kumaşlar, ve mozaikler gibi mekan duygusunu artıran dekoratif uygulamalar, zemin, duvar ve mekanın tavan bölümünü vurgulamak için kullanılmıştır. Bu çalışma, "mozaikleri" dekoratif uygulama olarak araştırmayı, tarihsel ve çağdaş uygulamalarda seçilen örneklere odaklanmayı, mozaikleri, iç mekanlara vurgu yaparak mekanın sanatsal ve deneysel değerlerine potansiyel katkısını göstermeyi amaçlamaktadır. Bu çalışmada, "mozaik" dekoratif el sanatı olarak, malzeme, teknik ve teknoloji açısından ve ayrıca mekandaki konum ve etkisi açısından incelenecektir. İç mimarlara sanatçılara, ve mımarlera yönelik bu tür araştırmalar, tekil efektlerin ve iç mekanın değerlerine katkının yanı sıra, öz mekana özgü sanat ve zanaat tekniği olarak mozaiklerin çeşitli potansiyellerini ortaya koyma niyetindedir.

Anahtar Kelimeler: Mozaik, İç Mimari, Dekorasyon, Mekan duygusu, Mekan algısı.

To my beloved Mom

For her endless love and support…

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INTRODUCTION

1.1 Background of the Study

The sense of 'place' has a very important relationship towards human existence. Mosaics can be seen as both a surface decoration – i.e. an element of space/place, and as a dynamic design tool. Based on an understanding of how relations between humans and environment work, and how the creation of place can be enhanced, is extremely important for design. Hence a general survey of mosaics in historical and contemporary interiors can help raise awareness of architects and designers and accumulate relevant knowledge on the potentials and role of mosaics in interior space.

The character of the surfaces which define a space influences, amongst many factors, the sense of the place. Decorative crafts and practices such as murals, carving, fabrics, or mosaics to highlight the floors, walls and ceiling and other architectural elements, spaces have been articulated as place throughout history. According to Wynveen, a distinctive cognitive form of an attachment may exist, together with emotional and behavioral responses to place (Lin & Lockwood, 2014) when meanings of places are associated with some particular physical attributes. Therefore, decorative practices can be used as a tool for highlighting and enhancing the spatial characteristics of any component of architecture. Among these various techniques and crafts, mosaics have proven to be a powerful tool as it is integral to architectural space, and vice versa, architectural space has provided the ideal material support to showcase creativity and

craftsmanship contained in mosaic artist works. Among the various decorative practices applied to larger interior surfaces, mosaics take a special place: they work not only through pictorial contents, but furthermore, mosaics have special tactile qualities. They work through their materiality, the size and shape of smaller pieces, the character of the materials used, the nature of the surface they constitute, along with the colors, textures and patterns they create.

In order to artistically contribute to interior space, we need to learn from the great examples of mosaics found throughout history. The discovery of the earliest examples of mosaics made out of colored stone, shells and ivory took place around 3,000 BC in Ubaid, Mesopotamia. In the 8th century BC, mosaics became widely used in Ancient Greece. To give a great range of color they used small cubes cut from stones. Mosaic as art was used to build the tomb for the daughter of Constantine in Santa Costanzo, in Rome, in about 350 AD. Great examples of the Roman mosaics are located at Pompeii, in Italy (just like the dramatic battle image of Alexander and Darrius). From the earliest 4th century, the great tradition of Christian mosaic design on Roman traditions began. The 5th - 6th century Byzantine period mosaics applied mostly in churches and monastery. By the beginning of the Islamic era in the 8th century, Byzantine iconography had replaced with geometric and floral motifs sometimes with calligraphy. Both the Alhambra palace (14^{th}) in Spain as well as the Tomb of Hafez in Iran are the most prominent Islamic examples of mosaics. Due to the rising influence of paintings subsequent the Renaissance, this type of artforms went through a period of decline. However, it was revived in the 18th and 19th century.

Today, mosaics have become popular again, because they adorn architectural surfaces and public spaces (Elber & Wolberg, 2003). There is a lot to be learned from their

powerful presence of mosaics in modern and historical buildings. New approaches and techniques are being developed following the unique contribution of artists such as Antoni Gaudi. Gaudi has become one of the most prominent artists of the late 19th century and early 20th century in this field. Gaudi used techniques and crafts of ceramics and stained glass to articulate 2D and 3D surfaces, and through his consideration of every detail of his spatial creations, he integrated mosaics into his architectural elements and components.

The main factors leading towards the decline of mosaics and other crafts, include the production of building materials which are industrialized, the need and requirement for speed in construction works, the general decline in the demand for craft products, as well as the rejection in modernism of decorative elements in space.

For many years the decorative arts have no longer been an integral part of the process of designing in recent construction practices. Rather these have been left to special requests, to be applied after the completion of the construction as an addition.

Postmodernism re-generated the emergence of ornamentation as the carrier and conveyor of meaning and also as a means of exaggeration, stemming from questioning and challenging the universality of the International style, it sought to oppose the insignificance of meaning and expression of functionalism. This revival has restored the relationship between architecture and decorative arts in new ways (Mitrache, 2012).

Mosaics presents an architectural surface treatment and articulation that is both most elegant and functional. It is a crafts and an architectural surface treatment adaptable to

various climatic and atmospheric conditions. It is durable. It can be adapted to different functions or surfaces because of its versatility. In different sizes, shapes and materials it can be employed on horizontal and vertical surfaces. Mosaic is also considered an eco-sustainable product. Therefore, in a modern design for interior and exterior decoration, it has the ability to change the decorative approaches in surfaces. The aesthetic values of mosaics contribute towards the unique character of a place and frequently provisions the pictorial contribution. In order to articulate space/place, it offers one of the most innovative and flexible tools of design.

There's a powerful presence of mosaics in modern and historical buildings. As a decorative element it possesses functional as well as visual contribution with effects which are strong in a place experience. In order to enhance design approaches towards the articulation of space/place in essential ways, lessons need to be extracted from history as well as utilizing technology.

Today, mosaics are primarily attributed to their functional terms. Practically, mosaics can be used in kitchens and bathrooms and various floors throughout the home as they are easy to maintain and durable. The beauty of mosaics is characterized by size, shape, color, and design and is always a secondary consideration. This has not always been the case, however historically.

The aesthetic contribution of mosaics throughout the ages has played a major role in ceramic tiles development even though the practical function of tiles and mosaics has always been significant.

In protracted period of time, trending materials go out of fashion and new ones are funneled into the market. The articulation of surfaces-as-places is made up of the old technique and approach of mosaic. Although the attractiveness of these techniques has declined, it still offers the best coatings for different spaces as well as purposes. Mosaics have a way of improving the overall outlook for the home and raising the value of a home because of their special pictorial value and place-specific nature. Since mosaics are open to creative ideas, they can be utilized to achieve a more attractive and unique outlook. Using their durability and materiality they enhance the sense of a place, highlighting place articulation and pictorial contribution.

Decorating with mosaics means achieving a more unique and lively space through providing rooms with an extra measure of exclusivity and luxury. Contemporary design approaches can achieve a unique place through the integration of mosaics as visual points of attention, finding approaches for any atmosphere and combining mosaics with surface materials such as ceramics, wood and stone. Mosaic art offers an ecologically friendly decorative application and this serves as another aspect value of mosaic art. In order to create low maintenance and high impact mosaic imagery, artisans used recycled glass, stone, pebbles and even shells for centuries. Due to mosaics inherent durability, sustainability, and timeless beauty, the art has become the ultimate choice for surfaces (Artaic, 2019).

Using computerization technique and not hands to produce mosaic applications has become very popular. The computer design software (AutoCAD) can assist in designing mosaics. Using a design software to produce mosaics is easier, faster, and more accurate and it has an overall lower construction waste. Using a robot to produce mosaics involves loading mosaics into buffers and through the execution of a

command file from the design software, the robot is instructed to pick and place tiles individually. This type of application together with this type of production automation lessens the high cost of labor. Since mosaic images are assembled upon a plan by a robot and not by hand as unique place-specific design, they may become endlessly repetitive and reproducible (Artaic, 2011).

1.2 Problem Statement

There is a reduction of the use of crafts in general, and mosaics in particular as an artistic contribution to interior space. The disappearance of place-specific art and craft techniques with their unique value for interior space is in strong contrast to the rapid growth in industrialized production of surface materials, and digitalized surface design. Consequently, there is a shift of interest away from traditional decorative techniques, and there is a lack of research on the role of mosaics in interior space, and on its potential for space/place definition in traditional and contemporary uses.

However, as place-specific craft, mosaics has the potential to contribute to the sense of place with their materiality, aesthetic dimensions, tactility, and pictorial contents. According to its location, it may highlight an area on the floor, a special ceiling treatment, extending the space with a representation of landscape or other spaces. Furthermore, it offers a great degree of practicality such as durability, versatility, integration with other materials, and spaces. Its special contribution includes the reference to traditional crafts and add to its historical value. The study of mosaics can also help to understand the intuitive relationships of humans with space/place and enhance its applications as an effective tool of design.

1.3 Aim of the Study

This study focuses on mosaics as a decorative practice surveying a range of historical and contemporary cases. It seeks point to the potential contribution of mosaics to the artistic experiential values of space/place with an emphasis on interior spaces. It intends to accumulate a broad overview on mosaics as a decorative craft form, studying selected historical and contemporary examples. It proposes such a study to follow a general structure for analysis in terms of materials and techniques, pictorial contents as well as location in space. It seeks to explore the potential of mosaics as a tool of articulation of place. Mosaics ensure dynamism in interior design, in contrast to a set of tiles; mosaics can provide places with more liveliness and unique character. For instance, it is possible to integrate a mosaic as a decorative element in the habitat, highlighting a specific wall or breaking the monotony of flooring or wall tiles. One of their other advantages, and more specifically with regard to the relief mosaics, is the fact of providing the space with simulated movement while achieving a combination of lights and shadows which enriches the design. In order to highlight such potentials, this study will explore mosaics through a series of historical examples. In terms of contemporary applications, it will also explore the production of some of the powerful companies which work in this field and try to revive this art again. Few companies have a special product line by the name of "Mosaic". Companies mostly have different products in these fields by other names such as ceramics and tiles. By doing so, it is expected that this study will show how mosaics may not be a simple surface cover. Mosaic can be one of the most effective parts of our interior space, and effective tool of design.

1.4 Objectives of the Study

Based on a broad survey of mosaics in the proposed terms such as materials, techniques, pictorial contents and location in space, this study will outline and develop a set of dimensions of mosaics as a tool of design and means of artistic expression in space/place. This includes generating a list of possible materials, a range of implementation techniques, both traditional and currently developing.

Such a broad overview can help derive understanding on the potentials of mosaics as design tool and element in space from certain prominent implementations in different historical periods. In turn, further studies may build up and develop references for the evaluation of the contribution of mosaics to space/place.

1.5 Research Questions

- What may be the potential import of mosaics as a pictorial and/or geometric decorative surface technique in interior space?
- What is the potential contribution of mosaics as a place-specific craft on the perception and value of space/place?
- What are the main characteristics and qualities of mosaics as design tool and how these contribute to the unique character to space/place?

1.6 Methodology

The general analysis of cases follows a structured descriptive method defining materials and techniques, pictorial content, and location in space issues. These are expected to help develop ongoing research on mosaics in terms of decorative art and craft form, clarify the uses of mosaics and their effects in space, as well as help link the potential role to the sense of place.

The case studies will build up a brief historical overview of on the use of mosaics as decorative practices, following the prominent relevant examples in consequent historical periods chronologically. It will also conduct a study on contemporary implementations by studying best practice examples. This survey is based on reviewing and analyzing cases through articles, thesis, books, journals, other academic references, as well as internet sources.

The selection of historical examples will be on prominent cases that are appearing in most sources and based on history researchers' findings in Middle East and Europe region. The selection of the case studies of contemporary examples will be based on the best practice list of companies supplied by CERSAIE FAIR, an international organization which is the foremost authority in the field of mosaics and tiles. Moreover, the detailed study will be based on each company's website one by one and search for the images, references, products, and news that are most related to contemporary usage of mosaics in interiors. In order to present also certain more experimental practices, several mosaic artists are also included in this survey.

1.7 Structure of the Study

The study is divided into five chapters. The first chapter introduces the context of the study and discusses the general idea about choosing mosaic as interior design contribution. It explains the problems and aims that will be illuminated in this study, as well as the methods that will be used. Chapter 2 is the major chapter of the theoretical framework of the thesis. It contains different parts addressing Space Perception and Interior Space Formation, as well as theoretical discussion on mosaics at the intersection of design, fine art and craft. Chapter 3 gives an overview of the mosaics in historical perspective in different periods, covering Ancient beginnings,

Greece and Rome, Christian Mosaics, Byzantine period, Islamic art, and the Baroque period also including modern development and industrialized production. Chapter 4 is about current applications of mosaics and contemporary use of it. It will also introduce some influential producers of mosaics in the world, along with the study of selected cases. It will discuss such cases focusing on architectural context and function, as well as include the visual and spatial effects and values of mosaics. Chapter 5 is the final chapter of the study and will include the major findings of this study.

1.8 Limitations of the study

This study does not present a full analysis of mosaics as interior design element. It is a survey that offers a preliminary broad overview. It will focus on mosaics as decorative surface and contribution in space/place. It will discuss the value of mosaics as an interior design element, including the relation between sense of space/place and mosaic as a decorative material in general terms.

Hence this study of mosaics will be confined to noting materials and techniques and pictorial content and location as decorative design tools. Both the historical and the contemporary examples are obtained through a selection process, and hence offer a partial overview of applications.

Based on this broad overview, further studies will be required to contribute to the subject by examining each of the range of qualities that have accumulated in this current survey, such as for instance sustainability, versatility, and aesthetic quality. Another way of extending on this study, may be a more detailed analysis in depth as to the special effects of any implementation of the perception and experience of space/place.

Chapter 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

There are several key issues that need to be examined in order to better understand the role and potential of mosaics in interior space and its possible contribution to the sense of place. Hence the survey of relevant sources concerns the concepts of space formation, perception, and the possible links and effects on the sense of place. It also concerns a more extensive survey on literature discussing properties and qualities of mosaics as place-specific and integral element in interior space.

This chapter is dedicated to the discussion of space, its formation through various elements, and their effective role in perception. As it will be shown, the formation space, perception and experience of space and place is important to human existence, and part of the sense of being. The character of this import, and the nature of the sense of space and place on human existence will be surveyed as argued by great philosophers as well as architecture theorists of the modern era such as Heidegger, Norberg-Schulz, Pallasmaa, and Holl. These will help gain better understanding the necessity of articulation of architectural space elements, and hence point to mosaics as a decorative element that provides such articulation of space/place in special and specific ways. The survey of literature on mosaics follows the structuring proposed for this general overview, focusing on materials, techniques, pictorial contents, and

location in space. It seeks to accumulate relevant knowledge on mosaics with respect to these, so as to lay out a range of approaches and effects.

2.1 Interior Space Formation

While the notions of space and place are integrally connected, it is important to understand the physical properties of space which, perceived and experienced contribute to the formation of the sense of place.

The term form is used in art and design to signify the relations of parts in a composition to produce a coherent image, denote the manner of arranging, and signify the formal structure of work. A complementary and inseparable aspect of architecture is made of form and space. The physical substance that makes up the form of a building are materials and structures that enclose or create the spaces within the building thus making up the building. Architectural elements which shape space include structural elements such as columns, walls, floors and ceilings. The form of a space provides both for the functions, and for the specific experiences therein. Form and space are controlled by parameters like shape, degree of enclosure, dimensions, proportions, as well as characterized by the materials, colors and textures (Eckler, 2012).

Our being is always incorporated by space. Our perception of spatial boundaries as defined by the elements of form, determine its visual form, dimensions, scale and the quality of its light. Architecture emerges when space begins to be captured, enclosed, molded and organized by the elements of mass. The connotative meanings of the language of architectural forms and spaces include associative values and symbolic content that vary according to personal and cultural interpretation, which can change with time (Ching, 2012).

The concept of place is comprised through physical, cultural and aesthetic qualities. These help shape users individual and social involvement in the world, and thereby the sense of place associates closely with the formation of built environments (Hubbard & Kitchin, 2010).

The sense of 'place' builds up on the properties of physical space, and becomes distinct by the formulation of perceptions and interpretations of the inhabitants. According to Seamon (2015), a place is defined as a "locus in and through which individual or group actions, experiences, intensions, and meanings are drawn together spatially." The formation of meanings and the sense that familiar, frequented places contribute to place bonding (Altman & Low, 2012) and satisfaction in everyday life is facilitated by the "drawing together" which pushes people to make involuntary emotional connections or become attached to a certain place (Mclane & Kozinets, 2019).

2.2 Space Defining Elements

Nylander (2002) claimed that, the essential role of perception of a place for the user could easily be facilitated by enclosure and openness. Enclosure of spaces provides the feeling of security and privacy in the house (Ebrahimi, 2013).

Spaces that are well defined and possess a distinct identity are created using one essential element called (visual) enclosure. This element is visual, physical, and assists in creating places providing a feeling of shelter in which people feel comfortable. A lack of visual enclosure in a space can feel daunting and unwelcoming.

A degree of environmental separation is provided through building enclosures which are expected to be durable and also address issues like energy efficiency (design objectives: sustainability, optimization of energy-use), daylighting

(resources/daylighting), indoor air quality (design-objectives/sustainable/enhance-indoor-environmental-quality), fire safety, thermal comfort (design objectives/ productive/provide-comfortable-environments), and carbon footprint. From the design stage, there's a need to explicitly ensure these performance objectives need to be fully satisfied.

A relatively recent opportunity for building designers became the new design strategies for building enclosures. A highly traditional building industry where certain types of performance problems (i.e., energy efficiency, thermal comfort, etc.) were considered acceptable was guided by locally available materials and successful past precedents. In the middle of a marketplace of innovative materials, components, and systems the designer has a responsibility to fully integrate and the constructor has to deliver properly in order to ensure full satisfaction of a multitude of performance requirements (Kesik, 2016).

The user's overall experience of a particular space is defined by qualities which are provided by spatial components that do not only define the qualities of a space, but significantly, have an effect on the user. Special surface treatment of these boundaries help define these qualities. Spatial boundaries consist of tangible, solid corporeal qualities, as well as by intangible qualities. These give clues for the criteria to be achieved by design – they offer the basic tools of space design, and also define space within its organizational pattern and articulation. They render the haptic character of space, its texture and tangible qualities. Intangible qualities include light and shadow, color, as well as the feelings that all of these generate.

