A Methodological Guide in Progress of Interior Design of Fitness Centers: The Case Of Famagusta, North Cyprus

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ABSTRACT

New technology and transportation made life more comfortable, which does not requires more physical effort comparing the lifestyle with the old generations. Because of that, the need for physical activity has become one of the social needs of people. In the 1970s, fitness centers were created to be an invention to represent a unique indoor physical activity environment. Most of these facilities follow an unguided scheme for interior design atmosphere which could affect the user. Studies showed a connection between interior design atmosphere components and user behavior in the space. In this study, the connections between both interior atmosphere components and fitness center spaces explained to answer the main question of this study "What should be taken into consideration while designing or renewing fitness center interiors?" On this basis, the main aim of the study is to create a source of a guideline on the interior design of fitness centers. This study includes five main chapters. The development of this study guided by the literature information found in the second and third chapters. The factors of interior design and interior atmosphere found in the second chapter. The information including interior design and interior atmosphere of fitness centers explained in the third chapter. The case study found in the fourth chapter which includes all the existing fitness centers in Famagusta / North Cyprus. The case study will be done by observation method including an observation table, which obtains data gathered from the literature review. The interiors of all the fitness centers in the city of Famagusta / North Cyprus will be included in this case study and analyzed. At the end of this study, suggestions will be provided to be used as guidelines for a positive interior design atmosphere in fitness centers.

Keywords: Interior Atmosphere, Fitness Center, Ambiance factors, Interior Design, Physical activity, Indoor exercise.

ÖZ

Günümüzde yeni teknoloji ve ulaşım hayatı daha konforlu hale getirmiştir. Yaşam tarzı ise eski nesillerle karşılaştırıldığında daha az fiziksel çaba gerektirmektedir. Bu nedenle fiziksel aktivite insanların sosyal ihtiyaçlarından biri haline gelmiştir. 1970'lerde spor merkezleri özgün bir iç mekan fiziksel aktivite ortamını temsil etmek için ortaya çıkmıştır. Söz konusu tesislerin çoğu iç tasarım atmosferi için kılavuzsuz bir şema izlemektedir ve bu da kullanıcıyı etkileyebilmektedir. Çalışmalar iç mekan tasarım atmosferi bileşenleri ile mekandaki kullanıcı davranışı arasında bir bağlantı olduğunu göstermektedir. Bu araştırmada, iç mekan atmosfer bileşenleri ve spor merkezi alanları arasındaki bağlantılar, araştırmanın ana sorusu "Spor merkezi iç mekanlarını tasarlarken veya yenilerken nelere dikkat etmeliyiz?" cevaplamak için açıklanmıştır. Buna dayanarak araştırmanın temel amacı, spor merkezlerinin iç mekan tasarımı üzerine bir rehber kaynak geliştirmektir. Araştırma beş ana bölümden oluşmaktadır. Araştırmanın gelişimi ikinci ve üçüncü bölümlerde bulunan literatür bilgileri ile yönlendirilmiştir. İç mekan tasarımı ve iç mekan atmosfer faktörleri ikinci bölümde bulunmaktadır. Spor merkezlerinin iç mekan tasarımı ve iç mekan atmosferi ile ilgili bilgiler üçüncü bölümde açıklanmıştır. Dördüncü bölümde Gazimağusa/ Kuzey Kıbrıs'ta bulunan tüm spor merkezlerini içeren vaka çalışması bulunmaktadır. Vaka çalışması, literatür incelemesinden toplanan veriler ile oluşturulmuş gözlem tablosunu içeren gözlem yöntemi ile yapılacaktır. Gazimağusa/ Kuzey Kıbrıs'taki tüm spor merkezlerinin iç mekanı bu vaka çalışmasına dahil edilecek ve analiz edilecektir. Çalışmanın sonunda, spor merkezlerinde olumlu bir iç mekan tasarımı atmosferi oluşturulması adına kılavuz öneriler sunulacaktır.

Anahtar Kelimeler: İç Mekan Atmosferi, Spor Merkezi, Ambiyans faktörleri, İç Mekan Tasarımı, Fiziksel aktivite, İç mekan egzersizi.

TO MY FAMILY

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Chapter 1

INTRODUCTION

Different forms of research carried out to prove that regular exercise inhibits cardiovascular-related deaths, diabetes mellitus, and obesity, and therefore regular physical activity has become an imperative social need within every human society. The World Health Organization (WHO) has identified physical inactivity as the fourth major contribution of death rates in the world and this results in about 3.2 million deaths every year (World Health Organization, 2012). Health and life quality of every human being can substantially be improved through regular physical activity such as walking or cycling (Warburton, Nicol, & Bredin, 2006). Gym and other fitness facilities became one of our most important daily life pursuits within the last few decades. Technological innovation has added effortlessness towards our quest for daily physical movement. Moreover, this has increased our demand for Fitness and Gym facilities to keep up with maintaining good physical health. Fitness centers and gyms have become much popular nowadays because they have sought to address the growing physical inactivity and obesity perpetuated by the downsides of using technology. Modern fitness centers and gyms boast a contemporary indoor environment and atmosphere. An Italian humanist by the name of Vittorino da Feltre was a prominent modern educator in the 1420s. He started a top-rated school that offered and explored physical education and excluded humanist subjects rounded from his expertise. Spaniard Cristobal Mendez authored a book called El Libro del Ejercicio Corporal y Sus Provechos in 1553, which became the first of its kind to solely

discourse the benefits of physical exercise (Álvarez, 1996). The book provides description, analysis and classification of exercises, games and sports from a medical point of view and also bits of advice on physical injury recuperation and prevention. A few chapters will provide material advice regarding specific drills and games suitable for the elderly, women and children. An Italian physician by the name of Mercurialis authored a book called De Arte Gymnastics (Ford, 1995) which incorporated his medical and classical studies of literature, with a specific focus on the ancient Greeks' and Romans' ways of hygiene, diet, exercise and usage of natural medication to treat illnesses. The book was the first of its kind to perfectly illustrate the physical therapy principles (although they were speculative), and exclusively propounds on sports medicine; it also has a larger influence on physical education as well as the training methods which began surfacing a few centuries later in Europe. Customer serving is a mixture of the newest and oldest development in every institution. To ensure survival and prosperity in a business context, it is paramount to provide quality services that will attract customers and keep them coming back for the service (Neda, Farahani, & Salamat, 2013). Organizations today remain competitive by dealing with the issue of customer needs and tuning organization performance so that it gathers information on customer perception of the organization's products and services. In order to remain competitive and seize a bigger portion of the market share, organizations need to keep track of customer needs. In order to understand product and service customer interaction, many companies have developed ingenious ways to collect customer information to analyze customer attitude. It is paramount to make use of a system that can gather the correct numerical index of customer needs. Organizations providing their customers with intangible products have a bigger obligation to make use of such a system (NourOlNesa, Shadehlouei, & Samimi, 2008).

Most customers engage quality products and services offered by sports facilities; therefore, these facilities are very well aware that the luck of having customers coming back to purchase non-quality products eventually runs out. Making use of their sporting contribution, they understand that only continuous effort to learn, function on honesty and adaptability will indefinitely engage their customers. For facilities to work towards a point of satisfying expectations, a solid plan has to be derived which should ingeniously measure customer needs (Hasanzadeh, 2005). The success of sports facilities, as well as the increase in public health awareness, can be proliferated through increasing marketing researches in industry as well as in fitness centers and this will, in turn, result in the recruitment of suitable managers who would have to familiarize themselves with the needs, preferences and motivations of the members of the fitness center, thereby fostering member satisfaction, needs, and stimulating interest of potential members to join the center (Parks, 2003). According to the research conducted by Ehsani (2003) titled 'The analysis of preventive factors of physical activities', he asserted that offering high-quality services as well as establishing fitness centers in public frequented places could attract more potential members, particularly women. According to the conclusion given by Kouzechian et al. (2009) in their research titled 'A study of efficient factors in the customers' satisfaction in public and private men fitness centers across the city of Tehran,' He asserted that there is a big difference between customer satisfaction in private and public fitness centers in accordance with the respective centers' quality of employees, environment and equipment.

1.1 Problem Statement

In 'The Architecture of Happiness' (2008) philosopher Alain De Botton states: 'one of the greatest (but often unmentioned) causes of both happiness and misery is the

quality of our environment: the kind of walls, chairs, buildings, and streets we are surrounded by.' In the book, he argues that the user is a profound influence who can be happy in an environment is not only a consequence of the interior architecture shell of the building (i.e., bricks, facade), only a matter of meeting a requirement list of objective conditions. Instead, being happy in an environment is linked to what people that reside in the concerned environment can do with it and in it. In the book 'A philosophy of interior design,' Abercrombie states (1990, p. 9): '… Interiors have a power over us that façades can never have. This is not due to the commonly observed fact that users spend most of their time indoors; it is instead since interiors surround us. User does not merely pass them on the street; they inhabit them. When the user enters a building, they cease being only its observer; they become its content. The awareness of the effect of the design atmosphere, ergonomics, and the human factor is seen as the striking feature that helps to achieve an optimal design. In each method, the interior atmosphere is set to provide aesthetic, physical, and psychological comfort for the user to give a continuance level for the user in this facility (Abercrombie, 1991). A leak of awareness choosing and applying and unguided scheme for these facilities interior design atmosphere has been applied by the facilities owner, designers, or architects without the implementation of these elements and their effect on the user. That can directly influence the user continuance in the facility, their level of satisfaction, and comfort within their space.

1.2 Research Questions

In each designed Fitness center, the different interior atmosphere has been made by the designer or the owner. In this study, the main questions will be, "What should be taken into consideration while designing or renewing fitness center interiors?" Followed by sub-questions to be answered about what is the interior design atmosphere elements

that affect the user in the Fitness Center. Moreover, how does the interior atmosphere affect the user in the Fitness Center?

1.3 Aim of the Study

The aim of the study is to assemble a set of guidelines, outlining the proper application of interior design atmosphere a commercially owned fitness and gym facilities, with a focus on the beneficial effects of this atmosphere on the user. The guidelines that are going to be provided after finishing the study could be used on both the new construction and renovating phases of any fitness center interior design. The instructions will include general improvements with substantial support for the effectiveness of the application. Briefly, the main is to create a resource that could be a guide for the design of the interior of a fitness center that will be opened, planned, or renewed correctly and consciously.

1.4 Methodology

The literature review will be the first step in this methodology. Books, articles, Ph.D. thesis, and online sources will be used to cover the needed data on interior design, interior atmosphere, and fitness center design and ambiance factors. The case study of this research using both quantitative and qualitative research (observations) methodology. In Figure 2: Structure of The Study is explained.

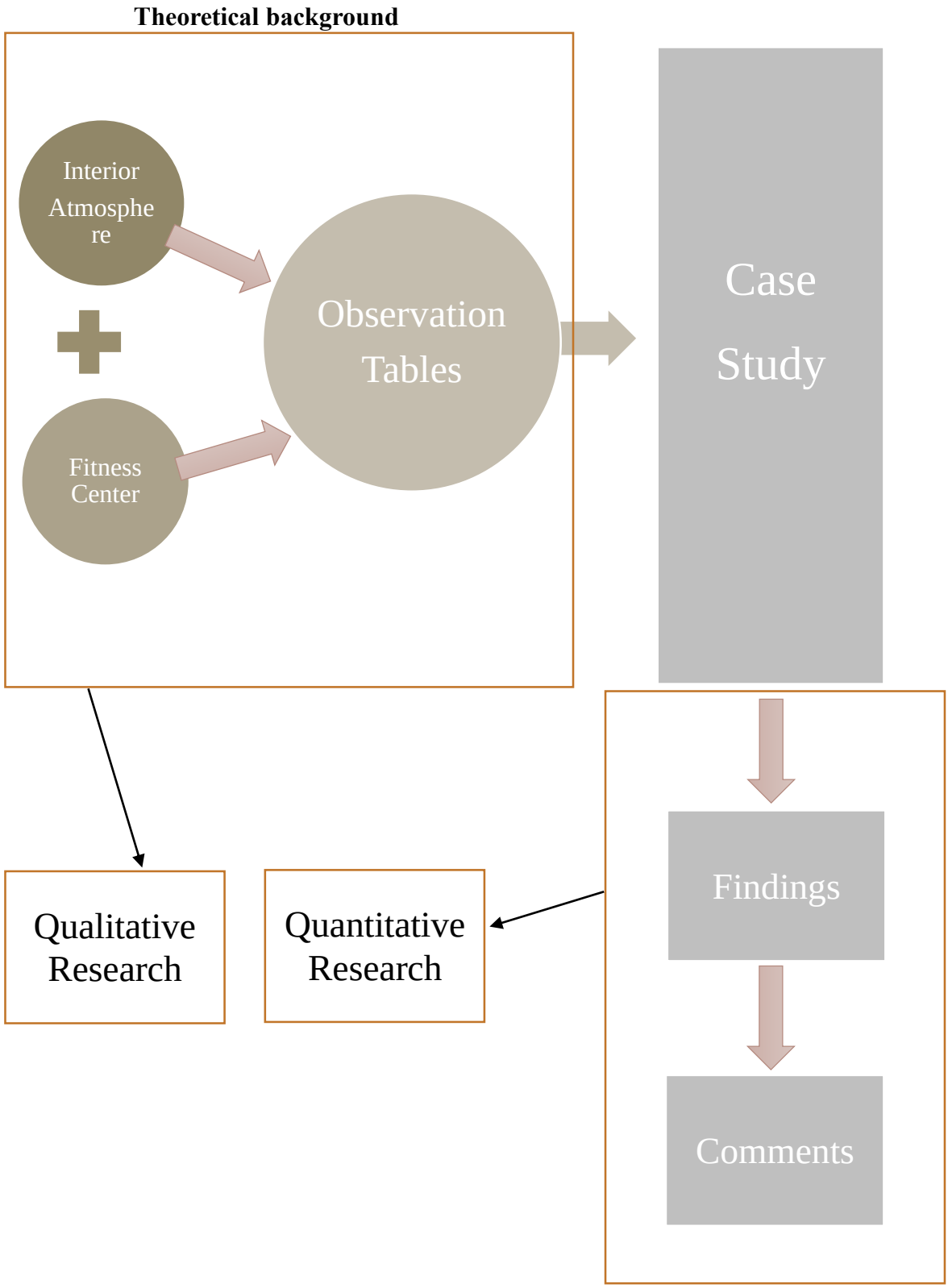


Figure 1: Methodology of The Study

1.5 Limitation

This study will be based on new and old private fitness centers in Famagusta, North Cyprus. User's personal tastes, ethnic character, gender and cultural issues are not included in the study. Fitness centers located in collective housing, shopping centers, hotels and similar functions are not included in the study. Geographical location and climatic changes will not be included in this study.

1.6 Structure of the Study

This study includes five main chapters. As it is shown in Figure 2, this study includes five chapters. Chapter one introduction, chapter two, explains the interior atmosphere. Chapter three explains the fitness center, chapter four be based on the case study, and the conclusion and suggestions provided in chapter five.

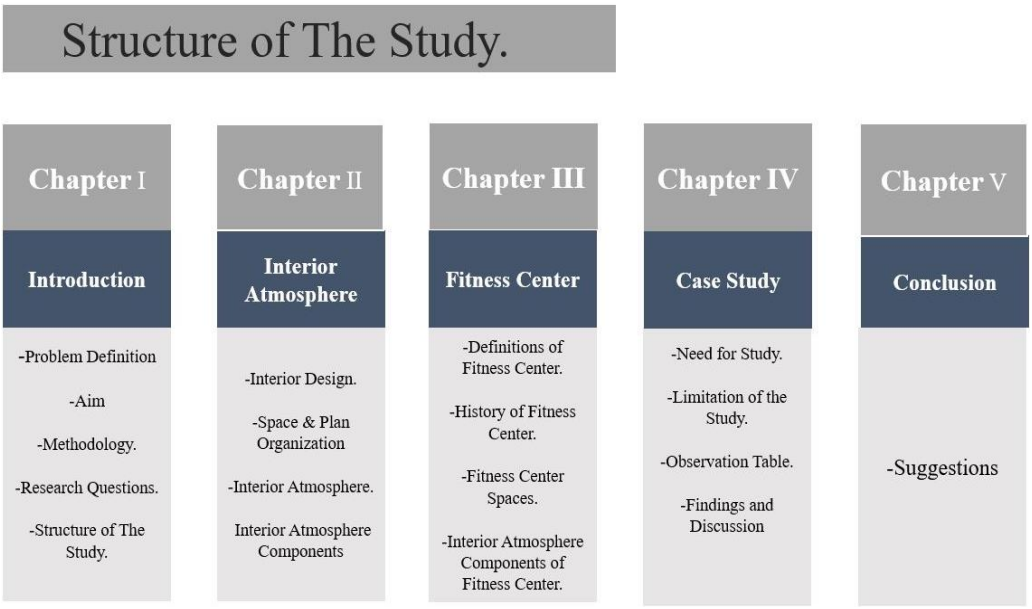


Figure 2: Structure of The Study

Chapter 2

INTERIOR DESIGN

In this chapter, there will be an application of the literature review based on interior design and interior atmosphere. Interior design will be defined in terms of design elements, design principles, space, and plan organization in interior space. The second part will describe forwarded, interior atmosphere components, and ambiance factors. The findings of this chapter will conclude it.

2.1 Design Elements

The basic units of any visual design which make up its structure and also transfer visual messages are called design elements (Vasseallo, 2019). Painter and design theorist Maitland E. Graves (1902-1978), made an effort to conceptualize the fundamental principles of aesthetic order in visual design (Martin, 2019), and gave the definition of the elements of design as point, line, shape, and form in his book, The Art of Color and Design (1941).

- **Point**

Pythagoreans have given the first acknowledged definition of 'Point.' According to Proclus, a point is a "monad having position." Plato asserted that the existence of points as an undetectable class is a fiction of geometry. He frequently refers to a point as an 'indivisible line' (Hartshorne, 2013) and further defines it as the start or end of a line. The fusion and mutation of parts that originate from diverse elements make up the most important characteristic of form creation. The point can only participate

dynamically in computations only through the sum and not through altering components. The appearance of the point could conversely attain a limitless assortment of forms.

Figure 3: Point (Kandinsky & Rebay, Point and line to plane. , 1979)

- **LINE**

According to Proclus (p. 96, 21-97, 3), the definition of a line is "magnitude in one dimension" or "magnitude extended in one way." Although the point is defined negatively, the first dimension is introduced by the line, and from this perspective, the point definition becomes positive and also coincides with the negation that rejects another dimension. (Kandinsky & Rebay, 1979, p. 57) Perceives the line as a derivative element when pursuing the Pythagorian perspective. The line represents the track of the starting point, which shows the visual transformation from static to dynamic. The eye is guided by horizontal, vertical, and horizontal lines which also help to shape space. In order to attract the eye towards a focal point and also alter space so that it appears full and extended, interior designers highlight horizontal lines. Feelings of freedom and strength are induced by vertical line features such as windows and doorways. An illusion of a taller space on a functional level can sometimes be designed by broadening vertical lines (Ching F. D., 1987). Diagonal, zigzag or curved lines represent dynamic lines. These types of lines mostly signify energy and movement and are represented by the stairs, for example. Dynamic lines are eye stimulants and therefore seize our attention for long. A frivolous number of dynamic lines can be obstructing and eventually drown out vertical and horizontal lines. Interior

designers will, therefore, maintain balance by comprising different lines. This is achieved through the selection of one prominent feature line from client briefing and the feeling they would like to stimulate in space (Schular & Namioka, 1993).

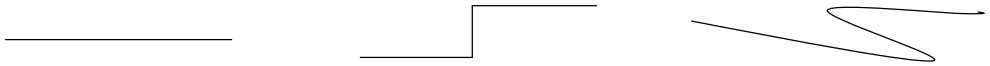


Figure 4: Line Shapes

Shapes are produced by simple straight or angular lines. To produce the simplest shape, we need at least three lines or angles, and from that, we can derive a plane created out of straight lines whilst the first plane of a circle can be made out of one curved line. The triangle, as well as the circle, therefore becomes a divergent pair of shapes in accordance with Kandinsky. More reliability between the lines and planes can be created (Kandinsky, 1979). In order to accurately point to planar shapes, the qualitative characteristics of angles can be utilized. The basic planar forms are presented as products of angular lines. The typical forms of the plane become the square, triangle, and circle. The square is constructed by right angles with qualities that are balanced. Acute angles which are sharp build the equilateral triangle. The form without angles distantly relates to passive obtuse angles. The passive obtuse angles make up the circle which is the third primary shape of the plane (Kandinsky, 1979) as it showed in Figure 5: Line, Angle, and Shape.

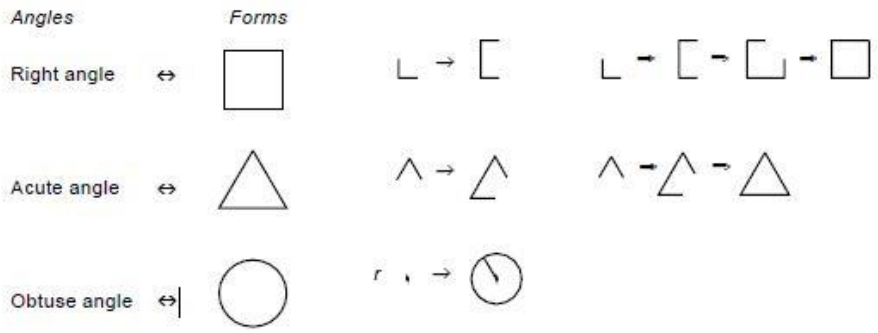


Figure 5: Line, Angle, and Shape (Kotsopoulos, 2000)

- **Plane**

According to Proclus, (Proclus, 1992, p. 117) a plane is "a surface such that a straight line fits on all parts of it" and Aristotle (Metaph. 1020 a 12) defined a plane as a magnitude that can be extended in two ways, or "divisible in two ways." According to Aristotle's (Heath T. , 2015) common remarks, "a line by its motion produces a surface" or that is "the extremity of a solid" and Euclid (Heath T. L., 1956) remarked that "a plane is a surface, which lies evenly with the straight lines on itself." Bolyai and Lobachevsky (Frischauf, 1876) derived a modern approach that gave a new meaning to the plane as "the locus of all points equidistant from two fixed points in space." Kandinsky (1979) and Klee (1964) have two regards about a plane. A plane refers to a planar shape or form that has closed boundaries. Its graphic surface is also rudimentary. The finite graphics context that has closed linear boundaries replaces the material plane of the graphic surface and therefore, it resembles a composition shape approach. In this approach, it is imperative that the manner in which the plane and other basic elements interact appear on the shape of the composition (Frischauf, 1876). How all value forms relate to one another as well as how ambiguous their dimensions are can be exposed to some extent when compared with other forms as well as the basic finite context. The whole sum of forms as well as the relative value of an isolated

form can be defined by this context and its linear parts (Klee, 1961, p. 112). From a moving line, it can generate the plane. A plane with a rectangular or square shape stimulates a perception of the trace of the constant motion of a straight line on the plane. A planar circle can also be generated through a linear rotation about a point. According to (Klee, 1964, p. 112) while the plane becomes visible or active, the line becomes invisible as an element, or it becomes passive as it is shown in Figure 6.

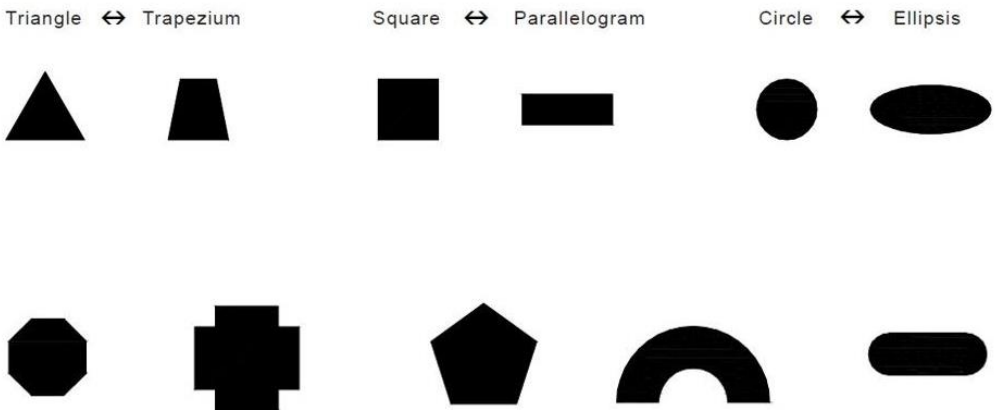


Figure 6: Plane Shapes (Kotsopoulos, 2000)

- **Shape**

The shape gives a description of a two-dimensional space. Other elements of design such as line, space, value or color primarily give a clear definition of shape (Dağlı, Şahin, & Güley, 2012). The combination of all these elements formulates all different types of shapes we interact with. When tone or color fill up areas between lines shape takes place (Klee, 1964). The brain's attempt to resolve an object as familiar (logical) to an individual's experience is shaped. The two-dimensional world is comprised of the square, triangle and circle, as it is shown in Figure 7: Shapes. Any other shape in geometry is the convolution of these three shapes.

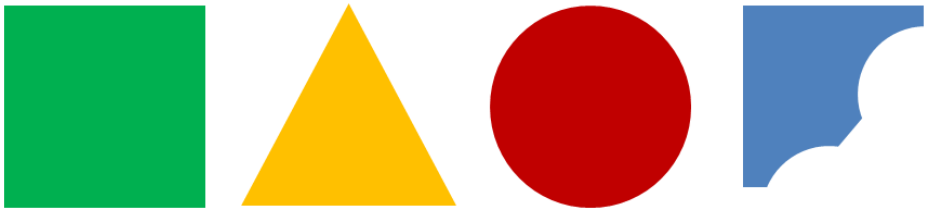


Figure 7: Shapes (URL 1)

- **Form**

The three-dimensional counterpart to shape is formed (Dağlı, Şahin, & Güley, 2012). Formulating a square is the shape and formulating a form is a cube. The basic geometric forms in the three-dimensional world comprise of cube, sphere, pyramid, cylinder and cones (Brainard, 1998). Form basically translates to shape with volume or dimension (Klee, 1964). Adding tone or color transition within a shape is a requirement for creating a dimension which will facilitate changing shape into form. This is the basic illusion of creating three-dimensional space in a two-dimensional space Figure 8: Example of Form.

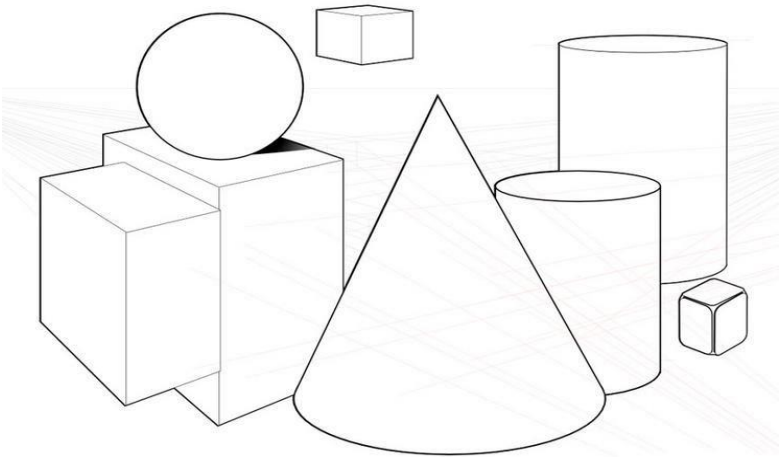


Figure 8: Example of Form (URL 2)

2.2 Design Principles

The design elements should be appropriately arranged in order to build an effective communicating environment. The basic rules which assist the designer in aligning the elements effectively are called Design Principles (Brainard, 1998). The principles, as well as the elements, are almost impossible to separate. The designer needs to carefully choose how the principles and elements need to be arranged since they work together dependently. This chapter will clearly give a description of 11 design principles including contrast, proportion, balance, unity, order, hierarchy, repetition, rhythm, harmony, and pattern.

- **Contrast**

Space exists when two adjoining parts exhibit obvious dissimilarities (Brainard, 1998). This contrast can further emphasize an object in space. In order for designers to contrast and visually distinguish their designs, they have to make use of distinct elements adjustments such as size, shape, mass, color, texture, pattern, lighting, and other elements (Brainard, 1998). In order to attract user's attention, it is imperative to apply contrast in some areas and also some directions, colors, and textures. To emphasize the priority of a particular part of space over its surrounding environment, a contrast in a proper design should prevail (Lauer & Pentak, 2011). See Figure 9: Contrast Examples.

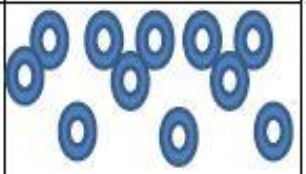
Contrast by characters of elements	Explanation	Examples
Contrast by Shapes	It is the contrast that is realized through differences of the shapes of elements. Organic and geometric shapes are contrasting with each other.	
Contrast by Scale	It is the contrast in measurement of the elements. Between the horizontal forms big and small, between vertical forms high-low difference can be indicated. When most of the elements have the same magnitude, similar but small element gains visual importance.	
Contrast by Colour	Construction of contrast by means of using colour is the most frequently applied situation. Contrast is constructed through colour difference, lightness-darkness, and warmness-coldness difference.	
Contrast by Texture	Apart from differences in textures, contrasting condition is constructed by such oppositions as softness-hardness, flatness-rudeness, and brightness-dullness.	
Contrast by Orientations	Maximum contrast is constructed when the angle of elements relative to each other is 90°. Any rotation of same elements within 180° also constitutes a contrasting structure.	
Contrast by Location	It is the contrast situation that is constructed by means of location of elements in the composition. It is realized through such differences in location as up-down, high-low, left-right, central-out of center. .	

Figure 9: Contrast Examples (Güley, 2014)

- **Proportion**

To seize a bigger effect, the use of proportion might have to be evolved. In this context, the concept of proportion is less linked to the compositional elements and more linked to the intended function. Human feelings are directly affected by proportion. In every design, it is imperative to find the most appropriate proportional

relation between the sizes in a building (Lauer & Pental, 2011) .Equality or ratio perceived can be indicated by the proportion between the elements of design see Figure 10: Proportion in Color and Shape. A designer is assisted by proportion to construct a firm set of visual relationships amongst individual components, entire building components, and the entire composition as well as its context (Elam, 2011).

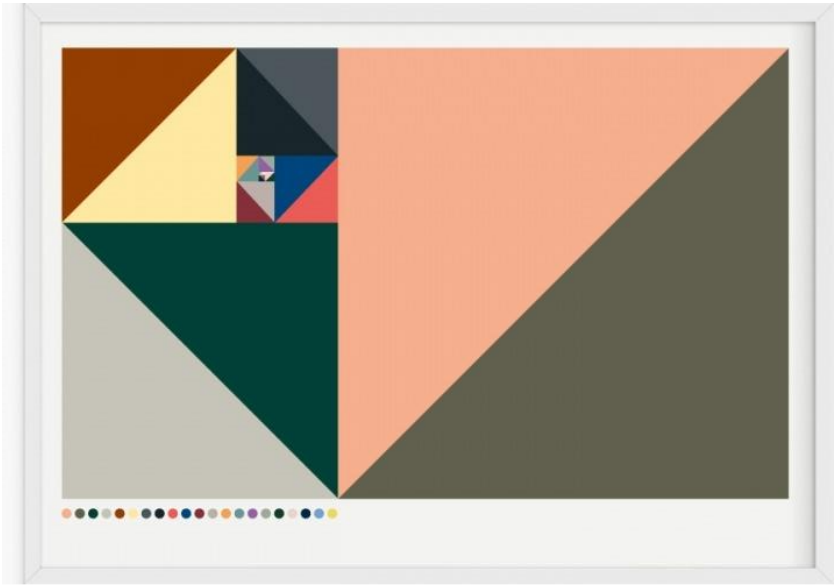


Figure 10: Proportion in Color and Shape (URL 3)

- **Balance**

Different elements can compose any design which has a visual weight. It can be concluded that the design is balanced if the elements are equally distributed in space (Lauer & Pental, 2011). To keep users engaged, space should be well designed. To maintain the order of things there's always a request in nature. The request in nature will remain intact and everything will exist in harmony if space is well balanced. Every design is taken into comparison with the imaginary vertical axis naturally created by human eyes to verify balance see Figure 11: Balance Example. A design is considered to be balance in this instance if it weighs equally within both sides of the

axis. The user will, therefore, feel unsettled when there's a skewed distribution around the axis (Bevlin, 1994)

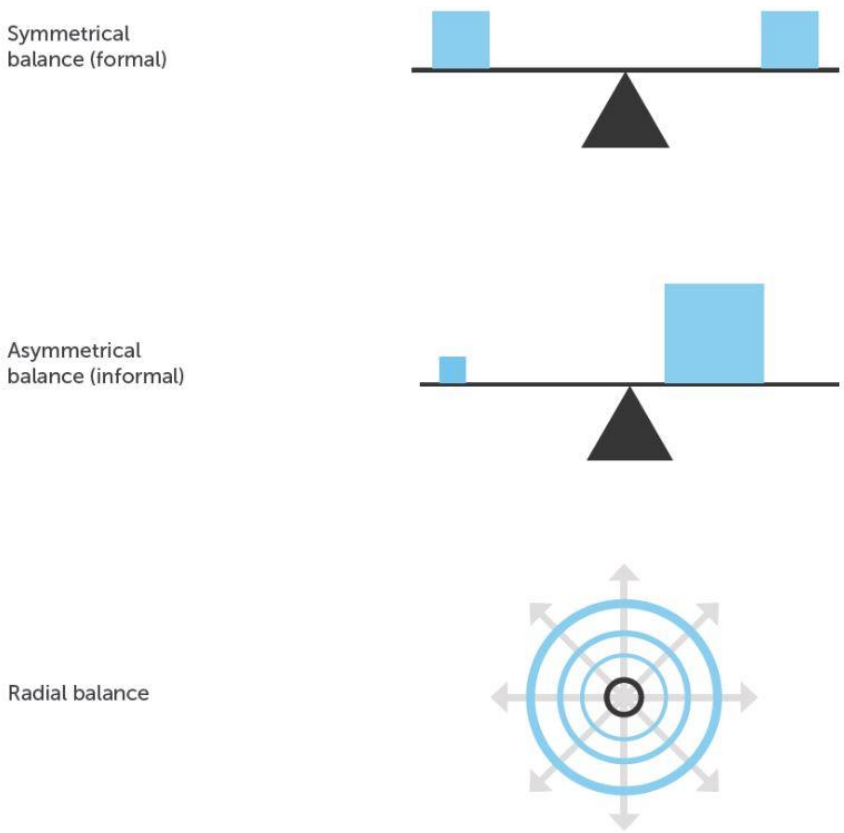


Figure 11: Balance Example (URL 4)

- **Unity**

The major principle of design that is wholly supported by other principles is Unity (Thomas & Evans, 2004, p. 5) . Designs can never be preconceived successfully if they lack unity (Brainard, 1998). An integrated view is created by unity (Lauer & Pental, 2011) and the design is supported by all the elements working as a whole (Brainard, 1998, p. 118). Unity proposes harmony exists within the entirety of the design. A sense of oneness is created on the visual image by unity. In the case of unity becomes existential, all the unimportant parts of design need to be kept in order and only remain active when the necessity to assist the bigger parts arises in the development stage of

the structure (Gillbert, 1992). Unity is considered to be a paramount principle in the designing landscape and is fully supported by other principles (Thomas & Evans, 2004). Unity as it is shown in Figure 12: Unity just as the name proposes, provisions a framework that is fully united and merges together all the other elements to fully give a promotion to a design (Brainard, 1998). There's a contention that a unified design is usually a successful design (Bevlin, 1994). See Figure 13: Unity in Color.