According to Wright (1954) the functional quality of spatial elements are as follows: the side of the box is not part of the cognizance of “wall”; only when necessary the wall becomes an enclosure of space that represents protection against heat and steam. However, the other performance of it is to bring the outside world into the inside of the house and at the same time the inside of the house has this potential to go outside. In this order, working on the wall as well as playing the function of a screen, a feature to opening up space with the control of building-materials (Wright, 1954). Although architects mainly define space by giving from to architectural elements like walls, floor, ceiling, door, window, etc. space is not simply a physical entity (Rapoport, 1969). A physically defined and articulated boundary also generates meanings for a user – i.e. the non-physical reality and qualities that grow out of physical properties.

2.3 Space Perception and Architectural Theory

A process in which humans and other beings are made aware of their relative positions, as well as the objects around them, is called perception of space. Dimensions such as depth and distance become important for moving and orienting in the environment through understanding space (Kai V.J. von Fieandt, 2017).

Perception involves the use of all our senses, even though it is frequently understood as visual perception only. The relation of building and its site, as well as the perception of it, is the subject of deep concern, especially in terms of the phenomenological perspective on architecture, which seeks to account for the multisensory experience of space/place.

However, highly successful generic solutions in market economies strongly clash with this approach in our global age. A conflict involving the global and local has transpired

into the field of architecture within the contemporary socio-economic conditions. Global architecture is frequently being reduced to just a universal image by the communication rules of the network society. It has also lost possible multiple layers of perception because it is being designed today as just a generalized image. In order to maximize the multisensory perception of our environment in our current society, it is imperative that we revisit the phenomenological understanding of architecture. Even more imperative is the need for orientation in this global age of rethinking meaning and experience so that these play a functional role in the construction of future cities. The challenges of current and future processes of urbanization such as densification, environmental sustainability and social identity can be better addressed by a phenomenological approach to architecture. The most important role in architecture is to create better cities, society and better world (Casanova & Hernandez, 2013).

Perception in the space is a primary fundamental process from which understanding and sense begin. Through bodily experience the perception of space is possible. Through the perception of space, the user understands the depth of space, based on its thresholds. The potentials of space to the user's activities is directed by thresholds which are defined by boundaries. The user's desire and emotions within the space is created by all these steps. 'A sense of space' for the user is created by this realization. From this fact the user develops an understanding for spaces with other spaces around. Emphatically, the spatial organization of space could well be understood as a harmony for the user. In this visual perception which is single, shifts to notion of harmony in space, that could be defined as a sense of space (Ebrahimi, 2013).

The special transformations by the end of the 20th century, which was referred to as the Network Society by authors Manuel Castells and Jan Van Dijk, came about through the converging of few major social, technological, cultural and economic conditions. The impact of mass media as well as the latest developments of new communication technologies highly transformed space perception, excluding the multisensory experience that provides direct perception of reality. Our sensory experience when we communicate as well as our normal communication techniques have been altered by these developments of new communication technologies, which slowly deteriorated direct communication. Our spontaneity to communicate in quick and short ways enables us to communicate with an increased number of people. There is a significant growth in the number of social activities which were formerly developed in the real world and are currently developed in the virtual world. In order to favor concepts such as convenience or productivity, a wider concept of multisensory perception had to decline in importance to align with virtual reality that is dominating the real world and many aspects of our lives. Whilst many aspects of our lives are ignored and increasingly becoming redundant to keep pace with progress, consumer society is promoting the idea that new technological commodities are an essential part of our lives. Since it is apparent there's no time to waste, an extremely flat culture communicates far better (Casanova & Hernandez, 2013).

In conclusion, in order to remain relevant to the occupant, a sense of space should be integral to architectural spaces. Multiple methods of interaction and perception should fully be facilitated by spaces. A space/environment is requisite to be more approachable and acceptable to the majority individuals and imperative for the establishment of human perspectives in design. Human beings should generally perceive art and architecture with their consciousness and understanding. An

architectural theorist Juhani Pallasmaa declared that "The artistic dimension of a work of art does not lie in the actual physical thing; it exists only in the consciousness of the person experiencing it. […] Its meaning lies not in its forms, but in the images transmitted by the forms and the emotional force that they carry. Form only affects our feelings through what it represents" (Pallasmaa, 1986). When creating a built space, the focus should be the contributions of emotions and feelings in order to generate spatial impact and memorable experiences (Emeney, 2016).

2.4 "Place" and its Formation in Phenomenological Perspective

The concept of 'place' in philosophy, as well as in architectural design is intimately linked to the experiential - i.e. phenomenological perspective. Accordingly, the main emphasis of interior design is to use interior elements and design tools in order to create a unique space which ensembles the physical and psychological needs of those interacting with the space. Painting walls and hanging curtains is not the ultimate end in the concept of interior design. An important aspect in interior design is that there's a wide range of factors which need to be considered in order to determine the perception of people inhabiting a place. To model a space intended to be conceived by the user, interior designers employ sophisticated tools and resources, regardless the amount of space available or the appearance of the space before the designer models it. The philosophy and psychology of how space is conceived within interior designing context is a product of how the designer can intelligently manipulate the looks of a space so that it invokes certain feelings to users of the space. A Journal of Research Practice article stated that "When designers create interior spatial designs for various types of uses and experiences, they consider both the aesthetic qualities of a space and how people experience interactions and sensations within the spaces" (Poldma, 2010, p. 13). Although the tools employed by interior designers do not entirely change the

space, they manipulate the aesthetic aspect of the space so that it embodies the user and the designer's visual goals (Al-Zamil, 2017).

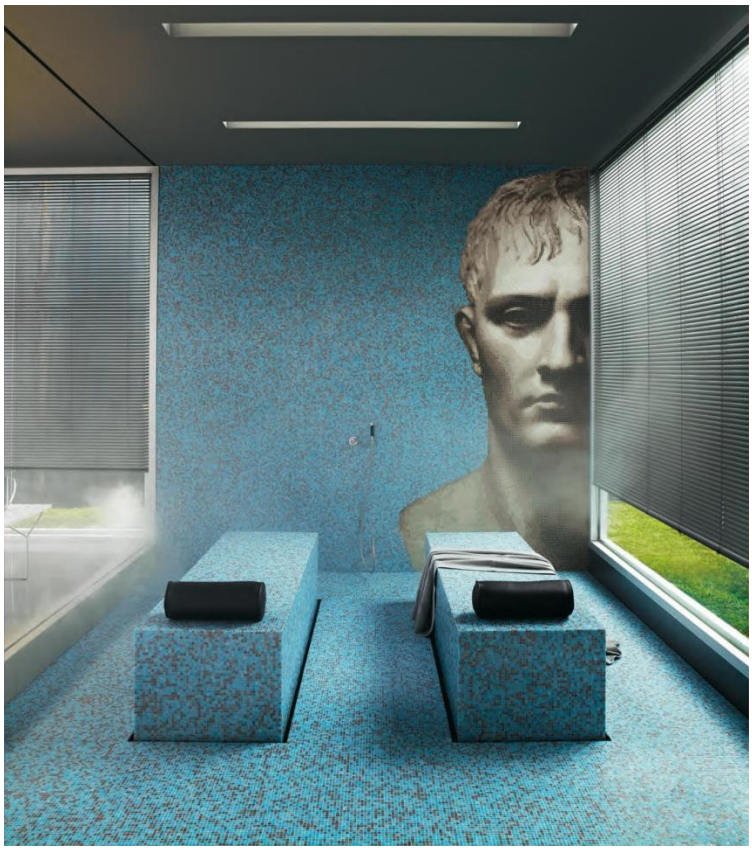

Figure 1: Bissaza Mosaic, (Architonic, 2010) (URL1)

Human experience and consciousness is addressed by special branch in philosophy called phenomenology. In relation with the notion of 'place', philosophy i.e. phenomenology - offers a focus on the experience, while in architecture theory we can find more tangible connections to concrete spatial situations, and criteria. Phenomenology in its simplest terms is the description and interpretation of human experience (Finlay, 2009).The main purpose of phenomenology is to encourage human beings to understand the world and question their experience of it. Since the concept of Phenomenology provides for the conceptual and methodological way to examine spatial, environmental and architectural dimensions of human life, it ultimately carries

the potential value that directs interior design research (Seamon, 2015). Our long-term memory stores images and symbols of items. According to Brebner (1982), "these relationships are abstracted from our experiences and allow us to anticipate the next event". This influences anticipation which covers all sensory channels because it is complex, complete, and integrated. Brebner also states: "missing or unexpected features of any kind can force a reorganization of a person's perceptual and cognitive interpretation of the world at the expense of time. This is an important point since even one new element can lead to a total reorganization of the perceived world" (Brebner, 1982).

The founder of the phenomenological approach in philosophy, Husserl, especially in his late works has paid attention to the historical explanation; he found that our knowledge has been historically instituted and we are essentially historical beings. He maintained that our everyday life is alienated from the mathematical idealization that presents the essence of space-time and natural things. In "The Crisis of European Science" the idea of the "life-world," as "the surrounding world of everyday life," or the world that is experienced by a living subject in his particular perspective (Spiegelberg, 1982) possesses very important prominence. All the objects of consciousness exist within the life-world and it is a world in which all experiences take place. The life-world being the world experienced in everyday life, is a 'phenomenological' structure and not an 'ontological' structure. This means that the life-world takes an impression of the range of noematic sense from which it takes the form of sense, presenting objects that are of daily experience in life, and that is to say it is not made up of a separate field of objects (Smith D. W., 2013). A brief explanation of the life-world according to Moran is as follows: We experience the life-world in unity as conscious beings, and it is provided to us in advance and we will always live

in it. The merging of objectivity and thing hood in different ways as they emerge from different cultures making up the general structure of the life-world. Husserl believed that a rudimentary examination of cultural differences exhibited an irregular structure of the life-world although different societies held different views and understanding of nature (Moran, 2000). The life-world refers to our everyday life that includes natural and man-made features. The life-world is made of the environment in which human species live. As life progresses and we become entities from history, the life-world then resembles variant and invariant characters.

Taking up the main principles of the working of the life-world and phenomenology, philosopher Martin Heidegger brought into attention that the human condition will not be satisfied by the inappropriate environment presented by the architectural styles of the time which were too visual and straightforward. Architecture should entice the senses along with the visual. Human beings should be able to create a meaning out of architecture that embodies all the senses and also incorporate a sense of place. An application of phenomenology can be directed to the psychological state of human beings inhabiting an architectural space. By instinctual perception, human beings feel the inclination to maintain the phenomenology of spatial experience. According to Heidegger, "We do not dwell because we have built, but we build and have built because we dwell, and that is because we are dwellers" (Heidegger, 1971). From these sentiments, it is imperative to understand the connection between being and architecture. In Heidegger's perspective, building fully incorporates dwelling because it translates our general human existence. This is because the manner or arrangement of how we dwell demonstrates how we identify ourselves and how well we are placed on this planet.

Heidegger's idea of space is partly made up of rudimentary methods of Da-sein and it is the fundamental key in the mechanism of being-in-the-world. He established his understanding which opposes three main traditional opinions on space namely the absolute theory, relational theory and the Kantian theory. The absolute theory claims that space exists independently of other things and it's a homogenous structure. This means that space is self-reliant. Motion and motionless objects and events exist within absolute space but it doesn't dependent on them. Absolute space serves as a basis of existence for moving objects and the immediate space within it (Ariskala, 1995). Objects and relational space are intertwined and therefore exist concurrently. Space exists through the evaluation of the relationship between objects or object properties. This means that the existence of objects within space give existential meaning to space. From the analysis of these theories, it can be presumed that space possesses some form of objectivity or reality. The theory of space recited by Heidegger assumes a position of animate existentiality from which our activities and participation plays a major role.

Heidegger claims that we are familiar with works of art and we treat work of art as things like pictures, paintings, hymns, etc. Heidegger emphasizes that all works of art are treated according to their nature (Heidegger, 1993, p. 157), and it is through their nature that we want to know what they are. Heidegger differentiated three interpretations of the nature of a thing that is widely regarded and revered in the western thought history. In the first interpretation he asserts that the nature of things exhibits their own properties and characteristics. For instance, a block of granite exhibits its characteristics and properties as being a heavy, bulky, shapeless and rough material (Heidegger, 1993, p. 148). From this description we can deduce that the nature of a thing is its properties and design. In the second interpretation he asserts that a thing is a unity of the diverse material perceived within the senses (Heidegger, 1993,

p. 151). A thing needs to be perceived by one or more of the five senses, the sense of sight, hearing, touch, taste and feeling. In the third interpretation, he asserts that a thing needs to be formed or originate from matter. Form needs to be attached to the matter in a thing. Heidegger states that all the modes of determining the thingness of the thing as a bearer of traits, as the unity of a manifold of sensations, and as a formed matter, just cover the thingness of the thing, and do not permit it to be manifest. The first interpretation extends the meaning of the thing, the second one identifies its physicality that exceed the scope of our interaction with physicality, and the third one is too broader to comprehend all that makes up the thing that it is. Through his phenomenological approach, Heidegger tries to seize the meaning of the thing beyond its thing-interpretation. He confessed that "We ought to turn towards the being, think about it regarding its Being, but using this thinking at the same time let it rest upon itself in its very own essence" (Heidegger, 1993, p. 157).

The phenomenological perspective in philosophy exerts a crucial influence on architecture theory, because it addresses the import of the nature of the correlations we have with the environment. In this regard Christian Norberg-Schulz expresses that "Phenomenology appeared to me as a method well suited to penetrate the world of everyday existence since architecture is in fact at the service of totality, which the term "world of life" implies, a totality that eludes scientific procedure" (Norberg-Schulz, 2000, p. 15). According to him, the life-world should not be understood as being the world of sensations but a world of characteristic and meaningful things. He defined phenomenology as a way which "approaches things with that same naturalness with which they present themselves, and therefore not as separate entities, but as manifestations of an essentiality or a way of being, which can only be understood in relation to other ways of being, and which persists over the passage of time, without

any loss of identity" (Norberg-Schulz, 2000, p. 20). Phenomenology seeks to unite things together according to how they relate with each other and with the environment, not isolate them. It analyzes places with full consideration of the life-world components of the combination of man-made features and natural phenomena.

Such analysis bring up the theory of Genius-loci (Spirit of the Place) formulated by Norberg-Schulz, where he provides an opportunity to explore an additional way of understanding the methodology for using sensory experience in architecture. This idea asserts that before space is physically built the full experience of the user needs to be recognized. The word "genius loci" is based on an ancient Roman belief and requires that "every being has its "genius", its protector spirit. This spirit gives life to people and places, goes along with them from birth to death, and defines their character" (Norberg-Schulz, 1979, p. 45). Therefore, "ancient man experienced his environment as a revelation of definite "genii" (Norberg-Schulz, 1979, p. 45). "The "genius" thus corresponds to what a thing "is", or what it "wants to be" (Norberg-Schulz, 1979, p. 45). The ancient man "understood that it is an existential necessity to come to terms with the "genius" of the locality where his life takes place" (Norberg-Schulz, 1979, p. 45). To catch the "genius" of a place indicates recognizing with the place. "To identify with a place primarily means to be open to its character or "genius loci", and to have a place in common means to share the experience of the local character. To respect the place, finally, means to adapt new buildings to this character" (Noberg-Schulz, 1985, p. 63). This documentation is contented through architecture. Architecture means to envision the "genius loci", and the mission of the architect is to generate expressive places, whereby he aids man to dwell (Norberg-Schulz, 1979, p. 5). "Genius loci" has two implications: meaning and structure. Meaning is the subjective feature of "genius loci." "The "meaning" of any object consists in its relationships to other objects; that

is, it consists in what the object "gathers". A thing is a thing by its gathering" (Noberg-Schulz, 1980, p. 160). Contrariwise, structure is associated to the aspect objectivity of "genius loci". "Structure," as an alternative, indicates the formal properties of a method of relationships (Noberg-Schulz, 1980, p. 166). Man is part of a world; he is "in" the world, and belongs to an entirety which involves natural and components. In this manner, meaning essentially infers a world. "Genius loci" contains in tangible architectural structures and holds a diverse character. "Such a character is never simple, and in our time it is certainly full of complexities and contradictions, but this does not mean that it is without structure or meaning" (Norberg-Schulz, 1971). Places permanently change and do not have any fixed structure; their "genius loci" do not essentially change and remains the same. Thus, even time cannot abandon the "genius loci"; places preserve their character throughout a certain period as "stability loci", and the existential substances of the human kind keep on the same in an extensive period. "Genius loci" is manifested as location, spatial configuration, and characterizing articulation. To domain the genius loci is regarding these factors: "the type of settlement and way of building ("massive," "skeletal" etc.) along with characteristic motifs…. If the primary structural properties are treasured, the over-all atmosphere or "Stimmung" will not get lost. It is this "Stimmung", which first of all ties, man to "his" place and strikes the visitor as a particular local quality" (Norberg-Schulz, 1980, p. 180). These "primary" structural properties are accomplished of interpretations, and concerning them is not recapping the same, but suggests new understandings and manifestations. "To respect the "genius loci" does not mean to copy old models. It means to determine the identity of the place and to interpret it in ever new ways" (Noberg-Schulz, 1980, p. 180). Incidentally, "any place ought to have the "capacity" of receiving different "contents," naturally within certain limits" and "a place may be

"interpreted" in different ways" (Noberg-Schulz, 1980, p. 18). "To protect and conserve the "genius loci" in fact means to concretize its essence in ever new historical contexts". Thus, a work of architecture "keeps" that essence through the building (Noberg-Schulz, 1980, p. 18). Accordingly, an architecture's task is expressing the self-realization of the place through the works of architecture and also taking care of other things. The never-ending possibilities of manifestation and interpretation could be proliferated by this endless process (Shirazi, 2009).

A furthermore enhanced expression for the statements above is to say that through its "genius", every being has full capabilities to accumulate its special character. Existence, it could be either a thing or a place, possess its own genius, its own defining distinctiveness. A human being, being part of all that is living, needs to understand the 'genius loci' of any particular place. Human beings need to be fully exposed to the environment to fully conceive its distinctiveness, and use the qualities perceived to present an architectural work, being a solid meaningful body of work comprising of its own unique characters. Man can reveal the 'genius loci' of any given place and also have it manifest its 'genius' by instituting buildings and designing and creating their architecture. Through 'visualization' or solidification of the building, the above action in line with 'identification' will be fulfilled. The manner in which the building 'gathers' its surrounding being a 'thing' and the manner in which it is manifested in a formal character make up the component meaning and structure of visualization. The two facets make up the entirety within which it takes place or the 'world' of the work.

On the contrary, the non-constant existing surrounding will over time change. The change does not make it entirely different. Every particular area bestows and conserves its special characteristics. Properties create the "Stimmung" or the general

atmosphere and hold a dimension that is existential. "Interpreting" these properties in different ways means respecting them and not repeating them. These interpretations are fully admitted and preserved by 'genius loci'. The two-fold implication of an interpretation are being fixed within the existential and fundamental 'genius of the place' and providing new display and manifestation of the place. The realm of never-ending interpretations and manifestations from which the 'genius loci' is preserved fully represent the work of architecture (Shirazi, 2009).

The Genius-loci in architecture needs be recognized because "Man dwells where he can orientate himself within and identify himself with an environment, or, in short, when he experiences the environment as meaningful" (Norberg-Schulz, 2000, p. 5). This notion asserts that the human condition needs to be satisfied by places. Not only do buildings accommodate a man, they represent the manner in which man wishes to be sheltered. A sense of satisfaction in a space is achieved through a sense of space, or a sense of belonging (Emeney, 2016).

While it is a conventional notion in the discipline of architecture to design a space for primary needs like shelter and comfort. However, as argued above, to live exceeds the limitations of being sheltered, because it varies in accordance to how people interpret their living space. A living space can very much be defined by the impressions of hearing, seeing, touching, smelling, or taste. The sensory experiences determine the perception of experiencing space. To master sensory mindsets and common personalities that make up individual people is very challenging and it can be very inspiring to succeed doing so. It is very imperative that architects shed their designing focus on creating an engaging attribute and experience about a place that will impress and pull people towards it. The success of an architectural space partly depends on

stimulating some sensory experience to attract significant audience towards the architectural qualities (Emeney, 2016).

Several other important theoreticians in architecture seek to develop understanding of the correlations with environment in keeping with the phenomenological perspective. Hence Pallasmaa (1996) states: “The phenomenology of architecture seeks the inner language of building”. He accordingly argues that planning is a game of form. Therefore, the outcome of experience within the building was disregarded. It is very crucial to not only represent the behavior of the user but also interpret it. He also stated that it is necessary to reposition our notion that an architectural feeling could only be fashioned in forms and geometry and the relevancy of the effect of form on our feelings could only be through that which it represents. Emotional feelings in our subconscious can be invoked by images of buildings. However, these feelings will not be invoked if a building does not fulfill a basic condition of phenomenological theory in which a building should visualize human existence symbol or a figure of presence in the world. A building acquires the status of a symbol of sculpture when it inspires these feelings (Pallasmaa, 1996).

According to Holl “phenomenology is a discipline that puts essences into the experience” (Holl, 2000) perceiving the smell, texture, taste, and temperature of materials and details, the complete perception will be fulfilled. Therefore, the sensory attributes of materials and the haptic realm are the subjects of phenomenology that are subjected to intensification. Since multinational identities are replaced with specificities of local cultures in this era, from which an increasing supply of new technologies and information overload deprive life from natural phenomena,

“Architecture, with its silent spatiality and tactile materiality can reintroduce essential, intrinsic meanings and values to human experience” (Holl, 1996, p. 11).

Since the beginning, the authentic issue in architecture has been the interdependence of the site and architecture. According to Holl’s belief, through the use of craft and local materials and also by associating the landscape with events of myth and history, this connection was unconsciously achieved. However, “Today the link between site and architecture must be found in new ways, which are part of a constructive transformation in modern life” (Holl, 1996, p. 18). In keeping with this understanding, Holl stated that an architectural idea should be comprised of material component instead of a mere conceptual theme and this cements his belief in the materiality of a work of architecture. “It is a shame to see a building that has a strong concept but no material component. Materiality has the potential to profoundly affect the experience of Space… One of the urgent missions for architects and city planners today is this task of I am awakening the senses” (Holl, 2004, pp. 18-19).

Holl claimed that not only the visual relates to the experience of material within the senses but, the tactile, aural and olfactory also fully. He stated that “perhaps no other realm more directly engages multiple phenomena and sensory experience than haptic realm.” (Holl, 2004, p. 18). Holl argued about the production of materials by industrial methods in the current situation. He claimed that architectural products affected by commercial and industrial forces will lose their true substantiality and thus become more synthetic. “Wooden casement windows are delivered with weatherproof plastic vinyl coverings, tiles are glazed with colored synthetic coatings, and wood grain is simulated. Materials lose their Three-Dimensional textures and are reduced to flat, superficial images. The sense of touch is diminished through these commercials,

industrial methods and the essence of material and detail are displaced" (Holl, 1995, p. 188) . Holl believes there's a way in which this connection can be mediated. He stated that there are various possibilities that could guarantee materials do not lose special properties but enhance them although the sense of touch may be dulled or obliterated by these possibilities. Finished details could be furnished various processes like sandblasting, bending, acid oxidization, etc. to open the door to new possibilities. Holl made a remark about how various materials carry various feelings and effects after paying attention to the various manifestations of materials in different situations and occasions in connection with time and place. "The transformation of material, either through the passage of time, use, or erosion, articulates a moment in the process. Materials record sun, wind, rain, heat, and cold in a language of discoloration, rust, tarnish and warping. As a testament to Histories of use and misuse, time is legible in the state of this transformation. It Compresses history present and future into an essential moment" (Holl, 1995, p. 188). New possibilities for architects are created by new materials, because of the new technological developments. Special impression is given by texture, color, and shape of the materials; for example, "materials that bear the marks of aging carry the message of time" (Holl, 2000, p. 75).

From these sources it can be understood that the richness and qualities of articulation of space such as tactile quality, color, texture and pattern of the materiality of the environment, is of extreme importance for the generation of the sense of place. These may be understood as aspects which present the prime potentials of mosaics as means and elements of articulation in relation to place.

2.5 Mosaics: Space/Place Articulation

The art of using closely set colored material such as tile, glass, and stone for decorating a surface is known as Mosaic. In this approach a large image can be formed by combining many small pieces of various colors into a meaningful whole. Just by simply looking at the individual pieces it's impossible to assemble the larger image. Though having its origin in pattern decorative practices, mosaic became the leading pictorial art in Byzantium from the 4th to 14th century. In the earliest applications the range of colors was limited because mosaics were constructed of pebbles. Smaller pebbles resolved more critical sections while larger pebbles were used as fillers in areas of lower sections. Later on in the 5th century BC this technique was further developed. Pebbles were painted in 4th century BC to increase the range of colors. Thereby conveying a sense of space and detail, mosaic started competing with painting. New materials such as glass enriched the medium in the beginning of the 3rd century BC because cut pieces replaced the pebble technique. In the 3rd century AD, mosaic developed into a rich art form and through the process of diffusion mosaic moved to Roman soil. During the growing use of mosaic in the 4th century, mosaic paralleled the style of paintings. From the 4th – 6th century mosaic took unique characteristics and it advanced during the Roman Imperial times. The newest mosaic designs from that period focused on higher contrast and greater brilliance whilst the former mosaic designs had gradual paintings made possible by both painted and unpainted pebbles. Middle tones in abundance were obliterated.

Once this new style was developed and mosaic became popular in church decoration, the painting styles themselves started to be influenced. Mosaic art may also have influenced Byzantine and Western European paintings of the Middle Ages which had

greater contrast and brilliance. Mosaic kept advancing and from the main style was developed the technology of Tesserae.

Tesserae technology design is made out of pieces that have been cut into triangular, square and other shapes with different sizes according to the level of detail necessary in the artwork. The bright decoration and colors are characteristic in the Hellenistic and Roman traditions, yet the tesserae allow to form a face with a gentle shading more common in an earlier period. Mosaic materials were chosen according to their level of appropriateness for the task, and the style took advantage of unique characteristics of the medium in the height of the development in the 10th century. The production of glass was carried out in thousands of tones by glass makers. Mosaic artists duplicated their work and sometimes went a few steps further to compete with painters of Renaissance. Images that produced three dimensional effects were created and they went beyond what was possible in paintings when combined with rich colors and the materials available (Silvers, 1996).

Figure 2: Cutting a blu sky, Beatrice Serre Mosaiste, (Serre B. , 2017) (URL2)

2.5.1 Materials and Techniques

There is a large body of know-how accumulated as to the techniques of varying the developments of the craft of the mosaics. Through the phases of development, the materials used in mosaic art were diverse. Since stone is widely available it became the first material to be used. In the earliest Greek and Roman works, pebbles which were not cut having a uniform size were used on the floor decorations. Only natural hues had a limited range of tint. A new wealth of possibilities brought into the art were unfolded by the glass pieces that began to be used in the 3rd century BC which could undergo a color intensification. Mosaics were often constructed of glass all together in the 5th century. Mosaic that used all these intense color schemes often used as wall art for durability because glass is brittle. To signify semantic information, different materials were employed. In order to enhance the range of colors and also signify light coming from God, gold leaf was used. Since silver signified light emanating from Christ, it was used within special restrictions. The metallic pieces in the 6th century were placed at an angle so that the light reflecting effects would be enhanced.

Other than the material noted above, mosaics, due to their composite nature, and the size of pieces, can combine and incorporate all sorts of materials like beads, jewelry, wood, concrete, brick etc. in addition (Silvers, 1996).

Planning a mosaic requires many considerations to be taken into account like the overall design, materials, location considerations, lighting, tile size and the shape of the cut. Only those professionals with a firm grasp of the technology can acquaint to the art because it requires a broad range of expertise. Initially, mosaics were created by sketch drafting and outline drafting, which detailed colors desired onto the surface.

The location of the mosaic defines the texture and appearance of the tiles to be implemented. For instance, a mosaic for a floor needs to be designed for increased durability and comfort of bare feet, and must have tightly set pieces and smooth surface. Wall mosaics could be closely or loosely set, and can be designed from a list of diverse materials, and thus, has more room for artistic control.

There are two basic ways to place the tiles of a mosaic on its site: direct and indirect. In the direct technique the pieces are placed one by one directly onto the surface or building sections. In the indirect technique, a section is indirectly assembled at a time in an independent way, and these assembled tiles then are placed according to a scheme in a larger composition.

There has been a radical change in the technique of mosaics throughout its development in history. Today, most mosaics are implemented by the indirect method. It should also be noted that earlier mosaics were often designed and constructed by the same artist. Later ones, including most made today, are not completed throughout by one person: the design, the cutting, the assemblage, and the execution at site are frequently done by different specialized professionals. This actually disconnects the design from the implementation. In turn this may perhaps lower the overall quality of the finished art work (Silvers, 1996).

2.5.1.1 Direct Method

This method entails placing and gluing the individual tesserae directly onto the supporting surface. This method is well suited to surfaces that have a three-dimensional quality, such as vases, or other difficult surfaces. This method was used for the historic European wall and ceiling mosaics, following underdrawings of the

main outlines on the wall, sketches which are often revealed again when the mosaic falls away.

Small projects which are transportable are well suited for the direct method. The adjustment of the tile color or placement is permitted by the progressively visible mosaic which serves as an advantage of using the direct method. The downside of direct method application is that the artist needs to work at the chosen surface directly, which becomes impractical overtime, especially for projects with larger scale. It is also difficult to coordinate the evenness of the finished surface. When creating a functional surface such as the floor or table top this is very crucial. Working directly onto the fiberglass mesh is what is referred to as the 'double direct' which represents the modern version of the direct method. The mosaic can be transported to its very final location after it has been constructed with the design visible on the surface. Mosaic can be cut up for shipping and then reassembled for installation in order to have the flexibility of working with larger projects. The artist will also be able to work in the studio rather than directly onto the site (Jean, 2018).

2.5.1.2 Indirect Method

The indirect method of applying tesserae is often used for very large projects, projects with have repetitive elements, or for areas needing site specific shapes. Tiles are applied face-down to a backing paper using an adhesive, and later transferred onto walls, floors or craft projects. This method is most useful for extremely large projects, or projects with high degree of complexity, as it gives the maker time to rework areas. It allows the cementing of the tiles to the backing panel to be carried out quickly in one operation and helps ensure that the front surfaces of the mosaic tiles and mosaic pieces are flat and in the same plane on the front, even when using tiles and pieces of differing thicknesses. Mosaic murals, benches and tabletops are some of the items

usually made using the indirect method, as it results in a smoother and more even surface (Jean, 2018).

2.5.1.3 Double Indirect Method

In order to see the work during the creation process, the double indirect method can be used because the work will appear when completed. To have the tesserae appear when it is being installed, it needs to be installed facing up on a medium (often adhesive-backed paper, sticky plastic or soft lime or putty). A similar medium as a mosaic is placed on top of it after the mosaic was completed. The piece is installed as in the indirect method described above subsequent it was turned over and carefully removing the original underlying material. To avoid damaging the work, this will require great skill on the part of the operator, and therefore this is a complex system in comparison to indirect method. The possibility from the operator to directly control the final result of the work presents an advantage, especially with the involvement of a human figure (Jean, 2018).

2.5.1.4 Composition Techniques

There are various techniques for arranging mosaics in a meaningful composition as follows:

- **Opus Regulatum:** A grid; all tesserae align both vertically and horizontally;
- **Opus Tessellatum:** Tesserae form vertical or horizontal rows, but not both;
- **Opus Vermiculatum:** One or more lines of tesserae follow the edge of a special shape (letters or a major central graphic);
- **Opus Musivum:** Vermiculatum extends throughout the entire background;
- **Opus Palladianum:** Instead of forming rows, tesserae are irregularly shaped. Also known as "crazy paving";

• **Opus Sectile:** A major shape (e.g. heart, letter, and cat) is formed by single tesserae, as later in pietra dura;

• **Opus Classicum:** When vermiculatum is combined with tessellatum or regulatum;

• **Opus Circumactum:** Tesserae are laid in overlapping semicircles or fan shapes.

• **Micro Mosaic:** using very small tesserae, in Byzantine icons and Italian panels for jewelry from the Renaissance on (Drostle, 2008).

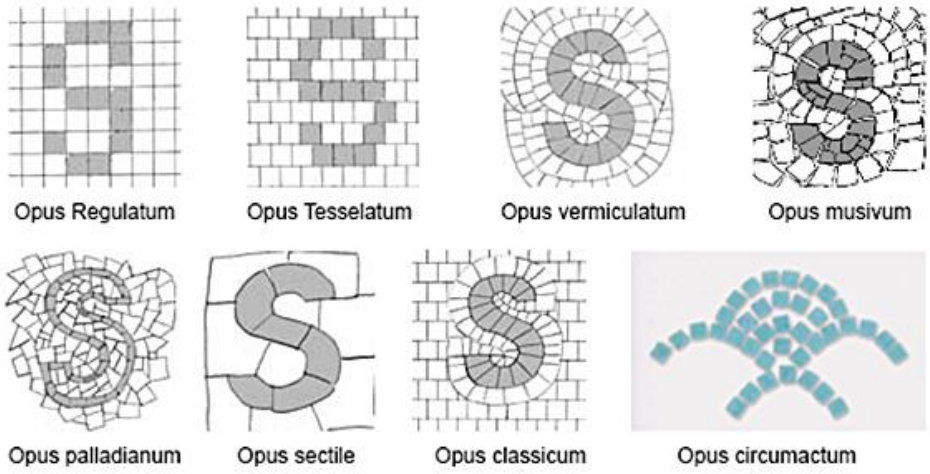

Figure 3: Mosaic composition techniques, (Designs.vn, 2018) (URL3)

2.5.2 Pictorial Contents

Every interior design intervention needs a suitable purpose as well as aesthetic and practical properties. Our choice of surface treatment is dependent on practical considerations which define our choices to an extent, although the flexibility in our choice allows us to use our creativity to a good impact. At an elemental level we can connect through touch and sight with the intent and soul of a project with the assistance of the unique quality of materials. In a very special way, the look and feel of a material

can communicate mood and emotion. Natural materials (wood and stone, for example) suggest a certain quality and honesty about the design, whether or not the materials are expensive. Additionally, the designer is responsible for finding balance between practicality and aesthetics and also consider the practical aspects of the material choice. It is highly unlikely to find one single material which will be suitable for the practical needs of the design solution. Two or three materials could provide for equal success and that provides an opportunity to work out different options which will be suitable in creating the best aesthetic impression. A richness to the scheme that often deviates the redundant decoration is provided by diverse but harmonious selection of materials that express their natural features in a beautiful way. It's always a delight to see and touch simply expressed honest materials. To maximize the impact of these qualities they need to be on stand-by, although they may not be superficial in the planning stages of the project (Dodsworth & Anderson, 2015).

Struck's (2009), description of mosaic involves arranging together small pieces of stone, tile, glass and other materials in order to create a picture or pattern. The pieces are usually solid and durable and this represents a special feature. The significance of mosaic is influenced by the physical qualities of the materials. Materials can either be iridescent or reflective. Objects and unusual items can be incorporated by the 3-dimensional Mosaics. This advocates for the fact that mosaic is closely connected to the decorative schemes of architecture. Mosaic as a word has been expanded to a broader meaning than wall painting initially meant. Mosaics today are applied onto the wooden panels, canvas, ceramics, etc., and others are implemented as installations on the wall (Attakorah, 2015). According to Seligman (2003) in her book "Painting, morals", in the introduction asserted that art commentators agree that Mosaic was incorporated into architecture because it is a work of art that was created for a

particular site. Its composition is strongly influenced by the force of its surrounding (Seligman, 2003).

The mosaics tiles provide rooms with rhythm and liveliness thereby ensuring dynamism. Mosaic can be integrated as a decorative element in the habitat which will highlight a specific wall or break the monotony of flooring or wall tiles. One advantage of relief mosaics is that they provide space with simulated movement simultaneously attaining a brilliant lighting combination and shadows which complement and augments the design (Grupo, 2017).

2.5.3 Location in Space and Aesthetic Considerations

Increasing the quality of human experience should become one of the goals of psychology of design. Helping people create and appreciate the beauty of the interior environment should become the contribution of the designer towards this dignified goal (Miller & Schlitt, 1985).

The larger aesthetical items making up the basic objects and material properties of space/place include shadow, texture, color and light. Recognizing an aesthetic experience as well as determining the viewer's possible perception could be employed as a trick to determine an aesthetic. Since beauty also provides an increase in aesthetic experience it can be well understood (Holgate, 1992).

All that the environment represents to us influences aesthetic judgement. A rich source of aesthetic pleasure could potentially stem from emotional associations that are influenced by certain design elements and arrangements. There's symbolic meaning for form, color, materials, shape lightings and special configuration (Pazooki, 2011) .

By using the main factors that influence the implementation of aesthetics (form - texture - color - light) and beauty, interior architectural designers can express the aesthetics and beauty of a certain space. “Forms are constructed from points, lines, planes, surfaces, and volumes that are made richer by texture, color, and material. In combination, these elements of form create a design, and similarly, all of these elements contribute to our perception of its meaning (Mothersill, 2014). When it comes to architecture and interior architectural design, aesthetics plays an essential role in the emotional satisfaction of users and residents. The degree by which an interior architectural designer understands human sensitivity to beauty and expression of perception determines the psychological impact of the aesthetic aspect success of interior architectural designers to reach the aesthetics of a space. Pallasmaa states that, “Settings and traditional towns are examples of pleasant atmospheres often arising from aesthetically rather uninteresting units. Such urban atmospheres are most often created by specific materiality, scale, rhythm, color or formal theme with variations” (Mahmoud, 2017).