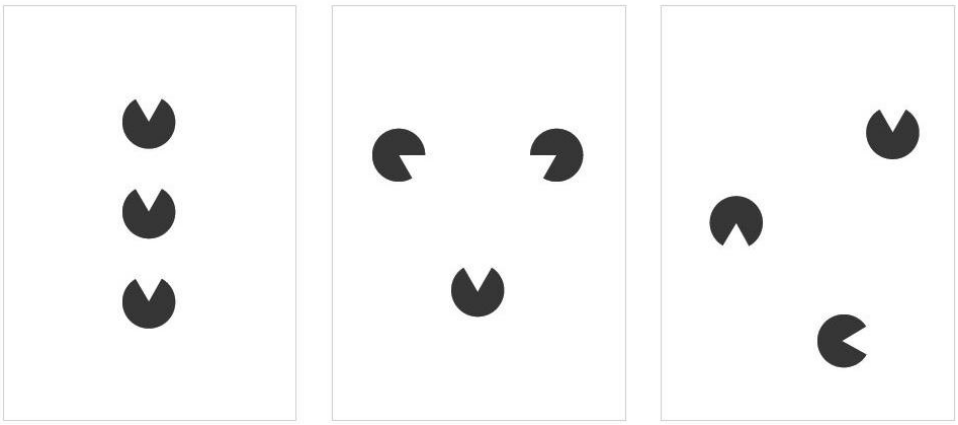


Figure 12: Unity (URL 5)

Figure 13: Unity in Color (URL 6)

- **Order**

Arranging elements in the form of repetition, hierarchy or juxtaposition creates order. Order can also be created by regularity and element arrangement as it is shown in Figure 14: Order Shapes. It is pure logic and it is also likely predictable (Ching F. D., 1987).

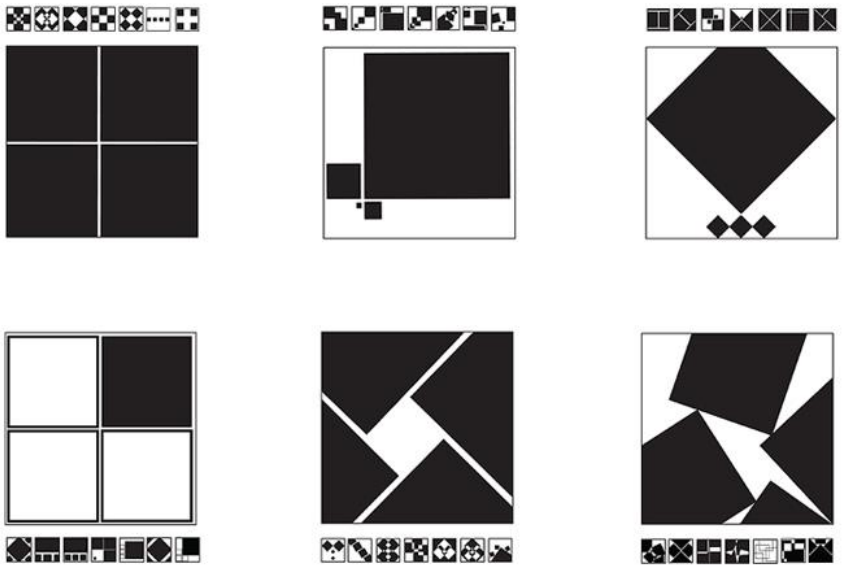


Figure 14: Order Shapes (URL 7)

- **Emphasis**

A principle of design that assists designers in creating a focal point or frame of design discontinuance is called emphasis (Lauer & Pental, 2011). Emphasis seizes and channels the user's attention to what is important see Figure 15. The proper application of emphasis will bring a user to a moment of gaze (Bradley, 2010). The imminent communication within the display will commence because of this process. Figure 16

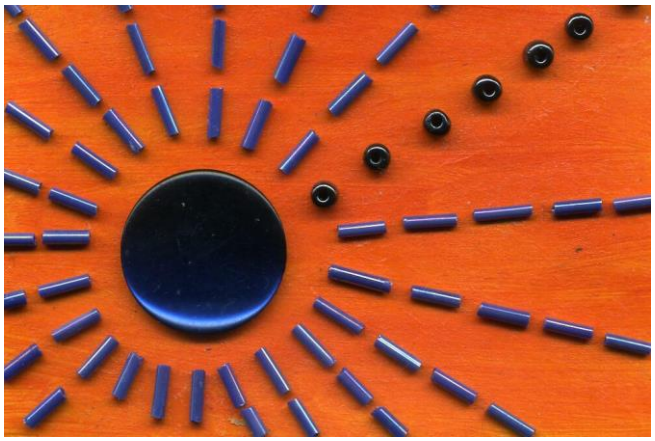


Figure 15: Emphasis (URL 8)

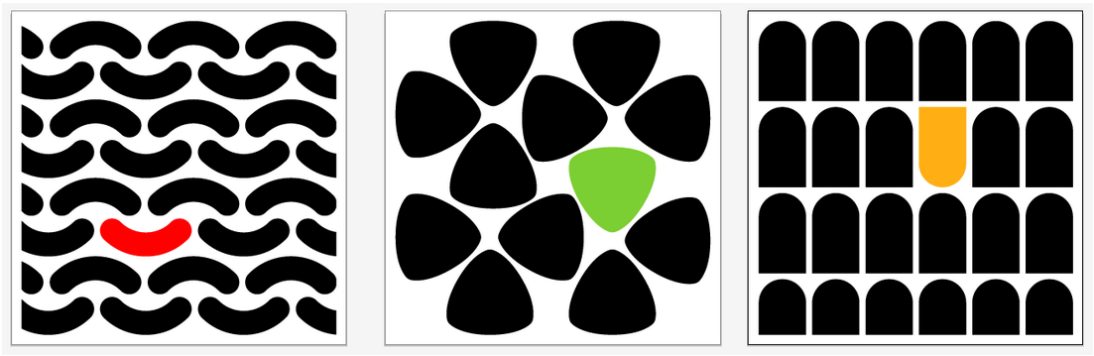


Figure 16: Emphasis in Shape (URL 9)

- **Hierarchy**

An organization of items into a variety of levels of priority is hierarchy. To create organization and prioritization visually the only sufficing need is visual hierarchy (Bradley, 2010). The purpose of each design is to address how to communicate with users . A distinct message is conveyed through the manner in which design elements are prioritized and organized. Users are guided in navigating the story of design by visual hierarchy and it also assists in conveying messages. In order to understand the differences in designs, it is essential to make use of hierarchy as it is shown in Figure 17 (Bevlin, 1994).

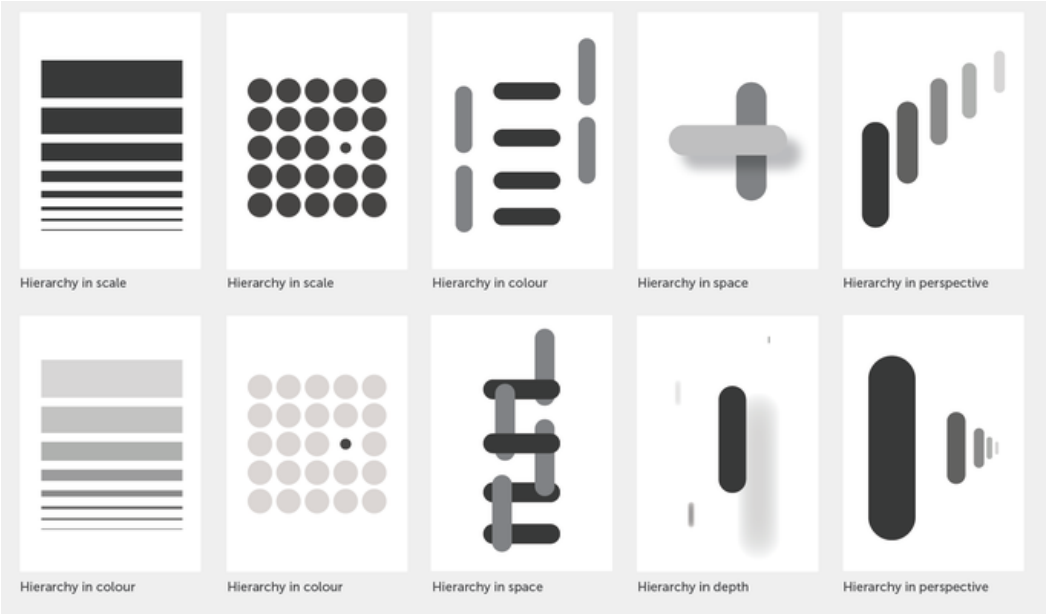


Figure 17: Hierarchy Types (URL 10)

- **Repetition**

According to the Principles of Repetition, it is stated, "Repeat some aspect of the design throughout the entire piece." (Williams, 2015) Elements of repetition may be comprised of a bold font, a thick line, a certain bullet, color, design element, particular format, spatial relationship, etc. (Bevlin, 1994). As it shown in Figure 18 it may consist of anything a reader may visually perceive as a “theme.” Since repetition is the process of a conscious effort to unite all design parts, it can be considered consistency (Bradley, 2010).

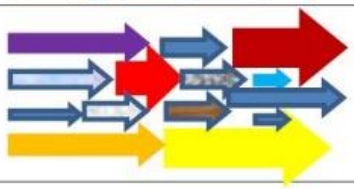
Repetition by characters of elements	Explanation	Examples
Repetition by Shape	Shape is the identity of design elements. Repeated shapes can have different characters as of colour or texture.	
Repetition by Proportion	It is a repetition type in which magnitudes are same but other characteristics are different.	
Repetition by Colour	Despite the shapes are different, same colours come side by side.	
Repetition by Texture	All elements have the same texture but can have different shapes, colour and magnitudes.	
Repetition by Direction	Existence of explicit direction of the shapes and the repetition of these directions are required.	

Figure 18: Repetition Types (Güley, 2014)

- **Rhythm**

A designer should appropriately control the principle of rhythm although he/she regularly applies it. Space needs to be carefully investigated for the usage of rhythm. A sense of chaos can erupt in space if too much rhythm is applied in a design. A sense of movement is created by rhythm. Although the elements which create rhythm may be physically dissimilar, they possess similar qualities. A skin of zebra makes up a great example of this rhythm type (Bradley, 2010). In Figure 19, types of rhythm followed with explanation and examples.

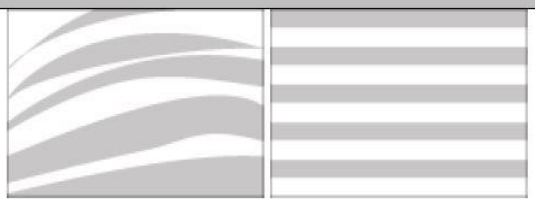
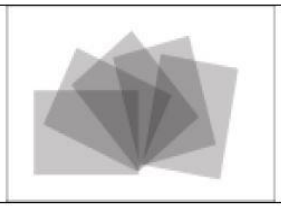
Types of Rhythm	Explanation	Examples
Alternating Rhythm	Happens when two element groups alternate with each other to produce a regular sequence such as the alternation of elements in the sequence of positive/negative, positive/negative….A regular rhythm occurs when the intervals between the elements, and often the elements themselves, are similar in size or length.	
Progressive Rhythm	Happens when the repetition changes in a character: progressive variation of the size of elements, or their shape or colour, texture etc.	

Figure 19: Rhythm Examples (Güley, 2014)

- **Harmony**

Harmony is arranging similar elements in such a way that all the elements seem to be relative to one another to create a feeling of completeness in the entire arrangement. In Figure 20, the opposite of design principle of contrast is harmony. In design, harmony generates unity. Harmony exists in design elements or design context. Composition can also exist in harmony (Bevlin, 1994).

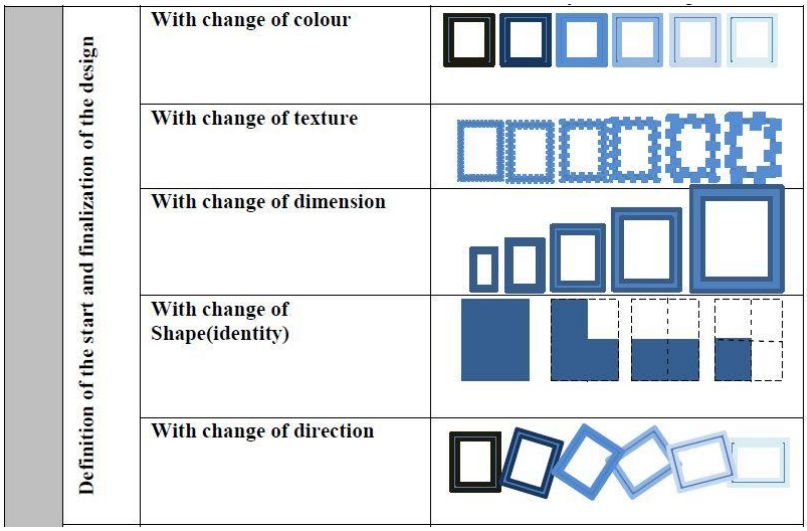


Figure 20: Harmony Shapes (Güley, 2014)

- **Pattern**

A regular arrangement of repeated similar elements within the principle of design comprising of line, shape, colors, is pattern. The pattern exhibit surface interest, thereby stimulating visual excitement. These types of patterns Figure 21 and Figure 22 stimulate the experience of the user and also the design and look of the end product, but caution must be applied when using these patterns because they may complicate and spoil the layout (Borchers, 2000). As it is depicted below, a user can make use of a beehive pattern to design an object which is stationery. The design was created by Federica Belafonte for beehive that facilitates conduits for the famous beehive honeycomb shape and derives a great looking simplistic shape (Kiely, 2017).

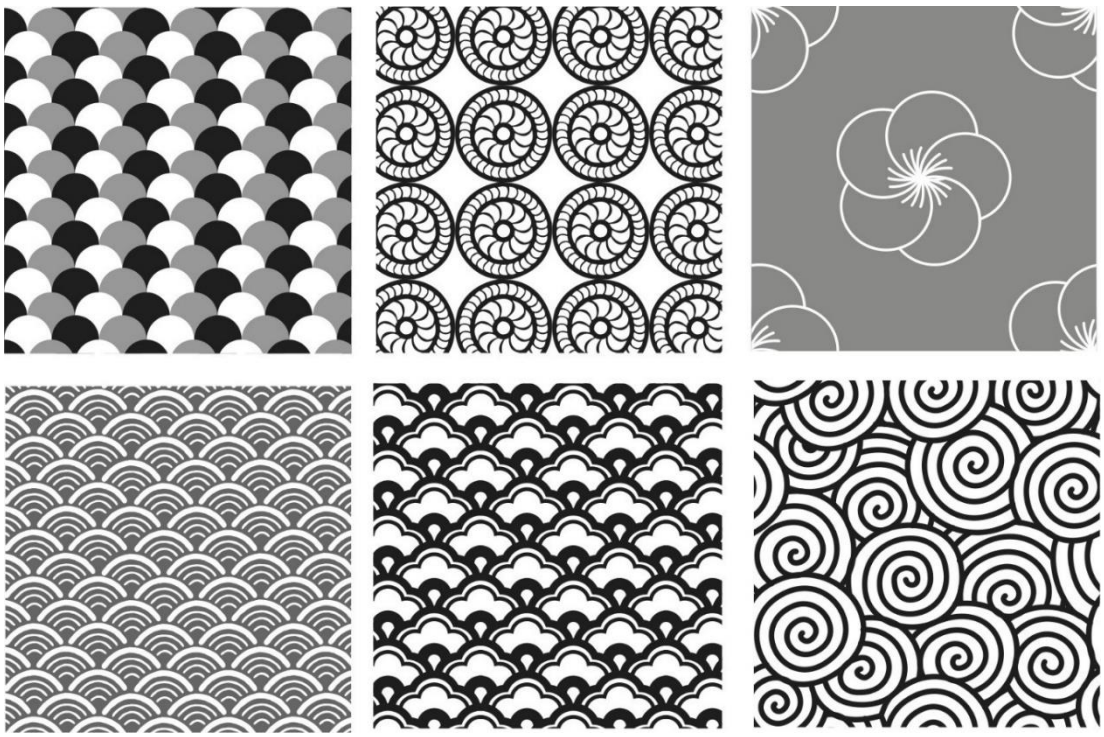


Figure 21: Pattern Shapes (URL 11)

Figure 22: Pattern in Color (URL 12)

2.3 Space & Plan Organization in Interior Space

An in-depth analysis that explains the utilization of physical space in structures is Space Planning. It involves the usage and purpose of space (Madani-Pour & Madani, 1996). Space planning is an essential component for the work produced by interior designers and architects and it demands purposeful steps of action to proliferate. It limits floor space wastage and ensures efficient use of the floor space (Rapoprt, 1969). It also accommodates the possibility of using a particular floor space if it's carried out appropriately. The outcome of a successful space planning is a comprehensive space plan (Spiller, 1998). This plan is comprised of a drawing and the required elements of spaces including windows, doors, and furniture.

2.3.1 Definition of Space

Although architects largely define space on the basis of attaching form to architectural elements like walls, floor, ceiling, door and window (Rapoprt, 1969), space can exist beyond its physical nature. A user that requires a physically defined confinement to the non-physical reality provided by the functionally oriented volume of space could find

space to be very essential. Space represents a void or emptiness (Antoniades, 1980). Architects who rapport about space qualities essentially refer to the non-physical qualities of space embodied by physical, tangible and fixed spatial boundaries. Space represents an idea, not a concept. Translating this idea into words diminishes the main fabric of the idea (Hertzberger, 2000). Many attempts to define the simplistic idea of space have emerged, trailing back from ancient times to modern times. According to Aristotle, space is a container of items and it covers all that exists within the edges of the sky. Space is occupied internally and restricted externally (Meiss, 1990).

2.3.2 Sense of Space

Since the age of antiquity, philosophers and architects have always been fascinated by the concept of sense of space. According to David Morris (2004), sense of space is attached to social experience with an exception of perceptual experience in general because deprivation of perceptual experience means the sense of space won't find existence (Meiss, 1990). Hertzberger (2000) has further maintained that space exists in parallel with what a person sees in front or above them and an individual is attracted to the usage of space according to these perceptions. An individual receives freedom of view from space and also a view of freedom. To fill a space is unfathomable and to get ahold of space is difficult. Therefore, the ability to see or understand space internally fulfills the experience (Hertzberger, 2000).Frank (1995) and Spiller (1998) maintained a different view with regards to the sense of place in the sense that they are more focused on the theoretical non-existing physical bodywork of perception level. This could exist with a virtual or distinct type of architecture. The quality of their thesis is based on the performance of virtual reality from which the body and building could ultimately be dematerialized. The existence of virtual reality is beyond the physical dimension of perception and experiencing it does not involve interaction with

elements which are tangible; it misleads the user into thinking the moving images it projects are fixated onto one space. Architects maintain the perception that cyberspace could one day go beyond the nature of the physical world.

2.3.3 Perception of Space

This concept of perception of space is given form by architecture since it is the initiator of space. The designer needs to first understand and perceive space before creating or initiating it. The last few decades have been very aerated because architectures and psychologists attempted many times to connect architecture and an individual psychology perceived as the user of these spaces (Epstein & Rogers, 1995). The definition of perception of space is becoming more expanded and limited in accordance with the field of study defining the terminology; for instance perception in experimental psychology is defined as the manner in which the receptors are acted upon by stimuli (Pedersen, 1986). In social psychology it indicates possessing the capability of identifying objects within a social environment and also consists of images representing different events, people and objects connected to previous experiences molded by an individual. Perception is defined in a more expanded manner within the field of geography and is comprised of a wider assortment of percepts, memories, attitudes and preference, internally signifying that the entirety of the information directly relates to the environment and various aspects of the information is suitable to be tagged under environmental cognition (Downs & Stea, 1974). We need to develop a method of arranging information we obtain from the environmental stimuli in order to appropriately recognize, identify and link significance to our surrounding environment comprised of people, objects and events. We can easily find our way around our surrounding environment and respond sufficiently towards a variety of circumstances when we appropriately identify the

features and conditions of the environment. According to Gestalts perspective, all the features and relationships credited to space do not characterize space but characterize objects furnishing the space (Arnheim, 1977). Therefore, in theory we would not be able to identify even the most trivial relationships of up down, right-left, close down, if we were to remove all objects occupying space because all reference objects of concluding such judgments would not exist. Arnheim (1977) maintained that the relationship between two or more objects produce space. Various processes of architecture, urban planning and general designing create and build space through cutting out, enclosing, border by compressing or decompressing space. Gestaltists presented the idea of perceptual forces, a terminology with its roots originating from physical sciences to describe these tensions appearing in visual field from a compositional viewpoint (Rapoport, 1990).

2.3.4 Plan Organization of the Space

If the designer intends to amplify the user's perception, the plan organization would receive greater priority just as it was previously mentioned. In his book titled Architecture, Form, Space and Order, (Ching F. D., 2014) defined organization classification of space described below:

- **Centralized Organization**

In this instance the designer has an option of considering a variety of secondary spaces because the central type is employed in a region consisting of an abundance of space Figure 23. Either assymetrical organization with geometrics which are regular or an asymmetrical organization with geometrics which are irregular succinctly harmonizaing with their surrounding environment will become the outcome for this organization (Lawson, 2007). The entry to this organization should be considered

through the condition of site because it is nondirectional and the entrance should be selected as one of the secondary spaces as it showen in Figure 24 (Borchers, 2000)

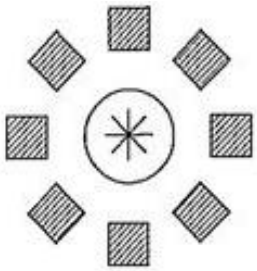


Figure 23: Centralized Plan Organization (URL 13)

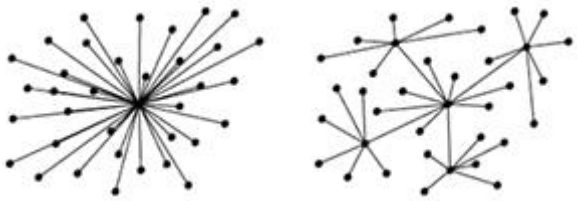


Figure 24: Centralized Organization Shapes (URL 14)

- **Linear Organization**

A series of spaces which can directly link to each other or link to each other through a separated linear space describe this type of an organization (Ching F. D., 2014). The form or size of the repeated spaces along the sequence could be the same or different, nevertheless, all the spaces in both positions consist of an exterior exposure. Figure 25 explaines one shape of the linear organization. The more flexible one is the linear type as it showed in Fiqure 26. A set of related forms in context could be applied by the designer. A wall that separates the space along its length could be represented by a linear organization.

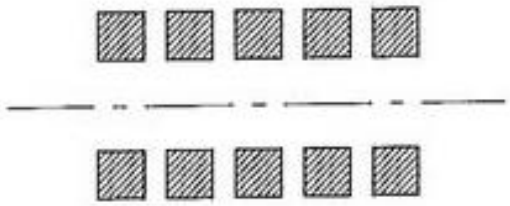


Figure 25: Linear Plan Organization Example (URL 15)

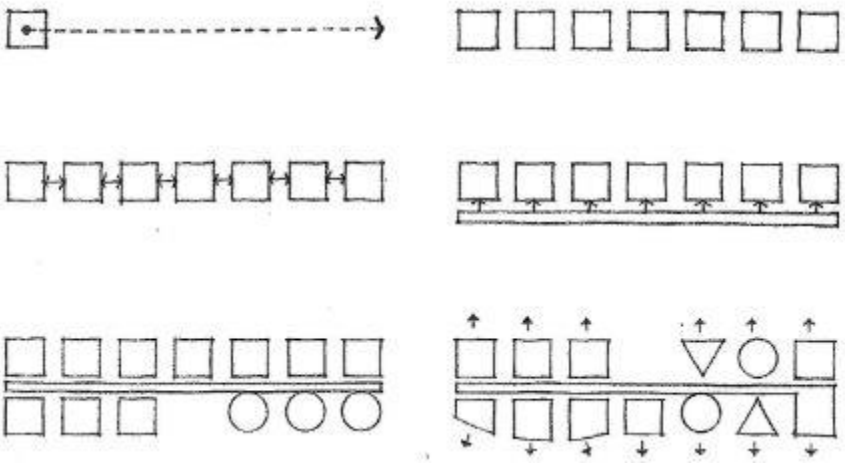


Figure 26: Linear Organization Examples (URL 16)

- **Radial Organization**

A new type of organization called radial organization could be created by combining both linear as well as centralized organization Figure 27 and Figure 28. This organization could create a space which is dominant within the center. (Ching F. D., 2014).

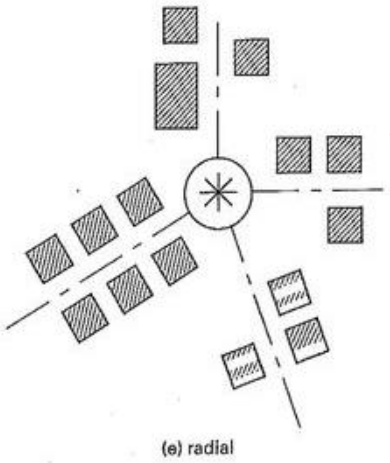


Figure 27: Radial Organization (URL 17)

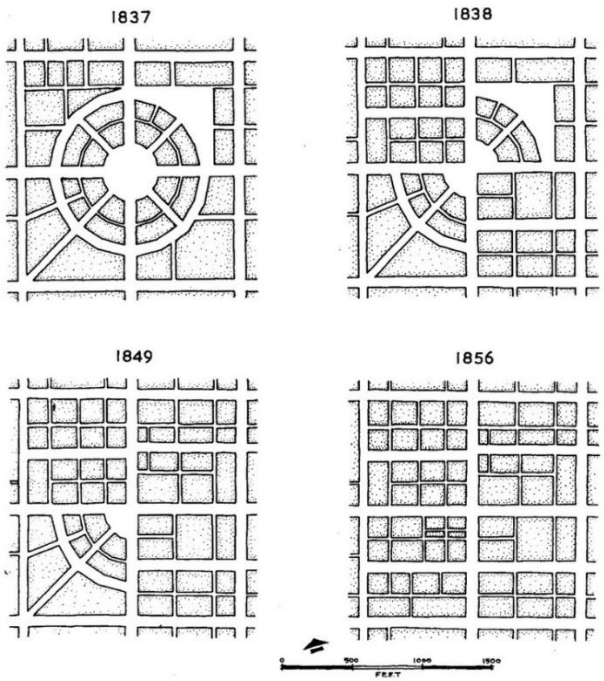


Figure 28: Radial Organization Examples (URL 18)

- **Cluster Organization**

The grouping of space is called Cluster Organization Figure 29. According to Ching (2014) this organization depicts scenarios which form compelling situations in which a group of spaces need to be organized.

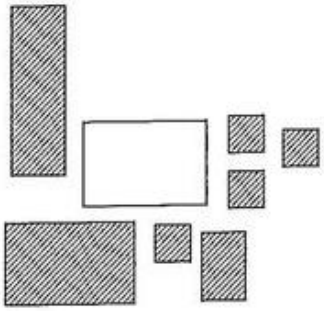


Figure 29: Cluster Organization (URL 19)

- **Grid Organization**

The final orgnaization is grid organization which possesses a grid structure organization. As it showed in Figure 30 and Figure 31, spatial continuity within the grid is modified because of the influence of the set of intersected visual objects (Rapoport, 1990).

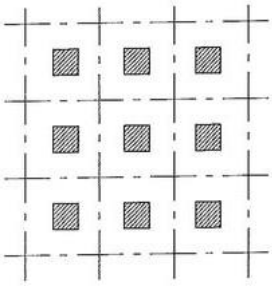


Figure 30: Grid Organization (URL 20)

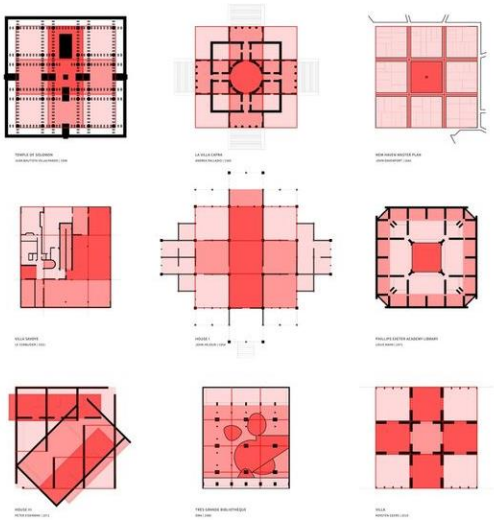


Figure 31: Grid Organization Examples (URL 21)

In accordance with interior design elements, all organization types can succinctly function. User perception will differ according to the outcome of each organization. Different aspects of space affect the user's perception of space. The importance of organization of space should be a conscious approach for the designer (Ching, 1979).

2.4 Interior Atmosphere

Illnesses have affected today's societies in epidemic proportions. People therefore desire spaces which will have a positive impact on the totality of their wellbeing. The purpose of this chapter is to discuss how an individual's surrounding environment could be affected by interior design elements and also how the design elements could promote harmony and health through the discussion of principles of general interior architectural elements. This could also be used to enhance the environment and benefit the user.

2.4.1 Definition of Interior Atmosphere

What is the atmosphere? Could it be air and weather? On the other hand, could it be midway – effect, matter, immaterial, space and ephemera? How could the atmosphere be designed when it seemingly begins whereby design halts? These questions deal with direct issues of time and presence of material, scientific inquiry and description, space, phenomena and the body (Zumthor, 2006). Areas that are immaterial and ephemeral conditions affect our experiences in terms of what we see, register and experience. Our ability to perceive the atmosphere conditions the existence of the atmosphere. People who make use of space make up part and parcel of the atmosphere and other associated atmospheres including climatic, acoustic, emotional, kinetic, material, polluted, energetic, etc. (Lawson, 2007). The presence of the world around us is affirmed by these bodily relationships which are intimately connected to us and form a mortal base from which we could experience pain and pleasure. They intimately

relate to our naturalness and form the immediate perception of that which is invisible or abstract to us (Manning, 1991). Our discriminative minds are framed by the most primitive form of perception which is emotional sensibility (Manning, 1991). Humans have evolved to intimately surround themselves with preferred atmospheres. Our atmospheres of association could range from home, office, work studio or café. Elements come together in a definite order in every single space. Our senses are aroused by this composition in that particular approach. An image of that particular place is created in our minds because of that stimulus (Lawson, 2007).The atmosphere of a place determines how long we will relax or contemplate in one single area. The formation of an image in our heads consists of many layers. These layers are comprised of characteristics which make up the space. Although the make-up is purely physical, the impression of every single material within its compositional proximity affects our senses resulting in sensorial experience of that particular space. The sensorial experiences include tactility, sound, temperature, tension between interior and exterior levels, levels of intimacy, light (Pallasmaa, The eyes of the skin: Architecture and the senses.). Instead of finding form, the process of space making focuses on coherence between these factors. Form is derived through tactful considerations of these experiences and they will be referred to as being "beautiful" (Benedito, 2013). As it is usually wrongly assumed that the quality of a place or space is visual perceptual quality, in reality it involves the judgment of environmental character which is a complex multisensory fusion of countless factors which are synthetically understood to be an overall atmosphere, ambiance, feelings or mood. "I enter a building, see a room, and – in the fraction of a second – have this feeling about it", this is a confession of Peter Zumthor, an architect who publicly acknowledged architectural atmosphere importance (Zumthor, 2006). John De – way the visionary

American philosopher (1859-1952) grasped and understood the abrupt, personified, emotive and subconscious importance of experience. In its very essence this experience is multi-sensory. Tony Hiss's book 'The experience of a place' used the idea "simultaneous perception – the system we use to experience our surroundings" (Hiss, 1991). Additionally, atmospheres which exist include cultural, social, workplace, family and interpersonal. Social atmospheres could either be supportive, discouraging, liberating or obstructing, inspiring or dull. Genius loci, the spirit of a place represents an ephemeral, unfocused and an experiential character which is non-material which is intimately tied with atmosphere and therefore gives rise to the atmosphere of a place which resembles a unique perceptual character and identity. According to Dewy this unifying character possesses a special quality which is an experience consisting of unity making up its name, meal, storm and friendship rapture. This unity's existence is determined by a single quality which permeates the whole experience although there's a discrepancy of essential parts. The qualities of this unity are not emotional, practical or intellectual because these qualities only give a difference that which reflection can alter (Dewey, 1958). Essential components for an indoor space atmosphere include interior atmospheric factors (Pan, Su, & Chiang, 2008). Turley & Milliman, (2000) asserted that general interior variables are comprised of flooring and carpeting, color schemes, lighting, music, scents, width of aisles, wall composition, paint and wallpaper, ceiling composition, merchandise, temperature, and cleanliness. Turely and Milliman (2000) adapted music, scent, lighting and color for study.