A mark of distinction in today’s world is a handmade product. It is difficult to exercise responsibility in a world we exist in being ready made and the moral responsibility predicated to citizenship eventually becomes overrated. Sometimes our incapability inhibits from interacting with the world as it is and it seems the world is out of our reach (Ingold, 2013). According to Ingold’s statement, he emphasizes major reasons for the criticality of maintaining craft skills and at the same time the attractiveness of owning handcrafted objects and all this transpire towards an alternative economic model that seeks to render material obsolete and mass production with instant gratification. We can sustain our lives with knowledge of craft skills, through the work application of our mind and hand, whereas depending on technology ultimately govern

our lives. According to this socio-cultural context, a political agent that can contribute towards an agenda of transformation is the craft (Doolan & Brown, 2017).

The focus for the inclusion of environmental considerations is proliferated by the sustainable interior design principles which involve functionality, accessibility and aesthetics. For instance, factors such as planning an efficient use of space, choosing materials with low environmental impacts, reducing consumption, pollution and waste influence sustainable design projects. A commitment from sustainable interior designers was made in order to balance aesthetics and functionality with choices that decrease the environmental impact of their designs (Templeton, 2011).

To conclude, space perception occurs in interior design when the designer cleverly changes the appearance of space to stimulate user's emotions. From Heidegger's point of view, human should consider a place where all his senses are incorporated, and this will allow human to find himself on this planet. He claims that human beings are intrinsically familiar with works of art and that it is also our identity revealed through the nature of them. For Schultz phenomenology comes from the unification of things by the relation between them and the environment. He offers a topic called Genius-Loci or the Spirit of Place. According to Genius Loci, one must live in a meaningful space in which to interact with the environment, and so the full experience of the user must be recognized and incorporated in the design. The design of a space should be based on the interaction and the feeling of satisfaction and belonging in that space. Steven Holl admits that "Architecture, with its silent spatiality and tactile materiality can reintroduce essential, intrinsic meanings and values to human experience". According to him, the link between the site and architecture was achieved through the use of local materials as well as crafts with mythical events, and this link in modern

life had to be presented in new ways. Since architects are responsible for awakening the human senses, materiality can be a good potential to influence the experience of space.

In this age of technology, architects can achieve certain effects of shape and texture as well as the color of materials. Aesthetics can also be influenced by the designer's specific elements and arrangements. Mosaics presents an important tool and element of articulation, giving basis for meaning both as pictorial art, and as surface with distinct and special materiality and tactile quality. Putting the pieces together in a mosaic composition artistically and using creativity and personal value makes up the mosaic design. Since interior design requires aesthetic features as well as flexibility, mosaics can be considered as a special element on the surface. In addition, the dynamics and rhythmicity of the mosaic, along with the sense of vitality, can be considered as a special decorative element. Mosaic as an ancient element with properties such as durability, sustainability, and functionality and with very little environmental impact can be a good option for fulfilling the commitment of interior designers. It can be used with a wide variety of materials in different locations with different applications. From walls and ceilings to floors to tables and columns and many more. Mosaic is applicable in a variety of ways, but in general, the three methods of direct, indirect and double indirect can be mentioned, although in the modern era, the latter method has been more favored. The next chapter of this study deals with the history of mosaics in architecture from ancient times to the twentieth century.

Chapter 3

MOSAICS IN HISTORICAL PERSPECTIVE

(MIDDLE EAST AND EUROPE)

Mosaic is an artistic expression going back to old times, starting from the first preserved examples in the Archaic period. It includes putting little bits of rock, stone, shell, tile, glass or other material (called tesserae) together to shape pattern. Mosaic has a powerful presence in historical buildings. It presents one of the best surface coatings for different spaces and purposes. It is also one of the oldest techniques and approaches to the articulation of surfaces in place. The awareness and understanding of the potential of this place-specific art and craft, and its importance in term of the unique value it adds to interior space can be enhanced by an overview of its evaluation over consequent historical periods. Throughout history, various decorative practices that enhance the sense of place have been used to highlight the floor, walls, and ceiling of architectural spaces through the craft of murals, carving, fabrics, and mosaics. In turn, architectural space offers the showcase for the creativity and craftsmanship involved in such artistic works. The contribution of mosaics is special in that is not only added as decoration to space. It can be considered as both functional finishing material – i.e. integral to the construction of space, and as one of the most elegant surface treatment and decorative craft element. It is durable and survives in various climatic and atmospheric conditions. It is also so versatile and can be adapted to many different functions or surfaces. It can be employed on horizontal and vertical surfaces in different sizes, shapes and materials. Historical examples are cases to study and

learn from as to the potential artistic contribution of mosaics. The selection of the historical examples noted here is based on the prominent cases that are referred to in most sources, frequently those that are best preserved. However, it also aims to highlight the evaluation of the craft terms of materials and techniques, as well as potential contribution of mosaics as both functional and decorative finishing in interior spaces. As can be seen in the map (Figure4), this chapter focuses on the history of mosaics in the Middle Eastern region (due to its emergence in this region) and Europe. The brief historical overview of the use of mosaics as decorative practice will be followed by relevant examples in consequent historical periods with the aim to highlight these in terms of materials, techniques, pictorial contents and location in space. It's worth noting that familiarizing with how this important element of interior architecture is used in different historical periods would help architects and designers to have a more complete understanding of its potentials, and can guide them how to employ it in contemporary designs.

Figure 4: Ancient Europe map, (World Map, n.d.)(URL4)

3.1 Archaic Period Mosaics (3,000 BC)

From the beginning, human has been looking for beauty. For this reason, it has been trying to achieve this goal somehow by decorating its environment. Therefore, to meet this demand, human has sought help from materials and the environment around him. Since mosaics, as a natural and elegant element that is found anywhere in the world and accessible, is therefore an appropriate option for use in decoration. Probably the most punctual types of mosaic craftsmanship go back to the Sumerians, and can be observed from the columns of the temple at Ubaid in Mesopotamia around 3,000 BC (Ling, 1998).

Figure 5: Sumerians columns decorate, 3rd millennium BC, mosaic-like technique with polychrome terra-cotta cones, Ubaid, Mesopotamia (Klink, 2013) (URL5)

Figure 6: Cone Mosaic, Mesopotamia, 3000BC, (Klink, 2013)(URL6)

Materials and Techniques: In this application, pieces of colored stone, shell, and ivory were combined to create geometric patterns. However, the main materials of Mosaic decoration in this era is made up of red, white and black terracotta wedges (Piermattei, 2017). These patterns are primitive mosaics which make up the roots of the later tile art (Iranian Visual Arts, 2019). The construction and finishing of the ancient Middle East, involve this mosaic-like technique where terracotta wedges have been inserted on the clay brick wall, and a protective layer has been created (Waage & Nordhagen, 2017).

Pictorial contents: These terracotta cones are implanted in the wall surface. While they are rather large and crude, they are also in a way of standard size and shape and form uniform surface with large geometric patterns.

Location in space: These early mosaics were utilized for exterior wall and column decoration (Piermattei, 2017).

However, dating also from this period, mosaics that are picture-like (Figure7) representational have also been found. These show that more refined techniques had already been developed.

Figure 7: Standard of Ur, Sumerian, 2600-2400 BC, British Museum, Detail, (Wal, 2009) (URL7)

3.2 Ancient Greek and Hellenistic Mosaics (800-400 BC)

The advancement of mosaic craft in the antique history can be seen in three primary stages. The first, principally a Greek issue, included the continuous idealizing of the pebble medium. The second, which involved the creation and spreading of the tesserae strategy, occurred mostly in the Hellenistic Greek world and some Roman region. The third, to a great extent a Roman phenomenon, can be described as extensive promotion of mosaic and the utilization of the medium to new capacities (Waage & Nordhagen, 2017).

Materials and Techniques: The development of mosaics begins with found materials, such as black and white pebbles, to include the production of artificial pebbles and cut-off stone particles in new color, but also the use of glass pieces. Ancient Greeks began building stone mosaics with geometric designs as early as about 800 BC. But in 400 BC the technique developed in more important ways. Cut off stone particles began to be used, and designs became more complex. These techniques were initially used in floor decorations and then on the wall surface (Attakorah, 2015). At Pella in Greek, "artificial pebbles" were made and are found in several of the floors, when the request for specific tints could not be met with pebbles of natural colors. These pebbles were mostly green and red. The new development also allowed for smaller size of the pebbles, where pictures could be set more closely. Outlines of figures were made not with pebbles, but instead long strips of terra-cotta or lead wire were employed, to obtain the accurate design of limbs and features. Although the mortar can be found between them, the pebbles are arranged close enough to provide regular images. In the early third century BC, the next innovation began with the introduction of new principles that led to the abandonment of pebble techniques. In this new technique, the

detrimental effects of suspended mortar particles were almost eliminated. It offers a wide range of new colors as well as the use of new materials, especially glass. However, new methods and materials are emerging slowly (Waage & Nordhagen, 2017).

Figure 8: Pebble floor mosaic, ancient city of Olynthus, Greece, 500BC, (A, 2006) (URL8)

Pictorial contents: Pictures made in this technique reflect a manner for epic hunt scenes and battle with wild animals, themes affected by court art, praising the ruler, as well as mythological themes. For instance, The Olynthus mosaics (Figure 8) also define that picture making with light and dark pebbles had by then transformed into complicated art. Here black or dark stones are used for the ground and white or slightly dark for stand figures and patterns. The pebbles are almost used to a uniform extent, but tiny stones have been used for faces and complex shapes and also used to represent lines with black and white pebbles (Waage & Nordhagen, 2017).

Location in space: In the Greek colonies in the east, and as far as west Sicily, pebble mosaics are found mainly as decoration of the floor area. In only two important areas,

Olynthus and Pella, in Macedonian northern Greece, they are saved in large number. In the site of Olynthus, which were part of the new city culture that developed in the 5th century BCE, there are floor mosaics, with detailed figures and complexed patterns (Kalostanou, 2016).

Figure 9: Stag Hunt Mosaic from the House of the Abduction of Helen, Ancient Pella, Ancient Greek, 300 BC, (Raddato, 2012) (URL9)

Figure 10: Pebbles mosaic in a Pella house atrium, Macedonia, northern Greece, 400 BC. (G., 2016) (URL10)

Figure 11: Lion hunt mosaic, Pella, Ancient Greek, 400BC, (Lees, 2011) (URL11)

Regarding the images, the Greeks have tried to create depth in the background using dark colors like black and green. They also create perspective using geometric patterns and using bright colors (Figure 10). In figure 8, Stag Hunt, the art of depicting depth is evident with the use of shading. In general terms, the Greeks, instinctively or acquired by creating such designs, have created remarkable artifacts with mosaics that still retain their value and are sampled to this day.

3.3 Roman Mosaics (100BC-400 AC)

Since the Romans were interested in the Eastern Mediterranean and Hellenistic art culture, they adopted the technique and used mosaic art extensively in their interior architecture and places of worship. The purpose of the Romans, was to create a simple and practical combination of style and technique and form (Attakorah, 2015). Although the Romans initially ignored the principles of the Hellenistic approach to mosaics, in fact, many of the mosaics in this period are signs of Greek art such as the sea waves and the scenes of Greek mythology. For example, in the city of Pompeii, Italy, a mosaic named Alexander was found with the theme of the war between Alexander the Great and Darius III (Figure 12), which dates back to the third century

BC, inspired by the Hellenistic method. The mosaic can be mentioned as the most prominent example of this era (Cartwright , 2013).

Figure 12: The Alexander Mosaic, 100 BC, Roman floor mosaic, Pompeii, Naples, National Archaeological Museum, (Warner, 2013) (URL12)

Figure 13: The Alexander Mosaic, Detailed, (Warner, 2013) (URL13)

Materials and Techniques: The elements for mosaics in this period were different variety of cut stone, marble, tile, glass, pottery, and even shells, while their size and form were becoming more precise, and offering refinement in colors and shading.

Mosaics in this period, otherwise known as opus tesseratum, were made with small black, white and colored squares typically measuring between 0.5 and 1.5 cm but fine details were often rendered using even smaller pieces as little as 1mm in size. These squares (Tesserae) were cut from materials such as marble, tile, glass, pottery, stone and even shells. A base was first prepared with fresh mortar and the tesserae positioned as close together as possible with any gaps then filled with liquid mortar in a process known as grouting. The whole was then cleaned and polished (Dunbabin, 1999).

Pictorial contents: In this period, mosaics became a unique art to a typical decorative environment (Attakorah, 2015). Decorative themes, such as sea waves, used especially in Roman baths, used black and white mosaics, which continued until the third century AC. Another feature of the Roman mosaics is the emphasis on geometric patterns and the preference for two-dimensional representations . In the eastern part of the empire at the same time, especially in the area of Antioch in the fourth century AD, the expansion of a two-dimensional and repetitive mosaic motif to reach a design such as a carpet, which later strongly influenced the designs of Christian churches as well as the synagogues of the Jews can be noted (Cartwright , 2013). Furthermore, throughout the Roman Empire, the use of mosaics in aristocratic villas extended to even on wall and ceilings, showing themes drawn from scenes of life, hunting, and legends of the gods (Attakorah, 2015).

Location in space: Mosaics in aristocratic houses appeared as decorative contribution in floor, wall and ceilings. As a typical example of these villas in Sicily, Italy was found in a place called Piazza Armerina, dating back to 300 AC, which has mosaic flooring with lively subjects like girls who are playing with the ball (Figure14) (History of mosaic, 2018).

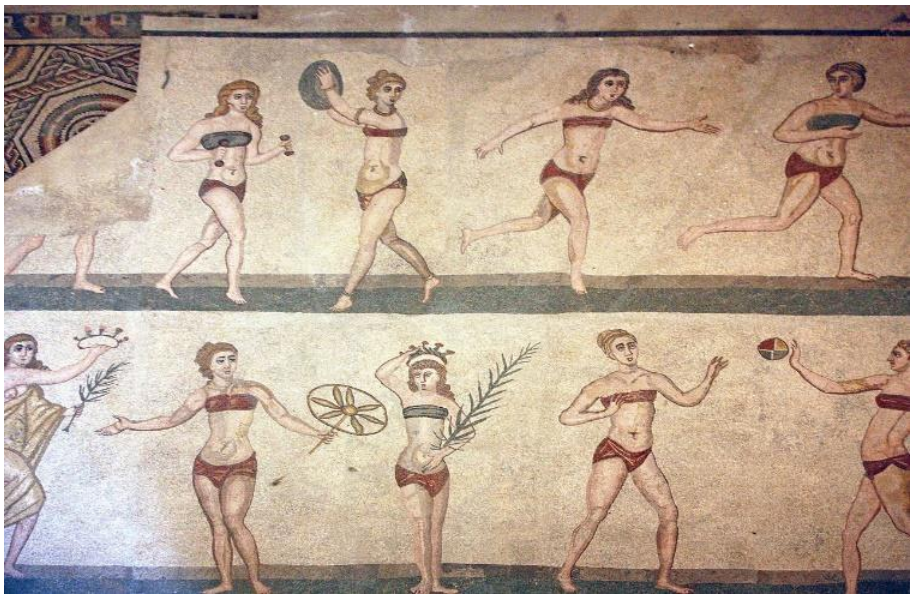

Figure 14: The "bikini" mosaic, Piazza Armerina, Sicily, Italy, 300AC, (Greening, 2013) (URL14)

The art of Roman mosaics for a long time was influenced by the art of Hellenistic art, but with time it found its own identity. In this period, the diversity of subjects and the use of various colors with cut-stone mosaics and also more application of glass are seen.

3.4 Christian and Byzantine Mosaic (350 AD - 14th)

With the advent of Christianity, major changes took place in art. The topics were often religious and spiritual. It is noteworthy that in the art of Christianity and Byzantium, the religious scenes are mainly used in striking colors such as golden and dark blue. In general, the art of this period, which is one of the most important periods of mosaics, is a glamorous and luxurious art with religious themes and narratives that are more likely to be featured in iconography.

Materials and Techniques: Early Christianity mosaic makers, with little knowledge of optics, but with a lot of experience, have used Tesserae Glass to display reflections of light, and especially the showing of God in the early middle Ages, the Byzantines

used a variety of marble pieces in various shapes, which ultimately formed a geometric mosaic and had silver foil or gold leaf to cover the floor. In Byzantine period, we are witnessing a new type of mosaic called Smalti, in which the use of glass mosaic with a cover of silver foil or a sheet of gold brings in depth and beauty and radiance. They were inlaid by direct method with wonderful golden background (Waage & Nordhagen, 2017). In the late thirteenth and early 14th centuries, innovations in the style of painting and mosaics occur, and their effects clearly show the Byzantine culture. In this new trend, the size of the tesserae is far smaller than the initial periods; the line's tightness is lost and thinner or eliminated. On the wall, a shell pattern is sometimes used to increase light distribution and prevent excessive glare (Nordhagen, 2018).

Pictorial contents: Another example of the works of the fourth century, which has similar indications of the old tradition, can be found in the mosaics of the Cathedral in Aquila. Here, the first mosaics include objects and animals, while in the second decade of the century, images contain scenes of religious stories, symbolic animals, and bread and wine. In general, the relationship between the architecture of the building and its decoration with classical rules has had an impact on Christian art Byzantine mosaics have interesting things. For example, they were often rough, and this led to the reflection of light from the edges. Also, by using Smalti mosaics on a small angle, light reflections from different angles were possible. The scales of Romanian mosaics can be found in the fifth century Ravenna mosaics that have images of biblical topics as well as the interpretation of religious beliefs (Allan & Evans, 2005).

Figure 15: The mosaic of Emperor Justinian and his retinue, Basilica of San Vitale, Ravenna, Italy, 600AD, (Raddato, 2015) (URL15)

In the sixth century, efforts were made to increase the brightness of the Byzantine mosaic art. As previously explained, this refinement involves the insertion of golden cubes at steep angles to reflect to the eyes of the viewer. In addition to the golden field that had its effect, the tremendous delicacies that the Byzantines had in their mosaics were also delivered by Byzantine craftsmen to foreign territories (Dalton, 1911). A prominent feature of mosaic decoration in Hagia Sophia in the twelfth century is its linearity, which was a fundamental step in this art. Here it is used to represent the face by tesserae in ripple lines. Also, the tendency to make symbolic faces on the golden forehead seen in many places in this place has become a decorative principle since the ninth century.

Figure 16: Christ Pantocrator mosaic from Hagia Sophia, Byzantine mosaics, Istanbul, Turkey, 12th, (Georgoudis, 2014) (URL15)

The highpoint of mosaic art that has not been matched up to this day can be found in the exceptional art of Byzantine religious iconography. Placing colored stone cubes that were well-marked based on the principles of color between the tinted and golden glasses gave the spiritual atmosphere. With the triumph over the artistic metaphors and visualizations of these works, the material that was used to make these obscure images was not recognizable (Maguire, 1988).

Location in space: With the advent of Christianity, the vaults and domes of churches began to be covered with mosaics. A sample of the first examples of mosaic art by Christians in Rome in a region called Santa Costanza was built as a tomb for Constantine's daughter around 350 AD(Figure17). Its features include the decoration of the walls to the floor, as well as lively images for decorating the dome (Maguire, 1988).

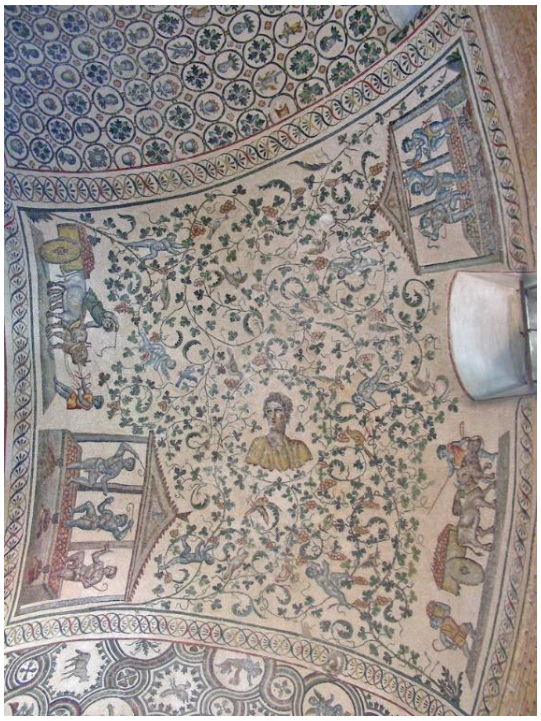

Figure 17: Mosaic in the ambulatory, Church of Santa Costanza in Rome, Italy, early Christian, 350 AD, (MM, 2010) (URL17)

In the Byzantine era, mainly the use of floor mosaics gave way to wall and ceiling decorations with religious themes. The city of Ravenna located in Italy became known as the city of mosaics, in the 5th century (Grant, 2015).

Figure 18: Mausoleum of Galla Placidia, Ravenna, Italy, 5th, (Emil Kren, 2010) (URL18)

One of the most prominent examples of Byzantine mosaic art can be referred to Hagia Sophia in modern Turkey. Over the centuries, this place was decorated with very beautiful mosaic that included images of Jesus Christ, the Holy Mother, Christian clerics, or the king and queen with beautiful geometric patterns in some sections. In 1453 AD, when Hagia Sophia became a mosque from church, due to the contradiction of Islam with visual imaging, especially iconography, many decorative mosaics of this place were covered with stucco (Grabar, 1987).

Figure 19: Mosaic of Daphni Monastery, Athene, Greece, 12th, (Dimkoa, 2011) (URL19)

The mosaic art of this era is seen more in the interior, especially on walls and vaults with religious themes. Most of the places that this art can be seen in churches and monasteries. The light and the use of glass tesserae with various colors in the mosaic work have been taken into account to showcase the religious space as much as possible. Also, some images of flowers and plant and symbolic animals such as sheep are used. Valuable examples of this art can be found in the city of Ravenna in Italy, once called the Mosaic City (Figures 15 and Figure 18). Also in Greece, this artwork is used in the

Daphni monastery using light and colorful glass tesserae, skillfully arranged in the architecture of the windows and the base of the dome (Figure 19).

3.5 Islamic Mosaic (from 800 AD)

Although the Islamic mosaic is somehow derived from its predecessors, this art has its own identity in architecture. Compared with the art of Byzantine mosaics, which mainly focuses on facial expressions and is often seen in the interior, Islamic mosaic art covers the entire interior and exterior, due to the prohibitions of iconography, with geometric designs, flowers and plants. It is safe to say that the culmination of mosaic decorative art emerges in the Islamic era. In fact, mosaic work in this course is complementary to architecture. An art in which the artist tries to acquaint the viewer with beauty through the creation of a geometric design and math design, and even with help from calligraphy, and thus connect with his god. An art that has preserved its visual and architectural values to this day.

Islamic art, which combines the art of its predecessors, such as Sassanian, Roman, and Byzantium, expanded throughout the middle Ages, North Africa, Iran, and southern Europe through the seventeenth century through Arabic loggers. Also, the artistic and specific design of the architecture with the geometry and calligraphy of this art meets any taste (Gregorian, 2003).

Materials and Techniques: Contrary to the Byzantine mosaic art style, Islamic art has focused on geometric patterns by using glass, stone, and mosaics (Ahmed, 2014).

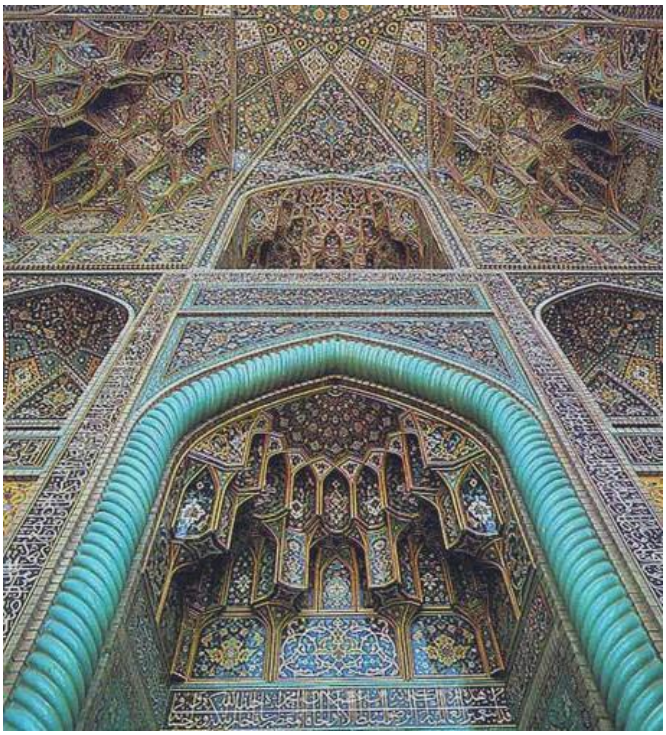

Figure 20: Goharshad, Abbasid Ivan in Atiq yard, Imam Reza complex, Mashhad. Iran, 15th, Islamic art, (Zereshk, 2005) (URL20)

Pictorial contents: The art of Islamic mosaics is based on the prohibitions of the Quran on iconography in its way. In this way, mosaic frames decorated with flowers, plants and geometric designs completed with calligraphy inscriptions (Papiu & Suciu, 2017). Here, the artwork is a means to show the connection between God and his creatures by depicting inner beliefs through mosaic art, architecture, geometric shapes, even music and dance (Canby, 2005). In Dar Aisha Balcony in Alhambra Palace, colorful star-shaped tiles at the bottom of the wall, as well as black ceramic pieces on a white-tied surface, have shaped a puzzle-like pattern. Where the inscriptions are placed - exactly the high decoration of the tiles in the lower part of the wall, it has led the eye viewer to read well to the scrolls (Figure21) (Gregorian, 2003).

Figure 21: Arch with Colorful Mosaics and Details with Arabic Symbols in the Alhambra, Spain, 8th, Islamic Art, (Akela, 2016) (URL21)

Location in space: One of the best examples of Islamic mosaic art in Europe is the Alhambra Palace in Spain. One of the beautiful parts of the Alhambra Palace is the Dar Aisha Balcony. Under the curtained arch of muqarnas, there is a remarkable decoration with geometric combinations and graphic lines with delicate gypsum (Gregorian, 2003).

In Islamic religious tradition it is said that "God is beautiful and he loves beauty" (Prophet Muhammad), so the Islamic artist does his best to create beauty for the pleasure of God. Islamic mosaic artists have created unique architectural masterpieces using geometric designs and mosaics that are mostly blue and green. Valuable examples of mosaic art of this era can be found in abundance in Iran in the interior and

exterior of mosques in cities such as Yazd, Isfahan and Mashhad. Also, in Spain at the Alhambra Palace, mosaic art is well integrated with plaster (Figure 21).

3.6 Baroque Period Applications (16^{th} – 18^{th})

In the Renaissance, with the great attention given to the paintings by the artists, the art of mosaics became diminished. Accordingly, during the Baroque period mosaic artists used cartoons made by painters for their work. In the late sixteenth century, a Baroque-based approach to Renaissance art began in Italy, followed by other European countries such as France and Portugal, and Spain and Germany. This style continued until the end of the eighteenth century, and has effects on all arts, painting, music, sculpture and even literature. The architectural features of this style include the luxury of building curved spaces and the many uses of decorations to magnify the work. It can be said that the ultimate goal of Baroque architecture is to create complete integrity in space (Palacios, 1977).

One of the most important examples of Baroque mosaic art can be seen in the Chigi Chapel or Chapel of the Madonna of Loreto in Rome, Italy. Here is a dome of mosaics performed by Venetian artist Luigi da Pace after Raphael's cartoon. In the center, God is surrounded by Putto. Eight mosaic panels include symbols of the sun, the moon, the sky as well as the six known planets, each with an angel with a colorful wing (Figure22) (Palacios, 1977). The special effects of this work enhance the perspective of the dome and extend the space upwards. The space under the dome is established as place-center.

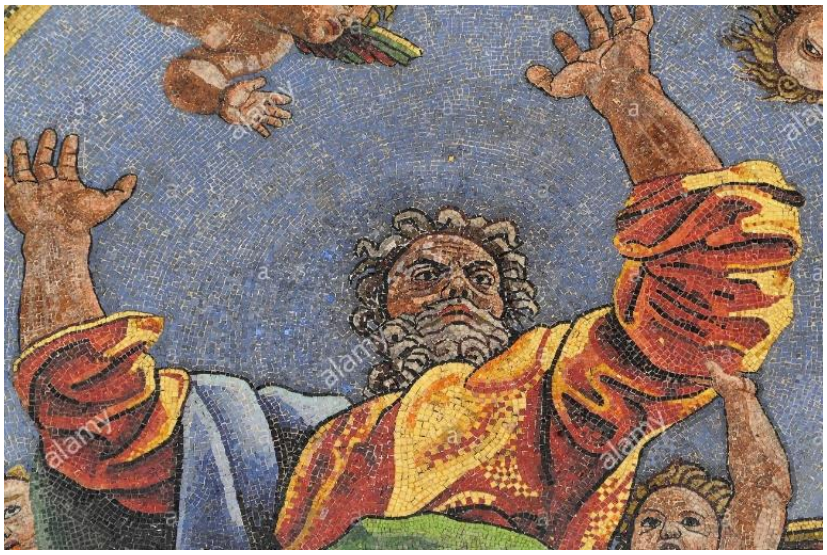

Figure 22: Chigi Chapel mosaic,detail, church of Santa Maria del Popolo, Italy, Rome, 16th, (Bonetti, 2012) (URL22).

Materials and Techniques: Baroque-era mosaic artists used mostly marble and glass mosaics to represent their art. The earliest scenes were made by a graffito technique: drilling tiny holes and scratching lines in the marble and filling these with bitumen or mineral pitch. In a later stage black, white, green, red and blue marble were used. This technique of marble inlay also evolved during the years, finally resulting in a vigorous contrast of light and dark, giving it an almost modern, impressionistic composition (Bednorz, 2013).

Pictorial contents: gilded stucco ornamentation enclasp the mosaic panels. The blue background witch is giving architectural framework opening to the sky above the chapel, creates by an optical illusion and mentioned panels represents illusionistic sky window between the gilt stucco ribs whereas God is standing on the boarder of the central sight (Palacios, 1977).

Location in space: They are mostly decorated dome and highest level of the facades with religious scene.

3.7 Modern developments (late 19th – 20th)

The early modern period was in the beginning of 20th century. But technology and industrial development could not meet all human demands. Human always interact with nature and there is a desire to create beauty by using natural decorative elements. Mosaics, being a craft with high artistic potential offers more to practicality and aesthetic taste and has a higher value than machine products.

In the late nineteenth century, the Arts and Crafts Movement began with William Morris, who was named the father of the movement. The task of designing in this movement was to oppose the modernized traits of the Industrial Revolution. Hence it began as a rebellion against the age of the machine, which brought about fundamental changes in the whole world and every class of society. Artists of this movement demanded the quality and beauty of handicrafts and getting away more from the machine. Another of their goals was to create an environment-based atmosphere inside the home by integrating all aspects of design. Architects did not just design the exterior of a building, they also designed the interior spaces with elegant decor (King, 2003).

3.7.1 Art Nouveau (1890-1914)

The Art Nouveau style, which dated from 1890 to 1910 with decorative features and architecture and applied arts, was a response to nineteenth-century academic arts which followed the classical and neoclassical tradition. It took inspiration especially from natural patterns, mostly the curved lines of plants and flowers. The Art Nouveau style in the field of architecture expressed itself as a reaction to the eclectic styles that surrounded Europe's architecture in the mid-nineteenth century (Janson, Janson, & Marmor, 1997). As it is all about art and its style, arts like fine and decorative arts blended with other arts like interior design, furniture, and ceramics. The architecture

was the main object and aim of Art Nouveau, as the main objectivity for buildings were beauty and design as it is in fine arts (Dewidar, 2018). Art Nouveau became a demanded and limited art after 1910, which was only seen as a different decorative style (Encyclopaedia, 2019).

Materials and Techniques: The foundations of the Art Nouveau architecture were generally based on the rejection of traditional practices of classical decoration. It employed new industrial materials such as metal and concrete, in new ways. Therefore, the main features of the architecture of this style are the floral, and geometric patterns of the architectural elements (Sandrolini, Franzoni, Varum, & Nakonieczny, 2011). Other than the plasticity of surface and detail, the Art Nouveau is marked with bright colors and decoration of the facade of the building with multi-colored tiles. Due to the nature of this art, especially in Spain, mosaic is used to cover wide surfaces with waste tiles. The best examples of this art can be found in Spain, in the architectural projects made by Antoni Gaudi and Joseph Maria Jujol. Their works are among the best examples of this genre in the world. It was the first time that the mosaic style was used with broken dishes and other common objects. The same techniques made great progress in crafts that creative artists follow to this day (Notturni, 2017).

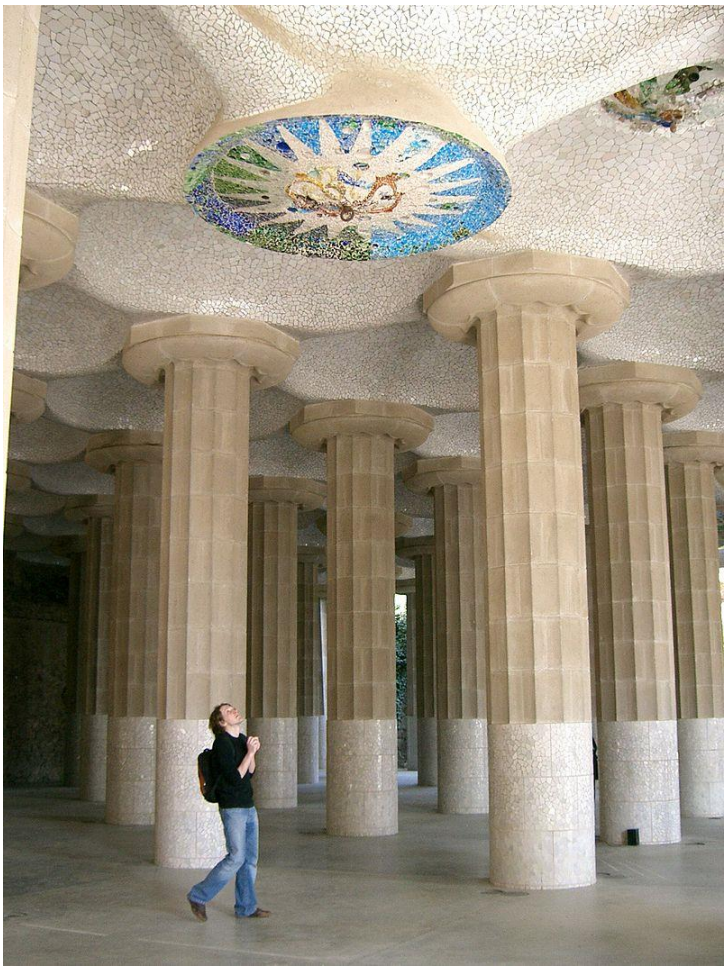

Figure 23: Gaudi's Tiled Mosaics on the ceiling, Park Guell, Barcelona, Spain, 1914, Art Nouveau. (Shkermaker, 2005) (URL23)

Curving lines were the definition of Art Nouveau, structure was in organic shape starting from the ground level and going up in rolling shapes. Like whiplash which is one of this art hallmark which is being created by stretching lines and then curved back on themselves (Sandrolini, Franzoni, Varum, & Nakonieczny, 2011). Antoni Gaudi can be considered the main artist of this genre. He was an architect and sculptor who abandoned linear strict orthogonal geometry of the building and used curved lines, bright colors and organic shapes. His masterpieces include Casa Batllo, La Sagrada Familia Basilica Cathedral and The Park Güell (Howard, 1996). The designs of Park Güell are perhaps some of the most inspirational works when it comes to contemporary mosaic design.

Figure 24: Mosaic detail, Park Guell, Barcelona, Spain, 1914, Art Nouveau, (Menhem, 2017) (URL24)

Pictorial contents: The most popular signature of Art Nouveau is the use of delicate arrangements with flower designs and decorative plants in floor and walls mosaics. Here, buildings are arranged with curved lines based on images of flowers, plants or animals such as butterflies, peacocks, swans, orchids, and lilies. Sometimes, the facades are asymmetrical and decorated with colorful ceramic tiles. Furthermore, the structure has no advantage over the ornament, and the embellishment is inferred the movement (Howard, 1996). Ornament and structural architectural elements are integrated. Because nature is the main inspiration of this style, elements such as leaves and flowers are seen in the structure of this decorative style. Buildings in this style were characterized by ceramic tiles which were bright and colorful and have been done by floral patterns and used to be the cover of flat surfaces. These are the main characteristics of Art Nouveau (Dewidar, 2018).

Location in space: One of the best examples of attention to the true connection of the human body with space can be found on the ergonomic bench mosaic balcony of Guell

Park, designed by Anthony Gaudi and Josep Maria Jujol. It is the snake shaped with colorful small pieces of mosaics with zodiac signs, stars, flowers, fish and also religious motifs (Figure24) (Suescun, 2017).