2.4.2 Interior Atmosphere Components

"Atmosphere" as a terminology is prevalent within the study of meteorology and it denotes the earth's envelope of air. From the 18th century, moods roaming 'in the air'

were described by using atmosphere as a metaphor – denoting an emotional feel of interior space. The atmosphere represents a quality of architecture (Schular & Namioka, 1993). In his essay titled 'Atmosphere as the Subject Matter of Architecture' (2005), the German philosopher Gernot Bohme declared that "…we must be physically present" to experience 'mood' of a space in its entirety. This is a personal matter to him. This part of the study discusses wall, floor, ceiling, stair-case, openings, furniture and accessories (Benedito, 2013).

- **Wall**

The most effective vertical planes are represented by the wall. They are a primary element which define interior space in its entirety and distinguishes it from another space visually and physically. Mirror units are suspended on the wall backgrounds at the exhibition centers to suitably display goods being exhibited and walls also serve as a design form background for the type of goods to be exhibited. Two types of structural walls exist:

a. Bearing walls, in support of other planes which define space they represent a fundamental element in such regards.
b. Non-bearing walls like partitions, the fixed, and the moveable kinds. By limiting interior spaces they offer freedom of usage. They may consist of different forms and are also highly flexible for changes. Some walls which are more dynamic and visually active are curved and with their curvatures they could lead our vision (Ching F. D., Interior Design, 1987).

- **Floor**

Floors represent elements from which other elements are constructed and are the prime element in the construction of interior spaces (Abercrombie, 2018). Since they are considered to be flat planes which are horizontal from which mobility takes place, they represent events of stages from which a variety of activities and events take place. With the emergence of heavy tools and machineries of technology, floors which are static and moveable should be constructed to a safe standard to be able to constantly withstand all type weight exerted on them. (Ching & Binggeli, 2004). Through technological advances, manufacturing glass plates which will be used on the floors and are strong enough to withstand heavy weights is achievable, and this will create an assortment of 22 transparencies rooted in the flat surface of the space. Different types of hidden lighting can be installed through this glass plates which will be able to reflect visual lightweight on the floor masses in order to increase transparency. The structure of floor should withstand high dead loads which are exerted by the equipment, together with heavier loads from:

• Users

• Accidental point load impact (e.g., dropping of free weights)

• Dynamic effects (harmonic vibration from users on machines) Reference to British Standard BS 6399: Part 1 is essential.

- **Ceiling**

Ceilings determine the interior space height and scale effect and are horizontal elements which lay parallel to the floors (Abercrombie, 2018). They possess a critical function of defining aspects of the interior space together with its vertical dimension. They play a very important role in interior space. The spatial limits of adjacent spaces

can be identified by variations in the ceiling height (Ching F. D., 1987). Variations of psychological and mental impressions can be stimulated by ceiling transparency manipulations. Some form of transparency can be achieved by utilizing skylights via the transparency glass at roof level from which the size of the space will be enlarged. Two structural types of ceilings exist:

A. the interior space is covered by the structural ceiling which is the main element. It is directly related to building materials and therefore it is part of the building system of the structure of the building.

B. the secondary roof makes up the non-Structural ceiling. It can either be in a repetitive form or echoes differently towards the interior space aspects (Ching F. D., 1987).

- **Staircases**

These provide vertical passages between various floor levels. The two structural types include: Structural elements staircases and escalators which coincide with the constructional system of the building. No constructional elements staircases which the designer adds to the space post the construction phase (Abercrombie, 2018). Different points of view are reflected by vertical transition operations since they bring forth the surrounding interior perception. Different types of images appear to the eyes when ascending while other images disappear, and a change in the relationship between those occupying the space when emerging images demand attention will result, and all this will have an outlook of a theatrical feature. Designers sometimes pay less attention on the theatrical feature point of view when they want to design a simpler looking staircase, operational and does not demand attention (Abercrombie, 1991).

- **Openings**

Openings can be characterized by windows, gates, and shop facades which connect the inside to the outside. They take part and parcel of transitional elements which open up surfaces of the wall and give form to the interior spaces as well as a definition to its properties with more regards paid to how they relate with adjacent spaces with which they visually and physically connect with. In a commercial space, apertures which open vertical constructs are a source that creates transparency because they are mostly visually active (Ching & Binggeli, 2004).

- **Furniture and accessories**

These elements are comprised of furniture and aesthetics, and fall under the same umbrella of interior spaces designs which provide spaces with rich content in texture and vision (Myers, 2008). These elements are differentiated in accordance with the style of goods relevant within a specific marketplace and make up a group of elements which belong to the interior design field. They make up the most important elements which link man with interior space and also add elegance of vision, texture and furniture to the space. (Myers, 2008).

2.4.3 Ambiance Factors

According to Kotler, the atmosphere can be technically defined as “the air surrounding a sphere”. The terminology is also used conversationally to describe the quality of an environment (Kotler, 1973). This gives the impression that it permeates an individual because the elements of an environment are comprised of ambiance and atmosphere. Any individual can make a contribution towards ambiance but this can only be achieved with other additional factors combined. The ambiance in simpler words is an interaction that takes place between individuals and the environment. It is relevant to

make a differentiation between atmosphere and ambiance and servicescape in the context of service delivery (Bitner, 2000). The outcome of human and environment interaction is called ambiance whereas servicescape represents a physical environment that accommodates service delivery. The main important fact is that ambiance can be experienced and discerned. Additionally, the ambiance phenomenon is intangible and vague and people may have different opinions of it. The background conditions in the environment including color, texture, material, light, temperature, music, noise, and smell are atmospheric factors.

- **Color**

The result of a certain quality which is recognized by the eye and interpreted by the brain represents the color. A color cannot be seen if it is not present in light (Matusiak, 2004). For instance, the red wavelengths of light reflected from an apple are emitted by the light. Thus, light and color coincide, and the design of health and fitness facilities should resemble similar attention to detail towards their psychological, physiological, visual, aesthetical and technical aspects. The experienced spaciousness of the room is increased by light or cool denature colors Figure 33. The reason is light-colored surfaces enlarge the perception of space by diffusing the distribution of light. The cooler of light colors makes it seem is further away by receding. (Matusiak, 2004) Made an observation that by using a light color the impression of the dimension of the room is manipulated. Changing the color of the walls, floor and ceiling will make it seem a small room looks bigger. The perceived height of the room looks elevated when the ceiling is light-colored. It consists of three properties namely hue, intensity and property (Oberfeld, Hecht, & Gamer, 1999-2011). Hue can be a name of color like blue. Intensity represents the clarity or strength of the color like vibrant, dull or

grayed. The value represents the main property in colors, like how dark or light it is. How big a room look is impacted by the color of the room. The perception of space is impacted by the intensity and value of the color. Oberfeld, Hecht, and Gamer (1999-2011) stated that the brightness or lightness effects of the interior services of a room can be regularly applied and using color to change the perceived dimensions of spaces can become profuse. The way people perceive the size and shape of a certain room can be manipulated by color. A great deal of research has been carried out to investigate the use of color in interior design; and to make a space appear bigger color and light are frequently used both hand in hand. A study carried out analyzed and compared color emotions emoted by people in accordance with luminance and wall color within a full scale test room in the absence of light. According to the revelation of the study, the wall emitted the colors light yellow and light blue respectively, and when taken into comparison, the light yellow wall resemble a positive emotion and are much more stimulating (Manav, KUTLU, & KÜÇÜKDOĞU, 2010). Therefore, since color can influence the manner in which people perceive a room, in this instance color has direct impact on people's emotions when they're occupying a room. For instance light colors when compared to darker colors make a room have an expanded look. Re-translated this means rooms with adequate lighting, whether its emitted from lamps or overhead lamp fixtures or perhaps large windows which consequently allow large amounts of light to be reflected within a room can influence the appearance of a room to look bigger. The perception of space is determined and affected by different natural colors. Lighter colors such as white and yellow makes the appearance of a room look bigger than they actually are because lighter colors have a receding effect tendency. Consequently, darker colors shrink the size of the room Figure 32. Therefore, we can now conclude that the perception of a room's space is affected by different natural

colors. In order to create a desired effect we can manipulate natural colors Figure 34. They can be used to either create a receding or advancing effect (Matusiak, 2004, p. 115).

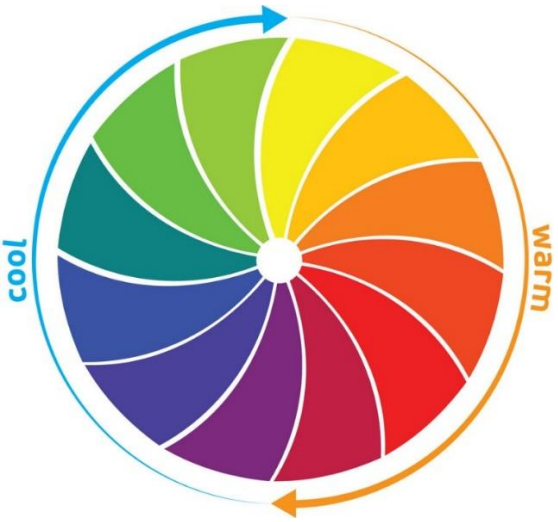


Figure 32: Warm, Cool Color Wheel (URL 22)

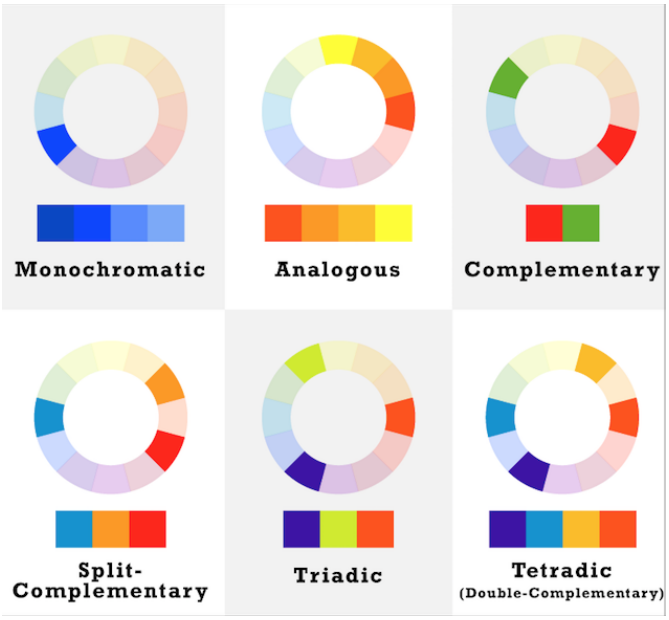


Figure 33: Color Harmony (URL 23)

Figure 34: RGB and CMYK Color (URL 24)

- **Texture**

The tactile surface on an object or finish is texture. Although texture is sometimes ignored, it can bring an exclusive dimension on a space. In order to also give texture a subtle sense of depth, an interior designer mixes textures within a space just as similar as mixing pattern and color. It can either become glossy, coarse or smooth. Texture has the ability of adding interest and detail on furniture, accessories and fabric to make it visually pleasing to the eye. It also gives a feel to the room. Texture exists in either visual texture or actual texture (Pile, 1979). Visual texture can be perceived by the eye. Only through viewing an object you can detect or perceive this type of texture. Only in the form of a pattern does this effect exist. Tactile textures or actuals have a 3D characteristic and can either be seen or felt. For instance in order to appreciate a fluffy colorful cushion you can either touch it or view it. Good interior designers have the ability to foretell whether something missing in a room could be because of lack of texture. It is very important to manage texture with careful consideration because it plays a very important role on every object selected for a room. Any object placed beside texture always adds emphasis and contrast to the finished design (Horn, 1974).

- **Material**

Peter Zumthor's work shows a clear psychological impact. To engage the mind in an awful manner and create a mental impact, he used a multiplicity of textures, materials and interests in his designs of Therme Vals. Zumthor got ahold of beauty through the simplicity of material which became the major form determinants together with environment over which a function became other determinants (Zumthor & Galbraith, 2006). He celebrated the idea that material may formulate the idea in its own accord. The design now moved forward utilizing a gray-blue stone originating from the region going by the name Valser Quartzite, which was located by the mountainside and was layered to form a monolithic structure. The overall sense of an environment is influenced by materiality. Amongst other things materials can affect the sound environment, circulate movement, increase /decrease comfort, and perform many other actions. Therefore, the powers of a form's placement will be determined by the material that which the form becomes part of (Zumthor, 2006). The design will also be affected by the associated dimensions of the material. For instance, the concept of natural environments can associate with materials like wood because it retains heat and it's also soft and comforting. Another material which can associate with natural environments is sand because it is soft to touch and gentle on feet and this portrays a therapeutic value to it. Another material which however has a disadvantage to it is the stone because it is hard on the feet but is cool and hard to touch. The quality of the materials will resemble the vision of the space when the materials are integrated into the program and this will advance into a unique dimension in the healing environment. To evoke specific responses in order to stimulate the mind and its perceptual visioning of space, other elements, not usually referred to as materials, like light, sky, water, and vegetation will be manipulated with the built environment (Zumthor & Galbraith,

2006). The overall sense of the environment is directly influenced by materiality. The inherent ability of materials can affect the sound environment, circulate movement, increase /decrease comfort, and perform other actions (Kaplan, Kaplan, & Ryan, 1998). The powers of the material's placement are determined by the form in which the material becomes a part of. The design is also affected by the associated dimensions of the material. For instance, the concept of natural environments can associate with materials like wood because it retains heat and it's also soft and comforting. The quality of the materials will resemble the vision of the space when the materials are integrated into the program and this will advance into a unique dimension in the healing environment. To evoke specific responses in order to stimulate the mind and its perceptual visioning of space, other elements, not usually referred to as materials, like light, sky, water, and vegetation will be manipulated with the built environment. The spaces which integrate all the senses include taste, smell, hearing and touch. An occupant can draw their own conclusion when they are aware of these physical things in space and their properties. Becoming conscious of one's thoughts begins the healing process in one's mind (Kaplan, Kaplan, & Ryan, 1998).

- **Light**

A critical aspect to any space is natural or man-made light. All of the other elements would not be able to function at their best capability without it. Light can be dividing into the following categories: task lighting (defined purpose), accent lighting (emphasizing objects), and mood lighting (adding ambiance). It's important to address activities which will be undertaken in space when making light considerations. Quantity and quality should be assessed in a direct approach. For instance, for workers to see clearly, an office will require bright lighting. On a lighter note we can use a

softer touch to apply the living room lighting (Dobashi, et al., 1994). To make a space much more versatile you can apply a dimmer. Cleverly placing doors, windows, and mirrors can assist in manipulating natural light when taken into consideration. Light can simultaneously define color, line and texture and also set the mood and atmosphere of a space. Any good interior designer understands that lighting fixtures are instantly visual features and can add the right compliment to any design (Robert, 2014). When the eyes and the skin make up two pathways for lights biologic effect. Vitamin D produced by the body intimately relates to the skin. The systemic physiologic response and mood can both be affected by visible light (Zilber, 1993). There are significant differences between natural and artificial light which amongst many include levels of luminance uniformity, and diffusion of the light, variation of time, color, and amount of ultraviolet radiation (Zilber, 1993). A number of in-depth studies have investigated the importance of sunlight towards healing. According to the studies, a user who has sustained an injury recovered faster when exposed to bright light (Beauchemin & Hays, 1996). The poorly designed light or maintained indoor lighting resulting in glare and flicker is documented because of its resultant negative impact on the body. These negative impact include vision problems, eye fatigue, headaches, and loss of concentration especially when doing some physical activity (Arneil & Frasca-Beaulieu, 2003).

- **Temperature**

The most important role played by thermal comfort is to set the room temperature to become optimum. Thermal control directly relates with the state of feel an individual is experiencing. Factors which affect the normal space temperature include environmental factors such as air humidity and the sources of heat affecting the

ambient space temperature, and personal factors such as the clothing on a human body (Woodson & Tillman, 1981). A huge role is also played by humidity. The level of moisture in the air changes together with optimum space temperature and at lower temperatures users occupying a space with high humidity feel comfortable. So this means when the room temperature is high, humidity will be low. According to research, spaces which are warmer make it almost impossible to fully concentrate. Accordingly, the environments as well as the financial side of things are negatively impacted when the heat goes above normal space temperature. The recommended room temperature should in the range of 20 – 22 degrees Celsius whilst other rooms are kept at a minimal warmer temperature. The table below shows the effect of various temperatures on human space listed in Table 1 (Woodson & Tillman, 1981).

Table 1: Temperature Effects (Woodson & Tillman, 1981)

Temperature	Effects
32	The upper limit for continued occupancy over any reasonable period of time.
26-32	Expect universal complaints, serious mental and psychomotor performance decrement, and physical fatigue.
26	80Maximum for acceptable performance even of limited work; work output reduced as much as 40 to 50%; most people experience nasal dryness.
25	The regular decrement in psychomotor performance; individuals experience difficulty falling asleep and remaining asleep; optimum for bathing or showering.
23.5	Clothed subjects experience physical fatigue, become lethargic and sleepy, and feel warm; unclothed subjects consider this temperature optimum without some type of protective cover.
22	Preferred for year-round sedentary activity while subjects are wearing light clothing.
21	Midpoint for summer comfort; optimum for demanding visual-motor tasks.
20	Midpoint for winter comfort (heavier clothing) and moderate activity, but the slight deterioration in kinesthetic response; people begin to feel cool indoors while performing sedentary activities.

18	Midpoint for winter comfort (very heavy clothing) while subjects are performing heavy work or vigorous physical exercise.
17.5	A lower limit for acceptable motor coordination; shivering occurs if individuals are not extremely active.
15.5	Hand and finger dexterity deteriorates, limb stiffness begins to occur, and shivering is positive.
12.5	Hand dexterity is reduced by 50%, strength is materially decreased, and there is considerable (probably uncontrolled) shivering.
10	Extreme stiffness; strength application accompanied by some pain; the lower limit for unprotected exposure for more than a few minutes.

- **Music**

People occupying a space can act according to the mood or ambiance provided by the room space (Shedroff, 2001). Occupants can show activeness if the music played in a space is active and energetic (Shedroff, 2001). The emotion translated by music is the same emotion reflected on the architectural entities and building and stylish arts (Mohamed, 2018).

- **Smell**

According to experts, pleasant aromas are capable of reducing blood pressures, lower the respiration, and also lower the levels of perception. Research has concluded that fragrance users show signs of lowered stress levels when they smell moderate to extremely pleasant smelling fragrances. It has also concluded that anxiety, fear and stress are stimulated by negative smells (Redd, Manne, Peters, Jacobsen, & Schmidt, 1994). Our moods, work performance and behaviors are affected by different types of odors because we interact with these odors according to how we have experienced them in the past. An observable behavior can be obtained from how a certain mood can easily influence the thought process. According to an expanding vessel of

literature, productivity, performance and assisting others is directly linked to positive mood and prosocial behavior is directly linked to negative mood. Pleasant ambient odors could also enhance either prosocial behavior or productivity. For instance, people became more helpful to strangers after perceiving the smell of baking cookies or roasting coffee than when they haven't perceived any pleasant smell. Accordingly, people have reported higher self-efficacy, set higher goals and were likely to strategize more reasonably when they work in the presence of a fresh smelling air freshener than people who are working in a non-odor environment (Holloway, 1999).

2.5 Well-Being in Interior Atmosphere

Satisfying the objective assessment of the external conditions of the degree to which a high quality life can be had is known as Objective Well-being (OWB) (Costanza, Fisher, Ali, & Beer, 2007). OWB is directly referred to the relation between objective, physical and external conditions of the designed environment when its focus is shed on architecture as well as interior architecture. Within the field of OWB in the last few decades, researchers from different subdomains investigated ways in which identifying and fulfilling objective parameters could contribute towards the wellbeing of the people. Best possible acoustics, isolation, heating, and cooling facilities are for instance the main topics of interest. Universal design is also worth mentioning in this line. In the initial conceptualization of universal design, it was defined as a method of design which includes products and buildings features which to a greater stretch can be accessed by everyone (Ostroff, 2001). Designers needed to focus and therefore it was defined as a barrier-free design. In order to allow environments to remain accessible to everyone universal design in its original conception focused on physical obstructions. Meanwhile, attention has shifted to a more human perspective in the European interpretation of this stream of literature. How people experience

environments (interior) is a current key question within interior architecture (Seamon, 2014). This question can be extrapolated further by taking the approach of linking interior architecture to research with the focus on human happiness. Focusing on the cognitive and affective evaluations of an individual's life is imperative. Amongst others, these evaluations should include cognitive judgments of fulfillment and satisfaction as well as emotional reactions to events. Experiencing high levels of pleasant emotions and moods, low levels of negative emotions and moods, and high life satisfaction make up some of the qualities of the broad concept of the Subjectivity of Well-being (SWB) (Stock, Okun, & Benin, 1986). Happiness in an environment is not a consequence of a comfortable architecturally sound building or fulfilling a list of conditional objectives. It is the ability to interact freely with an environment. Abercrombie (1990, p. 3): in his book titled 'A philosophy of interior designs declared "… Interiors have a power over us that façades can never have. This is not due to the commonly observed fact that we spend most of our time indoors; it is due instead to the fact that interiors surround us. We do not merely pass them on the street; we inhabit them. When we enter a building, we cease being merely its observer; we become its content. We never fully know a building until we enter it." From an inhabitant's viewpoint, the words "interior surrounding us" in the citation sound rather passive, as if there's no role to play by the person. However, Abercrombie seems to be calling for a more people oriented approach within interior architecture when he indicated that "… become its content".

It seems to be a promising approach for The Positive Design framework that was recently developed by (Desmet & Pohlmeyer, 2013) to be considered in further detail for interior architecture. The framework will be outlined in the following. Additionally, it is illustrated by a master project example in interior architecture

(Petermans & Pohlmeyer, 2014) how an interior architecture can design for SWB using insights. The Figure 35 below shows three steps required for a positive design and includes design for pleasure, design for virtue, and design for personal significance.

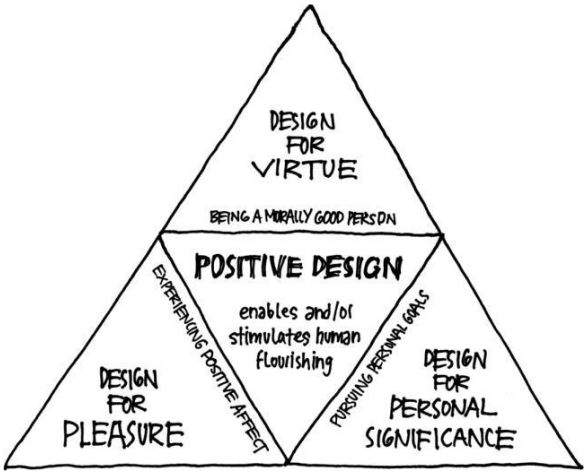


Figure 35: Positive Design Framework (Desmet & Pohlmeyer, 2013, p. 7)

2.6 Psychology Effect on User

“The mental and psychological effects of architectural frames on human beings have been considered from the early shelters to today´s modern structure. Since human behavior is performed in defined spaces, it is necessary to design the physical space based on people’s behavioral characteristics" (Einifar & Tabaeian, 2011). The designs of interior architecture through various aspects affect the psychological attitude of a human. We receive, perceive and respond differently. This is because of our dissimilarities physically and psychologically together with personal experience differences. Factors of concern that shape an individual’s need include culture, physical status, age, education level, gender, socioeconomic class, and ambitions. The humanitarian characteristics as well as the the interior architecture approach of design engages the interaction between interior architecture and the psychological condition. How designers can manipulate a certain space to achieve a certain feeling or perception from those occupying it can be achieved within the context of interior design,

philosophy and psychology of the perception of space. Jaglarz asserted that "Proper planning, interior elements, furniture, and mirror placement can correct every space, while color and lighting considerations can be used to emphasize space or place" (Jaglarz, 2011). The tools used by interior designers create visual illusions which change the manner in which individuals perceive space in accordance with the manner in which the designer likes it to be perceived. People who will make use and live in a specific room are strongly linked to the role of perception of space in interior design. Form, color, light and the organization of interior elements such as furniture, lights and mirrors are materials used by interior designers to manipulate the perception of space. In order to make the room seem bigger, the furnishing in the room can be used. In order for the room not to appear cluttered or overly crowded, interior designers ensure that the furniture and other fixtures within a room are proportional to the room. Interior designer may also additionally use design elements such as mirrors in order to reflect light to expand the size of the room or accentuate interior details. How a space is seen is also determined by culture together with these psychological factors. Annett Zinsmeister confessed that, "Culturally shaped perception models change our understanding of space, our relationship to space and our use of space". Jonathan Crary, another interior designer, asserted that "human perception is based on a culturally significant range of expertise that is changing over time and has become controlled since the invention of optical devices in the nineteenth century" (Perrem & Mlecek, 2015). Since culture shapes an individual's value and what type of design elements are appealing to them, it makes sense that an individual's perception of space could be influenced by their culture. Therefore, interior designers' aesthetics need to also include their cultural values. Different cultures will therefore view spaciousness differently; what is considered meager in one culture might be considered sufficient in

another and vice versa. The manner in which a room appears influences interior designers to apply techniques which will maximize space, and therefore this makes the concept of space very essential in interior design. The usage of optical illusions such as color, light and strategic placement of furniture could make a room appear bigger and this in a bigger picture equals the usage of psychology of perception. Since colors are used by interior designers to enhance the space, they form an important quality in the perception of spaciousness. A certain quality of light recognized by the eyes and interpreted by the brain causes a sensation called color, and color does not form part of a property of surfaces, spaces and objects. Therefore, an approach of defining or describing color should not exclude light (Oberfeld, Hecht, & Gamer, 1999-2011).

Chapter 3

FITNESS CENTER

In this chapter, the meaning of the fitness center is explained. Later, the main sports activity and sub sports activity are mentioned. Followed by Interior atmosphere component, plan and function organization, and the ambiance factors in fitness centers.

3.1 Definition of Fitness Center

Since 1985 terminologies such as activity, fitness, and training were frequently interchanged so much in a mixed way that they even substituted each other (Caspersen, Powell, & Christenson, 1985). Activities which represented fitness began increasing rapidly within the last decade. To stay fit and healthy, people started doing aerobics, step aerobics, jogging and then bodybuilding. The category of fitness expanded furthermore with the introduction of Zumba, cross-fit, yoga and pilates (Paoli & Bianco, 2015). All the terms were given to some form of exercise or working out the program were generic thesis terminologies and this is because it had become a psychological process that changed the real meaning of every terminology in the user's head (Paoli, Moro, & Bianco, Lift weights to fight overweight, 2015)**.** Fitness, amongst many other definitions, is defined as using strength to have the ability to do work and the demonstration of traits and capacities associated with a low risk of development of hypokinetic disease (e.g., those associated with physical inactivity) (Wilder, Greene, Winters, & Long, 2006). Talking about fitness in a multidimensional state of existence warrants, the inclusion of elements such as the state of wellness and wellbeing, whilst the existence of positive health within the term translates to the quality of life as well

as the sense of well-being (Baranowski, 1981). It has been proven by research that physical training lowers the chances of contracting illnesses and early death (Baranowski, 1981). Fitness additionally improves the mental capabilities of an individual engaging in it. Sassatelli denoted and delivered keynotes about the history of fitness center and the possibility of reconnecting with ancient Greece (Sassatelli, The commercialization of discipline: keep-fit culture and its values., 2000)**.** The progress of modernity and development of the nation-state are directly linked to the fitness center (Green H. , 1986). In modern Scandinavia, health ideals, as well as body ideals, have inspired the concoction of the term fitness center together with its main subcategories namely physical and fitness (Steen-Johnsen & Kirkegaard, 2010)**.**

3.2 History of Fitness Centers

Gyms and Fitness centers are considered to be an invention that is recent. It all began in the 1970s with simple workout programs such as jogging and jazzercise (Kunitz, 2016). In the olden days, people were not aware of physical workout routines, all they ever did was engage in their daily physical work and activities in the absence of weights, machines and open spaces. In 1420, physical activity turned out to be their workout regimen (Kaplan, Lazarus, Cohen, & Leu, 1991). The agricultural revolution became the order of life in the dawn of human civilization between 10,000 and 8,000 BC. Since men had to fend for themselves by hunting, farming and gathering, his body shape changed towards accommodating his daily endeavors (Andreasson & Johansson, 2014). Actions of running and jumping became what they had to engage for their own survival. Post the collapse of the Roman Empire beyond the year 476 AD, Assyrians, Babylonians, Persians, Greeks and Romans began training their boys for battles by instilling strength and endurance in their physique (Andreasson & Johansson, 2014). The same natural hunting techniques used by cavemen were used

by the ancient military as their training techniques (Charlesworth & Nathan, 2004). Civilized populations, however, valued and adorned the culture of physical activeness and therefore considered it a sport for staying/being well. For instance, the ancient Egyptians and Greeks held the very first Olympic game competitions (Lee, 1998). The Greeks then followed by the Romans developed a culture of sending their men away into the military and sports camps to learn about physical activity and considered body endurance and strength a philosophical idea that needs to be celebrated (Lee, 1998). The Renaissance era that unfolded between 1400 and 1600 BC had people develop a huge body fascination which led them to develop and explore anatomy, biology and physical education (Aufderheide, 2003). At the school of Vittorion de Feltre in 1420, physical activity was given priority. A man by the name of Spaniard Christobal Mendez published a book titled El Libro del Ejercicio Corporal y Sus Provechos which became the very first book at the time to discuss physical exercise and its benefits (Sánchez-Martín, et al., 2014). The book gave thorough explanations, descriptions and classifications regarding different types of sports, exercises and games. Some parts of the book express medical views regarding physical activity (Sánchez-Martín, et al., 2014). Mercurialis, an Italian physician published a book titled De Arte Gymnastics which entailed studies of medical literature, diet, and exercise of the Greeks and Romans in 1569. This was the first book to propound on physical therapy in physical education and ultimately the first book to explore physical education from a medicinal point of view (Pletier, 2007). After two centuries, these techniques and exercises were conveyed to Europe. The business sector decided to delve into this growing wave of fitness centers and gyms to find ways to capitalize on it. Because of this move, the business sector has propagated a vast amount of fitness centers and gyms since the beginning of the 1970s. This growing wave can be traced back from

its roots in the 19th century in the European Turnhalle (gymnasium) and also from physical workout programs developed by Friedrich Ludwig (Honzová, 2017). An enthrallment in muscles was also found to be ludicrous. Circus performances in the 1900s circuses consisted of exhumes and sometimes bodybuilders especially in the USA (Kimmel, 2005). In the late 19th century, the provisions of unique methods meant to develop strong, muscular and masculine bodies were found in the USA. The physical exercise wave propagated by the west phenomenon influenced countries around the globe to indulge into the physical fitness culture and begin by seeking for physical education. Tapping into the German, Swedish and Danish gymnastic techniques has inspired experts all over the world to offer healthful exercise routines. This inspiration arose when a concern was raised about physical male bodies not being well and physically capable. In the beginning of the 1900s in Germany, Italy and the Soviet Union, aristocracy as well as the workers began raising concerns about the physical culture (Grant, 2012). In the 1980s, femininity was still linked to fitness and working out was seen to be appropriate when carried out by housewives (Connell, 1995). Fitness was seen to correspond with child care and work and was fully supported by Jane Fonda. Her videos mainly targeted housewives because the notion that exercise can be carried out at home in front of the TV appealed to them (Mansfield, 2011). There was a huge observable absence of black women at the fitness classes (Lau, 2011). At the beginning of the 1990s things changed and workout and fitness classes accommodated a larger part of the population covering all races. Jane Fonda inspired a Swedish maiden by the name of Susanne Lanefelt, and she developed her own Swedish TV workout program (Andreasson & Johansson, 2014). In the first two decades of the 21st century, people became overly fascinated about going to the gym and the fitness franchise starting making huge amounts in turnover revenue. People

used the term workout in the 1980s, and then aerobics in the 1990s and today fitness is used when people refer to fitness gym and different methods of working out applied at the gym (Jeffords, 1994). In the 1990s in Sweden, a variety of physical activity techniques were grouped together when a switch was initiated of classic training with body builder gyms and weights to fitness gyms with multidimensional uses (Spielvogel, 2003). A typical fitness gym in Sweden in the 1990s consisted of a large room and training server machines, cardio room and two studios consisting of group activities. The global industrial development of the late 1990s brought different fitness methods within different countries (Klein, 1993). In the 1990s, many fitness centers were arranged in such a way that one section of the gym for men consisted of high weights and machines and another section is meant for women (Klein, 1993). The section for women eventually got developed as they began engaging in strength workout routines. It had become an imminent need to utilize high weights, machines and barbells because there weren't enough weights to develop and train the body. Fitness gyms started opening doors in different countries and began fully accommodating women (Luciano, 2001). Aerobics became widespread in Japan in the 1980s and 1990s because Japanese feared many health conditions over their population (Spielvogel, 2003). According to the released data of the time, Japanese people hardly exercised or moved towards a culture of physical activity. Fitness centers began opening doors in Japan in the dawn of the 1990s (Spielvogel, 2003). Cooper wrote a book about Aerobics which sought to promote fitness in Japan. The Japanese had their own approach of physical fitness even though the fitness culture in America was the main promoter of fitness all over the world (Andrews D. L., 2008). The ordinary Japanese perceived fitness centers as spaces of leisure whereas the richest Japanese perceived them as relaxation spaces. Although the main purpose of these fitness

centers was to provide a space for physical activity, Japanese used them for entertainment, massages and relaxation (Crossley, 2006). The middle class population used these private fitness centers as a relaxation space for a variety of lifestyle preferences. Fitness centers acquired a new meaning which now then translated to everything luxury (Andrews D. L., 2008). The wave of fitness and gym culture expanded on a global scale between the 1980s and 1990s. For instance, bodybuilder fanatics were the only users of the fitness centers in the beginning of the 1980s in Sweden and in 1991, over 200 fitness centers opened doors and over 200,000 people were regularly using these centers (Sassatelli, 2000).