3.7.2 ART DECO-1930

It was in the early twentieth century that Art Deco style appeared. At that time, the traditional interiors had a different shape, and the innovations that came with technology were an incentive for developing interior design as a special professional practice. Although this style was more popular in the 1920s and 1930s, it still has its effects on art until today (Dowdy, 2005). Unlike handicrafts, the Art and Craft movement, and Art Nouveau, the Art Deco has not copied anything from the past, and this is one of the unique features of this style. The designers of this style was inspired by the changes that took place around them, eventually turning it into a new form that was their own. The main idea of the designers of this style was that "the beauty inside the house is essential for the well-being of the people". Therefore, the decorations designed by the artists of this style are thoroughly thought-out and carefully designed so that the homeowner can continuously enjoy this decoration (Dowdy, 2005). Nevertheless, the history is repeated, and the old styles and arts are redefined, this repetition in Art Deco art is also well suited for mosaic use (Kostov, 2018).

Materials and Techniques: The Art Deco is all about showing wealth and richness with extremes in the use of materials, especially in interior architecture (Kostov, 2018). Deco Art was recognized as a good design for mass productions, as most decorations were limited to geometric shapes and specialty styles (Dowdy, 2005). Deco style, instead of painting or sculpture, was more focused on applied arts. At the same time, fine arts artists inspired by many of the past cultures, but in the new form. It should be noted that the mosaic in this style was by no means a special technique. With the

unique choices that the architects of this period had in fabric and printing, metal and ceramics, mosaics could also be used as a special technique to create an interesting design (Kostov, 2018).

Pictorial contents: Their products included exclusive luxury products as well as mass production, but it is worth noting that in both of them they intended to display wealth and perfection with a sleek and unconventional elegance (Encyclopaedia, 2019). The Chrysler Building in New York, which can be said to be the world's capital of Art Deco, is considered one of the best examples of Art Deco because of its symbolic elements. Likewise, the mosaics used here for elevator can be considered the best features of the building. Its triangular form is lavishly decorated with Red Moroccan marble walls, sienna-colored floor, onyx, blue marble and steel (Figure 25) (Kostov, 2018).

Location in space: Art deco style mosaics are often performed on floors and walls as well as decorative surface coatings for objects such as elevators.

Figure 25: Chrysler Building, New York, 1930, (Sveiven, 2010)(URL25)

In summary, this section briefly examines mosaics and their use in architecture in two Middle East and Europe regions from the past to the twentieth century. What is certain is that mosaics as a decorative and functional element in interiors have a valid background, In the Byzantine and Islamic periods, its application reaches its peak. Mosaic has been considered at different periods due to its durability and variation in performance, and is recognized as a craft art. Mosaic has been used to cover and decorate the exterior and interior surfaces of the building. From the walls, floors and ceilings to the columns, vaults and domes, they have been used for decoration with various purposes and themes – such as to emphasize architectural elements as arches, columns, and use larger surfaces for representing important teachings and concepts through mythological, religious and everyday scenes. Mosaic also have articulated place by using on floor, ceiling, and walls. Mosaic always have the potential as a space unique character. With the passing of time and the beginning of the age of industry and technology, this art is removed from the hands of the craftsman and produced by machines. With the advent of science and the digital age, this art enters a new field that will be further explored in the next chapter.

Chapter 4

CONTEMPORARY IMPLEMENTATIONS OF MOSAICS

The most relevant and primary research sources to study the subject of historical and modern development of mosaic art creation and designs is the mosaic artworks, since mosaics are extant and interactive with historical and present-day living environment for humans. Mosaics are publicly depicted as monuments, architectural, sacral, ambient, and environmental artworks or decorations. There exists an extensive body of global, contemporary, artistic, architectural, industrial and traditionally handcrafted mosaic production besides the existence of public, sacral, monumental, heritage and historical (Pantic, 2018). New insights in creative and expressional possibilities of mosaic as daily basis art medium have been revealed by contemporary artistic and creative researches that use mosaics as medium of artistic expression (Hu, et al., 2015).

Within the domain of Visual Arts, contemporary, theoretical, practical and creative researches frequently focus on artistic, experimental, subjective, discursive, philosophical and sociopolitical concerns (Klinke, 2014). Expressions in contemporary art possess fluid, dynamic, hybrid and multidisciplinary character that is in connection with the focus. This is in accordance with 21 century avant-garde art principles of radical creativity. A tendency and capacity of novel forms invention in visual art expressions, or questions and already existing challenges are shown by the contemporary artistic expressions and practices (Smith & Wilde, 2008).

Contemporary art expressions are not designed upon use of formal-visual opportunities offered by known artistic media or technique, such the mosaic is, but rather on diverse, original visual design ideas, and on conceptual principles (Hickman, 2005). Anything that serves the purpose of this model of creativity is utilized by the model's medium. In favor of semantic or multimedia expressions, there's often a transgression in the character of visually (Smith & Wilde, 2008). This in fact conflicts with the mosaic art character that is tangible, static, representational and monumental.

4.1 Mosaics in the Changing Architectural Context and Function

Today decorative art is regaining its popularity. The most popular art of decorating surfaces in public spaces such as churches, parks and sidewalks, is mosaic. The patterns in mosaics are regarded as a popular form of folk art because they provide an established method of decorating surfaces. The broken pieces of crockery, ceramics or glass used in mosaics, exists in diverse shapes and colors and are called tesserae (Hu, et al., 2015).

Mosaic is an art which can be intensely thriving today. New artists need to understand its effects and potentials then use it independently in ever new creative works. Looking at the patterns of mosaic art may evoke childhood memories of standing in a welcoming kitchen or submerged in a steaming hot bathtub. The mosaic patterns tend to have a lasting impression in our memories as of a space or place. They are also lastingly integrated with the space or place. Mosaic art patterns cannot be regularly replaced just like wallpaper or paint. Generations to come may be affected by the shapes and images that are frozen on the surfaces of mosaic art. The mosaic art is not only appealing for individual people but it is globally appealing. Mosaic patterns have been created by every single culture with capable technology to create it.

Mosaics are considered primarily as functional projects today. Patterns are used in kitchens, bathrooms and other floors in homes for as long as they are practically durable and easy to maintain. Aesthetics in mosaics have played a major role in its development through the ages although its functionality has become its designing point. Good materials tend to reappear into the fashion market over time. Although it seems like the look and feel of mosaics has declined over time because of their prolonged existence and craft full application, the art is still used in many different levels as a coating. Many people today opt to use customized mosaic patterns to print on the tiles they prefer and this fosters the evolution of mosaics. Mosaic simultaneously raises the value of the home and improve the overall interior of the home. To create an eye appealing mosaic decoration, creative ideas can be employed to organize the mosaic tiles.

Decorating with mosaics involves providing rooms with an extra measure of exclusivity, therefore, achieving a more unique and lively space. The combination of mosaics as visual points of attention for any atmosphere, with other elegant materials such as ceramic, wood or stone make up a beautiful integration feature of interiors in contemporary houses (Pantic, 2018).

Mosaics have diverse qualities and values such as:

- Items portraying symbolic values, symbols and expressions of cultural, aesthetic, artistic and religious views and value-system; Symbols of cultural identity; Symbols of social, economic and political status, wealth or power;
- Items portraying documentary and heritage values such as sources of knowledge and information about past times, testimonies of past times` cultures; monuments, historical artworks;

- Items portraying aesthetical and artistic values such as artworks, visual designs and decorations, expressions and testimonies of historical, regional, local and individual creative, artistic and artistry practices;
- Items portraying technical and technological values such as Human-made material and physical structures and constructions, expressions and testimonies of distinct craftsmanship, technology, and technical methodology, structural and formal design;
- Trading commodities for being arts and crafts industry products.

The existence of mosaic artworks and their unique, perceivable formal aesthetic, structural and technical qualities and properties play an important role in transferring knowledge and experience of the mosaic production practice within the context and discourse of mosaic making practice (Pantic, 2018).

4.2 New Materials and Technologies

Architects with the sole responsibility of designing surrounding environments for mankind should work towards clarifying the human-environment interface as well as the environmental design. They should be able to design/understand human behaviors and human motivations and needs, as well as their perceptual processes and their emotional actions and responses. Additionally, they should also learn more about the human senses and how they function for different stimuli. Architects in other words should make designs according to the needs of the human inhabitation (Abdel Kader, 2018).

4.2.1 Materials

The selection of materials that architects and interior designers use make up the most related issue to the touch sense. Every material possesses a different touch as well as a different effect. Some ideas that could be applied to enhance a room from furniture arrangements to background effects were discussed by Anderson. He discusses in his article (RTO Design for the Senses), a variety of materials which could be used for tabletops and the associated feelings "Tabletops of wood give warmth to room. Tabletops of glass make a room appear larger. Tabletops of marble or stone give a feeling of quality." He also claimed, "If you use woodwork (paneling) in a room, the room will feel warmer and more comfortable." The user is therefore affected by the materials used in any space with associated material difference being hard or soft, rigid and flexible, light and heavy, etc. The design decisions of the architect is influenced by all these various specifications. The user's behavior as well as his perceptions and feeling could be affected by the materials used in any designed space (Abdel Kader, 2018).

4.2.2 New Techniques, Technologies

The whole phenomenology of mosaics making techniques fits the general phenomenological model of traditional medium-based artistic practices. It does not mean that the practices of mosaic making is conserved and frozen at one stage of its technical development. Fortunately, within the contemporary technical framework the number of possibilities and opportunities for technical and visual design of mosaics are practically limitless. Furthermore, technical, technological, engineering and industrial innovations as well as inventions of new tools, materials and computerized image processing, exponentially widens the technical and creative opportunities that artists have on their disposal (Pantic, 2018).

Over the last three decades the industrial production of architectural decorative mosaics became fully established. The assembling process of the product is fully automated, whilst the creative human component is connected to the visual and aesthetic part of designing. Using a specialized computer software, artists/designers create original visual, decorative mosaic patterns together with their variations. To accommodate the machine assembling of decorative mosaic panels, prepared digital templates are used as instruction software. Mosaic wall decorations that are easily installed on building walls commonly use these panels in architecture, furnishing and housing industry. Additionally, the mosaic tesserae are uniform in their visual characteristics in contrast to natural or handmade manufactured mosaic materials and they are used for industrial mosaics production since they are serial, industrial product (Pantic, 2018).

4.2.2.1 Design: Digital Mosaic Generation

According to recent evidence, computer-aided design software (CAD) could be used to design mosaics. Individual craftsmen or robotic manufacturing systems can employ these programs (Lowden, 1997). Lowden also claimed that computer-driven robots, rather than hands are currently assembling mosaics, to speed up the mosaic making process and obliterate errors and reduce costs; therefore, production can be accelerated with fewer errors.

4.2.2.2 Production and Application

Mosaics always prevailed a popular art form for centuries beginning from Ancient Greek artifacts to pre-Renaissance biblical murals, Islamic architecture, modernist designs, all the way to our current subway stations. From the 3rd millennium BCE the earliest examples of mosaics were discovered in a Mesopotamian temple and were designed out of ivory, seashells and stones. The mosaic art designed thousands of

years later is the outcome of the abstract artworks that laid the groundwork, and today the craft is still in practice. Contemporary artists are pushing the boundaries of their chosen materials and at the same time reinventing the ancient art. When other artists are creating their own medium through the combination of sculpture, installation, and digital art with the aesthetics of the age-old art form, others are putting a modern spin on the styles of the past (Taggart, 2018).

4.3 Extended Scope and Potential Contributions of Mosaic Decoration

Since ancient times mosaics were used to decorate homes and public buildings and they have never been out of fashion. Mosaics are extremely practical and very beautiful at sight. Mosaics can easily be applied to flat and curved surfaces and can also be used to cover large areas or to provide a simple accent or contrast depending on the material they are made up of. The versatility of mosaics extends towards decorating commercial interiors whereby hard-wearing properties and appeal is paramount, and is not only limited to residential kitchens, bathrooms and other living spaces. Mosaic can be tailor-made to accommodate anything from a simple motif or logo to a precious or special photograph to be embedded onto a mosaic panel (Original Style, 2019).

4.3.1 Health and Well-being

Mosaic tiles can be used as insulator and could also be used in assisting to stabilize temperature swings because of their ability to store thermal energy. In cold climates low thermal conductivity warms up and cools down in hot climates (Artaic, 2019). Another advantage of mosaics is the dust-free, immediate cleaning and easy hygiene. Mosaic also can increase a sense of wellbeing with creating it as a craft and help the mental health.

4.3.2 Flexibility, Sustainability and Durability

"Sustainable" has been defined as the ability to address the current needs simultaneously remaining adaptable to make sure that future needs will be fully met (Hyllegard, Ogle, & Dunbar, 2006). According to the USGBC (U.S. Green Building Council) a sustainable building should be able to encourage the health of the environment and building occupants over the lifespan of the building and should also be designed, constructed, and operated to be both environmentally and economically responsible (Kang & Guerin, 2009).

Many interior designers are generally supportive of the movement toward sustainable design and also hold a generally positive view of the environment. They are more interior designers advocating for a positive perception of sustainable interior design and less interior designers actively practicing sustainable interior design (Kang & Guerin, 2009).

Interior designers can achieve sustainable design solutions through the area of material and finishing selection. The specification of long-lasting, sustainable materials can become a feasible solution which can be available to interior design professionals to conserve natural resources (Kang & Guerin, 2009).

In this respect, vernacular structures of traditional cultures can be used by designers as a learning point. Primitive forms of shelter were built taking into consideration the local climate. Interior designers and related professionals who wish to find sustainable design solutions can take hints from such shelters (Ballard, Ncidq, & Taylor, 2002). Interior designers can learn from traditional housing sustainable techniques such as passive solar, the use of local materials, energy conservation and natural ventilation

(Templeton, 2011). Buildings were designed with natural materials in the 19th century before the prevalence of the fossil fuels, and older structures were considered unfashionable and therefore were not demolished or wasted (Berman, 2008).

The art of mosaic is one of the original products recycled which possesses a rich history that dates thousands of years. To create a low maintenance high impact mosaic imagery, artisans used recycled glass, stone, pebbles, and even shells for centuries. Due to mosaic's inherent durability, and timeless beauty it has become the ultimate choice for green surfaces. Mosaic tile has become the most capital efficient material overtime because the tile installation has an outstanding record of durability and performance dating back thousands of years. Mosaic tiles last longer than conventional flooring products such as carpet, vinyl, laminate flooring, ceramic and porcelain tile (Artaic, 2019).

Mosaics have managed to survive the ravages of time far more gracefully than paintings because of the durability of their materials. Many cultures and periods are reported to have been permeated by mosaics as a result. During the Greco-Roman, early Christian, Byzantine, Islamic, medieval and post-Renaissance art they played a huge affirmative role. Today in public spaces like buildings, plazas, subways, gardens and restaurants mosaic has continued to dominate (Elber & Wolberg, 2003).

4.3.3 Aesthetics of the Current Implementations of Mosaic

Post-modern art-world favor conceptual, dynamic and minimalistic art-forms which is opposed by static, monumental and exclusive character of mosaic art form (Keliner, Mamiya, & Tansey, 2000). Additionally, traditional and established cultural, artistic and creative models and values are challenged by large amounts of 21 century artistic production (Noël, 2000.). There's an existing misalignment between popular

consumeristic economic and cultural behavior, and tedious, expansive and time-consuming mosaic artwork production/creation process (Henry, 2007). It is unnecessary to waste time and money on creating mosaics when equally aesthetically valuable solutions which costs less money and time investment can be created. Mosaic is currently facing its greatest revival at the global visual arts and crafts industry scene because of the following reasons:

- A variety of diverse information concerning mosaic artworks and its creation, as well as many various materials which are affordable and also accessible to a wider population of artists, artisans and crafters worldwide, was made by the general technological, economic and informational development;
- The probability of an assistance in pointing people's attention at the heritage and historical values of mosaic as traditional, long-standing art-form emerged from the popularity of the heritage-centered cultural productions and consumptions, during last few decades;
- Individual's creative initiatives will largely be supported and evaluated by the emergence of the so called creative economy at the end of the 21st century (Harrison, 2012).

4.4 Selected Case Studies: Companies, Artists and Applications

4.4.1 Companies: Mosaics for Customized Production

The case studies of contemporary examples will be selected from the top ten list supplied by CERSAIE FAIR, an international organization which is the foremost authority in the field of mosaics and tiles. The list contains of Sicis, Target, Bisazza, Nuova Riwal , New Ravenna, Marazzi/Ragno, Decoratori Bassanesi, Orsoni Group, Eco ceramic, Artaic, that six of them will be considered as a case study. Also, each

company is more closely monitored through its own website. New products, technologies and new images and news related to contemporary use of mosaic in the interior are being explored.

SICIS: The mosaic of art factory by Maurizio Leo Placuzzi. The establishment of SICIS in 1986 in Ravenna resulted in the fascinating challenge of trying to match ancient arts with modern industrial processes. SICIS relied on the ability of its management, it enables master mosaicists who have been schooled in specialized establishments to win its challenge which unfolded an intelligent mix of technological innovation and philologic-iconographic investigation. SICIS has gained practicality and functionality, having passed from art to industry, it has not lost its value. This today makes up entirely what architects and designers are promoting for. Constant research portrays SICIS as an enormous know-how company that facilitates an amalgamation of style, technology, and materials with the main purpose to generate avante garde products and the company has amassed over the years. SICIS is well known within the market for reinventing the art of marble and stone mosaics in industrial production. It also influences and leads the realization of artistic mosaic and possessing the strength to have every single product produced in Italy in its entirety. The idea is to see mosaic not as a simple tiling product, but as a means of communication, and an expression of trends, fashions, lifestyles. For SICIS, surfaces exist to be transformed into beauty and art form that represent the signs and languages of our time. It's the mosaic tesserae that acts as the interpreter, joined together in infinite chromatic and decorative combinations, shaping the outlines of architectural and living spaces (SICIS, 2019).

Materials and Techniques: Glass mosaic, including transparent, iridescent, mirrored, and textured materials. The 'tesserae' which is used in the company's works directly

in Ravenna is manufactured by it. All the sophisticated systems used in the production of tesserae are invented and patented by the internal engineering department possessing sizes ranging from 10 x 10 mm to 15 x 15 mm including several customized formats. Also Sicis has integrated other materials with mosaic to achieve new designs such as combination of jewelry or Vetrite.

In order for SICIS to optimize all procedures for which manual labor is not appropriate, it exploits the most advanced technologies such as cutting edge technique. SICIS can offer unique and inimitable solutions through the combination of handicraft skills, planning and continuous research. Mosaic tesserae express this through the combination of infinite chromatic combinations and decorative patterns. Invention of the meshing mosaic process is the best combination of speed and accuracy.

Figure 26: Salone Del Mobile, Lounge Bar, Milan, Italy, 2019, Sicis Company, (Sicis, 2019) (URL26)

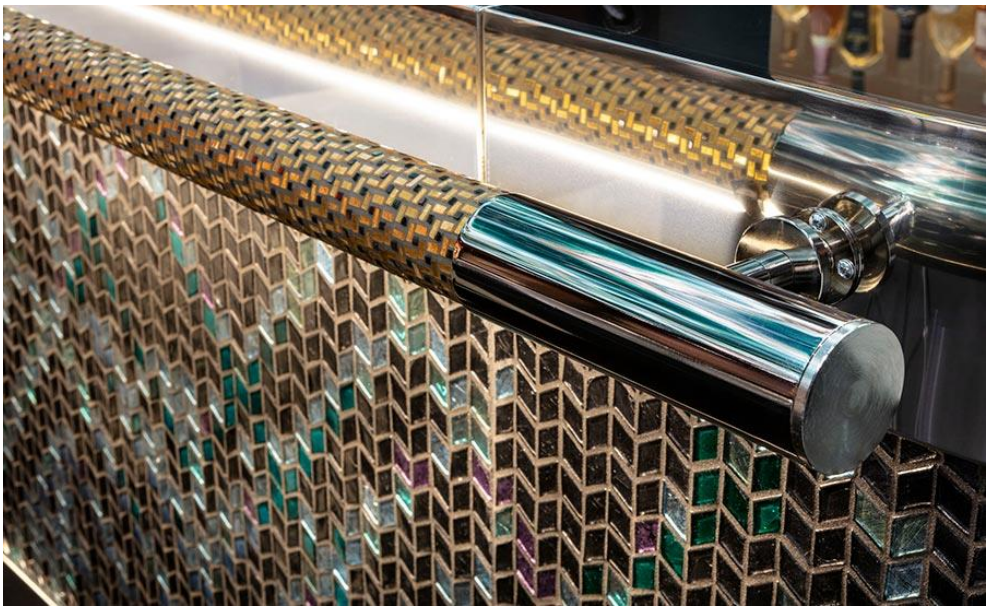

Figure 27: Salone Del Mobile, Lounge Bar, Milan, Italy, 2019, Sicis Company, detail, (Sicis, 2019) (URL27)

Pictorial contents: There is a contemporary dimension given to mosaic by SICIS. The attribution of made in Italy has the capability of transforming communication tools to express trends and lifestyles although it started off as a simple surface covering. Furnishings with fluid lines, along with multi-dimensional Vetrite walls and artistic mosaics of incomparable beauty become a new mood of interior architecture, a unique language that can involves every surface and element (refer to Figure26). In result, the artistic product is a mosaic capable of transmitting three-dimensionality thanks to a play of reflections and shades of tesserae (Figure27).

Location in space: The Company has installation mosaic in different surfaces for interior and exterior. From floor and wall to swimming pool and bathtub, lounge bars, and many others.

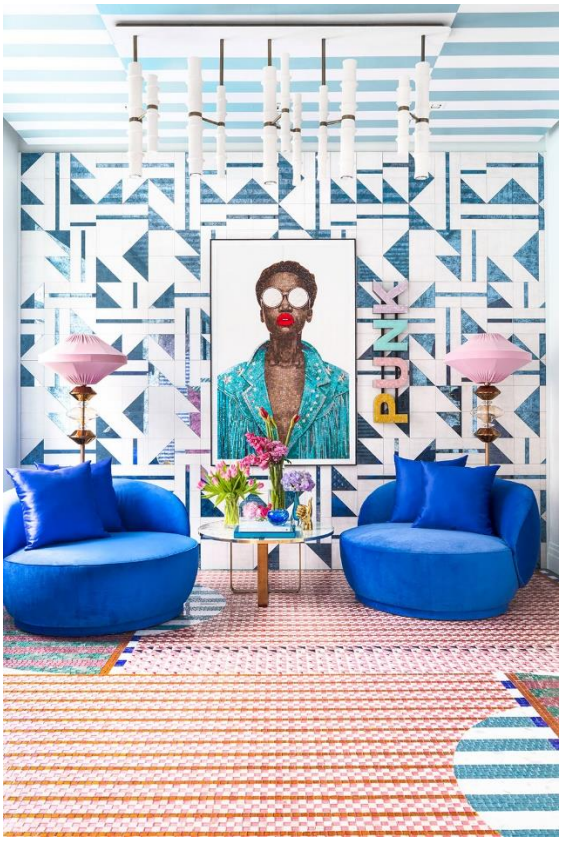

Figure 28: Casa Decor, Madrid, 2019, (Sicis, 2019) (URL28)

Figure 29: Casa Decor, Madrid, 2019, (Sicis, 2019) (URL29)

BISAZZA: Bisazza is leading producer of glass mosaics, tailor made for interior and exterior decoration. Established by Renato Bisazza in 1956 in Alte, Vicenza, Northern Italy, this company has an ability to read and anticipate the global market needs and is marked by a dynamic entrepreneurial spirit as well as the mastery of modern technologies. Over the past few years, the company started offering new materials made from processes which use the combination of the value of design with the charm of craftsmanship, using this to extend its decorative offerings. Bisazza's brand strategy includes expressing a unique style which brings a contemporary flair to the classic through the combination of elements of fashion and design and also offer a wide range of luxury decor and furnishing solutions which are suitable for living and outdoor areas (Bisazza, 2019).

Materials and Techniques: In addition to the classic glass mosaic produced industrially in paper faced tesserae format, Bisazza also creates specialty mosaics featuring 24 carat gold and traditional vitreous glaze finishes (hand-cut), also with avventurina – a synthetic stone developed in Venice during the 17th century which gives a glittering jewel-like effect to the glass mosaic. The mosaic tiles for such unique designs are backed glued to a paper face at the back for ease of installation (Materialdistrict, 2005).

Figure 30: Limited edition coffee tables crafted, Bisazza and Marcel Wanders, 2019, (Bissaza, 2019) (URL30)

Pictorial contents: As Marcel Wanders mentioned about the design of the limited edition mosaic coffee tables (Figure30) for this company, “Bisazza’s affinity for beauty with just the right amount of innovation is in perfect alignment with our goal of uplifting the human spirit and bringing the human touch back to design” (Bissaza, 2019).

Figure 31: The dome and foyer of La Seine Musicale auditorium, Paris, 2017, (Bisazza, 2017) (URL31)

Figure 32: The Toledo metro Station, Napoli, Italy, 2015, (Bisazza, 2015) (URL32)

Location in space: Different places and applications, such as swimming pools and entrance halls, also mosques and churches.

NEW RAVENNA: Founded in 1992 by artist and designer Sara Baldwin, America's premier designer and manufacturer responsible for producing stone and glass mosaic tiles for both residential and commercial implementations is New Ravenna. The main products of the company consist of handcrafted mosaics which are molded into decorative borders, murals, field tile and medallions. In order to create distinctive styles, subtle shade variations and textures, tiles can be cut, tumbled, honed and treated. The end result usually incorporates the designs of architects, interior designers and their clients and this could be a custom, one-of-a-kind work of art in mosaic tiles (Ravenna, 2019).

Figure 33: A hand-cut stone mosaic, New Ravenna Company, (Newravenna, 2017) (URL33)

Materials and Techniques: The Company has been using the variety of materials such as stone, gold, jewel glass, metal, shell, basalto orvieto, and serenity glass. According to Sara Baldwin “It is our constant thrill to be on the cutting edge of design, using both traditional stone-cutting mosaic methods and modern ones, such as the use of water-jet saws, which have brought us into a new era of stone and glass mosaic” (designcurial, 2013). Using a mix of the traditional Italian hand-cut opus tessallatum technique and the modern day water jet technique, these spectacular patterns range from the lyrical to the geometric and from the graphic to the organic (Walker, 2013).

Figure 34: A handmade mosaic, New Ravenna Company, (Ravenna, 2013) (URL34)

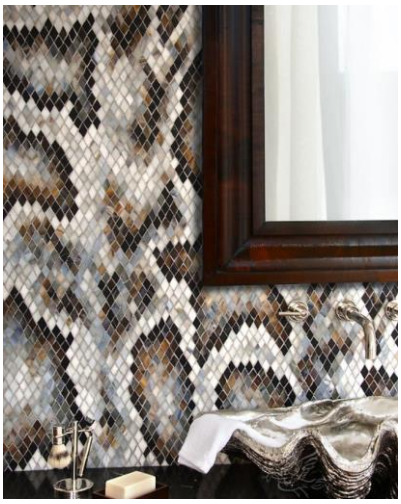

Figure 35: A hand-cut glass mosaic, New Ravenna Company, (Newravenna, 2017) (URL35)

Pictorial contents: Most of the mosaics of this company, due to the use of gold, have an aristocratic and luxurious sense by texture and motifs inspiration from nature.

Location in space: The products can be found in homes, restaurants, hotels, casinos and businesses around the world (Ravenna, 2019).

ECO CERAMICA: The pure expression of the best Italian craftsmanship is Moderna Manifattura. Its products are created with unique and timelessness beyond current fashion trends because the company's passion for beauty (Ceramica, 2019).

Materials and Techniques: Materials are rectangular tiles, precious metals, matte, glazed porcelain stoneware, and handmade terracotta tiles. All items are painted by hand in accordance with the centuries old traditions of Italian craftsmanship.

Figure 36: Le miniature collections, La Moderna Manifattura collections, Eco Ceramica Company, (Ecoceramica, 2011) (URL36)

Figure 37: Le miniature collections, La Moderna Manifattura collections, Eco Ceramica Company, (Ecoceramica, 2011) (URL37)

Pictorial contents: The product made by hand with Islamic geometric patterns.

Location in space: Mostly on floors and wall.

ARTAIC: In order to contribute towards the accessibility of the beauty and artistry of mosaic medium, Artaic was established in 2007. Artaic brings the ancient art of mosaic into the modern age by creating sophisticated design software and innovative robotic mosaic assembly systems. The award-winning tile-work is custom designed and fabricated by Artaic designs. Through fast design iterations, free sampling and American robotic production, Artaic modernizes the creation of architecturally compelling mosaics. Currently, custom tile designing is fast and easy. Artaic proliferates the availability of the highly artistic mosaic design to everyone and also increases the accessibility of mosaic as a medium for artists to work with (Artaic, 2019).

Figure 38: Envoy Hotel, Boston, (Artaic, 2017) (URL38)

Materials and Techniques: Sintered Glass, Vitreous Glass, Clear Glass, Unglazed Porcelain, and Natural Stone. Creating sophisticated design software and innovative robotic mosaic assembly systems. The company possesses software that allows for visualization and virtual manipulation prior fabrication, a wide range of characteristics experimentation, and reduction of labor barriers through mechanization.

Figure 39: Ayrtaik, (Artaic, 2014) (URL39)

Figure 40: Hilton Costa Mesa, California, (Artaic, 2014) (URL40)

Pictorial contents: It allows people to see the different ways their design could be created in tiny squares. Then, after an iteration has been approved, custom tiles are manufactured in the precise colors and patterns needed to create the work. This is an enormous advancement in mosaic art capabilities, since before that, people had to work with a set amount of tile colors, or maybe paint on tiles to achieve certain visual effects (Katz, 2018).

Location in space: Columns, Walls, Facades, Bathrooms, Kitchen, Floors, Logos, Decoration objects.

ORSONI: The Founder Angelo Orsoni , 1889

His multicolored panel, which had been created as a sample collection of smalti and gold mosaic tiles, represented Orsoni's first goal in a life dedicated to mosaic. Orsoni developed more than 3,000 different colors from just a few dozen oxides. Each color comes in a wide variety of shades (Veniceinsider, 2017). Clients and projects range from Gaudi's Sagra da Familia in Barcelona to the Saudi Royal Clock Tower in Mecca, Rudolf Nureyev's tomb in Paris, St Paul's Cathedral in London, and the Vatican in Rome. They also work on numerous projects with contemporary interior designers, decorators and artists (venicesothebysrealty, 2016).

Figure 41: Olivetti Showroom, Venice, Italy, 1958, (Orsoni, 2018) (URL41)

Materials and Techniques: Smalti and gold mosaic tiles in variety of colors of different tones and shades. It uses ancient techniques to produce 24K gold leaf mosaics, colored gold and enamels (venicesothebysrealty, 2016).

Figure 42: Tottenham Court Road, London, 2015, (Orsoni, 2015) (URL42)

Figure 43: Tottenham Court Road, Detail, London, 2015, (Orsoni, 2015) (URL43)

Pictorial contents: Orsoni smalti, is rectangular in shape, and is intriguing precisely because it is cut at an angle to the glass slab. It is the sheared, cut side of the glass which serves as the top surface of the tesserae. It is this cut that gives Orsoni smalti its reflective, shimmering brilliance that just cannot be matched (mosaicsmalti, 2015). Create a minimalist space using mosaic as a decorative element for the concrete space (Figure 46, 48).

Location in space: Different application and location. Interior and exterior and objects.

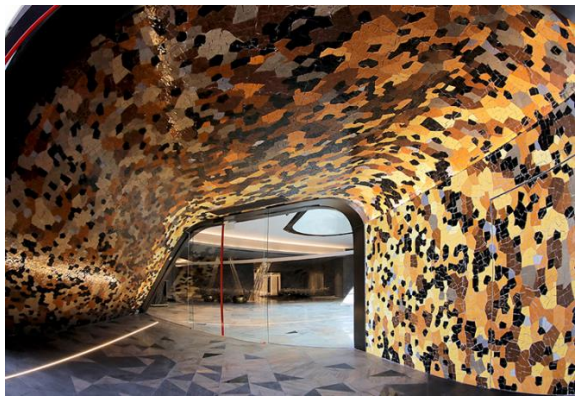

Figure 44: W Hotel, The Palm, Dubai, (Orsoni, 2019) (URL44)

Figure 45: W Hotel, The Palm, Dubai, (Orsoni, 2019) (URL45)

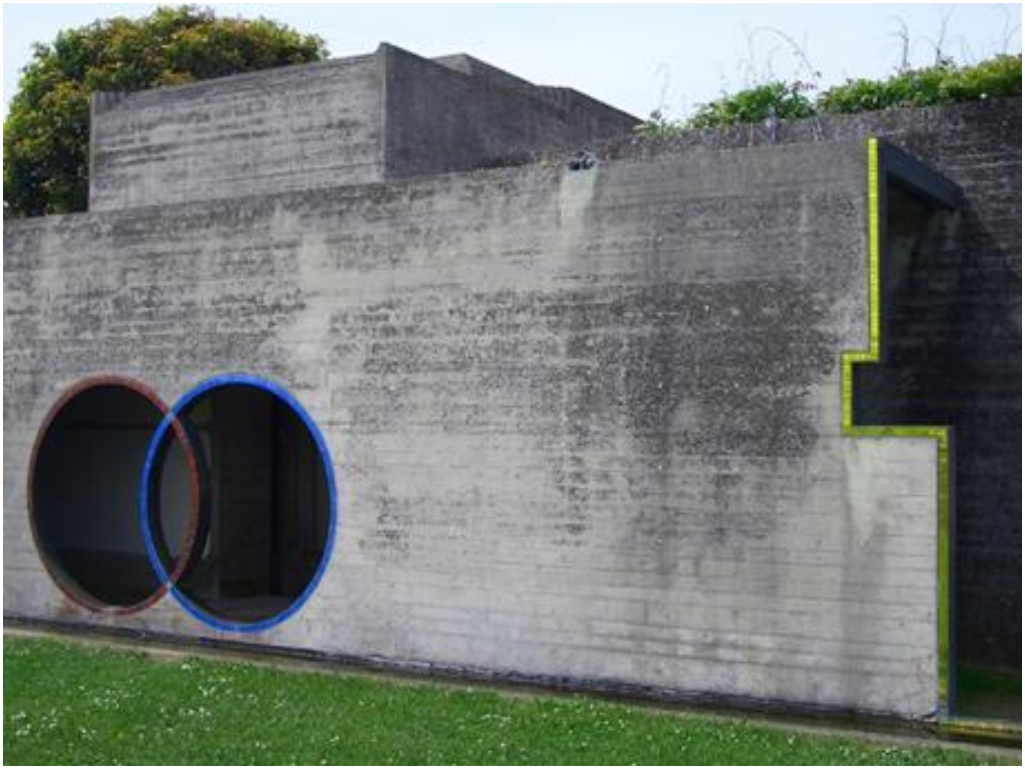

Figure 46: Brion Tomb, Altivole, Italy, 1978, (Orsoni, 2018) (URL46)

Figure 47: Brion Tomb, Detail, Altivole, Italy, 1978, (Orsoni, 2018) (URL47)

Figure 48: Querini Stampalia, Venice, Italy, 1963, (Orsoni, 2018) (URL48)

Figure 49: Querini Stampalia, Venice, Italy, 1963, (Orsoni, 2018) (URL49)

Figure 50: Querini Stampalia, Detail, Venice, Italy, 1963, (Orsoni, 2018) (URL50)

Table 1: Comparison of Contemporary Mosaic Companies

Companies	Materials	Techniques	Pictorial contents	Location in space
SICIS	Glass mosaic- Micro-mosaic- Combine vetrite and jewelry with mosaic	Invention of meshing mosaic process	Creative- Adaptabilities- Geometric- Pictorial- Continuity in space- Play of scales- Poetic and inventive	Floor- Wall- Ceiling- Furniture
BISAZZA	Glass mosaics- 24 carat gold mosaic- Traditional vitreous glaze finishes- Aventurine(synthetic stone)	Backed glued to a paper face at the back for easy installation	The expression of a unique style that brings a contemporary design and fashion to the classic style	Floor- Wall- Ceiling- Furniture
NEW RAVVENA	Stone and Glass mosaic tiles- Gold- Metal- Shell- Serenity glass- Basalto orvieto	Water jet- Hand cut opus tessellatum	Lyrical- Geometric- Graphic- Organic	Residential- Commercial- Decorative borders- Murals
ECO CERAMICA	Precious metals- Colored glazes- Handmade terracotta tiles- Matte- Porcelain stoneware	Hand cut and hand painted	Historical atmosphere with hand painting geometric patterns	Floor- wall
ARTAIC	Glazed Porcelain- Natural Stone- Sintered Glass- Vitreous Glass- Unglazed Porcelain	Robotic mosaic assembly systems	Inventive – Pictorial- Geometric-	Floor- Wall- - Ceiling- Columns- Decoration tools
ORSONI	Multi-color Smalti and gold mosaic tiles	Reuse of ancient techniques Produce 24K gold leaf mosaics, colored gold and enamels	Reflective – Flexibilities- Shimmering Brilliance- Minimalistic	Floor – Wall- Ceiling- Objects

4.4.3 Mosaics as Artistic Medium

To indicate the variety of styles and scales of applications of mosaics, artists all over the world try to redefine ancient traditions and crafts and transforming environments with individual fragments known as “Tesserae”. Also, by using their creativity and mixing mosaics with other elements, artists have been able to achieve new

manifestations of aesthetics, especially in the field of interior architecture. Each project is a melding of personal taste.

- **Beatrice Serre** (b. 1970)

  Beatrice Serre is a French contemporary artist. In order for her to create mosaics, architectural decoration and furniture design, she uses natural minerals. She uses her work to transform the terrestrial fossils into alien landscapes and ruins and also unites an old tradition with a futuristic imagery (Serre, 2018).