3.3 Sports Activity in Fitness Centers.

To assume that every fitness center and gym was designed to fairly accommodate everyone is fallacy. The upside of this projection is that users have a room of options to choose from in terms of selecting a center which provides more than one access to the machines, weights or space. Centers now create workout programs as a way to shed more focus on their clients in order to improve their wellness and lifestyle. Different forms of fitness centers exist today and a careful examination of center atmosphere, location, price, and fitness goal should be exercised thoughtfully (Afthinos, Theodorakis, & Nassis, 2005). Fitness centers should appeal to one's activities or exercise preference. All Fitness centers fit into two categories, namely main function and sub function; every function entail space requirement that is different as well as different activities.

3.3.1 Main Sport Activity

- **Gym**

A hall location which offers services such as gymnastics and athletics is called a gym or a gymnasium (Chaline, 2015). The word comes from an ancient Greek word called

gymna-sium (Kennard, 1994). In educational institutions, gymnasiums represent an activity and learning space which is found in athletic and fitness centers. A Slang for fitness center is “Gym” and this represents an indoor recreation area (Chaline, 2015). Weight lifting and strength training is the main focus of Gyms. Gyms typically provide an extended set of free weights, dumbbells, and weight machines which are purposed for intense exercise, strengthen and develop muscles (Chaline, 2015). The primary focus of gyms is to provide weight training, although many gyms may sometimes offer cardiovascular equipment or aerobic classes (Kennard, 1994). Individuals who are only interested in weight lifting and strength training are best suited for a gym because members of the gym are mostly focused on weight lifting and strength training. In comparing other fitness centers to the gym, it is apparent that gyms attract more male members than female (Johnston, 1998). Therefore, it is always a good idea to contemplate the most relevant environment suitable for one’s needs.

Figure 36: Gym Silhouette (URL 25)

- **Fitness Space**

An area or place encompassing exercise equipment for physical exercise is referred to as a health center (also known as fitness club, fitness center, health spa, and commonly referred to as a gym) (Caspersen, Powell, & Christenson, 1985). The main focus of

fitness centers is to incorporate different workout facilities into a single space (Caspersen, Powell, & Christenson, 1985). Most fitness gyms, for instance, offer the following within their facilities: a free weight area (gym), weight machines (gym), cardiovascular equipment (aerobic and gym), aerobic classes (aerobic), yoga classes (yoga), swimming pool, Jacuzzis, saunas, tanning beds, and child daycare centers (Caspersen, Powell, & Christenson, 1985). Other fitness centers, however, do not provide all the above listed amenities while others do. Since fitness centers provide an assortment of health, fitness and exercise options they attract a diverse variety of potential members (Sassatelli, 2007). The will be a widened and balanced ratio of men to women, young to old, and thin to heavy. This type of space functions in an orderly way across a higher proportion of the population and provides a high level of comfort. All fitness centers have taken a stance of employing personal trainers within their facilities (Sassatelli, 2007). The main role of personal trainers is to discuss nutritional aspects associated with good health or weight loss and how to use gym equipment. Build fitness routines and help members manage their fitness goals. Personal trainers need to be fully qualified to execute their duty. Some trainers have an intermediate knowledge of health and fitness. Some trainers hold university qualifications and other third-party qualifications whilst others have fully completed courses offered by the fitness facility (Möller, et al., 2012).

Figure 37: Fitness Silhouette (URL 26)

3.3.2 Sub Sports Activity

Different shape of physical activities have been found in fitness centers beside gym and fitness activities (Pollock, 1978). Aerobic, yoga, dance, pilates, cross-training and other activites used to create a unique indoor space in the fitness centers (Pollock, 1978). Other sub activities like trx and kick boxing classes found to be use a separated spaces which might not be found in fitness center spaces. (Peterson & Tharrett, 1997). According to (Crossley, 2006) the following activities could use separated areas or studios in fitness center to be practiced:

- **Aerobic**

Aerobics is a form of physical activity and exercise which combines strength exercise and stretching to improve flexibility. Two different types and levels of aerobics complexity and strength exist today (FitnessHealth101, 2018)**.** Thus, it is necessary to create two different spaces within the fitness center in accordance with the available number of users. The following spaces are required to achieve an aerobics class which is well balanced: an area to warm-up between 5 to 10 minutes, a space to cool down for 5-8 minutes, stretch and flexibility space for 5-8 minutes, Cardio space 20-30 minutes, and muscular strength for 10-15 minutes. Since this session usually incorporates some form of cardiovascular action, a necessity for cardio equipment such

as bikes, stair climbers, and treadmills is imminent (Vyas-Doorgapersad & Surujlal, 2016).

Figure 38: Aerobic Exercises (URL 27)

- **Yoga**

Yoga is a form of exercise which positions the body a certain way to allow body relaxation and instigate controlled breathing and calmness of the mind. All studios which facilitate yoga are required to be isolated and maintain a perfect acoustic soundproofing because yoga requires an overly silent space (Luck & Krikke, 2017)**.** According to Ansari's research (1999), it is required that yoga classes maintain a unique lighting system as well as privacy space which are at low levels when compared to other exercise classes (Lockwood & Ansari, 1999). Using curtains to cover all the glazing openings seem to render a better outcome. Yoga is a form of exercise which caters for the physical as well as the mental dimensions. A clean air, well ventilated space is required for the practice of yoga because it involves breathing techniques that coincide with the stretches (Pollock, 1978)**.** Appropriate yoga seating positions can either include a U shape, circle, half-circle or line. Every yoga participant is required to extend 3 – 4 square meters (Bryant, 2015).

Figure 39: Example of Yoga Studio Plan. (URL 28)

Figure 40: Yoga Exercises Example (URL 29)

- **Dance**

The requirement of intensity and speed is necessary to execute different dance moves mixed with aerobics. The advantages of engaging dance exercises include increase in body flexibility and cardiovascular health. Dance studios need to implement wooden floors as a minimum requirement to maintain a suitable interior atmosphere (Franklin, 2004). This is because wooden floors maintain resiliency when landing from different altitudes and this will facilitate easier jumping movements. The floor shouldn't be sticky nor sloppy (Stidder & Griggs, 2013). In the spaces where jazz, ballet or modern dance will be performed, linoleum covering should be used. Eight square meters are required for each user with four to five meters of ceiling height. No columns should be added onto the interior space. Bars should be installed on the walls 90 - 100 cm from the ground, 15 -20 cm away from the mirrors and the walls. Mirrors should be

installed between two attached walls and 15cm away from the floor as shown in Figure 27 (CENTERS, 2005).

Figure 41: Some of the Dance Movements (URL 30)

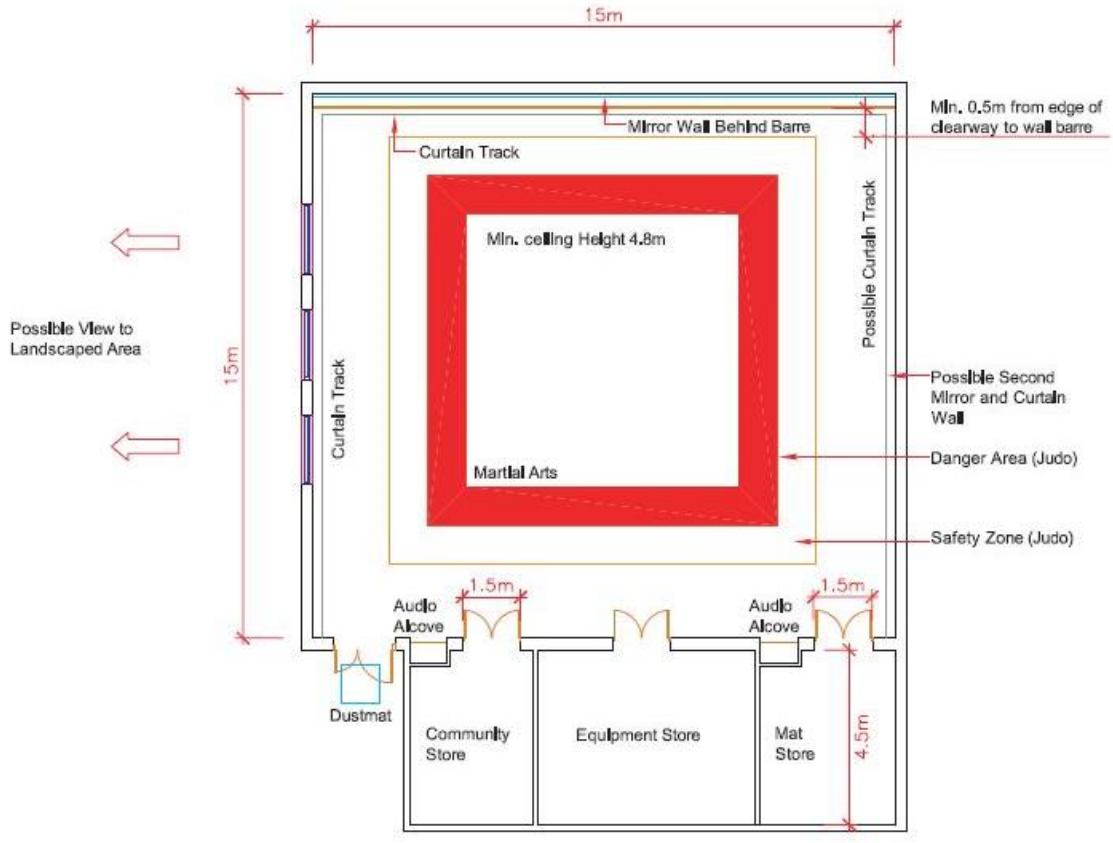


Figure 42: Dance Studio (Stidder, Lines, & Keyworth, 2012)

- **Pilates**

To carry out the pilates exercises, a subtle environment should be considered that facilitates a dimmable light, curtains should entirely block external lights and the floor should be smooth and covered. To facilitate sound and noise proof, acoustic isolation is a basic requirement. Participants will be well accommodated by a mat floor that spans an interior space of 15 x 12m or 15 x 15 (Joubert, 2012).

Figure 43: Pilates Movements Silhouette (URL 31)

- **Cross-Training**

Several different forms of exercise make up the training routine involved in cross training (Marks, Sabella, Shawn, & Zaccaro, 2002). This simply translates to a combination of different forms of exercises by working various body parts. Since cross training routines involves different activities which use up muscles in different ways, it essentially prevents stress that targets a specific muscle group (Kraemer & Ratamess, 2004). In Korea and Saudi Arabia, becoming proficient in every phase of unarmed combat involves the practice of multiple martial arts or fighting systems that make up the concept of cross-training (Green & Svinth, 2010). The shortcomings

associated with one style of combat will be compensated by another style when this type of training is undertaken.

Figure 44: Cross-Training Silhouette (URL 32)

In Table 2, a perif conclusion of fitness center functions needs and type explantion.

Table 2: Needs of Fitness Center Functions.

Type	Explanation of the Type	Sound	Light	Material
Aerobic	Complexity and strength exercise to improve body flexibility.	Sound-proofing wall	Natural light	Padded floor. Robust Wall Slip/Moisture Materials.
Yoga	Exercise is done by controlling breathing in different positions to relax and calm	Acoustic Soundp-roofing wall	Natural light	-Padded floor. -Robust Wall -Slip/Moisture Materials.
Dance	Exercise requires speed and intensity mixed between cardio moves and aerobic	Acoustic Soundp-roofing wall	Natural light Colored arti-ficial light.	-Padded floor. -Robust Wall -Slip/Moisture Materials.
Pilates	Low impact exercise aims to strength the muscles and improve flexibility		-Dimmable - Natural -Artificial	-Padded floor -Mat floor -Slip/Moisture Materials
Cross-Training	Training in many martial arts or styles.		Natural light Artificial light	Slip/Moisture Materials.
Gym	Done in an indoor area, aims at strength gain, and lifting heavyweight.		Natural light Artificial light	Slip/Moisture Materials
Fitness Center	Space could include all the areas and types that have been mentioned above.		Natural light Artificial light	-Slip/Moisture Materials -High dead load resists

3.4 Interior Atmosphere Components of Fitness Center

3.4.1 Wall

The ease of cleaning and maintenance is the key factor in wall finishes (Jones,1989). Wall abrasion caused by moving things around can affect the aesthetics of a wall. Pointed and sharp objects should be moved away from the walls. Any wall fixed exercise equipment, weight storage racks & mirrors should effectively and safely be supported by the wall. Hollow concrete blocks should not be used. In order to minimize the risk of sound transmission to surrounding areas adjacent to the gym, the wall should be designed in such a way that it will effectively reduce sound. To ensure minimum project acoustic performance, a consultation with an engineer should be set up. Wall surfaces which are nonabrasive, flush and protrusion free should be implemented in the activity spaces to diminish chances of impact injuries. To protect people in the walkways and adjacent areas, a perimeter ball-containment barrier should be setup to trap airborne projectiles such as volleyball and basketballs. Protrusion free walls should be intended by the designer to obliterate protrusions such as a railing that protrudes onto a court surface and a storage shelf that extends into the activity area of a group exercise studio which could accidentally make contact with with any person who's engaging in a physical activity routine.

3.4.2 Floor

When vibration or impact is structurally transmitted from the fitness gym towards other areas acoustic isolation may become an issue. In order for floors to be slip, stain, static resistant, and become best suitable for the gym environment, they have to resist deformation through compression (Küller & Wetterberg, 1996). To ensure the equipment could become a trip hazard, the floor finish should differ in color with the equipment. A walkway which is differently colored will positively impact clarity in

the gym for users who are visually impaired. Using a different color for the walkway will also assist in completely hiding the cable instantly solving the safety and appearance issue (trip hazards avoidance). The following need to be given careful consideration:

• In the event of changes in humidity, the proposed floor finishes should be expanded.

• In the event of the consideration of fitness gym layout, the structural engineer should agree with the position of the structural movement joints.

• In order to avoid risk of weights dropped onto the floor and causing significant damage to structure or finishes, the floor structure and floor finish need to be resilient enough to absorb shocks 53% safely. The impact should not permanently deform the finish and it should be able to recover from the shock.

• In order to prevent equipment from rolling back and forth, the floor finish should supply enough floor friction (Küller & Wetterberg, 1996).

• Users of the gym must be well protected from any potential electrostatic charge build up. Changes in floor finish or color emphasize fitness gym zones (Allen, 1990). In relative to development, using carpet flooring must be in careful consideration. In the UK fitness gym equipment areas, carpet flooring is commonly used and the walkways are comprised of a more coarse finish. Carpet is rarely used in the mainland Europe. A reaction to a warmer climate may subject the flooring to:

• Oil and grease leaking from exercise equipment.

• Perspiration shed by fitness gym users.

• Drink spillage.

If the fitness gym is located at the first floor level, the reverberation (echo) and impact sound transfer can be reduced through a gym's acoustic performance which is

improved by carpet flooring (Küller & Wetterberg, 1996). A regime of specialist cleaning will be required if the carpet is selected. Since carpet tiles can individually change the minimal impact, they should be used where possible. Specialized floor finishes may be needed by some individual exercise areas like vinyl-covered padded foam mats within stretch areas; or heavy duty shock rubber matting in areas of free weights. To reduce the risk of trip hazards between finish depths varied floor areas, considerations may be required (dos Santos, Fiuza, Carmona, Avila, & de Carvalho, 2013).

3.4.3 Ceiling

Facilities need to provide ceiling and surfaces which allow moderate to excellent sound absorption in order to assist with the reduction of sound levels within these spaces. The optimum ceiling height should not be lower than 2.7m because this would limit the use of some exercise equipment, and therefore, the ceiling should be between 3.5 – 4m from finished floor level (Harper, 2016). Users may also become claustrophobic because of lower ceiling heights and room odors and room temperature regulation may also become a problem (Küller & Wetterberg, 1996). The appearance and atmosphere of the fitness gym be the result of the ceiling height relative to the floor. The combination of the following can make a ceiling:

- Ceilings which are fully suspended
- Ceilings which are fully suspended comprising of raised feature which gives extra height which is necessary for some particular equipment
- Ceilings formed by the structural soffit above, with or without independent suspended raft features. The Minimum ceiling height for this kind of space between (2.3-2.5 M). Also, acoustic isolation should be considered as a necessary in this spaces.

• Support integrated or hanging fixtures, e.g. loudspeakers, ventilation grilles, general or spotlighting. (dos Santos, Fiuza, Carmona, Avila, & de Carvalho, 2013).

• Minimum clear heights above various activities should be provided. Considerations need to be given to activities which may use the equipment to elevate the user next to the ceiling or the need for the user to swing equipment, in the action of establishing the ceiling height. The studio space is enhanced by the increased headroom and it widens the variety of activities which can be accommodated and also hikes flexibility. The color red when used on the floor evokes a feeling of consciousness, when used on the ceiling it becomes invasive, and when used on the walls it evokes a sense of advancing or aggression. When the color blue is used on the ceiling it evokes an openness and tranquility like the sky, when it is used on the floors it evokes a sense of effortless movement, and when it used on the wall it evokes a sense of coolness and distance (Mahnke, 1996)

3.4.4 Staircases

A feature stair which is located in the foyer/reception may be used by split level clubs which are spread over more than one level. Any facility split requires lifts over one level. The lifts should be easy to locate and signposted from main entrance, therefore they should be strategically placed in order to minimize traveling horizontally. Stairs and lifts should be located next to the reception if mezzanine floor or second flower are available (Andreasson & Johansson, 2014).

3.4.5 Opening

Using windows with tinted and insulated glass can emphasize natural lighting. Direct light sources which mostly produce glare are less preferred and indirect light sources which bounce lights off the walls, floors and ceilings are more preferred. Incandescent lamps are artificial lighting sources which are mostly used but are the least energy

efficient. Energy efficiency which is higher can be produced with fluorescent light fixtures, compact fluorescent bulbs, metal-halide light fixtures, and mercury-vapor light fixtures. The most often used, but the least energy-efficient, artificial lighting sources are incandescent lamps. Greater energy efficiency can be achieved with fluorescent light fixtures. The usage of doors opening up into hallways and circulation paths need to be avoided. Providing appropriate warning signage could assist in reducing any risk conveyed by doors which are mandated by local codes or privacy situations.

3.4.6 Sport Accessories

When fitness center users engage in their own chosen activities, they can utilize fitness accessories which include training equipment such as weight training belts and protective lenses meant to provide safety for the users. The most common accessories in fitness centers include jumping ropes, kettlebells, ab Rollers, resistant bands, running belt, wearable weights, stretch out strap, furniture sliders, foam roller, and balance ball.

3.5 Plan & Function Organization of Fitness Center

All the spaces and different types of exercises are incorporated by the fitness center. Fitness centers are usually comprised of gym areas that provide a variety of free weights and machine weights, bicycles, walking machines as cardiovascular space, sauna, jacuzzis, often a swimming pool, and multi-usable studios (yoga, dance, spinning) (Andreasson & Johansson, 2014). In order for fitness centers to appeal and cater for all the needs of the users, they incorporate various health care facilities and exercise machines (Ulseth & Seippel, 2011). One of the common themes deployed by fitness centers is open plan design. The orientation of the design is to facilitate ease of movement in space with a circulation that allows the avoidance of corridors which

are long and narrow. In order for the user to circulate easily, the lobby should consist of a view which faces all the main spaces. The stairs or lifts should be located next to the reception if the second flower or mezzanine floor is inbuilt (Ulseth & Seippel, 2011). Access to any public space should be entirely boundless for people with any form of disability. Inclusive Fitness Initiative (IFI) is an inclusive resource that advocates for accessibility, machines and weight bar. (Anderson, Grant, & Hurley, 2017).

3.5.1 Core Spaces

- **Lobby**

Since a control access system should be well enforced, a separate space for reception and entrance is required (Anderson, Grant, & Hurley, 2017). Space should be visible and inviting. Since the entrance space is the initial area to accommodate members and visitors, it should be warm, welcoming, comfortable, and it should also exist unconnected to any building or facility. In order to control the access point at the reception desk through an access system, there should be an installation of the access point. An access system should be installed at the gate and it should be wider so that it facilitates a free flow of disabled users and vehicles. In accordance with IFI, the system should be comprised of:

- PIN code or card system to swipe/scan
- System to Pay as you Go" for daily users
- Manually controlled access by reception staff. (American College of Sports Medicine, 2003).

The size of the access control system should have the capability to manage the highest number of users in accordance with the space and size of the fitness center facility.

The reception desk should be able to facilitate a lower section that is used by children and wheelchairs. The following equipment should be available at the reception desk:

- Point Sale system that is electronic
- A system that manages members subscriptions in the facility
- Different kind of paying systems
- Electronic tills. (American College of Sports Medicine, 2003).

How these systems are integrated should be given careful attention and consideration. The side occupied by the staff at the reception desk should be entitled to a secure office access (American College of Sports Medicine, 2003).

- **Café**

Most of the space of the facility should be supported by the cafe. The service spaces within the facility could be optionally fitted with separated vending machines and a seating area should be supplied. The café can either be built next to the reception space or inside the reception space because it will offer convenience to users in terms of reachability. The smell from the kitchen should be trapped by the design fitted onto kitchen so that it does not spread out to other areas within the facility. The size and the customer needs within the facility should be dependent on the size of the serving area in the kitchen. The customer should not feel forced by the serving area to get to the café part using access spots.

- **Changing Area**

The material covering the floor should not be slippery because the area is supposed to remain dry. Since the changing area needs to remain dry, the showering area should be disconnected to the changing area. The capacity of the facility should coincide with

the available number of lockers to accommodate all the participants who will make use of the lockers. In order to use the maximum circulation space, an island could be replaced with benches between lockers and in front. The lockers' placement should relate to the dimensions of the benches (Scott, et al., 2000)**.** A good ventilation and resistance to water need to be taken into consideration. The dimensions at minimum for the locker should be 185 x 38 x 45 cm. A variety of designs of could be carried out if:

Lockers become redundant because of frequent use overtime, and an alternative of lower ratio lockers can be provided. Most gym and fitness users arrive to the facility with suitable attire on. This suggests that space should only be enough at the peak time use of the space subsequent knockoffs. Therefore, the number of lockers in fitness centers and gyms should be reduced to 25% - 35%. One shower should be provided for every six changing spaces.

- **Lockers**

All of the facility activates .Every physical activity class need to be comprised of active participants. This period needs to be catered for by the arranged changing spaces when the classes commence and end (Scott, et al., 2000). Since most users may arrive without needing to change or take a shower before they leave, the following options need to be taken into consideration:

- There should be one changing spot for every $5m^2$ class area
- One shower should be provided for each one of the 6 changing spots
- 1.5 lockers should be provided in every 1 hour training period
- Space circulation or covering floor material should separate wet and dry foot peak hours

- Showers
- WC
- Mirrors
- Hairdryers
- Cooling area
- Only robust and pragmatic material should be used (American College of Sports Medicine, 2003).

Customers who prefer more privacy should be provided with personal changing cabinets and not accompanied by the benches as mentioned before. Since vandalism is a common issue, the designs should be fitted with inexpensive material (Desmet & Pohlmeyer, 2013).

- **Showers**

In order to increase privacy for the user, shower cubicles should be provided for every user. The cubicle should span 200cm x 100cm. The drainage under the showerhead as well as the floor incline is required. Clothing hooks should be installed at the back of the door for hanging clothes (Peterson & Tharrett, 1997).

- **Restrooms**

Enlarged WC Cubicles:

In the presence of 4 or more cubicles within a washroom, one cubicle needs to be enlarged. The enlarged cubicle must span a 1200mm minimum width and should entail an outward opening door. Grab rails which are horizontal and vertical are required around the WC. Standard Toilet Cubicles: A minimum of 450mm diameter maneuvering space on all standard cubicles is a prerequisite (Peterson & Tharrett,

1997). It is necessary to use a closed fist to operate indicator bolts and in a case, the user is collapses and is trapped inside the cubicle, doors must allow for emergency access. Ambulant Disabled Cubicles: One WC cubicle should be present in every same-sex washroom to accommodate the ambulant disabled. In a case there's a single cubicle in the washroom it must fully accommodate disabled people. An outward opening door must be attached onto the ambulant disabled cubicle door (Peterson & Tharrett, 1997).

- **Director's Office**

The entrance and the reception space should resemble a connection with the administration space. In order to control and manage the facility, one or two offices are required. According to Vischer (2012), the use and needs of the office directly relate to the space of the office and need to include the following:

  - Sufficient movement and stuffing space.
  - Office furniture
  - Cash safe
  - CCTV system
  - Equipment for communication

- **Staff Workroom**

Andrews, Sudwell, & Sparkes (2005) mentioned that a secondary desk should be located next to the fitness gym and should provide:

  - Staff desk area
  - A platform for recording each other's training progress using a fitness program card storage.

- Towels for users.
- Machine cleaners and paper dispensers for tidying the machine after usage.
- Display boards to exhibit information.

- **Assessment Room**

Used by fitness gym staff for a private consultation. According to the American College of Sports Medicine (2003), It may include:

- Chairs and desk
- Communication equipment.
- First aid treatment
- Lifesaving equipment
- Heart rate equipment
- Weighing scales.
- Storage.

3.5.2 Fitness Spaces

- **Stretching Area**

In order to cool down, fitness gym users make use of the areas used for stretching at the beginning of warming up and after finishing up the training (Knudson, Magnusson, & Mchugh, 2000). In order to promote using the stretch area, it should be located next to the facility entrance because warming up is an important pre-exercise activity. Vinyl materials should be used in covering the floor and mirrors should cover the walls. A holding bar should be installed approximately 1m high relative to the floor. For finishing, building material and the other walls will need a rigid material. To accentuate the activity of warming up, stretching accessories with light free weight

should be provisioned (Seamon, 2014). A consensual signage should be put forth with injury prevention information to engage in an appropriate stretching exercise. Since users might eventually need to lie down and face the ceiling, direct light should completely be avoided because it might cause glare to the members (Knudson, Magnusson, & Mchugh, 2000).

- **Free Weight**

There are three main categories for weight lifting and every category consists of a separate style of equipment. These categories are lifting for muscle gain (weight gain), muscle maintenance (weight control), muscle conditioning (weight loss). Similar equipment is used in all the categories but the load and lifting motion is different. Weight lifting is comprised of bench press, incline and decline, preacher curl, adjustable benches, bars, weights, and varied machines. Since muscle groups categorize most weight lifting, the layout is mostly influenced by the muscle groups. Some weight lifters prefer complementary muscles such as chest and arms whilst other weight lifters prefer opposing muscles such as chest and back. Different types of weights distinguish categories of weight lifting, dumbbells as well as loaded and unloaded bars represent free weights, and machines are made up of a guided weight connected to a rail and bearing system and moved through a series of pulleys and belts. Open racks are used to store dumbbell weights in accordance with their chronological weight and stands as well as additional benches store for barbell weights which are heavier (CENTERS, 2005)**.** The location of the heavier weights should be at the rear of the fitness gym space or at a separate area. To minimize the risk of injury towards other gym users, the location of the weight lifting area should be moved into a different area (Lim & Luft, 1961). In the development of the design, the possibility of free

weights doing damage or injury to other people other than the weight user should be taken into consideration. To avoid accidents, management and the users should ensure weights are well kept onto the racks after usage. Space should facilitate the ease of movement between the racks, benches and stands (American College of Sports Medicine, 2003). The quantity of equipment and weights to be used is dependent on the size of the free weights area (Andreasson & Johansson, 2014).

- **Cardiovascular**

At the single-level area, visual displays, as well as audio outputs, should be the product of the fitness machines. The power boxes installed on the floor should be provided at the CV area and they should be arranged in terms of the cardiovascular equipment placement (Tsang, et al., 2006). Power Supply is required by some CV equipment together with data such as rowers, recumbent bikes, upright bikes, treadmills, elliptical cross trainers, and steppers. In the absence of power, speeding bikes could operate (Colcombe, et al., 2004). There should be an avoidance of heavy base supporting or vase. A variety of CV equipment to be provided should include:

- Running machine
- Step machine
- Bicycles
- Cross trainers
- Upper/lower body machines
- Core machines for apps. (Tsang, et al., 2006).

According to (Colcombe, et al., 2004), CV equipment users spend 30 minutes on average using it. The CV machines contain an audio and visual technology which is

common on the flat screens typically mounted on the walls. Because of the CV equipment vibration, load transfer and acoustic isolation should be installed on the floor that the CV equipment will occupy.

- **Resistance area**

The swiftness of moving from one piece of equipment to another in such a way that a heightened heart rate beat will be maintained represents resistance training. Resistance training involves quickly moving from one piece of equipment to another in a way that maintains an elevated heart rate. In favor of an intense weight lifting, avid weight lifters often abandon cardiovascular workouts completely. All necessary training equipment must be relatively in close proximity to each other for easy reach out in order to have a successful resistance training area. The main motive is to move from one set to the other with less delay between sets, and having to wait for longer to move from one set to the other will result in an unsuccessful workout session. Resistance training comprises of so much variety of equipment for use and is not much different from weightlifting. To accommodate the possibility of higher occupancy, a facility which has a prime focus on resistance training will need to provision several areas of similar equipment. A variety of machines with a combination mixture of free weights makes up the possible list of resistance training equipment.

3.6 Ambiance Factors of Fitness Center

3.6.1 Color

The human body is affected by certain wavelengths of color in different ways. The mind can also be affected by color (Meerwein, Rodeck, & Mahnke, 2007). Colors such as greens and blues cause a sense of calmness and relaxation whilst other colors such as red, yellow and oranges provoke excitement. Substantial improvement towards user

experience and performance can be achieved if appropriate guidance and caution is undertaken on how to apply these colors inside the health and fitness facility interior (Meerwein, Rodeck, & Mahnke, 2007). According to studies carried out by Birren and others (2003), people who were exposed to the red color under test conditions shown measurable levels of stimulation. Since blue is on the opposite end of the color spectrum from red, people exposed to the blue light shown similar but opposite reactions. Generally, lighter and less saturated (pastel) colors are less dense whilst darker colors have a heavy appearance. The tendency always moves towards perceiving the warmer hues as heavier if the hues have similar value and intensity (Mahnke & Mahnke, 1987). Mahnke asserted that if the bases of machinery and equipment are painted darker than the equipment, then they will have a steadier and solid appearance. The perceived level of effort required to move an object can be manipulated by cooler and lighter colors which make heavier objects look lighter. Warm colors make objects seem larger and longer and cool colors make objects look smaller and shorter (Mahnke, Mahnke, 1987). The perceived height of the ceiling will appear lower if it is painted with a darker, warmer color (Meerwein, Rodeck, & Mahnke, 2007). Doing the opposite for lower ceilings will yield similar results. Johannes Itten discussed an analogy experiment in his book titled 'The Elements of Color' that illustrated a 5 – 7 degrees difference in the subjective feeling of heat or cold between a blue-green painted workroom and a red-orange painted workroom. The occupants of the red-orange room started feeling cold when the temperature dropped 12°C - 11°C whilst the temperature had to drop to 15°C for the occupants of the blue-green room to feel cold (Mahnke, Mahnke, 1987). In Table 3, a brief of color effects and meaning in interior spaces.

Table 3: Color Meaning and Effects

Colors Meaning and Effects		
Color Name	**Meaning**	**Effect**
Red (warm)	Fire, heat, warmth	Aggressive, Exciting, increasing blood pressure
Orange (warm)	Vibrant, Warm	Less Intense, Slows Blood flow
Yellow (warm)	Peace	Positive, Good Visibility
Green (Cold)	Youthful, Healing	Relieve Stress and Anxiety
Blue (Cold)	Peace, Tranquility	Cool, relaxing, comfortable
Purple (Cold)	Subduing, dignity and exclusiveness	Mournful, Pompous
White (Grayscale)	Clam, Clean.	Make the space larger, Reduce Shadows, Diffuse Light
Black (Grayscale)	Hollowness or Oppression	Ominous Feeling
Warm Light Colors	Depth	Increase muscular reactions

3.6.2 Texture

The texture of every surface can either be smooth or rough, glossy or unpolished, bumpy or flat (Brown, 2005). Based on our memory of touching distinct surfaces, textural contrast sensibility can either impact our minds negatively or positively. Our moods, perceptions, and actions can also be influenced by texture. If texture rendition lighting is installed close to a wall (‘grazing’ light) with the light hidden behind a baffle or trough close to the wall. The lighting can emphasize texture and surface irregularities provided that the light is hidden behind either a baffle or trough located right next to the wall (Ching & Binggeli, 2017). If the lighting is installed at some distance from the wall, just like it is done with wall washer luminaries, it can minimize texture and faulty seams or plasterwork (Ching & Binggeli, 2017). The wall will appear flattered if luminaires are installed further away from the wall and its surface

variation and texture will go unnoticed. According to the study and findings carried out by Ackerman in 2010, it was revealed that the objects in a person's environment or those that the person has interacted with affected the perception and the behavior of the person, with the attributes of that particular object influencing the actions and perceptions of the person. For instance, it's more likely that the person holding a clipboard perceives another person as being serious. The same criterion is used to link a rough texture to harshness, and people engaged in a negotiation seating on a wooden chair are frequently found to be rigid. John Bargh, a Yale University psychologist, made a discovery in one of his studies that revealed that people become more warmer, caring and generous towards strangers when they're holding a hot drink.

3.6.3 Material

In the design of any facility, there should be a thoughtful consideration of "Green" design as well as the implementation of sustainable construction materials and techniques (Akadir, Chinyio, & Olomolaiye, 2012). Although the official certification might not be the desired goal, the green design principles which were widely published with relation to site development, storm-water management, energy conservation, renewable resources, water conservation, indoor air quality, carbon reduction, and pollution control should be honored at any given instance. Independent contractors, as well as the employees, including custodial stuff, personal trainers, locker room and health/fitness staff, are at risk of being exposed to potentially hazardous chemicals and materials such as cleaning agents, paints, and lubricants. Particle matter such as debri coming from sanding, drilling, or similar activities can affect individuals who are enclosed in an area with little to no air circulation. Areas exposed to high humidity and water need to use waterproof material for all posted signage (Peterson & Tharrett, 1997). The Sound Transmission Class (STC) of a material indicates the degree of

insulation of airborne sound. The sound absorption performs better when the rating is higher. The material-technical function on a floor surface should satisfy the following DIN criteria: Shock absorption 53% minimum Standard vertical deformation 2.3 mm minimum Deflective indentation 15% maximum Sliding characteristics 0.5 to 0.7 range Ball deflection 90% minimum Rolling load (153.1 kg) (Bernstein, 2002).

3.6.4 Light

Our perception of the temperature of light can either be warm incandescent or cool fluorescent (Ching F. D., 1987). Also, the user has the capability of sensing some light wavelengths as well as the ultraviolet. We have not yet come to the realization of how light internally affects our bodies and minds. H.L Logan has asserted that the sun can get rid of the toxins of our bodies and decrease the load on our kidneys through the dilation of blood vessels to stimulate circulation (Logan J. , 2005). According to Birren, the presence of the sun stimulates energy in our bodies through the process of capillary dilation in our skin influencing the drop in blood pressure and an increase in the pulse rate. The ability to improve performance and general wellbeing (experience) exists when the qualities of daylight are stimulated within a health and fitness center. A positive outlook need not be implemented by installing UV lamps throughout the facility but through the improvement of the quality of light in the facility (Logan H. L., 1974). The user experience can further be enhanced by combining the quality of light within the facility with colors that are applied to space. The muscular reactions in the body are also affected by light. Exposure to warm colors causes slight muscle contractions. Warm colors stimulate more noticeable contractions than cool colors. Mahnke & Mahnke asserted that the function of a certain space can match a manipulated foreign mood or atmosphere. The color used determines the type of mood or atmosphere created. A diverging action which is directing attention outward and

towards the environment is influenced by warm and luminous colors with high levels of light (Mahnke, Mahnke, 1987). This environment type facilitates cheerfulness, action, and muscular effort. Centripetal action is produced by softer surroundings, cooler colors and lower levels of illumination (Mahnke, Mahnke, 1987). This type of environment improves concentration ability as well as an inward focus. Since this environment contrasts with warm and luminous spaces which were discussed previously, it is suitable for an area where a group of people needs to perform a challenging visual and mental task.

- **Ambient Lighting**

Within the work environment, ambient lighting provisions for an entirety of illumination. Two types of ambient lighting exist direct and indirect lighting (Steelcase, 1999). Light is directly distributed downward, indirect ambient lighting. Glare can be reduced by lights with parabolic louver although how effective they can get depends on an individual's positioning relative to the source of the light. These lights often contribute to an overall sense of dimness in space although they often create shadows and computer screen glare (Steelcase, 1999). Light is distributed upward and is reflected on the ceiling in indirect ambient lighting. The direct and reflected glare can be reduced to an absolute minimum when it is applied. Direct light sources like deep cell parabolic are not technically operational for computer users and preference is given to indirect ambient lighting because its soft diffused illumination proves to be more comfortable. An overall sense of brightness can be created by indirect lighting (Steelcase, 1999).

- **Accent Lighting**

One of the most potent elements of a lighting system which fully accentuates the lighting environment is accent lighting. It is practically used to for the provision of fill light and also for the ambient light finishing and balancing. It can also be used artfully for the reinforcement of an aesthetic tone and also be used for highlighting unique objects. In areas without daylight, it can draw people through space and also provision for visual relief. Accent lighting can transform the perception of space if it is skillfully applied (Steelcase, 1999).

3.6.5 Smell

A foul stench is an odor while a pleasant fragrance is a smell (Classen, Howes, & Synno, 2002). The amount of sweating within the fitness facilities is the main cause of foul stench. In order to remove some excess moisture and odor, some facilities install dehumidifiers throughout the working area. Someone who is engaged in a rigorous workout can be distracted by strong fragrances within the facility which may lead to an unsuspecting injury. The use of subtle air fresheners and deodorizers make somewhat a difference but it's almost impossible to eradicate the foul stench associated with frivolous sweating in the gym.

3.6.6 Music

The ambiance of interior environments of most fitness facilities incorporates music. The main purpose of playing music in the gym is to either hype up the members of the gym who are working out or to get rid of the silence provided that the music played is not too distracting or boring (Saarikallio & Erkkilä, 2007). Although many gym members do not enjoy loud music, it is prevalent in most fitness facilities. The music is always played in max volumes during the facilities' busiest times in order to drown out gym equipment clanked by members. There are some members, however, who

wear headphones in the gym tuned into an in-house station which plays music they prefer. According to Brelyne (1971), physiological arousal is stimulated by faster or louder music whereas lower levels of arousal are stimulated by slow or quieter music.

3.6.7 Temperature

It is imperative to maintain a room temperature of 20 - 22°C within the phase of all physical activity types (Steadman, 1979). These temperatures need to be maintained regardless of whether the room is vacant or fully occupied by gym members engaging in a physical workout. The demands of each space need to be met by the airflow adjustment capability of the heating, ventilation and air conditioning in the facility (HVAC). Facilities require a full installation of specific HVAC zones which can be individually controlled for specific areas such as group activity studios, the fitness floor, racquet courts, locker rooms, pools, and wet areas in the air. A technical monitoring system is required for facilities that offer sauna, steam room, or whirlpool in order to make sure these areas have a resonate maintenance at a suitable temperature and humidity level. Members need to be well informed in time of the potential risks of using these areas. Which also includes the risk of unsafe changes in temperature and humidity. Since Saunas, steam rooms and whirlpools are associated with high temperatures and humidity generation, they all present potential high risk to members of the fitness facility (Spielvogel, 2003). If these three areas are not well maintained at what is considered to be safe temperatures and humidity levels, members may fall sick and suffer hyperthermia, heat exhaustion, heatstroke, and cardiovascular emergencies. The use of these facilities can still pose significant danger although they are fully maintained at appropriate temperatures if members using them are not aware of associated risks and dangers. Although health risks such as heart attacks and strokes hardly occur, conditions such as orthostatic syncope (i.e., a condition where a person

feels dizzy or faint from the venous pooling of blood that occurs upon changing from a supine to the upright position) or heat exhaustion and heat stroke are common. The table provides an overview of the recommended temperature ranges and precautions for saunas, steam rooms, and whirlpool areas (Brelyne, 1971). Table 4 explain the recommended temperatures for each space according to activity.

Table 4: Recommended Temperatures

Recommended Temperatures in Saunas, steam rooms, and pools		
Space Name	Temperature	Warnings
Sauna	71-77 °C	•Limit use to no more than 10 minutes at one time. •Wait at least 10 minutes after completing exercise before entering. • If you are pregnant, have heart disease, have kidney disease, are on certain medications for cardiovascular disease, and/or have other medical issues that could be adversely affected by high heat, do not use. •Exposure to high temperatures for an extended period of time can result in heat exhaustion, heatstroke, heart attack, and, on occasion, death.
Steam Room	38-49 °C	
Physical Activity Areas	20-22 °C	
Locker Room		
Wet Area		
Studios.		

3.6.8 Noise

A fitness facility houses different types of sounds which range from member background noise, conversations, and music from the audio system. The unit of measurement for noise in decibels. Levels that exceed 90 decibels or greater are very loud regardless of any event sound emerges from (Stevens, 1960). Member and staff hearing damage can be caused by frequent exposure to sound levels that exceed 90 decibels or greater. Group exercise studio and fitness floors generally play higher decibel music whereas mind-body studio or massage centers play low decibel music

(Haskell, 1978). Generally, decibel level ranging from 30 – 40 is sufficient for listening without the risk of damaging hearing capabilities (Stevens, 1960). The following factors need to be considered in any case of attempting to limit excessive decibel levels in health/fitness facility: Since group exercise studios play music with the highest decibel levels, it is imperative that facilities should fully install the ceiling, floor and wall surfaces, which will facilitate moderate to excellent sound absorption process. Adjust audio volumes so that sound levels cannot be raised beyond 90 decibels. Develop policies that will restrict facility instructors from exceeding recommended sound levels (Siebein, Gold, Siebein, & Ermann, 2000). Movement of excess noise, which could travel into adjacent spaces, should be hindered through the addition and implementation of more sound-absorbing material. Additional sound-absorbing materials should be installed in the ceilings, floors and walls for spaces that require low levels of ambient noise such as massage rooms, mind-body studios, and lounges. Containing impact sounds and vibrations is far much more challenging. The most constructive way of inhibiting the impact sounds is by muting them through the usage of resilient materials which will prevent the sounds from penetrating into the building structure (Morse, 1948).

3.6.9 Cleanless

The cleanliness of a facility makes up one of the top five reasons consumers are compelled to join a fitness facility, in accordance with research sponsored by The International Health, Racquet & Sports Club Association (Miller & Miller, 2010). Members of a fitness facility can contaminate illnesses if a proper cleaning schedule is not properly followed and relevant areas are not disinfected properly. A written schedule for cleaning as well as disinfecting relevant areas needs to be developed by fitness facilities and should be religiously adhered to. Figure 45 provides samples of

recommended cleaning and disinfecting procedures for various areas of a health/ fitness facility (American College of Sports Medicine, 2003).

Facility area	Cleaning activity	Frequency
Fitness floor (gym)	• Remove trash. • Dust all horizontal surfaces. • Clean and disinfect vinyl pads on equipment. • Clean and disinfect equipment frames. • Vacuum carpets and clean stains. • Spot-clean mirrors. • Wash and disinfect hard floor surfaces, including all rubber floor surfaces. • Clean heating, ventilation, and air conditioning (HVAC) vents. • Clean light fixtures. • Vacuum and clean under all equipment. • Fully clean mirrors and glass surfaces. • Clean carpets. • Clean wall surfaces thoroughly.	• Daily • Daily • Daily • Daily • Daily • Daily • Daily • Monthly • Monthly • Monthly • Monthly • Quarterly or annually • Annually
Group exercise studio	• Remove any trash. • Dry-mop wood floors. • Dust all horizontal surfaces. • Spot-clean mirrors and glass surfaces. • Clean mirrors thoroughly. • Wet-mop wood floors. • Clean HVAC ducts. • Clean light fixtures. • Clean audio equipment. • Wash solid walls. • Refinish wood floor surfaces.	• Daily • Daily • Daily • Daily • Daily • Daily • Monthly • Monthly • Monthly • Monthly • Annually

Figure 45:Cleaning Frequancy (Peterson & Tharrett, 1997)

3.7 Need for Customer Satisfaction and Continuously

The basic physiological needs of a human including air, food, sleep and sex, need to be satisfied as well as additional basic needs that are connected to interior designing. A study conducted by Deniz (2006), titled 'Investigating customer satisfaction with health care and fitness center in Turkey,' he discovered that the most influential factors leading to a customer's satisfaction include satisfaction with society, spiritual/mental health, hygiene, equipment, physical environment and employee's treatment (Deniz, 2018). He also found out that the experience of one's own physical existence/concept of "I am" is very fundamental. Human beings learn how to differentiate their bodies with the outside world using a sense of touch and contact, and in doing so they learn to experience themselves (Salamat, Farahani, & Salamat, 2013). The boundaries,

objects and material of architectural space fully support this experience. Orientation is another fundamental need for a human being and it plays a big role in using the surrounding, planning and shaping a human's life as an enhancement factor (Salamat, Farahani, & Salamat, 2013). A people-oriented architectural design can communicate meaning and build values (Kastner, Neugschwandtner, Soucek, & Newman, 2005). The need for control coincides with the need for orientation which simply translates to coping with situations and also achieving goals. The desire to maintain control is connected to the desire for freedom, to deploy one's indicated actions (Kastner, Neugschwandtner, Soucek, & Newman, 2005). People can be encouraged to cope with their situation through a framework designed by the environment. Understanding something is "a first, important step along the path to control" (Kurz, 2005) . According to Lenelies Kruse (1990), the need for control can be seen, in particular, in control over. Another basic human requirement is the need to communicate. (Kruse, Graumann, & Lantermann, 1990). This incorporates a connection to one's surrounding objects, social bonding need and the requirement for identity. Through our fundamental, early childhood experience of security, confidence, and trust, followed by an upbringing that supports initiative, activity, and autonomous behavior and actions combined with appreciation, we learn to develop our identity. Our sense of identity is changed and unsettled by extreme experiences and changes and can be countered by external support and our own actions. Spaces that are designed need to convey a sense of trust and people need to understand their expression and feel compelled to interact with objects that could deliver some form of a social relationship. A major role in the process of the human-environment relationship is played by the complete system of our senses. Psychology regards the following types of needs as effective: The need for impressions: allowing oneself to be impressed by one's

environment, the need for expression: being able to express oneself, and the need for exploration: exploring and understanding one's surroundings (Kruse, Graumann, & Lantermann, 1990). Additionally, people inherently seek harmony and beauty. In Table 5, some of the customer needs and requirements related to the interior atmosphere.

Table 5: Example of customer needs

Clam	Order	Light	Hygiene
Closeness	Relaxation	Naturalness	Affection
Contact	Safety	Beauty	Atmosphere
Clean-less	Warmth	Freedom	Openness
Control	Respect	Privacy	Harmony
Creativity	Stimulus	Stability	Circulation
Clarity	Well-being	Leeway	Balance
Challenge	Touch	Independence	Material Quality

3.8 Findings of Chapter Three

After gathering all the information from this chapter. The tables provided below the conclusion of fitness center space requirements. Interior factors, material, lighting, furniture, and space needed for each space. In Table 6, a conclusion of lobby space requirments from 3.5.1 (Page 73).

Table 6: Lobby Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Lobby	Waiting area Reception desk Access control	—	Natural Light recommended Artificial light	Seating Area	0.20M² for each User as 4.5M² Minimum space	Music

In Table 7, a conclusion of Café & bar space requirments from 3.5.1 (Page 74).

Table 7: Café & Bar Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Café & Bar	Better to be located next to the Lobby	—	Natural Light recommended Artificial light	Stands Hangers Sales Counter Storage room	3.7M² for each unit	Music

In Table 8, a conclusion of lockears area space requirments from 3.5.1 (Page 75).

Table 8: Lockers Area Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Lockers Area	Heating HVAC Ceiling Air Circulation	Slip/Moisture Materials Rustproof Material	Natural Light recommended Artificial light	Mirrors Lockers Benches	—	Music

In Table 9, a conclusion of changing area space requirments from 3.5.1 (Page 74).

Table 9: Changing Area Space Requirements

Space Requirements					
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**
Changing Area	Heating HVAC Ceiling Air Circulation Well Ventilated	Slip/Moisture Materials Rustproof Material Drainage Large Tile Flooring	Natural Light recommended Waterproof Lighting	Mirrors Lockers Benches Wall hooks Towel Dispenser	$0.8M^2$ for each Locker

In Table 10, a conclusion of shower space requirments from 3.5.1 (Page 76).

Table 10: Showers Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Showers	Heating HVAC Ceiling Air Circulation Well Ventilated	Dark Grout Slip-resistant surface UPC Plumbing Small Tile Flooring	Waterproof Lighting	Shelves Standard Shower Base (90 X 106) cm Benches Hooks Towel Dispenser	For every 15 lockers 1 Shower	Music

In Table 11, a conclusion of restroom space requirments from 3.5.1 (Page 76).

Table 11: Restroom Space Requirements

Space Requirements					
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**
Restroom	Well Ventilated Well Hygiene	Dark Grout Slip-resistant surface UPC Plumbing Small Tile Flooring	Waterproof Lighting	Wash Sinks Hooks Towel Dispenser Soap Dispensers	For each 25 lockers 1 WC as Minimum Standard (75 X 160) CM

In Table 12, a conclusion of director office space requirments from 3.5.1 (Page 77).

Table 12: Director Office Space Requirements

Space Requirements					
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**
Directors Office	------	------	Natural Light recommended Artificial light	Standard furniture Security screen	8M² For each Office

In Table 13, a conclusion of staff office space requirments from 3.5.1 (Page 77).

Table 13: Staff Office Space Requirements

Space Requirements					
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**
Staff Workroom	------	------	Natural Light recommended Artificial light	Standard furniture Assessment equipment	8M² For 6 staff

In Table 14, a conclusion of Assessment room space requirments from 3.5.1 (Page 77).

Table 14: Assessment Room Space Requirements

Space Requirements					
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**
Assessment Room	------ .	------	Natural Light recommended Artificial light	Testing equipment Measuring equipment	8M² for each room

In Table 15, a conclusion of restroom space requirments from 3.5.2 (Page 78).

Table 15: Stretching Area Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Stretching Area	Bar 1.2m above the floor Avoid sharp edges	Padded floor Robust wall	Natural Light recommended Artificial light Avoid direct downlight	Mounted mirrors Stretching Accessories Correct Stretching Signs	2M² for each user	Music Acoustic proof walls Audio/Visual system

In Table 16, a conclusion of free weight area requirments from 3.5.2 (Page 78).

Table 16: Free Weight Area Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Free Weight Area	5M² for each set of racks	Padded floor Robust wall High dead load resists floor	Natural Light is recommended Artificial light Avoid direct downlight	Mounted mirrors Stands Open Racks Correct movements sign	2 X Weight set	Music Audio system Acoustic proof walls

In Table 17, a conclusion of cardiovascular requirments from 3.5.2 (Page 79).

Table 17: Cardiovascular Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Cardiovascular	Assessment area PT Area 1.5M² - 2M² per Machine	Acoustic isolation under machines Robust wall	Natural Light is recommended Artificial light Avoid direct downlight	Mounted mirrors Stands	1.75 x Machine footprint	Music Audio system Acoustic proof walls

In Table 18, a conclusion of restroom space requirments from 3.5.2 (Page 80).

Table 18: Spinning Space Requirements

Space Requirements						
	Interior Factors	**Material**	**Lighting**	**Furniture**	**Space Needed**	**Sound**
Spinning Area	Assessment area	Acoustic isolation under machines Robust wall Acoustic Isolation Walls	Natural Light recommended Artificial light Avoid direct downlight	Mounted mirrors	1.25 x Machine footprint	Music Audio system

In Table 19, a conclusion of resistance area requirments from 3.5.2 (Page 80).

Table 19: Resistance Area Space Requirements

Space Requirements					
Resistance Area	**Interior Factors**	**Material**	**Lighting**	**Furniture**	**Space Needed**
	2M² per machine	Slip/Static floor Resistant floor High dead load resists floor	Natural Light recommended Artificial light Avoid direct downlight	Mounted mirrors Stands Open Racks Correct movements sign	1.75 X Weight set

Chapter 4

CASE STUDY FAMAGUSTA FITNESS CENTERS

Analyzing the interior atmosphere design of fitness centers is the aim of this chapter. The observation and analyzing process based on the five sense of the user and their relationship with interior atmosphere elements. Space users tend to overlook the role played by their senses of perception in their lives. One of the five senses has to facilitate the type of information we perceive. Throughout our physical development stages, these capabilities improve and perfect our approach of perception. An in-depth understanding of our senses can positively influence our creative selves to develop new reactions to different types of experiences (Shedroff, 2001). Experts are debating about the total number of our perception senses. They are listed as kinesthetic, electromagnetic and psychic senses as some of their core senses whilst others only recognize the famous five senses, namely sight, sound, taste, smell, and touch (Shedroff, 2001).

- **Sight**

Sight is considered one of the critical senses. We could understand a lot of information about surroundings like the weather and time of the day by using the sight sense. According to Shedroff (2001), all the gathered data by the sight sense unconsciously used to deal with the surrounding space. By seeing a new space for the first time, sight vision helps the user to understand the space by three dimensional information gathered by the eyes. The shape of the space, movement organization, covered

material, color and etc (Pallasmaa, 1996). Each space has different characteristics that the user's eyes will be affected by. For example, the perceived level of effort required to move an object can be manipulated by cooler and lighter colors which make more massive objects look lighter. Warm colors make objects seem more extensive, and more extended and cool colors make objects look smaller and shorter (Mahnke, Mahnke, 1987). The perceived height of the ceiling will appear lower if it is painted with a darker, warmer color (Meerwein, Rodeck, & Mahnke, 2007).

- **Sound**

In accordance with a published article in the Green Bay Press-Gazette (2018), performance in the gym can be improved by music, and it also makes the pain of exercising much more tolerable. In a Green Bay Press-Gazette interview, Mark Anshel, a professor of physical education and sports psychology at Middle Tennessee State University, asserted that music could either be a natural stimulant or depressant. Some studies have stated that your heart rate can be raised by just simply listening to upbeat music. One notable benefit of listening to music while working out is its ability to shift your attention from unnecessary thoughts. A calming effect can be produced by relaxing music and is suitable for exertions such as yoga practices or calming down uncontrollable nerves before a big event. Krakov, Allen, and Schwartz (quoted in Birren 1982) discovered that the eye is more sensitive to green and less sensitive to red when it is exposed to loud noises and strong odors and taste. The relationship between noise and color leans more into the poetic nature or mental association, and the designer may profit from it. The most active effect of warm colors is associated with stimulation of the senses, brightness, and loudness and the reverse is also true (Mahnke, Mahnke, 1987). Olive green may be used to offset shrill or high pitched

sound. The perceived level of already muffled sounds tend to be increased by the darker hues, and lighter colors such as light, clean green (slightly toward yellow) can be used for compensation (Mahnke, Mahnke, 1987).

- **Smell**

A foul stench is an odor while a pleasant fragrance is a smell (Classen, Howes, & Synno, 2002). The amount of sweating within the fitness facilities is the main cause of the foul stench. In order to remove some excess moisture and odor, some facilities install dehumidifiers throughout the working area. Someone who is engaged in a rigorous workout can be distracted by strong fragrances within the facility which may lead to an unsuspecting injury. The use of subtle air fresheners and deodorizers make somehow a difference but it's almost impossible to eradicate the foul stench associated with frivolous sweating in the gym. Proper air ventilation should exist to refresh the air (Classen, Howes, & Synno, 2002).

- **Touch**

In the health and fitness industry, the only scenario where touch is recognized is only with machines and equipment used and touching someone in a gesture of greeting or pointing at them (Birren 1982). Generally, touching should be restricted to spotting at someone provided they have given their consent to do so. The only way to restrict touching is by deploying less conspicuous machines and more comfortable ones. Since the scope of this thesis does not include equipment design, the suggestion will not be explored any further (Birren 1982).

- **Taste**

Taste is often ignored just like the smell because it is perceived as a designed experience element. Although currently, no device can recreate the taste, it is well comprehended in food laboratories. Food has long been a major complement of experiences, be it parties, restaurants, theme parks, movies or theatre. We rarely, however, integrate food into the experience in the absence of restaurants and food events. We view food as some form of nourishment and supplement. Integrating taste into an experience demands more novelty beyond any of our sense of perception, and the outcome can be more fulfilling (Shedroff, 2001). It has been observed that the number of people who purchase a sports drink or bring one into the gym is very few. Water is the common drink among gym-goers while weight lifters usually consume protein shakes or energy drinks. The only other consumed liquid is a mixture of convenience beverage drinks. The user tries to identify the space surrounding them as they are looking for their personal needs. Through there five senses, they can be related to their five senses to space if it covers their needs. To feel more comfortable and free in space, user's most of the time analyze their surroundings and personalize their surrounding environment through their senses (Meerwein, Rodeck, & Mahnke, 2007).

4.1 Limitation of the Study

The study will include all the private fitness centers in Famagusta / North Cyprus. User's personal tastes, ethnic character, gender, and cultural issues are not included in the study. Fitness centers located in collective housing, shopping centers, hotels and similar functions, geographical location and climatic changes are not included in the study. As this study is based on five senses, taste sensations are not included as it can't be used during the observation process. As for taste one of the senses that require

physical contact with the matter, only the other 4 senses have been included in this study.

4.2 Methodology of the Study

The study obtains all the private fitness centers to be analyzed from 2005 until this day in the center of Famagusta / North Cyprus. To analyze the interior atmospheres of these facilities, the study will be based on observation methodology. After locating all the facilities, the researcher in four weeks chose the sunny days, and the most efficient daylight hours during the week (11.00-14.00) visited the facilities and did the observation. Measuring sound, smell, noise, and music used by the observer hearing sense in the crowded hours (17.00-20.00). Photos used in the observation tables were taken in while the facilities have no users in the morning hours. The drawing and plans of the facilities have been taken from the owner, architect, or constructed company and been analyzed. The researcher drew only four facilities plans (Power Gym, New Form, Super Body, and Ersin Fitness Center) after taking the needed measurements. Collected data from the literature review chapters, observations tables that will be used in this study made by drawing programs. Facilities plans and photographs add to the observation table, and the relation between five senses and the facilities spaces has been analyzed. The part of the research until this point has a qualitative research method. The data collected by this method have been structured into tables and used as a quantitative method. By using the percentages and data in the tables, the most preferred color, texture, material, lighting, acoustic, and ventilation systems for all the fitness centers in Northern Cyprus - Famagusta are given.

4.2.1 Selection of Fitness Centers

Each fitness center is located in a different street in the city and each one going to be examined and analyzed separately in this case study as it is shown in Figure 476 and Figure 47.

Figure 46: North Cyprus Map (URL 33)

To locate all the existing facilities in Famagusta, all the needed information has been taken from North Cyprus Weightlifting and Bodybuilding Federation. Nine existing facilities have been found in Table 20 list of the facilities, followed by their location on the map in Figure 47.

Table 20: Facilities Name and Construction Year

Number	Facilities Name	Year of construction
1	New Form Gym	2005
2	Ersin's Gym & Fitness	2006
3	Power Gym	2009
4	Super Body Fitness Center	2014
5	Gymaholic Fitness Center	2016
6	Döveç Fitness Center	2017
7	Fit Plus Fitness & Gym Center	2017
8	M8 Fitness Center	2019
9	Fit Art Health & Fitness	2019

Figure 47: Famagusta Map (URL 34)

In Figure 47, the map of Famagusta city and the selected fitness centers are marked on the map.

4.3 Observation Table

This part of the study is to investigate the interior design of the exists fitness centers from the 2005s until the present day in North Cyprus / Famagusta. The development of observation tables reliant on the literature review is provided in the following order: After considering the information found in chapter two, the factors needed to create interior design and interior atmosphere color, lighting, texture, and material. The fitness center spaces and functions from chapter three, the observation table was found. As a result of the research, there were 12 functions (Lobby, café & bar, stretching area, studio 1, studio 2, spinning area, free weight, cardiovascular area, changing area, showers, WC, lockers) in fitness centers (See chapter 3 3.5.1, 3.5.2) found and placed in the left part of the table for the individual examination of these functions as it is shown in Figure 48.

SPACES	LOCATION
1	LOBBY
2	CAFE & BAR
3	STRETCHING AREA
4	Studio 1
5	SPINNING AREA
6	Studio 2
7	FREE WEIGHT
8	CARDIOVASCULAR AREA
9	CHANGING AREA
10	SHOWERS
11	WC
12	LOCKERS

Figure 48: Fitness Centers 12 Functions

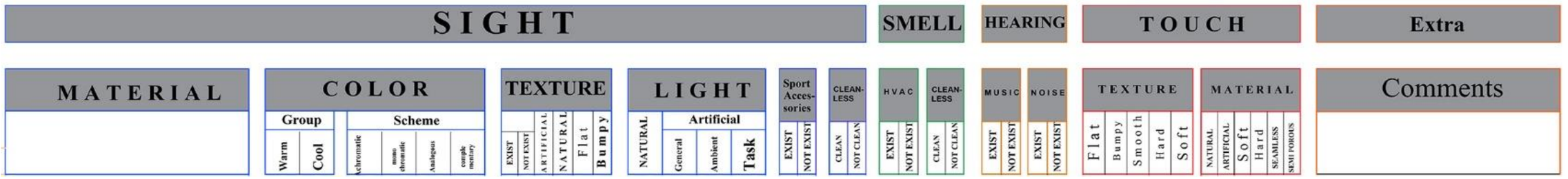


Figure 49: Atmosphere Component

The elements forming the atmospheres of the 12 fitness center functions are grouped by considering five senses that affect the perception of the user. Sight, smell, hearing, touch, and taste (see 4.1) Interior atmosphere components have been placed under each sense. According to Shedroff (2001), user's sense can directly be interacted with the surroundings atmosphere, which for each user will create a different kind of experiences. Although interior design atmosphere components effect the user senses in different shapes, senses listed according to the relation between the user senses experience and the interior atmosphere components:

- **Sight**

Covering material, color, light, sport accessories, and level of visual cleanness will be measured and observed by the researcher sight sense.

- **Smell**

HVAC system and air cleanness level.

- **Hearing**

Existence of music and noise.

- **Touch**

Material and texture characteristics effect by physical contact between the user and the surface. Taste one of the sense that is not included in this study by assuming that it requires one-to-one physical contact with the surroundings, and only four senses are included and these senses are located at the top of the table. The interior atmosphere component forming the space are grouped and placed in these sections as it is shown in. In addition, in the last part of the table, an extra part added by the researcher. The researcher could mention some points could play an important role in the interior

atmosphere or could have an effect on the fitness function, which is not mentioned in the table, could be written there. In order to observe which plan schemes and which schemes are found in the facilities plans; plan organization schemes in chapter 2 (2.3.4) are included in these observation tables.

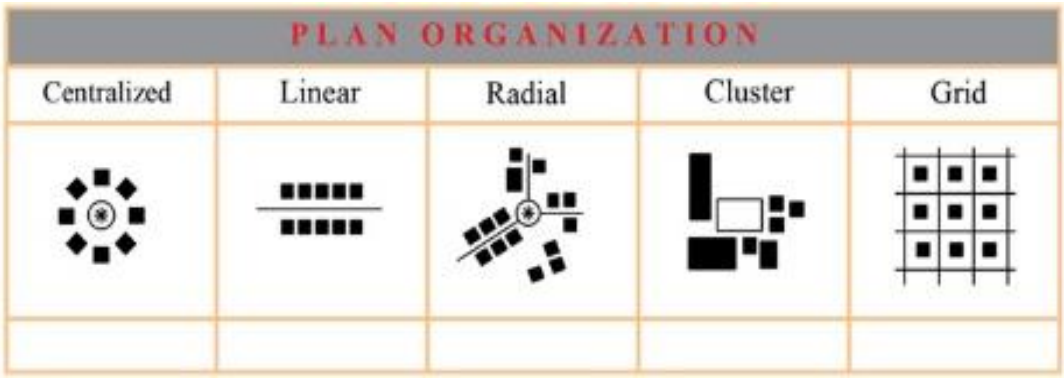


Figure 50: Plan Organization Schemes

Additional important point of the observation tables is the section where the names of the spaces, facilities names, photographs, plans and the facilities location on the map. This section is located at the far left side of the table. In the Table 21 below, an example of empty observation table which is taken to the be filled in the facilities.

Table 21: Observation Table

NAME:

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid

PHOTOS

1	2	3	4
5	6	7	8
9	10	11	12

PLANS

		LOCATION	EXIST	NOT EXIST	M²
SPACES	1	LOBBY			
	2	CAFE & BAR			
	3	STRETCHING AREA			
	4	Studio 1			
	5	SPINNING AREA			
	6	Studio 2			
	7	FREE WEIGHT			
	8	CARDIOVASCULAR AREA			
	9	CHANGING AREA			
	10	SHOWERS			
	11	WC			
	12	LOCKERS			

FIVE SENSE

SIGHT

MATERIAL	COLOR			TEXTURE				LIGHT			Sport Accessories		CLEANLESS	
	Group		Scheme						Artificial					
	Warm	Cool		EXIST	NOT EXIST	MATERIAL	NATURAL	Tile	Rough	NATURAL	Control	Ambient	Task	EXIST	NOT EXIST	CLEAN	NOT CLEAN

SMELL		HEARING		TOUCH				Extra
HVAC	CLEANLESS	MUSIC	NOISE	TEXTURE		MATERIAL		Comments
EXIST	CLEAN	EXIST	EXIST	Flat	Rough	NATURAL	Soft	
NOT EXIST	NOT CLEAN	NOT EXIST	NOT EXIST	Smooth	Hard	MATERIAL	Hard	
				Hard	Soft	SEMI-SYNTHETIC	SEMI-SYNTHETIC	

4.3.1 Filling the Observation Tables

Nine fitness centers have been observed in this study, each one of the facilities has been observed as it explained below. Filling the observation table for Fit Plus Fitness & Gym Center were as: The facility designed according to three different floors level: basement, ground, and mezzanine floor. The entrance is found on the ground floor level. After entering the facility, the lobby and reception area will be found. Waiting seating area were provided, followed by a café and bar section. The floor covered by large slip-resistant tiles. Wall is painted with black paint some parts of the reception wall covered with wood and stone texture. Ambient lighting fixed on the ceiling to generate general lighting followed with natural daylight through the glass walls of the area. Stone and wood texture found on the café and bar reception and waiting area. The different color schemes used in the wall covering texture and ambient lighting fixed in the ceiling. Kitchen were found and provided with a high quality air ventilation system to prevent the smell from other areas. An exterior seating area is attached to the café and bar found. On the mezzanine floor plan, the stretching area is found to be next to the changing. Stretching and assessment accessories exist, mirrors fixed on the wall with general ceiling lighting. Moving in the same floor plan, 10 treadmills, two spine bikes, and three ARC trainers are found to create cardiovascular areas. Provided with a view over the ground floor, Screens fixed on the wall, and Rubber floor tiles covered the floor. Stone and colored texture covered the columns in the space. In the basement floor level, five sets of free weight racks found supported with an 8 Rouge adjustable bench. Rubber floor black tiles covering the floor mirrors fixed on walls and columns, and two different lighting shapes are found in the ceiling. Tow studios found at the same level. One used for spinning area, floor covered with green vinyl floor covering, Yellow and green color found in walls texture. Two walls covered with

mirrors and green painted ceiling provided with sound, HVAC, and lighting systems. The second studio used for the boxing training area, supported with accessories and extra rubber floor tiles covering used on need. Yellow vinyl floor covering, mirrors fixed on the walls, motivation picture fixed on one wall, and Yellow painted ceiling provided with HVAC, sound, and lighting system. In the changing area, 78 lockers found for each male and female area. Eight showers and three bathroom cabinets. Three urinals found in the male's area. Floor and walls covered with large slip-resistant tiles, white painted ceiling, and showers wall and floor covered with small tiles. UPC Code system used in WC, shower, and washing sinks. After the observation**,** all the main and sub-areas achieved the needed requirements. The facility covered the requirements of the ambient factors that cover user needs. Table 22. The other eight facilities observation steps, comments, and filled observation tables placed in the Appendix.