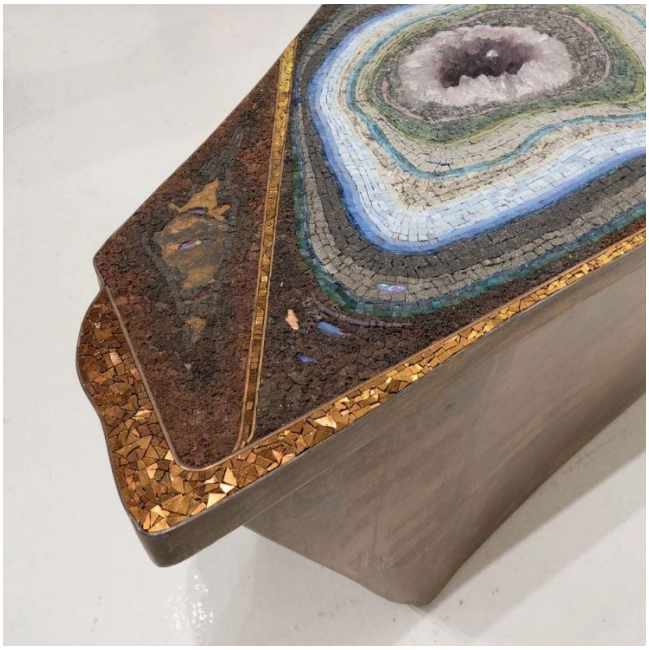

Figure 51: Coffee Table, 2016, (Gallery T. f., 2016) (URL51)

"All this prodigious mineral pathway on which I do not stop evolving, show myself step by step, how every tesserae finds its place within space and time, as the Mandala. This fabulous notion to recreate another dimension from natural elements, such as stones and minerals combined, is revealing me the dazzling truth of the importance of any existence on Earth and in the Universe. This thousand-year-old craftsmanship technique is metamorphosed into

contemporary mosaic, finding new horizons in architectural decoration, furniture design, the unusual object and pure artwork. The themes are inspired essentially by a combination of Space and Nature" (Serre A. , 2018).

Figure 52: Sun, Mirror, 2017, Beatrice Serre, (Gallery T. f., 2017) (URL52)

Figure 53: Coffee table, 2019, Beatrice Serre, (Mosaiste, 2019) (URL53)

- **Monir Shahroudy Farmanfarmaian** (1922 - 2019), made mirrored mosaics inspired by Islam. An Iranian artist whose geometric compositions which are mirror-encrusted were inspired by both Islamic architecture and the postwar abstractions being New York avant-garde (Farago, 2019).

Figure 54: Mirror Ball, 2010, (Farmanfarmaian, 2010) (URL54)

Figure 55: Mirror ball, 1974, (Chung, 2015) (URL55)

Her mirrored works was also inspired by the architecture of Safavid palaces, whose walls were decorated with mosaics made from thousands of remains of mirrors shaped into hexagons and tessellated triangles. She was informed by religious or mystical designs. She noted that the hexagon was “a polygon associated with heaven in the Islamic pantheon”. Her art was beyond all studies of forms, perceptions and light (Farago, 2019).

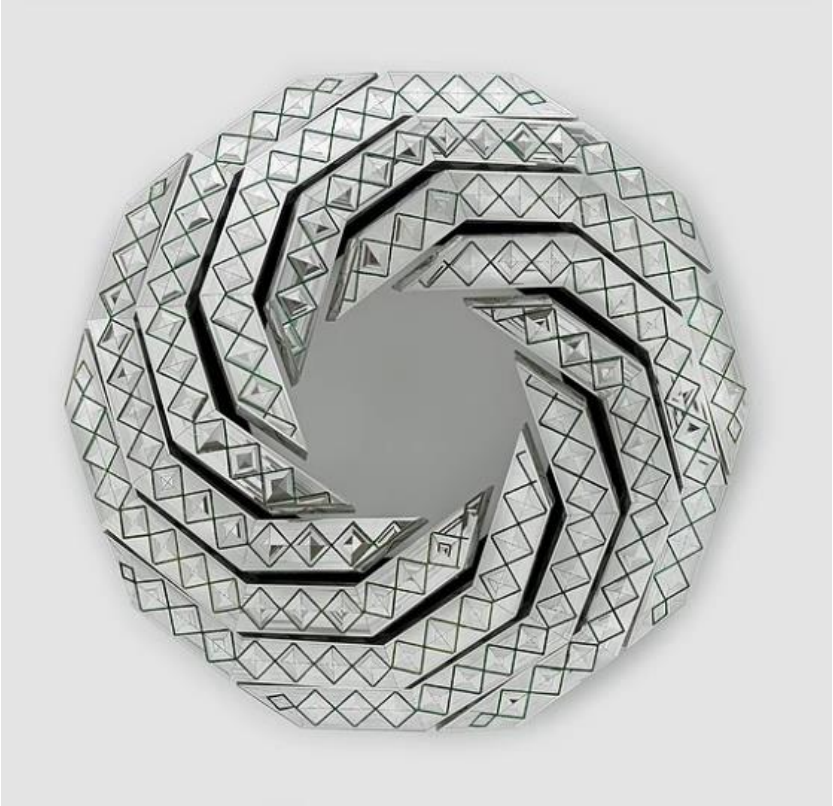

Figure 56: Mirror, Fourth Family, Decagon, 2013, (Farmanfarmaian, 2013) (URL56)

- **Marie-Laure Bourbon** Born in the Paris Region in 1962, Marie-Laure Bourbon, was involved in many creative activities which ranged from drawing to Ikebana and decoration while working mainly in the design department as an assistant in high-tech groups. She discovered the concept of mosaics by chance at the beginning of the 21st century to which she devoted herself to entirely (Bourbon, 2019).

Figure 57: Libellulle and butterfly, child bed, Marie-Laure Bourbon, (Bourbon, 2016) (URL57)

She asserted that this art synthesizes all centers of interest, materials and color combination, the art of cutting, the art of drawing and the vibration of light on the materials. In her perpetual search for movement and light she practices this ancestral art; she asserted that the work of cutting is privileged as well as the play of contrast between color and materials (Bourbon, 2019).

Figure 58: Butterfly, Detail, Marie-Laure Bourbon, (Bourbon, 2016) (URL58)

Table 2: Composition of Contemporary Mosaic Artists

Artists	Materials	Techniques	Pictorial contents	Location in space
BEATRICE SERRE	Stones-Natural minerals	Mixed media	The themes are inspired essentially by a combination of Space and Nature-Futuristic imagery	Furniture design with unusual object
MONIR SHAHROUDY FARMANFARMAIAN	Mirrored mosaic	Melding the Persian technique of reverse-glass painting with the formal language of Minimalism	The cyclical conception of spirituality, space, and balance in mosaics	Decorative surfaces and objects
MARIE-LAURE BOURBON	Enamels-Glass-Marble-Quartz-Pearls	Mixed materials and colors	Futuristic impression	Decorative surfaces and objects

4.5 Summary of research of mosaics in contemporary practice

In the digital age and despite many advances in all fields, yet one can use the elements to design their living environment in a way that satisfies both spiritually and sense of place. Since mosaics have many thousands of years of history and many applications, especially in architecture, it is worth exploring its potential for contemporary environments. Therefore, this thesis examines mosaic as a decorative element in interior architecture and seeks to point to the potential it can have in space. In this regard, the informative parts provided by Cersaie, the international organization of high quality in the field of mosaic, tile and ceramics has been very helpful. From the list of top ten companies in the world of mosaics, six companies were examined. Also, among the contemporary mosaic artists, three artists especially such that create objects with effect in space, such as furniture and decorations, were randomly selected. All case studies have been discussed in terms of materials, techniques, pictorial contents, and their location in space. By evaluating companies and artists in the field of mosaics,

it was found that few ceramic tile companies have a special production line for mosaics, powerful companies are now producing mosaics using state-of-the-art techniques. Companies have been able to add beauty and speed to the mosaic by using new technologies such as meshing, Water jet, and robotic installation. They produce mosaics by using various materials such as glass, gold, metal, and natural stones, and so on. In addition, these mosaics are sometimes combined with jewelry, colored glass, and other precious stones to make the space look more intimate.

Also, research has shown that mosaics have the potential to be applicable in any environment, with characteristics such as flexibility, sustainability, reflectivity, beauty as well as durability. These include both interior and exterior spaces, from ceilings, columns, walls and floors to the bar and coffee table and chandeliers and mirrors and other decorative items. Contemporary mosaic artists also use different ways to create their own works, such as mixing stones and different objects to achieve a new and unique combination. In their mosaic works, the effects of futuristic and minimalist art can be seen. Overall, research on mosaic companies as well as artists in the field has shown that mosaic as a historical decorative element has the potential to be used in a variety of ways in contemporary architecture. Mosaic, while being applicable to contemporary techniques, it can also very well evoke a sense of vitality, nostalgia and crafts. Mosaic can be one of the best and most practical decorative elements for interior designers.

4.6 Summary of Findings on Mosaics Material and Techniques

List 1: List of Materials for mosaic work

Materials

- Pebbles
- Shell
- Ivory
- Colored stone
- Glass
- Marble,
- Tile
- Pottery
- Tesserae Glass,
- Smalti - Marble with silver/gold leaf
- Concrete
- Multi-color tile
- Broken dishes
- Ceramic
- Metal
- Silver
- Gold
- Aventurine - synthetic stone
- Micro-mosaic,
- Vetrite and jewels
- Serenity glass,
- Sintered Glass,
- Vitreous Glass,
- Basalto orvieto
- Handmade terracotta tile
- Porcelain stoneware
- Glazed Porcelain,
- Unglazed Porcelain
- Natural Stone,
- Natural minerals
- Mirrored mosaic
- Enamels,
- Quartz,
- Pearls

List 2: List of Application Techniques

A. Methods of application of mosaics to surface

Direct method

Indirect method

Double indirect method

B. Composition / arrangement techniques for mosaics

Tesserae

Opus regulatum

Opus tessellatum

Opus vermiculatum

Opus musivum

Opus palladianum

Opus sectile

Opus classicum

Opus circumactum

Micro mosaic

Cut-off stone

Graffito technique

Meshing mosaic process

Sets backed glued to a paper face at the back for easy installation

Water jet

Robotic mosaic assembly systems

Mixed media

Design software (CAD)

Chapter 5

CONCLUSION

This research aimed to identify mosaics as a decorative contribution to historical and contemporary interiors. It is intended to help to architects, interior designers and designers in general to increase their knowledge of mosaics, one of the oldest decorative practices in interior space. Offering both a design tool and interior element, mosaics can be preserved and used as valuable natural material by its application in contemporary spaces. Mosaics have long been used as arts and crafts, as well as a surface cover with various advantages in architecture. In general to the living environment, it can have a profound effect on the sense of place. Since the purpose of phenomenology is to encourage human beings to understand the universe by experiencing the space around them in general, and of mosaics as integral part of it, it is important to study architecture and interior architecture with respect to human interaction with them. As Pallasmaa points out, our unconscious emotions and feelings can be evoked by images of buildings, and spaces provided that these offer a symbol of human existence and the universe. Heidegger believes that all works of art are of a thing nature and that is how we know them. From Heidegger's point of view, there are three interpretations of the nature of a thing. First, the nature of everything has its own characteristics. Second, it is a unifying thing of the sum of the five intelligible senses like visual sense and sense of touch. The third interpretation implies the formation and origin of a thing from the subject. In other words, in the thing, the form needs to connect to the subject. He proposes these interpretations to emphasize the importance

of expanding meaning, body and the importance of understanding a thing, and in this way seeks to express the meaning of a thing beyond his own interpretation with a phenomenological approach. Accordingly, mosaic as a work of art has the characteristics mentioned.

Norberg-Schulz refers to the spirit of place or "Gnius Loci" in the phenomenological discussion of architecture. That the task of the architect is to make a place meaningful for life. By connecting objects based on Gnius Loci as well as connecting humans with objects, the architect can create a sense of identity and meaning. Old and historic structures help the architect to capture them, but using these in a new way to achieve the manifestation and identity of the art of architecture is what design may be about. According to Schulz theory, mosaics, with historical antiquity and a sense of place and longevity, can help the architect to achieve (Gnius Loci) a powerful spiritual sense of place.

According to Steven Hall's theory, the sensory properties of materials and tactile areas are exacerbated in phenomenological terms. In Hall's belief, architecture and the site can be achieved through the use of local crafts and materials as well as by linking history with the new landscape. In any case, today there has to be a link between architecture and the site in new ways because it is part of the constructive evolution of modern life. Hall also points to the importance of materials and acknowledges that because materials have the potential to profoundly impact the experience of space, architects can use materials to awaken the senses. So, based on Hall's ideas, it can be derived that mosaics, as a historically widely used material, and stablished technique can help the architect to awaken the senses, especially the sense of touch.

Human has always interacted with his environment. Since human has been looking for beauty from the beginning, he has used natural elements to decorate his environment so that he can satisfy his sense of beauty. Among the decorative elements, mosaics can be seen as a natural component with a millennial history. This current study offers a brief chorological overview of mosaics in historical perspective focusing on materials, techniques, pictorial contents and location in space to articulate their decorative potential. All case studies from these four perspectives were reviewed. In fact, these four factors are of great importance in architecture and this has made mosaics as a decorative element challenged by these issues. Samples of historical study were selected based on research by historians in the two regions of the Middle East and Europe. Contemporary case studies were also selected with the help of the international organization Cersaie, which is an authority in this field.

Earliest mosaic ornamentation dating back to three thousand years BC can be found in the Ubaid area of Mesopotamia used by the ancient Sumerians to cover the wall area and other elements. Afterwards, the Greeks and Romans used mosaics more extensively in the construction and decoration of their buildings. They used small pieces of colored stones to cover and decorate the floor and wall with geometric patterns and in some cases epic and aristocratic illustrations. Initially the ancient Greeks used pebbles and over time they used colored glass as well, and later the Hellenists and Romans discovered the strategy of Tesserae. Notable examples of ancient Greek mosaics in the areas of Olynthus and Pella in Greece and prominent examples of ancient Roman mosaic art can be found in Pompeii and Sicily in Italy. With the beginning of Christianity, there were major changes in the field of art. The aristocratic and epic themes were replaced by religious and spiritual issues. The Byzantine Empire, which began in the 350AD and continued until the 14th century, is

a turning point in the use of mosaics in architecture. In this period, mosaics coated with silver and gold known as Smalti appeared. The Byzantines were able to show depth, reflexes, light, and angles by using smalti. Byzantine mosaic art on the ceiling, walls as well as dome of churches and monasteries features religious narrative motifs also symbolic figures and animals along with floral and plant motifs in a variety of dramatic colors. Examples of the magnificent mosaics of this period include the Church of San Vitale and the Gala Placidia Monastery in Ravenna, Italy, also known as the Mosaic City, as well as Hagiasophia in modern-day Turkey. As the Islamic era began about 800AC, mosaic art gained new prominence. Although Islamic art is derived from all its prior art, it has unique features such as the integration of calligraphy with motifs in mosaic art. Unlike Byzantine mosaics, Islamic mosaics are free of any iconography and illustration. Geometric and puzzle-like motifs with floral and plant patterns arranged together in a special order to show unity or the One God are prominent features of this period. During the Renaissance in Europe, due to special attention to painting, we are seeing a decline in the art of mosaics. Since the late 16th century, Baroque artists have used mosaics to decorate the ceiling and exterior, as well as the floors of churches, inspired by the cartoons of painters including Rafael.

More recently, in the nineteenth century, an art movement called Art Nouveau was created with the aim of beautifying the space using traditional arts and confronting the age of industry. Although the life of this style was short, it had many effects, especially on the revival of mosaic art. For example, Anthony Gaudi, the creative and influential architect of this style, has been able to create unique masterpieces, including Park Guell and Sagrada Familia Cathedral, using mosaics. Gaudi and Jujol are probably also the first artists to use mosaics from various objects such as teapots and broken utensils in a mosaic. Previously, mosaics consisted of all kinds of crushed stone and

glass. Another innovation of these artists was the use of mosaics to cover the surface of the table, benches, objects, and 3D sculptures with a variety of colors and subjects. In this way, art that until then was often practiced in churches on a two-dimensional level with religious themes showed a new and more practical effect to the audience. The next movement, Art Deco, emerged in the early twentieth century. The main purpose of this style was to show the luxurious life with geometric shapes, especially in interior architecture using mass production. An example of this period's decorative mosaic art can be found in parts of the floor as well as the door of the Chrysler Tower Elevator in New York.

The current research on mosaics has helped highlight the potential values of mosaics in several important respects, along with its artistic values and role in the sense of place. Mosaic as an ancient element, exhibits properties such as durability, sustainability, and functionality. With very little environmental impact it is a material and technique that can be a good option with a lot of potential for fulfilling the commitment of interior designers. It can be used with a wide variety of materials in different locations with different applications. Current case studies show applications of new technologies such as digital software with the ability to design and print 3D as well as the use of the new generation of robots to facilitate the material design. Mosaics have entered a new phase of their capabilities in architecture and interior architecture. Mass production is one of the components of the modernity era that has been considered since the industrial revolution due to the consumption of societies and the supply as well as demand besides speed of modern life and the cost-effectiveness of consumables. This has led to the diminishing of individual designs and handicrafts, and the subsequent loss of craftsmanship. In today's life, with the pressing need for human products, the placement of handicrafts can be highly felt. One of the

contributions of this study is that it helped accumulate list of materials and list of composition techniques to the currently available to designers as findings of the thesis.

The study on selected ‘best practice’ examples brings out a number of benefits on new developments in contemporary use of mosaics. Integration (industrial production and handicrafts) is one of the important and applicable factors that can restore the vacancy of the forgotten crafts. On the other hand, localization of industries is one of the biggest goals that is driving local economic growth. Therefore, the use of artists and their ideas and techniques in industrial production has a dual impact on meeting the needs of today’s consumers. Contrariwise, by applying the procedures mentioned above, the culture of the special areas can be revived. As a result of the current study investigation, it could be claimed that, there is strong gap and border between the contemporary factories and handmade artist’s approaches. This can be perceived from the analysis which was done in table2 (p104), handmade artists manly focused on interior objects, while contemporary factories mainly focused on the building components such as wall, floor, and column. Accordingly based on the findings of this study, mosaic industries/factories can provide unique and valuable products by employing and integrating the unique craftsmanship of the craftsman as well as the ideas and information of architects, interior designers and designers. As a result, these productions can be a new way of responding to the needs of the digital age in terms of visual sense and phenomenological effects. Mosaic as a functional and ecologically friendly material that has high potentials in terms of versatility, aesthetics, adaptability, and continuity with a wide variety of production and application. In spite of all the research done in this study and the useful features mentioned, it is hoped that in contemporary design, mosaics by architects and interior designers will be widely used.

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