Table 22: Fit Plus Fitness & Gym Center

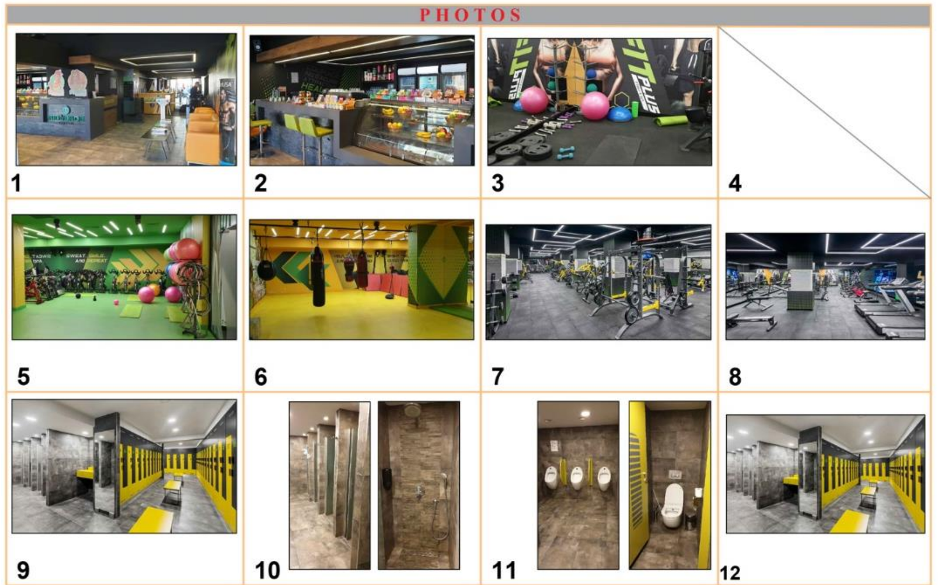
NAME: FIT PLUS FITNESS & GYM CENTER

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	√			

PHOTOS



PLANS

FIVE SENSE

SIGHT — MATERIAL, COLOR (Group: Warm, Cool; Scheme), TEXTURE, LIGHT (NATURAL; Artificial: General, Ambient, Task), Sport Accessories, CLEANLESS; SMELL — HVAC, CLEANLESS; HEARING — MUSIC, NOISE; TOUCH — TEXTURE (Flat, Bumpy, Smooth, Hard, Soft), MATERIAL (NATURAL, ARTIFICIAL, Soft, Hard, SEAMLESS, SEMI POROUS); Extra — Comments

	LOCATION	EXIST	NOT EXIST	M²		MATERIAL	Comments
1	LOBBY	√		18 M²	WALL COVERING	Paint + Stone + Texture.	
					FLOOR COVERING	Tiles	
					CEILING COVERING	Paint	
2	CAFE & BAR	√		44 M²	WALL COVERING	Paint + Stone + Texture.	
					FLOOR COVERING	Tiles	
					CEILING COVERING	Wood / Paint	
3	STRETCHING AREA	√		26 M²	WALL COVERING	Paint + Texture + Mirrors .	
					FLOOR COVERING	Rubber floor Mats	
					CEILING COVERING	Paint	
4	Studio		√		WALL COVERING		
					FLOOR COVERING		
					CEILING COVERING		
5	SPINNING AREA	√		150 M²	WALL COVERING	Paint + Texture.	
					FLOOR COVERING	Vinyl	
					CEILING COVERING	Paint	
6	Studio	√		100 M²	WALL COVERING	Paint + Texture.	- Kit Punch - Bag Sandbag - Kickboxing Set
					FLOOR COVERING	Vinyl	
					CEILING COVERING	Paint	
7	FREE WEIGHT	√		270 M²	WALL COVERING	Paint + Mirrors + Texture	
					FLOOR COVERING	Rubber floor Mats	
					CEILING COVERING	Paint	
8	CARDIOVASCULAR AREA	√		100 M² + 60 M²	WALL COVERING	Paint + Mirrors + Texture	
					FLOOR COVERING	Rubber floor Mats	
					CEILING COVERING	Paint	
9	CHANGING AREA	√		80M² M + 80M² W	WALL COVERING	Large Tiles + Mirrors	- Hair drying area exit. - Hangers. - No changing cabins.
					FLOOR COVERING	Large Tiles	
					CEILING COVERING	Suspended ceiling	
10	SHOWERS	√		8 M + 8 W	WALL COVERING	Large Tiles	- Big Ceramic Non-slip tiles floor and wall covering. - Plumbing UPC used
					FLOOR COVERING	Large + Small Tiles	
					CEILING COVERING	Paint	
11	WC	√		3 M + 3 Urinals + 3 W	WALL COVERING	Large Tiles	- Big Ceramic Non-slip tiles floor and wall covering. - Plumbing UPC used.
					FLOOR COVERING	Large & Small Tiles	
					CEILING COVERING	Paint	
12	LOCKERS	√		77 M + 77 W	WALL COVERING	Paint + Large Tiles.	- Big tiles floor and wall covering. - Lockers Tire 2 but with sharp L edges. - 2 Seating benches .
					FLOOR COVERING	Large Tiles	
					CEILING COVERING	Paint	

4.3.2 Findings by Percentage

After filling the observation tables separately for the nine exists facilities, the analyzed data have been gathered and compared all to each other by putting the tables on each other, which obitnaed a findings table as it shown in Table 23 that the results were out of 9. To make easier on the reader, the final collected data from all facilities converted from x out of nine (5/9) into percentage out of 100 as it shown in Table 24.

Table 23 Observation Findings

OBSERVATİON FİNDİNGS

PLAN ORGANIZATION

GRID

CLUSTER

RADIAL

1

LINEAR

6

CENTRALIZED

SPACES

	LOCATION	EXIST	NOT EXIST	M²
1	LOBBY	8	1	
2	CAFE & BAR	3	6	
3	STRETCHING AREA	3	6	
4	Studio	3	6	
5	SPINNING AREA	3	6	
6	Studio 2	3	6	
7	FREE WEIGHT	9		
8	CARDIOVASCULAR AREA	9		
9	CHANGING AREA	7	2	
10	SHOWERS	9		
11	WC	8	1	
12	LOCKERS	9		

FIVE SENSE

SIGHT

MATERIAL

	MATERIAL
1 WALL COVERING	8/8 Paint.
1 FLOOR COVERING	6/8 Tiles. 2/8 Wood.
1 CEILING COVERING	6/8 Paint. 1/8 Steel. 1/8 Gypsum Board
2 WALL COVERING	3/3 Paint.
2 FLOOR COVERING	2/3 Tiles. 1/3 Rubber .
2 CEILING COVERING	2/3 Paint. 1/3 Paint + Wood.
3 WALL COVERING	Glass + Mirror Texture Paint + Texture + Mirrors
3 FLOOR COVERING	2/3 Rubber. 1/3 Wooden.
3 CEILING COVERING	3/3 Paint.
4 WALL COVERING	2/3 Paint. 3/3 Mirrors . 2/3 Texture.
4 FLOOR COVERING	3/3 Wooden Floor
4 CEILING COVERING	3/3 Paint.
5 WALL COVERING	3/3 Paint.
5 FLOOR COVERING	1/3 Rubber 1/3 Vinyl 1/3 Wooden Floor
5 CEILING COVERING	3/3 Paint.
6 WALL COVERING	2/3 Paint. 1/3 Pictures + Mirrors
6 FLOOR COVERING	3/3 Rubber
6 CEILING COVERING	3/3 Paint.
7 WALL COVERING	9/9 Paint. 9/9 Mirrors
7 FLOOR COVERING	9/9 Rubber
7 CEILING COVERING	7/9 Paint. 2/9 Steel
8 WALL COVERING	8/9 Paint. 5/9 Mirrors. 1/9 Pictures + Mirrors
8 FLOOR COVERING	5/9 Wooden 4/9 Rubber.
8 CEILING COVERING	9/9 Paint
9 WALL COVERING	5/7 Large Tiles 1/7 Paint + Mirror 1/7 Paint
9 FLOOR COVERING	6/7 Large Tiles 1/7 Medium Tiles
9 CEILING COVERING	7/7 Paint
10 WALL COVERING	6/9 Large Tiles 3/9 Small Tiles 2/9 Medium Tiles
10 FLOOR COVERING	7/9 Large Tiles 1/9 Small Tiles 1/9 Wooden
10 CEILING COVERING	9/9 Paint
11 WALL COVERING	6/8 Large Tiles 1/8 Medium Tiles 1/8 Paint + Medium Tiles
11 FLOOR COVERING	8/8 Large Tiles
11 CEILING COVERING	8/8 Paint
12 WALL COVERING	5/9 Paint 3/9 Large Tiles 1/9 Paint +Large Tiles
12 FLOOR COVERING	8/9 Tiles 1/8 Wood
12 CEILING COVERING	8/9 Paint 1/9 Gypsum Board

COLOR

	Group		Scheme				
	Warm	Cool	Achromatic	mono-chromatic	Analogous	complementary
1 WALL COVERING	3/8		8/8		1/8	1/8
1 FLOOR COVERING	1/8		7/8		1/8	
1 CEILING COVERING			8/8			
2 WALL COVERING		1/3	2/3			1/3
2 FLOOR COVERING	1/3		3/3			
2 CEILING COVERING		1/3	3/3			
3 WALL COVERING	1/3	1/3	1/3		1/3	
3 FLOOR COVERING	2/3				1/3	
3 CEILING COVERING			3/3			
4 WALL COVERING	3/3					2/3
4 FLOOR COVERING	2/3					
4 CEILING COVERING			3/3			
5 WALL COVERING	3/3		2/3			2/3
5 FLOOR COVERING	2/3		2/3			
5 CEILING COVERING	2/3		2/3			
6 WALL COVERING	2/3		2/3			
6 FLOOR COVERING	2/3					
6 CEILING COVERING			3/3			
7 WALL COVERING	3/8		7/9			2/9
7 FLOOR COVERING			9/9			
7 CEILING COVERING			9/9			1/9
8 WALL COVERING		2/8	7/9			3/9
8 FLOOR COVERING			8/9			1/9
8 CEILING COVERING	2/8		8/9			1/9
9 WALL COVERING	1/7		6/7			1/7
9 FLOOR COVERING			7/7			
9 CEILING COVERING			7/7			1/7
10 WALL COVERING	1/9	1/9	7/9			1/9
10 FLOOR COVERING			9/9			
10 CEILING COVERING			9/9			
11 WALL COVERING	1/7	2/7	5/8			3/8
11 FLOOR COVERING			8/8			
11 CEILING COVERING			8/8			1/8
12 WALL COVERING	3/8		6/8			2/8
12 FLOOR COVERING			8/8			
12 CEILING COVERING			8/8			1/8

TEXTURE

	EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy
1 WALL COVERING	2/8	6/8			2/8	
1 FLOOR COVERING	8/8				8/8	
1 CEILING COVERING		7/8			1/8	
2 WALL COVERING	2/3				2/3	
2 FLOOR COVERING	2/3				2/3	
2 CEILING COVERING		2/3				
3 WALL COVERING	3/3				3/3	
3 FLOOR COVERING	2/3					
3 CEILING COVERING		3/3				
4 WALL COVERING	2/3					
4 FLOOR COVERING	3/3					
4 CEILING COVERING		3/3				
5 WALL COVERING	2/3				2/3	
5 FLOOR COVERING	3/3					
5 CEILING COVERING		3/3				
6 WALL COVERING	2/3				2/3	
6 FLOOR COVERING		2/3				
6 CEILING COVERING		2/3				
7 WALL COVERING	5/9	4/9			5/8	
7 FLOOR COVERING	8/9		1/9		7/9	
7 CEILING COVERING	2/9	7/9			2/9	
8 WALL COVERING	4/9	5/9	1/9		6/9	2/9
8 FLOOR COVERING	8/9	1/9			8/9	
8 CEILING COVERING		9/9				
9 WALL COVERING		5/7				
9 FLOOR COVERING	7/7				7/7	
9 CEILING COVERING		6/7				
10 WALL COVERING	7/9	2/9			7/9	1/9
10 FLOOR COVERING	9/9				6/9	3/9
10 CEILING COVERING	1/9	8/9			1/9	
11 WALL COVERING	7/8				5/8	3/8
11 FLOOR COVERING	8/8		1/8		7/8	
11 CEILING COVERING		8/8				
12 WALL COVERING	5/9	4/9			4/8	
12 FLOOR COVERING	8/9				7/8	
12 CEILING COVERING		8/9				

LIGHT

	NATURAL	Artificial		
		General	Ambient	Task
1 WALL COVERING	8/8			
1 FLOOR COVERING			2/8	
1 CEILING COVERING		8/8	3/8	2/8
2 WALL COVERING	3/3			
2 FLOOR COVERING				
2 CEILING COVERING		3/3	2/3	
3 WALL COVERING	2/3			
3 FLOOR COVERING			1/3	1/3
3 CEILING COVERING		3/3		
4 WALL COVERING	2/3			1/3
4 FLOOR COVERING			1/3	
4 CEILING COVERING		3/3	1/3	
5 WALL COVERING	2/3			
5 FLOOR COVERING				
5 CEILING COVERING		3/3	2/3	
6 WALL COVERING	3/3			2/3
6 FLOOR COVERING				
6 CEILING COVERING		3/3		
7 WALL COVERING	8/9		3/9	4/9
7 FLOOR COVERING				
7 CEILING COVERING		9/9		
8 WALL COVERING	9/9			3/9
8 FLOOR COVERING				
8 CEILING COVERING		9/9	3/9	
9 WALL COVERING	2/7			
9 FLOOR COVERING				
9 CEILING COVERING		7/7	2/7	3/7
10 WALL COVERING	2/9			
10 FLOOR COVERING				
10 CEILING COVERING		9/9		3/9
11 WALL COVERING	3/8			2/8
11 FLOOR COVERING				
11 CEILING COVERING		8/8		
12 WALL COVERING	2/8			
12 FLOOR COVERING				
12 CEILING COVERING		8/8		

Sport Accessories

	EXIST	NOT EXIST
1 WALL COVERING		
1 FLOOR COVERING		
1 CEILING COVERING		
2 WALL COVERING		
2 FLOOR COVERING		
2 CEILING COVERING		
3 WALL COVERING		
3 FLOOR COVERING	3/3	
3 CEILING COVERING		
4 WALL COVERING		
4 FLOOR COVERING	2/3	1/3
4 CEILING COVERING		
5 WALL COVERING		
5 FLOOR COVERING	3/3	
5 CEILING COVERING		
6 WALL COVERING		
6 FLOOR COVERING	2/3	1/3
6 CEILING COVERING		
7 WALL COVERING		
7 FLOOR COVERING	7/9	2/9
7 CEILING COVERING		
8 WALL COVERING		
8 FLOOR COVERING	2/9	7/9
8 CEILING COVERING		
9 WALL COVERING		
9 FLOOR COVERING		
9 CEILING COVERING		
10 WALL COVERING		
10 FLOOR COVERING		
10 CEILING COVERING		
11 WALL COVERING		
11 FLOOR COVERING		
11 CEILING COVERING		
12 WALL COVERING		
12 FLOOR COVERING		
12 CEILING COVERING		

CLEAN-LESS

	CLEAN	NOT CLEAN
1 WALL COVERING	5/8	3/8
1 FLOOR COVERING	3/3	
1 CEILING COVERING	2/3	1/3
2 WALL COVERING	3/3	
2 FLOOR COVERING	2/3	1/3
2 CEILING COVERING	2/3	1/3
3 WALL COVERING	3/3	
3 FLOOR COVERING	2/3	1/3
3 CEILING COVERING	2/3	1/3
4 WALL COVERING	3/3	
4 FLOOR COVERING	2/3	1/3
4 CEILING COVERING	2/3	1/3
5 WALL COVERING	3/3	
5 FLOOR COVERING	3/3	
5 CEILING COVERING	3/3	
6 WALL COVERING	2/3	1/3
6 FLOOR COVERING	2/3	1/3
6 CEILING COVERING	2/3	1/3
7 WALL COVERING	5/9	4/9
7 FLOOR COVERING	5/9	4/9
7 CEILING COVERING	7/9	2/9
8 WALL COVERING	8/9	1/9
8 FLOOR COVERING	8/9	1/9
8 CEILING COVERING	2/9	7/9
9 WALL COVERING	3/7	4/7
9 FLOOR COVERING	2/7	5/7
9 CEILING COVERING	4/7	3/7
10 WALL COVERING	5/9	4/9
10 FLOOR COVERING	3/9	6/9
10 CEILING COVERING	3/9	6/9
11 WALL COVERING	5/8	3/8
11 FLOOR COVERING	2/8	6/8
11 CEILING COVERING	2/8	6/8
12 WALL COVERING	5/9	4/9
12 FLOOR COVERING	3/9	6/9
12 CEILING COVERING	5/9	4/9

SMELL

HVAC

	EXIST	NOT EXIST
1 WALL COVERING	5/8	4/8
1 FLOOR COVERING	2/3	1/3
1 CEILING COVERING	3/3	
2 WALL COVERING	1/3	2/3
2 FLOOR COVERING	1/3	2/3
2 CEILING COVERING	1/3	2/3
3 WALL COVERING	3/3	
3 FLOOR COVERING	3/3	
3 CEILING COVERING	3/3	
4 WALL COVERING	2/3	1/3
4 FLOOR COVERING	1/3	2/3
4 CEILING COVERING	1/3	2/3
5 WALL COVERING	3/3	
5 FLOOR COVERING	3/3	
5 CEILING COVERING	3/3	
6 WALL COVERING	3/3	
6 FLOOR COVERING	3/3	
6 CEILING COVERING	3/3	
7 WALL COVERING	6/9	3/9
7 FLOOR COVERING	6/9	3/9
7 CEILING COVERING	6/9	3/9
8 WALL COVERING	6/9	3/9
8 FLOOR COVERING	6/9	3/9
8 CEILING COVERING	6/9	3/9
9 WALL COVERING	4/7	3/7
9 FLOOR COVERING	4/7	3/7
9 CEILING COVERING	4/7	3/7
10 WALL COVERING	3/9	6/9
10 FLOOR COVERING	3/9	6/9
10 CEILING COVERING	3/9	6/9
11 WALL COVERING	2/8	6/8
11 FLOOR COVERING	2/8	6/8
11 CEILING COVERING	2/8	6/8
12 WALL COVERING	3/9	6/9
12 FLOOR COVERING	3/9	6/9
12 CEILING COVERING	5/9	4/9

CLEAN-LESS

	CLEAN	NOT CLEAN
1 WALL COVERING	7/8	1/8
1 FLOOR COVERING	3/3	
1 CEILING COVERING	2/3	1/3
2 WALL COVERING	3/3	
2 FLOOR COVERING	2/3	1/3
2 CEILING COVERING	2/3	1/3
3 WALL COVERING	3/3	
3 FLOOR COVERING	2/3	1/3
3 CEILING COVERING	2/3	1/3
4 WALL COVERING	3/3	
4 FLOOR COVERING	2/3	1/3
4 CEILING COVERING	2/3	1/3
5 WALL COVERING	3/3	
5 FLOOR COVERING	3/3	
5 CEILING COVERING	3/3	
6 WALL COVERING	3/3	
6 FLOOR COVERING	3/3	
6 CEILING COVERING	3/3	
7 WALL COVERING	6/9	3/9
7 FLOOR COVERING	6/9	3/9
7 CEILING COVERING	6/9	3/9
8 WALL COVERING	6/9	3/9
8 FLOOR COVERING	6/9	3/9
8 CEILING COVERING	6/9	3/9
9 WALL COVERING	4/7	3/7
9 FLOOR COVERING	4/7	3/7
9 CEILING COVERING	4/7	3/7
10 WALL COVERING	3/9	6/9
10 FLOOR COVERING	3/9	6/9
10 CEILING COVERING	3/9	6/9
11 WALL COVERING	2/8	6/8
11 FLOOR COVERING	2/8	6/8
11 CEILING COVERING	2/8	6/8
12 WALL COVERING	5/9	4/9
12 FLOOR COVERING	5/9	4/9
12 CEILING COVERING	5/9	4/9

HEARING

MUSIC

	EXIST	NOT EXIST
1 WALL COVERING	8/8	
1 FLOOR COVERING	8/8	
1 CEILING COVERING	8/8	
2 WALL COVERING	3/3	
2 FLOOR COVERING	3/3	
2 CEILING COVERING	3/3	
3 WALL COVERING	3/3	
3 FLOOR COVERING	3/3	
3 CEILING COVERING	3/3	
4 WALL COVERING	3/3	
4 FLOOR COVERING	3/3	
4 CEILING COVERING	3/3	
5 WALL COVERING	3/3	
5 FLOOR COVERING	3/3	
5 CEILING COVERING	3/3	
6 WALL COVERING	3/3	
6 FLOOR COVERING	3/3	
6 CEILING COVERING	3/3	
7 WALL COVERING	9/9	
7 FLOOR COVERING	9/9	
7 CEILING COVERING	9/9	
8 WALL COVERING	9/9	
8 FLOOR COVERING	9/9	
8 CEILING COVERING	9/9	
9 WALL COVERING	2/7	5/7
9 FLOOR COVERING	2/7	5/7
9 CEILING COVERING	2/7	5/7
10 WALL COVERING	3/9	6/9
10 FLOOR COVERING	3/9	6/9
10 CEILING COVERING	3/9	6/9
11 WALL COVERING	3/8	5/8
11 FLOOR COVERING	3/8	5/8
11 CEILING COVERING	3/8	5/8
12 WALL COVERING	4/9	5/9
12 FLOOR COVERING	4/9	5/9
12 CEILING COVERING	4/9	5/9

NOISE

	EXIST	NOT EXIST
1 WALL COVERING	6/8	2/8
1 FLOOR COVERING	8/8	
1 CEILING COVERING	8/8	
2 WALL COVERING	1/3	2/3
2 FLOOR COVERING	1/3	2/3
2 CEILING COVERING	1/3	2/3
3 WALL COVERING	2/3	1/3
3 FLOOR COVERING	2/3	1/3
3 CEILING COVERING	2/3	1/3
4 WALL COVERING	2/3	1/3
4 FLOOR COVERING	2/3	1/3
4 CEILING COVERING	2/3	1/3
5 WALL COVERING	1/3	2/3
5 FLOOR COVERING	1/3	2/3
5 CEILING COVERING	1/3	2/3
6 WALL COVERING	1/3	2/3
6 FLOOR COVERING	1/3	2/3
6 CEILING COVERING	1/3	2/3
7 WALL COVERING	7/9	2/9
7 FLOOR COVERING	7/9	2/9
7 CEILING COVERING	6/9	3/9
8 WALL COVERING	6/9	3/9
8 FLOOR COVERING	6/9	3/9
8 CEILING COVERING	6/9	3/9
9 WALL COVERING	1/7	6/7
9 FLOOR COVERING	1/7	6/7
9 CEILING COVERING	1/7	6/7
10 WALL COVERING	3/9	6/9
10 FLOOR COVERING	3/9	6/9
10 CEILING COVERING	3/9	6/9
11 WALL COVERING	1/8	7/8
11 FLOOR COVERING	1/8	7/8
11 CEILING COVERING	1/8	7/8
12 WALL COVERING	2/9	7/9
12 FLOOR COVERING	2/9	7/9
12 CEILING COVERING	2/9	7/9

TOUCH

TEXTURE

	Flat	Bumpy	Smooth	Hard	Soft
1 WALL COVERING	8/8				
1 FLOOR COVERING	8/8				
1 CEILING COVERING	8/8				
2 WALL COVERING	2/3				
2 FLOOR COVERING	3/3				
2 CEILING COVERING	3/3				
3 WALL COVERING	3/3		3/3		
3 FLOOR COVERING	2/3		2/3		
3 CEILING COVERING	3/3				
4 WALL COVERING	3/3				
4 FLOOR COVERING	2/3		2/3	2/3	
4 CEILING COVERING	2/3				
5 WALL COVERING	3/3				
5 FLOOR COVERING	2/3			2/3	
5 CEILING COVERING	2/3				
6 WALL COVERING	3/3				
6 FLOOR COVERING	2/3			2/3	
6 CEILING COVERING	2/3				
7 WALL COVERING	7/9		4/9	5/9	
7 FLOOR COVERING	7/9			8/9	1/9
7 CEILING COVERING	8/9		4/9	5/9	
8 WALL COVERING	9/9		4/9		
8 FLOOR COVERING	8/9			1/9	
8 CEILING COVERING	7/9		4/9	4/9	
9 WALL COVERING	6/7			3/7	
9 FLOOR COVERING	4/7			5/7	
9 CEILING COVERING	6/7			4/7	
10 WALL COVERING	6/9		7/9		2/9
10 FLOOR COVERING	7/9		6/9	3/9	
10 CEILING COVERING	9/9		6/9	3/9	
11 WALL COVERING	4/8	2/8		2/8	1/8
11 FLOOR COVERING	7/8		3/8	5/8	
11 CEILING COVERING	8/8		3/8	5/8	
12 WALL COVERING	7/9			4/8	
12 FLOOR COVERING	7/9			4/8	
12 CEILING COVERING	9/9				

MATERIAL

	NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS
1 WALL COVERING	2/8	3/8	6/8	5/8		
1 FLOOR COVERING				7/8		4/8
1 CEILING COVERING	1/8	1/8	7/8	5/8		
2 WALL COVERING				3/3	2/3	
2 FLOOR COVERING				3/3		
2 CEILING COVERING				3/3		
3 WALL COVERING				2/3		
3 FLOOR COVERING	3/3			2/3		
3 CEILING COVERING				3/3		
4 WALL COVERING				2/3		
4 FLOOR COVERING				3/3	2/3	
4 CEILING COVERING				3/3		
5 WALL COVERING				2/3		
5 FLOOR COVERING				3/3		
5 CEILING COVERING				3/3		
6 WALL COVERING				2/3		
6 FLOOR COVERING				3/3	2/3	
6 CEILING COVERING				2/3		
7 WALL COVERING			6/9	5/9		
7 FLOOR COVERING			4/9	8/9		4/9
7 CEILING COVERING			2/9	7/9		
8 WALL COVERING			1/9	8/9		
8 FLOOR COVERING			1/9	8/9		4/9
8 CEILING COVERING			1/9	8/9		
9 WALL COVERING				4/7		2/7
9 FLOOR COVERING				7/7		5/7
9 CEILING COVERING				5/7		
10 WALL COVERING				6/9	3/9	
10 FLOOR COVERING				9/9		4/9
10 CEILING COVERING				6/9	3/9	
11 WALL COVERING				5/8		
11 FLOOR COVERING				8/8		4/8
11 CEILING COVERING				4/8		
12 WALL COVERING				6/9	4/8	2/9
12 FLOOR COVERING			1/9	9/9	4/9	4/9
12 CEILING COVERING	1/9	1/9	5/9	2/9		

Extra

Comments

- Only 8 Fitness Centers got lobby
- Only 3 Fitness Centers Cafe and bar
- Only 3 Fitness Centers Stretching area
- Only 3 Fitness Centers Studio
- Only 3 Fitness Spinning area
- Only 3 Fitness Studios
- Only 2 Fitness Centers Changing area didn't exists
- Only 1 Fitness Centers WC didn't exists

Table 24: Findings by percentage

PERCENTAGE

PLAN ORGANIZATION

PLAN ORGANIZATION		
GRID		
CLUSTER		
RADIAL		
LINEAR	66%	
CENTRALIZED		

SPACES

No.	LOCATION	EXIST	NOT EXIST	M²		MATERIAL
1	LOBBY	88%			WALL COVERING	100% Paint.
					FLOOR COVERING	75% Tiles. 25% Wood.
					CEILING COVERING	75% Paint. 12.5% Steel. 12.5 Gypsum Board
2	CAFE & BAR		66%		WALL COVERING	100% Paint.
					FLOOR COVERING	67% Tiles. 33% Rubber .
					CEILING COVERING	67% Paint. 33% Paint + Wood.
3	STRETCHING AREA		66%		WALL COVERING	Mirror Texture Paint + Texture + Mirrors
					FLOOR COVERING	67% Rubber. 33% Wooden.
					CEILING COVERING	100% Paint.
4	Studio		66%		WALL COVERING	67% Paint. 100% Mirrors 67% Texture.
					FLOOR COVERING	100% Wooden Floor
					CEILING COVERING	100% Paint.
5	SPINNING AREA		66%		WALL COVERING	100% Paint.
					FLOOR COVERING	33% Rubber 33% Vinyl 33% Wooden Floor
					CEILING COVERING	100% Paint.
6	Studio 2		66%		WALL COVERING	67% Paint. 33% Pictures + Mirrors
					FLOOR COVERING	100% Rubber Floor mats
					CEILING COVERING	100% Paint.
7	FREE WEIGHT	100%			WALL COVERING	100% Paint. 100% Mirrors
					FLOOR COVERING	100% Rubber Floor mats
					CEILING COVERING	77% Paint. 23% Steel
8	CARDIOVASCULAR AREA	100%			WALL COVERING	89% Paint. 55% Mirrors. 11% Pictures + Mirrors
					FLOOR COVERING	55% Wooden 45% Rubber.
					CEILING COVERING	100% Paint.
9	CHANGING AREA	77%			WALL COVERING	57% Large Tiles 14% Paint + Mirror 14% Paint
					FLOOR COVERING	85% Large Tiles 15% Medium Tiles
					CEILING COVERING	100% Paint.
10	SHOWERS	100%			WALL COVERING	66% Large Tiles 33% Small Tiles 22% Medium Tiles
					FLOOR COVERING	77% Large Tiles 11% Small Tiles 11% Wood
					CEILING COVERING	100% Paint.
11	WC	88%			WALL COVERING	75% Large Tiles 12.5% Medium Tiles 12.5% Paint + Medium Tiles
					FLOOR COVERING	100% Large Tiles
					CEILING COVERING	100% Paint.
12	LOCKERS	100%			WALL COVERING	55% Paint 33% Large Tiles 11% Paint +Large Tiles
					FLOOR COVERING	89% Tiles 11% Wood
					CEILING COVERING	89% Paint 11% Gypsum Board

FIVE SENSE

SIGHT

No.		COLOR Group Warm	Group Cool	Scheme A chromatic	Scheme mono chromatic	Scheme Analogous	Scheme complementary
1	WALL COVERING			100%			
	FLOOR COVERING			87.5%			
	CEILING COVERING			100%			
2	WALL COVERING		33%	67%			33%
	FLOOR COVERING	33%		100%			
	CEILING COVERING		33%	100%			
3	WALL COVERING	33%	33%	33%		33%	
	FLOOR COVERING	67%				33%	
	CEILING COVERING			100%			
4	WALL COVERING	100%					67%
	FLOOR COVERING	67%				33%	
	CEILING COVERING			100%			
5	WALL COVERING	100%		67%			67%
	FLOOR COVERING	67%		100%			
	CEILING COVERING	67%		100%			
6	WALL COVERING	67%		67%			
	FLOOR COVERING	67%		100%			
	CEILING COVERING			100%			
7	WALL COVERING			77%			23%
	FLOOR COVERING			100%			
	CEILING COVERING			100%			12%
8	WALL COVERING		25%	77%			33%
	FLOOR COVERING			88%			12%
	CEILING COVERING	25%		88%			12%
9	WALL COVERING	14%		85%			15%
	FLOOR COVERING			100%			
	CEILING COVERING			100%			15%
10	WALL COVERING	12%	12%	88%			12%
	FLOOR COVERING			100%			
	CEILING COVERING			100%			
11	WALL COVERING	15%	30%	62.5%			37.5%
	FLOOR COVERING			100%			
	CEILING COVERING			100%			12.5%
12	WALL COVERING	37.5%		75%			25%
	FLOOR COVERING			100%			
	CEILING COVERING			100%			12.5%

No.		TEXTURE EXIST	TEXTURE NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy	LIGHT NATURAL	Artificial General	Artificial Ambient	Artificial Task
1	WALL COVERING	25%	75%			25%		100%			
	FLOOR COVERING	100%				100%				25%	
	CEILING COVERING	12.5%	87.5%			12.5%			100%	37.5%	25%
2	WALL COVERING	67%	33%			67%		100%			
	FLOOR COVERING	67%	33%			67%					
	CEILING COVERING	33%	67%			33%			100%	67%	
3	WALL COVERING	100%				100%		67%	33%		
	FLOOR COVERING	67%	33%			67%				33%	33%
	CEILING COVERING		100%						100%		
4	WALL COVERING	67%	33%			100%		67%			33%
	FLOOR COVERING	100%				100%					
	CEILING COVERING		100%						100%	33%	
5	WALL COVERING	67%	33%			100%		67%	33%		
	FLOOR COVERING	100%				100%					
	CEILING COVERING		100%						100%	67%	
6	WALL COVERING	67%	33%			67%		67%			33%
	FLOOR COVERING	33%	67%			33%					
	CEILING COVERING	33%	67%			33%			100%		
7	WALL COVERING	55%	45%			55%		89%		33%	45%
	FLOOR COVERING	89%	11%			89%					
	CEILING COVERING	22%	78%			22%			100%		
8	WALL COVERING	45%	55%	12%		45%	23%	100%			33%
	FLOOR COVERING	89%	11%			89%					
	CEILING COVERING		100%						100%	33%	
9	WALL COVERING	28%	72%			28%		30%	70%		
	FLOOR COVERING	100%				100%					
	CEILING COVERING	15%	85%			15%			100%	30%	42.5%
10	WALL COVERING	78%	22%			78%	12%	23%			
	FLOOR COVERING	100%				67%	33%				
	CEILING COVERING	11%	89%			11%			100%		33%
11	WALL COVERING	87.5%	12.5%			62.5%	37.5%	37.5%			
	FLOOR COVERING	100%		12.5%		87.5%					
	CEILING COVERING		100%						100%		
12	WALL COVERING	55%	45%			55%		25%			
	FLOOR COVERING	89%	12%	12%		78%					
	CEILING COVERING	12%	89%			12%			100%		

No.	SIGHT Sport Accessories EXIST	Sport Accessories NOT EXIST	SIGHT CLEANLESS CLEAN	CLEANLESS NOT CLEAN	SMELL HVAC EXIST	HVAC NOT EXIST	SMELL CLEANLESS CLEAN	CLEANLESS NOT CLEAN	HEARING MUSIC EXIST	MUSIC NOT EXIST	HEARING NOISE EXIST	NOISE NOT EXIST	Extra Comments
1			62.5%			62.5%	87.5%		100%		75%		- Only 8 Fitness Centers got lobby
2			100%		67%		100%		100%			67%	- Only 3 Fitness Centers Cafe and bar
3	100%		67%		100%		67%		100%		67%		- Only 3 Fitness Centers Stretching area
4	67%		67%			67%	67%		100%		67%		- Only 3 Fitness Centers Studio
5	100%		100%		100%		100%		100%			67%	- Only 3 Fitness Spinning area
6	67%		67%		100%		67%		100%			67%	- Only 3 Fitness Studios
7	78%		55%		67%		67%		100%		78%		
8		78%	89%		67%		67%		100%		67%		
9				57%		57%	57%			57%		85%	- Only 2 Fitness Centers Changing area didn't exists
10			55%			67%		67%		67%		67%	
11			62.5%			87.5%		87.5%		62.5%		87.5%	- Only 1 Fitness Centers WC didn't exists
12			55%			67%	55%			55%		78%	

TOUCH

No.		TEXTURE Flat	Bumpy	Smooth	Hard	Soft	MATERIAL NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS
1	WALL COVERING	100%						25%	37.5%	75%	62.5%	
	FLOOR COVERING	100%								87.5%		50%
	CEILING COVERING	100%						12.5%	12.5%	87.5%	62.5%	
2	WALL COVERING	67%								100%	67%	
	FLOOR COVERING	100%								100%		
	CEILING COVERING	100%								100%		
3	WALL COVERING	100%								67%		
	FLOOR COVERING	67%						100%				
	CEILING COVERING	100%								100%		
4	WALL COVERING	100%								67%		
	FLOOR COVERING	67%		67%	67%					100%		
	CEILING COVERING	100%								100%		
5	WALL COVERING	100%								67%		
	FLOOR COVERING	67%			67%					100%		
	CEILING COVERING				100%					100%		
6	WALL COVERING	100%								67%		
	FLOOR COVERING	67%			67%					100%		
	CEILING COVERING	100%								67%		
7	WALL COVERING	77%		45%	55%					55%		
	FLOOR COVERING	77%			87.5%	12.5%			45%	88%		45%
	CEILING COVERING	87.5%		45%	55%				22%	78%		
8	WALL COVERING	100%		45%					12%	88%		
	FLOOR COVERING	87%			13%				12%	88%		45%
	CEILING COVERING	77%		45%	45%				12%	88%		
9	WALL COVERING	85%			43%				13%	57%		30%
	FLOOR COVERING	53%			72%					100%		71%
	CEILING COVERING	85%			57%					72%		28%
10	WALL COVERING	67%			77%	22%				67%	33%	
	FLOOR COVERING	77%			67%	33%				100%		45%
	CEILING COVERING	100%			67%	33%				67%	33%	
11	WALL COVERING	50%	25%		25%	12.5%				62.5%		
	FLOOR COVERING	87.5%		37.5%						100%		
	CEILING COVERING	100%		37.5%						100%		
12	WALL COVERING	100%								68%		22%
	FLOOR COVERING	77%		50%	50%				12%	100%		
	CEILING COVERING	100%						12%	12%	55%	22%	

4.4 Findings and Discussion

According to the chart percentages in Table 24, the most used plan organization was liner with 66%. As mentioned in chapter II (2.2): According to Ching F. D. (2014), this type of space organization can directly link spaces to each. Which is with (Ulseth & Seippel, 2011) in chapter III 3.3: Moving through the facility spaces should be easy and simple and the facility spaces should be connected.

- **Lobby**

One of the main core spaces in fitness centers as mentioned in Chapter III 3.3.1 is the lobby. In the observation process, only 8 out of 9 fitness centers found to have lobby areas to control access points. 100% of the lobby walls were painted with warm (33%), Achromatic (100%), Analogous (11%), and complementary (11%) color. As mentioned in chapter III 3.4, the finishing material of the walls should be taken into consideration to be easily cleaned. As all the facilities lobby walls covered with paint, the flat texture was used on by 25% of the facilities. In chapter III 3.6, Ching and Binggeli (2017) mentioned that flat texture gives the space a visual weight and ensures a visual reaction for the first visit of the space. Floor, wall, and ceiling texture found to be 100% flat. Natural light found in all the facilities lobby which is recommended for the user's well-being. The flooring was covered with tiles (75%) and wood (25%). As Kuller and Wetterberg (1996) mentioned, fitness centers' facilities flooring should cover the need of the covered area, tiles and wood fit the need and the purpose for the lobby. 87.5% used achromatic floor covering material color which provides a better contrast look as mentioned by Mahnke (1996) in chapter III 2.6. Natural light was provided in 100% of the facilities' lobby area. Ambient colored lighting used on lobby flooring in 25% of the facilities. 100% used general lighting elements in the ceiling,

37.5% ambient light, and only 25% used task lighting. As mentioned by Steelcase (1999), ambient lighting provides the needed atmosphere for a better bright working atmosphere. Flat surfaces covering material, texture, painted walls, with the correct color scheme lead to an easy cleanable space 2.6. But only 62.5% of the lobbies found clean depending on the used covering material, paint, and texture. Only 12.5% of the facilities' lobby ceiling was covered with gypsum board, 12.5% with steel, and 75% paint.

- **Café and bar**

Café and bar found in three out of nine facilities which could lead to a leak of user satisfaction as mentioned in chapter III 2.7. Painted walls (100%) with warm (33%), achromatic (100%), analogous (11%), and 11% complementary color scheme. As mentioned by Mahnke (1987), if warm color applied on walls will make space look wider which is less applies in the space. Flat texture exists with 67% on walls and floor. Only 33% of café and bar ceiling were covered with flat texture. Hygiene is an important feature of this space as it mentioned in customer satisfaction and continuously section 2.7, 100% looked clean. HVAC system found in 100% percent of the spaces which led to a comfortable temperature and clean smell by 100%. Noise founded by 67% of the facilities as they are provided with outdoor area.

- **Stretching Area**

The stretching area found in three out of nine facilities. Missing one of the leading fitness areas could lead to customer satisfaction and continuously, as mentioned in chapter III. Mirrors, texture, and paint were used in wall covering material in the space. The warm color used by 33% which, as mentioned in 2.6, warm color increases blood pressure and might lead to an exciting feeling which is not suitable for this area as

mentioned in 2.6 in case of cooling down the situation. Rubber flooring used in 67% which is fitting the need of the space (Seamon, 2014). Natural light provided by openings in two spaces (67%). Direct lighting was avoided and general lighting used in 100% of space's ceilings. Old covering material found in one (33%) of the area which leads appear not clean. HVAC system found in the two spaces (67%) which lead to cleaned air in both areas. Noise founded in two (67%) of three spaces as space was connected with the free weight area.

- **Studio 1 Area**

Three studio multi using space found in nine facilities to be used Dance, Pilates, and Boxing studio. Mirrors were fixed on (100%) of the studio wall with paint (67%) and texture (67%). The warm color used in 100% of the studio's walls which is appropriate for this type of activity in the space (2.3.2 + 2.6). Wooden flooring exists in 100% of the studios which might not be an appropriate floor covering material for Pilate's classes (2.3.2). 100% painted ceiling with an achromatic color scheme. Natural daylight missed in one studio (33%), General (100%) and ambient (33%) lighting found in the ceiling to avoid glare effect for the users. Sports Accessories found in two of three studios (67%) that could be used while exercising lead for safer movement (2.4). HVAC found in one out of three studios (33%) lead to unwanted foul stench by 33%. Smell as mentioned in 2.6 one of the ambiance factors, might affect on the satisfaction level and indoor atmosphere level for the user.

- **Spinning Area**

Spinning studios one of the most common indoor classes in Famagusta city. Only three out of 9 facilities provided the spinning area. 100% painted walls mixed with warm 100%, achromatic 67%, and 67% complementary color scheme. Rubber flooring tiles

covered the flooring of one area (33%). The vinyl used in one area to cover the flooring which considered as slip-resists material, while third used wood for covering material. Wood might not be ideal flooring covering as it should be acoustic isolation material under the machines to provide less noise. As mentioned in chapter III, spinning one of the physical activities include high intense effort, which increases the heart rate. Warm color might be unappropriated for this type of space (2.6.1). Natural light was provided by two studios out of three (67%), while 67% used ambient lighting fixed in the ceiling to provide the needed atmosphere. HVAC system found in three areas which lead to a 100% clean smell. (2.6.7).

- **Free weight area**

Free weight area one of the main facility spaces. Found in all facilities that have been included in the study (100%). Painted walls (100%) with mirrors (100%), the warm color used by 37.5%, achromatic 77%, and 23% complementary color scheme for walls. Flat texture found on 55% of the walls while natural light provided in 87% of the areas. Rubber floor mats used by 100% of the area with a 100% achromatic color scheme. As mentioned in chapter III findings, free weight area flooring should be padded and high load resistant. Only 1/9 (23%) of the area's ceiling covering material found to be steel, which is not appropriate covering material that preventing noise and controls the area temperature (Chapter II, 2.3.5). Sport accessories were not found in 23% of the areas. White painted walls and old used floor covering material affected the area clean vision as it showed in the charts giving above that 45% of the areas looked not clean. HVAC wasn’t provided in 33% of the areas which lead to foul stench smell that exists in 33% of the areas. Music as one of the affected ambient factors in fitness centers (chapter III, 2.6.6) exists in all the areas (100%).

- **Cardiovascular Area**

Cardiovascular is found in 9 out of 9 fitness centers. Walls were covered mixed with paint 89% and 11% pictures and mirrors. The cool color scheme exists by 25% which as mentioned in chapter III 3.6.1, cool color effect found to be cool, relaxing, and comfortable which is suitable for this area. Wooden flooring covering material founded to be the most by 55% which lead to bumpy flooring texture by 12% and hard texture by 88%. Followed with rubber tiles by 45% which provided flat flooring texture by 87% in the area that used in. The ceiling was painted 100% in all the areas with 88% achromatic and 12% complementary color scheme. Natural daylight found in 100% of the areas with a 33% task lighting system found on the walls. As only 67% of the areas were provided with the HVAC system, 33% found to have not clean smell.

- **Changing area**

The changing area found in 7 out of 9 fitness centers. The founded changing area walls covered with tiles by 57%, 14% paint, and 14% mirrors and paint. The most used color scheme in wall tiles and painting were achromatic with 85%, followed by 14% warm color and 15% complementary. Large tiles covering floor material found in 85% of the areas by 15% covered with medium tiles. Large tiles give an impression of larger space volume (3.4.2). Only 30% of the areas were provided with natural day light. Hygiene is one of the customer needs which was provided only in 43% of the areas. Which led to not clean smell in 43% of the areas as HVAC play a big role which was provided only in 57% of the area.

- **Showers**

Showers found in all the facilities by 100%. Large tiles used in showers walls area 66%, small tiles 33%, and 22% medium tiles. Large tiles make space look sleeker, and

reduce the spent time on cleaning 3.4.1. As achromatic color makes the space to look more hygiene, 88% of the used tiles were achromatic color scheme. Floor tiles were 77% large tiles, 11% small tiles, and 11% wood which is not recommended for wet areas 3.4.1. Flat texture found in the floor tiles by 67% and the highest percentage used covering were tiles, followed by a 33% bumpy texture. Showers area was not provided with natural daylight as only 23% of the areas were having natural light. Task light used in the ceiling only in 33% of the areas. While 100% used general lighting instead. Only 33% of showers area provided with HVAC system which leads to a high amount of not clean smell by 67% in most of the showers area. Hard texture material to be slip-resisted. And only 3 out of 9 (33%) facilities used UPC plumbing code in their showers.

- **Bathroom (WC)**

Only 8 restroom were exists in 9 facilities. 75% of the walls were covered with large tiles, 12.5% medium tiles, and 12.5% paint and medium tiles. Warm color scheme exists in the wall covering material by 15%, cool color scheme by 30% which is could be suitable for this area 3.6.1. The most used color scheme for walls were achromatic with 62.5%, followed with 100% for flooring. Large tiles used in flooring cover material by 100% of the areas with 87.5% flat texture. The complementary color scheme exists in the ceiling by 12.5%, and the highest used color was achromatic by 100%. As the most used covering material for wall, floor, and ceiling were large tiles. 62.5% of the areas looked clean. Only 12.5% used the HVAC system in their showers area which led to 87.5%, not clean smell. Hard touching texture and material found in the wall by 82.5% and flooring with 100%. General light provided in 100% of the areas followed with 37.5% natural light provided with an opening in the walls.

- **Lockers**

The area was lockers area which exists in 9 out of 9 facilities (100%). For wall covering material paint used by 55%, large tiles by 33%, and 11% mixed between paint and large tiles. The warm color used by 37.5% to provide contrast with the locker's color 2.3.1. However, the achromatic color was used the most in-wall by 75%, followed by 25% complementary. Wood exists in the floor covering material by 11%, but large tiles found to be used the most by 89% for their effect on the space and easier to be cleaned 3.4.2. Only double tier lockers were used by the facilities and 45% were provided with digital code system 3.5.1.

Chapter 5

CONCLUSION

In 1970s, fitness centers were created to be an invention to represent a unique indoor physical activity environment (Kunitz, 2016). In the first two decades of the 21st century, people became overly fascinated about going to the gym and fitness. People used the term workout in the 1980s and then aerobics in the 1990s. Nowadays, fitness refers to fitness centers, gym, and different shapes of physical activity applied in indoor spaces. The wave of fitness and gym culture-expanded on a global scale between the 1980s and 1990s. Moreover, fitness centers created a unique indoor atmosphere that enhances the user for exercising and using this space. Even though this space found to be a unique indoor physical activity space, no clear guideline found to show the appropriate use, design, or interior design atmosphere application. The leak of awareness in design schemes, interior atmosphere components, and fitness center atmosphere led to an encouraging environment and an unhealthy atmosphere reflected on the user in negative effects. In this study, the aim was to answer "What should be taken into consideration while designing or reestablish fitness center interiors?" Furthermore, the aim is to explain the proper application for fitness centers interiors design schemes. To answer this question, two different methodologies qualitative and quantitative were used in this study. To understand the interior design of the space, the researcher started the literature review part to explain design elements, design principles, space, and plan organization. Then, to understand the interior atmosphere more, interior atmosphere components and the ambiance factors were

searched depending on old researchers, books, and studies. With this part, the needed knowledge in interior design for this study ended. The second part of the literature review was about fitness centers. Starting with the definitions, history, and types of activities done in fitness centers. To create an understanding of the used and designed space. The main aim of the chapter was to explore the interior atmosphere components, plan and functions organization, ambiance factors and their effects in fitness centers. Furthermore, ending the chapter with findings that they have been used in the case study. The research aimed to answer the study question using quantitative methodology. By analyzing all the interior design of existing private fitness centers in Famagusta / North Cyprus from 2005 until the research day. The researcher gathered all the founded information in the literature review part to create an observation table (See page 112, 4.3). By considering five senses that affect the perception of the space user, the researcher grouped the findings according to the user's sense. After filling the observation tables (See 4.3.1) and gathering the findings (4.3.2), Table 24 shows the most used plan organization, interior atmosphere (color, lighting, texture, material, HVAC system), and fitness center spaces in Famagusta city. Each facility has been analyzed according to the interior design atmosphere factors of 12-fitness space (See Figure 48 & 49). The results showed in Table 25, obtained the interaction between Table 23 and the findings of the literature review (3.8). This table could be used by designers, facilities owners, and interior architects/architects in the progress of new design or redesigned interior fitness center space in Famagusta/North Cyprus. This methodology based on findings in the literature review and the observation by the researcher. The observation table could be used in different locations considering the steps showed in 4.3 and done step by step

Table 25: Recommendations

RECOMMENDATIONS

PLAN ORGANIZATION

GRID

CLUSTER

RADIAL

LINEAR

√

CENTRALIZED

SPACES

	LOCATION	Should Exist	Should Not Exist	Recommended M²	
1	LOBBY	√		0.2 M² For each User	WALL COVERING FLOOR COVERING CEILING COVERING
2	CAFE & BAR	√			WALL COVERING FLOOR COVERING CEILING COVERING
3	STRETCHING AREA	√		2M² For each User	WALL COVERING FLOOR COVERING CEILING COVERING
4	Studio	√			WALL COVERING FLOOR COVERING CEILING COVERING
5	SPINNING AREA	√		1.25M² x Machine Footprint	WALL COVERING FLOOR COVERING CEILING COVERING
6	Studio 2	√			WALL COVERING FLOOR COVERING CEILING COVERING
7	FREE WEIGHT	√		5M² for each set of racks	WALL COVERING FLOOR COVERING CEILING COVERING
8	CARDIOVASCULAR AREA	√		1.5-2 M² per machine	WALL COVERING FLOOR COVERING CEILING COVERING
9	CHANGING AREA	√		0.8 M² For each Locker	WALL COVERING FLOOR COVERING CEILING COVERING
10	SHOWERS	√		For each 15 Lockers 1Shower	WALL COVERING FLOOR COVERING CEILING COVERING
11	WC	√		For each 25 Lockers 1WC	WALL COVERING FLOOR COVERING CEILING COVERING
12	LOCKERS	√		15 lockers per shower	WALL COVERING FLOOR COVERING CEILING COVERING

FIVE SENSE

SIGHT

MATERIAL

1	Paint
2	Tiles
3	Paint
4	Paint
5	Tiles
6	Paint
7	Glass Texture Paint Robust Wall/ Mounted Mirrors
8	Rubber Floor Mats
9	Paint
10	Mirrors Robust Wall / Soundproofing wall
11	Wooden Floor Padded Floor / Slip Resist
12	Paint
13	Paint
14	Rubber Mats Vinyl Wooden Floor
15	Paint
16	Mirrors Robust Wall / Soundproofing wall
17	Wooden Floor Padded Floor / Slip Resist
18	Paint
19	Paint Mirrors Robust Wall
20	Rubber Floor mats High dead load resists
21	Paint
22	Paint Robust Wall and Mounted mirrors
23	Wooden Acoustic Isolation under machines
24	Paint
25	Large Tiles
26	Large Tiles
27	Paint Rustproof Material
28	Large Tiles
29	Large Tiles Small Tile Flooring
30	Paint
31	Large Tiles
32	Large Tiles Small Tile Flooring
33	Paint
34	Paint
35	Tiles
36	Paint

COLOR

	Group		Scheme			
	Warm	Cool	A chromatic	mono chromatic	Analogous	comple mentary
1	√	√	√			
2			√			
3			√			
4	√	√	√		√	√
5			√			
6			√			
7	√	√	√		√	
8			√			
9			√			
10	√	√	√			
11	√		√			
12			√			
13		√	√			√
14		√	√			
15		√	√			
16	√	√	√			
17	√		√			
18			√			
19		√	√			√
20		√	√			
21		√	√			
22		√	√			
23		√	√			
24		√	√			
25		√	√			
26		√	√			
27		√	√			
28		√	√			
29		√	√			
30		√	√			
31		√	√			√
32		√	√			
33		√	√			
34		√	√			
35		√	√			
36		√	√			

TEXTURE

	EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy
1	√	√				
2	√					
3	√	√				
4	√				√	
5	√					
6	√				√	
7	√				√	
8	√					
9	√				√	
10	√	√				
11	√				√	
12	√				√	
13	√	√				
14	√				√	
15	√				√	
16	√					
17	√				√	
18	√				√	
19	√	√				
20	√				√	
21	√				√	
22	√	√			√	
23	√				√	
24	√				√	
25	√	√			√	
26	√				√	
27	√				√	
28	√	√			√	
29	√				√	√
30	√					√
31	√	√			√	
32	√				√	
33	√				√	
34	√	√			√	
35	√				√	
36	√				√	

LIGHT

	NATURAL	Artificial		
		General	Ambient	Task
1	√	√		
2			√	√
3		√	√	√
4	√	√		
5				
6			√	√
7	√	√		
8				
9			√	√
10	√	√		
11				
12			√	√
13	√	√		
14			√	√
15			√	√
16	√	√		
17			√	√
18			√	√
19	√	√		
20			√	√
21			√	√
22	√	√		
23			√	√
24			√	√
25	√	√		
26			√	√
27			√	√
28	√	√		
29			√	√
30			√	√
31	√	√		
32			√	√
33			√	√
34	√	√		
35			√	√
36			√	√

	Sport Accessories EXIST	Sport Accessories NOT EXIST	CLEAN-LESS CLEAN	CLEAN-LESS NOT CLEAN	HVAC EXIST	HVAC NOT EXIST	CLEAN-LESS CLEAN	CLEAN-LESS NOT CLEAN	MUSIC EXIST	MUSIC NOT EXIST	NOISE EXIST	NOISE NOT EXIST
1			√		√		√		√			√
2			√		√		√		√			√
3			√		√		√		√			√
4			√		√		√		√			√
5			√		√		√		√			√
6			√		√		√		√			√
7			√		√		√		√			√
8			√		√		√		√			√
9			√		√		√		√			√
10			√		√		√		√			√
11			√		√		√		√			√
12			√		√		√		√			√
13			√		√		√		√			√
14			√		√		√		√			√
15			√		√		√		√			√
16			√		√		√		√			√
17			√		√		√		√			√
18			√		√		√		√			√
19			√		√		√		√			√
20			√		√		√		√			√
21			√		√		√		√			√
22			√		√		√		√			√
23			√		√		√		√			√
24			√		√		√		√			√
25			√		√		√		√			√
26			√		√		√		√			√
27			√		√		√		√			√
28			√		√		√		√			√
29			√		√		√		√			√
30			√		√		√		√			√
31			√		√		√		√			√
32			√		√		√		√			√
33			√		√		√		√			√
34			√		√		√		√			√
35			√		√		√		√			√
36			√		√		√		√			√

SMELL

HEARING

TOUCH

TEXTURE

	Flat	Bumpy	Smooth	Hard	Soft
1	√				
2	√				
3	√				
4	√				
5	√				
6	√		√		
7	√		√		√
8	√				
9	√				
10	√		√	√	√
11	√			√	
12	√				
13	√				
14	√		√	√	√
15	√			√	
16	√				
17	√		√	√	√
18	√				
19	√				
20	√				
21	√				
22	√				
23	√				
24	√				
25	√				
26	√				
27	√				
28	√				
29	√				
30	√				
31	√				
32	√				
33	√				
34	√				
35	√				
36	√				

MATERIAL

	NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS
1				√		
2				√		
3				√		
4				√		
5				√		
6				√		
7				√		
8				√		
9				√		
10				√		
11				√		
12				√		
13				√		
14				√		
15				√		
16				√		
17				√		
18				√		
19				√		√
20				√		
21				√		
22				√		√
23				√		
24				√		
25				√		√
26				√		
27				√		
28				√		√
29				√		√
30				√		
31				√		√
32				√		√
33				√		
34				√		√
35				√		√
36				√		

Extra

Comments

-Waiting area, Access Control, and Reception desk should be found in this space.
-Either built next or inside the reception space.
- Avoid Direct Light from the ceiling. - Bar fixed to the wall 1.2M above the floor. - Avoid sharp edges.
- The Minimum ceiling height between (2.3-2.5 M).
- Audio/Visual System. - Avoid direct down light. - Mounted mirrors.
- The Minimum ceiling height between (2.3-2.5 M).
- The floor should be high dead load resists.
- Stands. - 1.75x Machine Footprint to allow circulation. - Audio/Visual System. - Avoid direct down light.
- Slip/Moisture Materials should be used. - Waterproof lighting. - Lockers, Benches, Wall hooks, and Tower dispensers.
- Slip/Moisture Materials should be used. - Waterproof lighting. - Shelves, Benches, Hooks, and Towel Dispenser. - UPC Plumbing code should be followed.
- WC cabinet Minimum Standard (75 x 160)cm. - Slip/Moisture Materials should be used. - Waterproof lighting. - Wash Sinks, Hooks, and Towel / Soap Dispenser. - UPC Plumbing code should be followed.
- Slip/Moisture Materials should be used. - Rustproof Material. - Mirrors and benches. - Ceiling Air Circulation.

Literature Review Recommendations

Observation Recommendations

Both (Literature review and observation)Recommendations

Furthermore, further studies could be done including more details after considering more research on interior design atmosphere and fitness center factors. A questionnaire, interview, and customers' needs could be considered to be used in further studies.

- **Lobby**

The lobby should be provided with a waiting area, access control point, and reception desk. 0.20M² for each user as 4.5M² mınımum space. Paint is recommended in lobby walls, tiles on the floor, and paint covering the lobby ceiling. Warm, cool, or achromatic color in wall covering. Followed by achromatic color for floor and ceiling. Hard flat texture could be used in flat characters in wall, floor, and ceiling covering. Both natural and artificial light could be used in this space. Proper air ventilation to prevent unwanted smell, which can be provided with a good HVAC system. Music should exist to prevent the machine's noise if the lobby in an open space area.

- **Café & Bar**

Café and bar one of the critical space to get user satisfaction. Stands, hangers, sales counter, and storage room should be provided. It could be found either next to or inside the reception space to be easily accessible by the users. Painted walls with warm, cool, achromatic, analogous, or complementary colors recommended being used in walls. Achromatic tiles for floor covering, and painted ceiling with achromatic color. Flat hard texture is recommended in covering material. Both natural and artificial light could be used in this space. Space should be 100% hygiene with the HVAC system to prevent the smell from the fitness areas.

- **Stretching Area**

In order to promote using the stretch area, it should be located next to the facility entrance to warm up pre-exercise activity. Vinyl material should be used in covering the floor with achromatic color, and mounted mirrors should be found on the walls. Holding bar 1.2M above the floor. To accentuate the activity of warming up, stretching accessories with light free weight should be provided. Direct light should completely be avoided because it might cause glare to the members. Space about 2M² should be provided for each user. Rigid material should be used in walls. Cool color is recommended in this space, followed by audio and visual systems.

- **Studios**

Protrusion free walls should be intended by the designer to obliterate protrusions such as a railing that protrudes onto a court surface and a storage shelf that extends into the activity area of a group exercise studio, which could accidentally make contact with any person who is engaging in a physical activity routine. Recommended temperature between 20-22 °C. Padded achromatic color floor and slip resistance materials should be used in floor covering. Sharp edges should be avoided in walls. Mounted mirrors should exist on the walls. A soundproofing wall should be used to prevent the noise from the other spaces. Natural light needed to be followed by artificial colored light in space studios if needed.

- **Spinning area**

Studio space could be used for spinning classes if it covers the needed factors. For each machine, a 1.25M² x machine footprint should be provided. Acoustic isolation under each machine to prevent the noise. Robust walls with acoustic isolation. Cool,

achromatic, or complementary color could be used in the wall. The HVAC system is important in this space to control the temperature, followed by good air ventilation to prevent the bad smell. Audio/visual system with mounted mirrors. Direct light from the ceiling should be avoided. Natural light needed to be followed by artificial colored light.

- **Free Weight**

Different types of weights distinguish categories of weight lifting, dumbbells as well as loaded and unloaded bars, represent free weights, and machines should be provided to the user in this space. Open racks to store dumbbell weights in accordance with their chronological weight and stands as well as additional benches store for barbell weights which are heavier. The location of the heavier weights should be at the rear of the fitness gym space or at a separate area. To minimize the risk of injury towards other gym users, the location of the weight lifting area should be moved into a different area. To avoid accidents, management and the users should ensure weights are well kept onto the racks after usage. Space should facilitate the ease of movement between the racks, benches and stands. The quantity of equipment and weights to be used is dependent on the size of the free weights area. Mounted mirrors, stands, and signs providing the correct movements to prevent injuries. High dead load resists floor, robust wall and padded floor in weight lifting area. The cool, achromatic and complementary color scheme could be used in wall, floor, and ceiling covering in this space. Natural light recommended and direct light should be avoided.

- **Cardiovascular Area**

At the single-level area, visual displays, as well as audio outputs, should be the product of the fitness machines. The power boxes installed on the floor should be provided at

the CV area and they should be arranged in terms of the cardiovascular equipment placement. Power Supply is required by some CV equipment together with data such as rowers, recumbent bikes, upright bikes, treadmills, elliptical cross trainers, and steppers. In the absence of power, speeding bikes could operate. There should be an avoidance of heavy base supporting or vase. A variety of CV equipment to be provided should include Running machines, step machines, bicycles, upper/lower body machines and core machines for apps. The CV machines contain audio and visual technology which is common on the flat screens typically mounted on the walls. Because of the CV equipment vibration, load transfer and acoustic isolation should be installed on the floor that the CV equipment will occupy. Between 1.5M^2- 2M^2 space needed per machine.

- **Changing Area**

The material covering the floor should not be slippery because the area is supposed to remain dry. Since the changing area needs to remain dry, the showering area should be disconnected to the changing area. The capacity of the facility should coincide with the available number of lockers to accommodate all the participants who will make use of the locker 0.8M^2 for each locker. In order to use the maximum circulation space, an island could be replaced with benches between lockers and in front. The lockers' placement should relate to the dimensions of the benches**.** Proper ventilation and resistance to water need to be taken into consideration. The dimensions at minimum for the locker should be 185 x 38 x 45 cm. A variety of designs could be carried out. Most gym and fitness users arrive at the facility with suitable attire. This suggests that space should only be enough at the peak time use of the space subsequent knockoffs. Therefore, the number of lockers in fitness centers and gyms should be reduced to 25%

- 35%. One shower should be provided for every 6 changing spaces. Well ventilated and ceiling air circulation to prevent unwanted smell. Large tile for floor covering material. Hard flat texture suggested for wall, floor, and ceiling covering material.

- **Showers**

In order to increase privacy for the user, shower cubicles should be provided for every user. The cubicle should span 200cm x 100cm. The drainage under the showerhead as well as the floor incline is required. Clothing hooks should be installed at the back of the door for hanging clothes. Heating and HVAC should be provided to control the space and water temperature. Dark grout, slip-resistant surface, and small tile for floor covering. Large tiles could be used for wall covering. Natural light is recommended with waterproof artificial lighting. For every 15 lockers, 1 shower is needed. Shelves, benches, and tower dispensers should be provided in this area. The color scheme for this space recommended being achromatic.

- **Restroom**

Enlarged WC Cubicles: In the presence of 4 or more cubicles within a washroom, one cubicle needs to be enlarged. The enlarged cubicle must span a 120cm minimum width and should entail an outward opening door. Grab rails which are horizontal and vertical are required around the WC. Standard Toilet Cubicles: A minimum of 45cm diameter maneuvering space on all standard cubicles is a prerequisite. It is necessary to use a closed fist to operate indicator bolts and in a case, the user is collapsed and is trapped inside the cubicle. Doors must allow for emergency access. Ambulant Disabled Cubicles: One WC cubicle should be present in every same-sex washroom to accommodate the ambulant disabled. UPC plumbing code should be followed. For

every 25 lockers, 1 WC with the minimum standard. Large tiles for wall and floor covering. Natural light recommended, followed with artificial light.

- **Lockers**

Since most users may arrive without needing to change or take a shower before they leave, the following options need to be taken into consideration: There should be one changing spot for every 5m^2 class area. 1.5 lockers should be provided in every 1-hour training period. Space circulation or covering floor material should separate wet and dry foot peak hours. Mirrors. Hairdryers. Cooling area. Only robust and pragmatic material should be used. Customers who prefer more privacy should be provided with personal changing cabinets and not accompanied by the benches as mentioned before. Since vandalism is a common issue, the designs should be fitted with inexpensive material. Paint for wall covering, tiles for the floor covering, and paint for ceiling with the cool or achromatic color scheme

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URL 13: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 14: http://sustainabilityorbust.weebly.com/blog/a-sustainable-future-centralised-v-decentralised

URL 15: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 16: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 17: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 18: https://quadralectics.wordpress.com/4-representation/4-1-form/4-1- 3-design-in-city-building/4-1-3-1-the-circularradial-model/

URL 19: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 20: https://i.pinimg.com/originals/79/ad/c5/79adc5410524888740cbff083f19c912.jpg

URL 21: https://apiumtech.com/blog/color-combination-beginners-guide/

URL 22: http://chrysanthos.com/wp-content/uploads/2015/07/ColorWheel_WarmCool.jpg

URL 23: https://apiumtech.com/blog/color-combination-beginners-guide/

URL 24: https://medium.com/@cracustom/whats-the-difference-between-cmyk-and-rgb-c5d9267c192e

URL 25: https://t4.ftcdn.net/jpg/01/40/97/51/240_F_140975163_tfukVRc605WVwHnCzwb6HutV3dGv9l3s.jpg

URL 26: https://depositphotos.com/193135382/stock-illustration-man-fitness-silhouette.html

URL 27: https://www.freepik.com/premium-vector/fitness-aerobic-sport-male-female-silhouette_3260254.htm

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URL 29: https://superawesomevectors.com/yoga-silhouettes-vector/

URL 30: https://www.shutterstock.com/image-vector/silhouette-dancers-simple-302757734

URL 31: https://www.freepik.com/premium-vector/silhouette-healthy-woman_2653717.htm#page=1&query=Pilates%20silhouette&position=6

URL 32: https://www.fitnessandfreebies.com/fitness-tips/images/cross-training.jpg

URL 33: https://www.google.com/maps

URL 34: https://en.wikipedia.org/wiki/Districts_of_Northern_Cyprus

APPENDICES

Appendix A: Observation Tables of Fitness Centers.

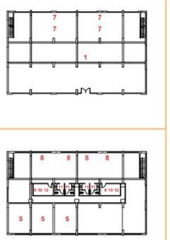

Table 26: Döveç Fitness Center

NAME: **Döveç Fitness Center**

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
				√

PHOTOS

1

2

3

4

5

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10

11

12

PLANS

FIVE SENSE

SIGHT

SPACES: LOCATION		EXIST	NOT EXIST	M²		MATERIAL	COLOR						TEXTURE						LIGHT			
							Group		Scheme											Artificial		
							Warm	Cool	A chromatic	mono chromatic	Analogous	comple mentary	EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy	NATURAL	General	Ambient	Task
1	LOBBY	√		32M²	WALL COVERING	Paint	√		√			√		√					√	√	√	
					FLOOR COVERING	Tiles + Rubber Floor Mats	√		√				√				√				√	
					CEILING COVERING	Steel	√		√				√				√			√	√	
2	CAFE & BAR		√		WALL COVERING																	
					FLOOR COVERING																	
					CEILING COVERING																	
3	STRETCHING AREA		√		WALL COVERING																	
					FLOOR COVERING																	
					CEILING COVERING																	
4	Studio 1		√		WALL COVERING																	
					FLOOR COVERING																	
					CEILING COVERING																	
5	SPINNING AREA	√		70M²	WALL COVERING	Paint + Mirrors + Pictures	√		√					√					√		√	
					FLOOR COVERING	Rubber Floor Mats	√		√			√	√				√					√
					CEILING COVERING	Paint	√		√			√		√						√		
6	Studio 2		√		WALL COVERING																	
					FLOOR COVERING																	
					CEILING COVERING																	
7	FREE WEIGHT	√		130M²	WALL COVERING	Paint + Mirrors + Pictures	√					√		√					√		√	
					FLOOR COVERING	Rubber Floor Mats			√				√				√					
					CEILING COVERING	Paint	√					√		√						√		
8	CARDIOVASCULAR AREA	√		75M²	WALL COVERING	Paint + Mirrors + Pictures		√				√		√					√			
					FLOOR COVERING	Wooden Floor			√				√				√					
					CEILING COVERING	Paint	√					√		√						√		
9	CHANGING AREA	√		8M² M + 8M² F	WALL COVERING	Large Tiles			√					√								
					FLOOR COVERING	Large Tiles			√				√				√					
					CEILING COVERING	Paint			√			√		√						√		
10	SHOWERS	√		2 M + 2 F	WALL COVERING	Paint			√				√				√					
					FLOOR COVERING	Large Tiles			√				√				√					
					CEILING COVERING	Paint			√			√		√						√		
11	WC	√		1 M+ 2 urinals + 2 F	WALL COVERING	Large Tiles			√				√				√					
					FLOOR COVERING	Large Tiles			√				√				√					
					CEILING COVERING	Paint			√			√		√						√		
12	LOCKERS	√		32 M + 32 F	WALL COVERING	Paint	√		√				√				√					
					FLOOR COVERING	Large Tiles	√		√				√				√					
					CEILING COVERING	Paint	√		√			√		√						√		

SPACES: LOCATION			SIGHT				SMELL				HEARING				TOUCH											Extra
			Sport Acces-sories		CLEAN-LESS		HVAC		CLEAN-LESS		MUSIC		NOISE		TEXTURE					MATERIAL						Comments
			EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	EXIST	NOT EXIST	Flat	Bumpy	Smooth	Hard	Soft	NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS	
1	LOBBY	WALL COVERING			√		√		√		√		√		√				√			√	√			
		FLOOR COVERING													√			√					√		√	
		CEILING COVERING													√		√						√	√		
2	CAFE & BAR	WALL COVERING																								- Included in the lobby.
		FLOOR COVERING																								
		CEILING COVERING																								
3	STRETCHING AREA	WALL COVERING																								- Included in the Free weight area.
		FLOOR COVERING																								
		CEILING COVERING																								
4	Studio 1	WALL COVERING																								
		FLOOR COVERING																								
		CEILING COVERING																								
5	SPINNING AREA	WALL COVERING	√		√		√		√		√		√		√		√							√		
		FLOOR COVERING																√					√		√	
		CEILING COVERING													√		√							√		
6	Studio 2	WALL COVERING																								
		FLOOR COVERING																								
		CEILING COVERING																								
7	FREE WEIGHT	WALL COVERING	√		√		√		√		√			√	√		√							√		
		FLOOR COVERING																√					√		√	
		CEILING COVERING													√		√							√		
8	CARDIOVASCULAR AREA	WALL COVERING		√	√		√		√		√		√		√		√						√	√		- 14 Treadmill - 2 Elliptical - 2 Recumbent Bike - 4 Spin Bike
		FLOOR COVERING													√								√		√	
		CEILING COVERING													√		√						√	√		
9	CHANGING AREA	WALL COVERING			√			√	√			√		√	√								√	√		- Changing area separated from WC - Changing cabinets exit.
		FLOOR COVERING													√		√						√		√	
		CEILING COVERING													√								√	√		
10	SHOWERS	WALL COVERING			√			√		√		√		√	√								√		√	
		FLOOR COVERING													√								√			
		CEILING COVERING													√				√				√	√		
11	WC	WALL COVERING			√			√		√		√		√	√								√		√	
		FLOOR COVERING													√								√			
		CEILING COVERING													√				√				√	√		
12	LOCKERS	WALL COVERING			√			√	√			√		√	√								√		√	- Medium tier lockers only.
		FLOOR COVERING													√								√			
		CEILING COVERING													√				√				√	√		

Appendix B: Observation Notes of Fitness Centers.

Doveç Fitness Center

Observation Notes:

The fitness center main activity found in two different levels: basement floor and ground floor level. Access point found on the basement floor with an access control system. The lobby was located to have an overview of the whole plan. The wall of this plan was covered by windows on the main entrance wall to provide the maximum amount of natural daylight. Cafe and bar were not found. The funding machine was found next to the lobby to sell water.

The spinning area was located on the ground floor level plan. Windows were found to provide natural daylight, the ceiling was painted in gray, and mirrors found on one wall.

Free weight area was located in the basement floor level behind the lobby, two sets of free weight racks followed with five Rogue Adjustable Benches. Mirrors were found on the wall so the user could see and correct there posture while exercising. The floor was covered with Rubber Floor Tiles to resist the dumbbells and high load pressure. The ceiling was painted half gray and half yellow. Exercise accessories were found next to the free weight racks set.

The cardiovascular area found on the ground floor level. Small windows were found at the eye level of the treadmill users. 14 treadmill, four spine bike, two ARC trainers, and one Recumbent Bike were found. Three Air conditioner fixed on the wall behind the machines users which could affect the health of the user.

Six changing cabinets were found in Male and Female changing area to provide more privacy for the users. Cabinets were provided with hangers and seating cube. Music found by ceiling speakers. The walls and ceiling were covered with white paint. The flooring was covered with big tiles.

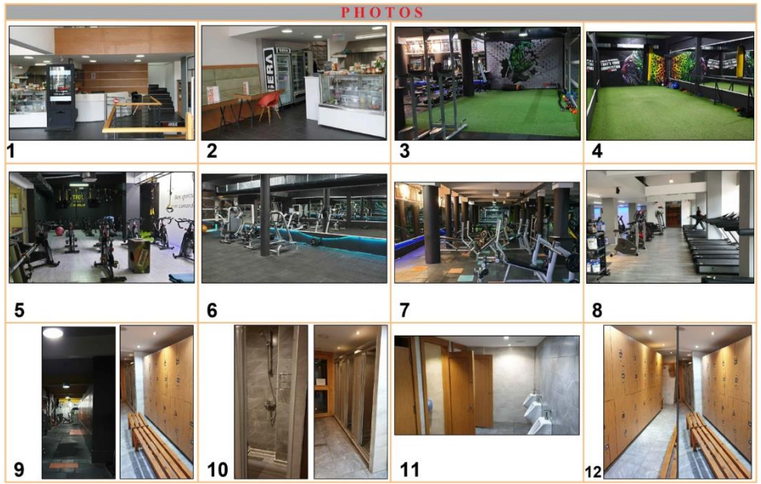
Two showers for each Male and Female located next to the changing cabinets. Wall and floor were covered with big tiles.

WC area was separated from the changing and shower area. One WC with two urinals for Male users, Two WC for Female users.

In each changing area, 29 Digital changeable code double tier lockers were found for each Male and Female.

After the observation, this fitness center covered the minimum space requirements for the lobby, free area, and spinning area. Natural lighting was provided for 80% of the space. Café and bar, stretching area and non-studio area were not found. However, ambient factors like music, noise, and smell were covered to satisfy user needs.

Appendix C: Observation Tables of Fitness Centers.



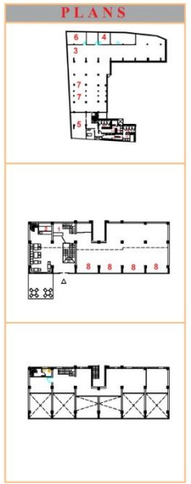


Table 27: Gymaholic fitness center

NAME: GYMAHOLIC FITNESS CENTER

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	✓			

PHOTOS

1

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12

PLANS

LOCATION		EXIST	NOT EXIST	M²		FIVE SENSE																																								
SPACES						SIGHT																					SMELL				HEARING				TOUCH											Extra
						MATERIAL	COLOR						TEXTURE						LIGHT				Sport Accessories		CLEANLESS		HVAC		CLEANLESS		MUSIC		NOISE		TEXTURE					MATERIAL						Comments
							Group		Scheme											Artificial																										
							Warm	Cool	A chromatic	mono chromatic	Analogous	comple mentary	EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy	NATURAL	General	Ambient	Task	EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	EXIST	NOT EXIST	Flat	Bumpy	Smooth	Hard	Soft	NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS	
1	LOBBY	✓		9 M²	WALL COVERING	Paint			✓				✓		✓		✓		✓						✓		✓		✓		✓			✓	✓						✓	✓		✓		
					FLOOR COVERING	Tiles			✓				✓				✓																		✓								✓		✓	
					CEILING COVERING	Paint			✓					✓						✓	✓														✓								✓			
2	CAFE & BAR	✓		35 M²	WALL COVERING	Paint			✓					✓					✓						✓		✓			✓	✓		✓		✓								✓	✓		
					FLOOR COVERING	Tiles + Wooden Floor			✓				✓		✓		✓																		✓								✓		✓	
					CEILING COVERING	Paint			✓					✓						✓	✓														✓								✓			
3	STRETCHING AREA	✓		25 M²	WALL COVERING	Texture			✓				✓		✓		✓						✓			✓	✓			✓	✓		✓		✓		✓				✓					
					FLOOR COVERING	Rubber floor Mats	✓						✓			✓																						✓			✓		✓			
					CEILING COVERING	Paint			✓					✓						✓															✓											
4	Studio 1	✓		35 M²	WALL COVERING	Paint + Texture +Mirrors	✓		✓			✓	✓				✓					✓	✓			✓		✓		✓	✓		✓		✓						✓					- Floor covered with wooden material
					FLOOR COVERING	Artificial Indoor Turf	✓						✓			✓																			✓		✓	✓				✓	✓	✓		
					CEILING COVERING	Paint			✓					✓						✓															✓						✓		✓			
5	SPINNING AREA	✓		54 M²	WALL COVERING	Paint + Glass	✓		✓			✓	✓				✓		✓				✓		✓		✓		✓		✓		✓		✓						✓	✓				- Glass wall led to have to privacy. - Hard floor covering used.
					FLOOR COVERING	Wooden Floor			✓				✓			✓	✓																		✓		✓	✓			✓		✓			
					CEILING COVERING	Paint			✓					✓							✓																	✓				✓	✓			
6	Studio 2	✓		20 M²	WALL COVERING	Paint + Glass			✓					✓										✓		✓	✓			✓	✓		✓		✓						✓					- Glass wall led to have to privacy. - Floor covered with wooden material which is not recommended for dancing studio
					FLOOR COVERING	Rubber floor Mats			✓					✓																					✓		✓	✓			✓	✓			✓	
					CEILING COVERING	Paint			✓				✓				✓			✓															✓			✓			✓		✓			
7	FREE WEIGHT	✓		112 M²	WALL COVERING	Paint + Mirrors			✓					✓					✓			✓	✓			✓	✓			✓	✓		✓				✓		✓							- Only 2 set of weight rex were found. - Not enough lighting. - Different levels in floor covering material
					FLOOR COVERING	Rubber floor Mats			✓				✓		✓																				✓			✓			✓		✓			
					CEILING COVERING	Paint			✓					✓						✓															✓						✓			✓		
8	CARDIOVASCULAR AREA	✓		90 M²	WALL COVERING	Paint + Mirrors			✓					✓					✓		✓	✓		✓	✓		✓			✓	✓		✓		✓			✓			✓		✓	✓		
					FLOOR COVERING	Wooden Floor			✓				✓		✓		✓																		✓			✓	✓		✓	✓	✓			
					CEILING COVERING	Paint			✓					✓						✓	✓														✓			✓			✓		✓			
9	CHANGING AREA	✓		7 M² M + 7M² W	WALL COVERING	Large Tiles + Mirrors			✓				✓					✓							✓			✓		✓	✓			✓			✓		✓		✓	✓				- Big tiles for floor covering. - Poor lighting - Small space comparing with the lockers number
					FLOOR COVERING	Large Tiles			✓				✓				✓																				✓	✓					✓	✓		
					CEILING COVERING	Paint			✓					✓						✓		✓													✓			✓			✓					
10	SHOWERS	✓		4M+4W=8 cubicles	WALL COVERING	Large Tiles			✓				✓		✓			✓							✓			✓		✓	✓			✓			✓		✓		✓	✓				- Big tiles floor and wall covering. - Poor lighting - Poor Ventilation.
					FLOOR COVERING	Large Tiles			✓				✓		✓			✓																			✓	✓					✓	✓		
					CEILING COVERING	Paint			✓					✓						✓		✓													✓			✓			✓					
11	WC	✓		4M+4F=8 cubicles 4M Urinals	WALL COVERING	Large Tiles			✓				✓		✓			✓							✓			✓		✓	✓			✓			✓		✓		✓	✓				- Big tiles floor and wall covering. - Poor lighting - Poor Ventilation.
					FLOOR COVERING	Large Tiles			✓				✓		✓			✓																			✓	✓					✓	✓		
					CEILING COVERING	Paint			✓					✓						✓		✓													✓			✓			✓					
12	LOCKERS	✓		64M+64W = 128 Small Lockers	WALL COVERING	Large Tiles			✓				✓		✓			✓							✓			✓		✓	✓			✓			✓		✓		✓	✓				- Only one tier of lockers were found.
					FLOOR COVERING	Large Tiles			✓				✓		✓			✓																			✓	✓					✓	✓		
					CEILING COVERING	Paint			✓					✓						✓		✓													✓			✓			✓					

Appendix D: Observation Notes of Fitness Centers.

Gymaholic Fitness Center

Observation Notes:

The facility consists of three different floor levels: basement, ground, and mezzanine levels. Lobby found on the ground floor level. Stairs located next to the reception desk for easy circulation between the facility areas.

Black tiles covering the floor area, wood and paint found on the walls while the ceiling painted white. Task lighting found on the reception ceiling.

Next to the reception café and bar exists. The kitchen provided with an air ventilation system to prevent the smell from the facility spaces. Sharing the same floor covering with the lobby area, the white paint covering the walls and ceiling. Outdoor seating area found connected with the café area.

At the same floor level, Cardiovascular are exists with 13 treadmills, two spine bikes, and four ARC trainers. The HVAC system wasn't found. The lighting system fixed on the ceiling, wood flooring covering, and Windows on the front side wall to provide outside view. Child care room found in the mezzanine floor followed with stretching and cooling area.

Moving to the basement level, Free weight including two set of free weight racks and three Rogue Adjustable Bench. Natural light from small windows exists on the wall, mirrors covering front and back wall, ambient lighting under the mirrors. Different color rubber floor tiles covered the floor, and the ceiling painted with white paint. The spinning area could be changed to the TRX class. Walls painted in black, full glass wall to provide natural daylight and wooden flooring. Another studio found to be used as a multi used studio, provided with Mirrors and floor covering with artificial indoor turf — fixed bar found on the wall for stretching movements.

The changing area provided with four wooden seating benches, hangers, paper dispensers, and a hair drying machine. 50 double tier lockers, three-bathroom cabinets, and four shower cabinets for each changing area (Male and Female). Three urinals found in the male changing area. Sauna room located next to the shower cabinets with a temperature controlling system.

After the observation, the smell could be prevented in the changing area caused by poor air ventilation system. Different types of lighting systems used through different parts of the facility. However, ambient factors like music and noise were covered to satisfy user needs.

Appendix E: Observation Table of Fitness Centers.

Table 28: Fit Art Health & Fitness Center

NAME: FIT ART HEALTH & FITNESS CENTER

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	√			

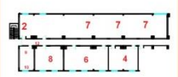
PHOTOS

1 2 3 4

5 6 7 8

9 10 11 12

PLANS



SPACES

	LOCATION	EXIST	NOT EXIST	M²	WALL COVERING	FLOOR COVERING	CEILING COVERING
1	LOBBY		√				
2	CAFE & BAR	√		22 M²	Paint	Rubber floor Mats	Paint
3	STRETCHING AREA		√				
4	Studio 1	√		57 M²	Texture + Mirrors	Wooden Floor	Paint
5	SPINNING AREA		√				
6	Studio 2	√		85 M²	Pictures + Mirrors	Soft Floors Interlocking Tiles	Paint
7	FREE WEIGHT	√		120 M²	Paint + Mirrors	Rubber floor Mats	Paint
8	CARDIOVASCULAR AREA	√		56 M²	Pictures + Mirrors	Wooden Floor	Paint
9	CHANGING AREA	√		2M + 2F	Paint + Mirror	Medium Tiles	Paint
10	SHOWERS	√		2M + 2F	Large Tiles + Small Tiles	Large Tiles + Small Tiles	Paint
11	WC		√				
12	LOCKERS	√		27 Both M+F	Paint	Big Tiles	Paint

FIVE SENSE

SIGHT

MATERIAL	COLOR: Group Warm	COLOR: Group Cool	COLOR: Scheme Monochromatic	COLOR: Scheme Analogous	COLOR: Scheme Complementary	TEXTURE: EXIST	TEXTURE: NOT EXIST	TEXTURE: ARTIFICIAL	TEXTURE: NATURAL	TEXTURE: Flat	TEXTURE: Bumpy	LIGHT: NATURAL	LIGHT: Artificial: General	LIGHT: Artificial: Ambient	LIGHT: Artificial: Task	Sport Accessories: EXIST	Sport Accessories: NOT EXIST	CLEANLESS: CLEAN	CLEANLESS: NOT CLEAN
Paint																			
Rubber floor Mats	√					√			√				√						
Paint		√				√			√										
Texture + Mirrors	√				√	√			√				√			√		√	
Wooden Floor	√					√			√				√			√		√	
Paint		√				√			√					√					
Pictures + Mirrors	√				√	√			√				√			√		√	
Soft Floors Interlocking Tiles	√	√				√			√				√			√		√	
Paint		√				√			√					√					
Paint + Mirrors	√				√	√			√				√			√		√	
Rubber floor Mats	√					√			√				√			√		√	
Paint		√				√			√					√					
Pictures + Mirrors	√				√	√			√				√			√		√	
Wooden Floor	√					√			√				√			√		√	
Paint		√				√			√					√					
Paint + Mirror	√				√	√			√				√			√		√	
Medium Tiles	√					√			√				√			√		√	
Paint		√				√			√					√					
Large Tiles + Small Tiles	√				√	√			√				√			√		√	
Large Tiles + Small Tiles	√					√			√				√			√		√	
Paint		√				√			√					√					
Paint	√				√	√			√				√			√		√	
Big Tiles	√					√			√				√			√		√	
Paint		√				√			√					√					

SMELL

HVAC: EXIST	HVAC: NOT EXIST	CLEANLESS: CLEAN	CLEANLESS: NOT CLEAN
√		√	
√		√	
√		√	
√		√	
√		√	
√		√	
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√		√	
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√		√	
√		√	
√		√	
√		√	
√		√	
√		√	
√		√	
√		√	

HEARING

MUSIC: EXIST	MUSIC: NOT EXIST	NOISE: EXIST	NOISE: NOT EXIST
√			
√			
√			
√		√	
√			
√			
√		√	
√		√	
√		√	
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√		√	
√		√	
√		√	
√		√	
√		√	

TOUCH

TEXTURE: Flat	TEXTURE: Bumpy	TEXTURE: Smooth	TEXTURE: Hard	TEXTURE: Soft	MATERIAL: NATURAL	MATERIAL: ARTIFICIAL	MATERIAL: Soft	MATERIAL: Hard	MATERIAL: SOFT AND HARD
		√							
		√							
		√							
		√							
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		√							

Extra

Comments
- Only Access control exit.
- Pilate's Studio.
- Kickboxing Studio.
- Changing cabinet exit. - No benches.

Appendix F: Observation Notes of Fitness Centers.

Fit Art Health & Fitness Center

Observation Notes:

Fit art health & fitness center located under Pop Art Dormitory in the North Campus of Eastern Mediterranean University. The lobby was not found, only access control point exists. All the facility activity found on the basement floor level. The plan organization found to be linear.

Café and Bar located on the entrance of the free weight and machines area. The personal trainer area found to support the users. Wall was covered with black paint with motivation pictures on different walls. Ceiling painted with white color. Flooring covered with Rubber Floor black tiles.

Pilate's studio exists with the necessary accessories, mirrors front and back walls. White painted ceiling with HVAC, sound, and lighting systems. Wooden smooth flooring covered the floor.

Followed by boxing area supported by two practicing areas, needed accessories, soft interlocking flooring tiles colored with red and blue. Black painted walls followed by motivations pictures and punching sandbags hanged from the ceiling and on the walls. The white ceiling supported with HVAC, sound, and lighting systems.

Four treadmills, two spine bikes, and three ARC trainer. Big windows provide natural daylight. Walls covered with mirrors and pictures on the front and backside of the room. Wooden floor and white painted ceiling which include HVAC, sound, and lighting systems.

Two changing cabinets for each Male and Female in changing area. Tile covered the floor, wall, and ceiling covered by white painting. Two showers in each changing area, a wall covered by small tiles and large tiles, large tiles covered the floor, and a white painted ceiling. WC was outside the facility as it is shared WC with the other facility on the same floor level.

After the observation, the facility covered most of the core and main fitness center activities in the facility. Stretching area and WC as they did not exist were weak points

of the facility. Ambient factors were at a high level to get user satisfaction from clean areas, air ventilation, and music covering the facility areas.

Appendix G: Observation Table of Fitness Centers.

Table 29: M8 Fitness Center

NAME: M8 FITNESS CENTER

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	√			

PHOTOS

1


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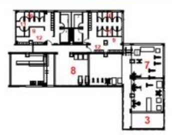
11


12


PLANS



SPACES

	LOCATION	EXIST	NOT EXIST	M²		MATERIAL
1	LOBBY	√		70M²	WALL COVERING	Paint
					FLOOR COVERING	Tiles
					CEILING COVERING	Paint
2	CAFE & BAR		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
3	STRETCHING AREA	√		72M²	WALL COVERING	Texture + Mirror
					FLOOR COVERING	Wooden Floor
					CEILING COVERING	Paint
4	Studio 1		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
5	SPINNING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
6	Studio 2		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
7	FREE WEIGHT	√		140M²	WALL COVERING	Paint + Mirrors
					FLOOR COVERING	Rubber floor Mats
					CEILING COVERING	Paint
8	CARDIOVASCULAR AREA	√		70M²	WALL COVERING	Paint
					FLOOR COVERING	Rubber floor Mats
					CEILING COVERING	Paint
9	CHANGING AREA	√		35M² M + 35M² F	WALL COVERING	Large Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
10	SHOWERS	√		4 M + 4 F	WALL COVERING	Large Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
11	WC	√		3 M + 3Urinals + 4 F	WALL COVERING	Large Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
12	LOCKERS	√		51 M + 51 F	WALL COVERING	Large Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint

FIVE SENSE

SIGHT						SMELL		HEARING		TOUCH		Extra
MATERIAL	COLOR (Group: Warm, Cool; Scheme: A chromatic, mono chromatic, Analogous, comple mentary)	TEXTURE (EXIST, NOT EXIST, ARTIFICIAL, NATURAL, Flat, Bumpy)	LIGHT (NATURAL; Artificial: General, Ambient, Task)	Sport Accessories (EXIST, NOT EXIST)	CLEAN-LESS (CLEAN, NOT CLEAN)	HVAC (EXIST, NOT EXIST)	CLEAN-LESS (CLEAN, NOT CLEAN)	MUSIC (EXIST, NOT EXIST)	NOISE (EXIST, NOT EXIST)	TEXTURE (Flat, Bumpy, Smooth, Hard, Soft)	MATERIAL (NATURAL, ARTIFICIAL, Soft, Hard, SEAMLESS, SEMI POROUS)	Comments

Appendix H: Observation Notes of Fitness Centers.

M8 Fitness Center

Observation Notes:

The facility consists only of the basement level floor. The plan organization found to be linear. No seating area found in the lobby. Large tiles covered the floor, gray painted walls with pictures and black paint covered the ceiling.

After the access control point, a cardiovascular area found with four treadmills, one running machine treadmill, two spine bikes, and one ARC trainer. Big windows exist to provide natural light and view, but no sun curtains found. Rubber floor tiles covered the floor, Ceiling painted with black color, and walls covered with black paint and pictures.

The stretching area found to be away from changing area or starting area. Glass windows over the three sides walls supported with gym accessories. Wooden flooring with Yellow texture, Ceiling painted with gray color connected with steel structure. Walls covered with pictures.

Free weight area includes one set of free weight racks and two Rogue Adjustable Benches. Lighting handed from the ceiling as general ambient lighting, Mirrors on both sides of walls with ambient colored lighting, and rubber floor black tiles covering the floor.

In changing area, wood benches in front of the lockers, 51 lockers double tire lockers, four-bathroom cabinets, two showers, sauna, and steam room, hair drying area, hangers, and paper dispenser found in each male and female changing area.

Walls covered with large dark tiles, white painted ceiling supported with sound, lighting system, and large tiles covering the floor. Ambient colored lighting found in the washing area.

After the observation, café and bar, studios, and the spinning area were not found in the facility. Ambient factors were effecting this facility. No sun-shading provided for windows. The bad smell was not found according to the excellent air ventilation.

Appendix I: Observation Table of Fitness Centers.

Table 30: Ersin's Gym & Fitness

NAME: Ersin Fitness Center

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	√			

PHOTOS

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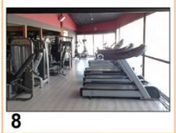
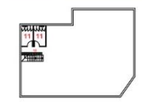


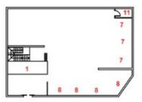
8

9

10/11/12

PLANS





FIVE SENSE

SPACES	LOCATION	EXIST	NOT EXIST	M²	MATERIAL	COLOR: Group: Warm	COLOR: Group: Cool	COLOR: Scheme: A mono	COLOR: Scheme: mono adjacent	COLOR: Scheme: analogue	COLOR: Scheme: complementary	TEXTURE: EXIST	TEXTURE: NOT EXIST	TEXTURE: ARTIFICIAL	TEXTURE: NATURAL	TEXTURE: Flat	TEXTURE: Bumpy	LIGHT: NATURAL	LIGHT: Artificial: General	LIGHT: Ambient	LIGHT: Task	Sport Accessories: EXIST	Sport Accessories: NOT EXIST	CLEAN-LESS: CLEAN	CLEAN-LESS: NOT CLEAN	SMELL: HVAC: EXIST	SMELL: HVAC: NOT EXIST	SMELL: CLEAN-LESS: CLEAN	SMELL: CLEAN-LESS: NOT CLEAN	HEARING: MUSIC: EXIST	HEARING: MUSIC: NOT EXIST	HEARING: NOISE: EXIST	HEARING: NOISE: NOT EXIST	TOUCH: TEXTURE: Flat	TOUCH: TEXTURE: Bumpy	TOUCH: TEXTURE: Smooth	TOUCH: TEXTURE: Hard	TOUCH: TEXTURE: Soft	TOUCH: MATERIAL: NATURAL	TOUCH: MATERIAL: ARTIFICIAL	TOUCH: MATERIAL: Soft	TOUCH: MATERIAL: Hard	TOUCH: MATERIAL: MIXED/OTHERS	Extra: Comments
					Paint + Mirrors																																								
					Wooden Floor																																									
					Gypsum Board																																									
	1 LOBBY	√		40 M²																																								
	2 CAFE & BAR		√																																									
	3 STRETCHING AREA		√																																									
	4 Studio 1		√																																									
	5 SPINNING AREA		√																																									
	6 Studio 2		√																																									
	7 FREE WEIGHT	√		41 M²	Wood + Mirrors + Painted Steel																																							
					Wood + Rubber floor Mats																																								
					Steel																																								
	8 CARDIOVASCULAR AREA	√		70 M²	Paint																																							
					Wood																																							
					Paint																																							
	9 CHANGING AREA		√																																									
	10 SHOWERS	√		2M + 2F	Medium Tiles																																							
					Medium Tiles																																							
					Paint																																							
	11 WC	√		2M + 2F cubicles	Medium Tiles																																							
					Medium Tiles																																							
					Paint																																							
	12 LOCKERS	√		2F M + F	Paint																																							
					Wood																																							
					Gypsum Board																																							

- Lockers Located Next to The Lobby

Appendix J: Observation Notes of Fitness Centers.

Ersin's Gym & Fitness

Observation Notes:

Built-in 2009. Ersin fitness center has two different floor levels. The ground floor includes Lobby, Cardiovascular, Free weight, Lockers, and machine area. The basement floor includes an open training area and a changing area. Lobby found on the ground floor provided with access control. Floor area covered with wood, walls with black paint and mirrors, and ceiling were made of suspended ceiling tile. Inside the lobby, 23 small deposit boxes were found accessed by the staff.

After the access control point, the cardiovascular area starts with six treadmills, two spine bikes, and one ARC trainer. Windows found in the wall facing the treadmill to provide street view and natural light. As it is in the lobby area, cardiovascular area flooring covered by wood. The ceiling was not covered with any material as it made by a steel structure.

Passing from the cardio area, one set of free weight racks were found supplied by three Rogue Adjustable Bench and two fixed benches. Mirrors covering part of the wall followed by wood and the building steel structure. Both Rubber Floor Tiles and wood material used to cover the floor. Lighting elements found on the wall facing the benches, with no lighting in the ceiling.

Lockers were located next to the stairs which lead to the basement floor. 20 lockers for both males and females.

Two showers and one WC for each female and Men. Each area provided with one bench. Urinals did not exist in the Men area. Showers and WC walls and flooring were covered by tiles and ceiling covered with white paint. WC paper dispenser didn’t exist in the washing area and the WC.

The temperature was low as there is no HVAC found in any area of the fitness center to control it.

After the observation, this fitness center was missing core and main spaces, main and sub-functions. The noise was found inside the facility as it found next to the main street. The steel structure was not covered with any sound or temperature insulation, music didn’t cover all the facility areas.

Appendix K: Observation Table of Fitness Centers.

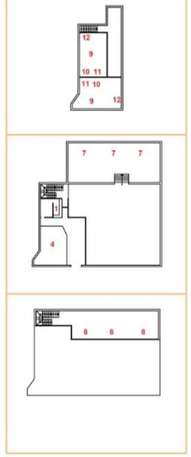


Table 31: New Form Fitness Center & Gym

NAME: New Form Fitness Center & Gym

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
	√			

PHOTOS

1

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12

PLANS

FIVE SENSE

SPACES						FIVE SENSE																																								
						SIGHT																					SMELL				HEARING				TOUCH											Extra
						MATERIAL	COLOR						TEXTURE						LIGHT				Sport Accessories		CLEAN-LESS		HVAC		CLEAN-LESS		MUSIC		NOISE		TEXTURE					MATERIAL						Comments
							Group		Scheme											Artificial																										
	LOCATION	EXIST	NOT EXIST	M²			Warm	Cool	A chromatic	mono chromatic	Analogous	comple mentary	EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy	NATURAL	General	Ambient	Task	EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	CLEAN	NOT CLEAN	EXIST	NOT EXIST	EXIST	NOT EXIST	Flat	Bumpy	Smooth	Hard	Soft	NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS	
1	LOBBY	√		12 M²	WALL COVERING	Paint			√					√					√							√		√	√		√		√		√		√						√	√		
					FLOOR COVERING	Tiles					√		√				√																		√								√	√		
					CEILING COVERING	Paint			√					√						√															√								√	√		
2	CAFE & BAR		√		WALL COVERING																																									
					FLOOR COVERING																																									
					CEILING COVERING																																									
3	STRETCHING AREA		√		WALL COVERING																																									
					FLOOR COVERING																																									
					CEILING COVERING																																									
4	Studio 1	√		29 M²	WALL COVERING	Paint + Mirrors	√					√		√					√					√	√			√	√		√		√		√								√	√		
					FLOOR COVERING	Wooden Floor					√		√				√																		√		√						√	√		
					CEILING COVERING	Paint			√					√						√															√								√			
5	SPINNING AREA		√		WALL COVERING																																									
					FLOOR COVERING																																									
					CEILING COVERING																																									
6	Studio 2		√		WALL COVERING																																									
					FLOOR COVERING																																									
					CEILING COVERING																																									
7	FREE WEIGHT	√		106 M²	WALL COVERING	Steel + Mirrors			√				√					√	√				√			√		√		√	√		√		√	√		√			√		√	√		
					FLOOR COVERING	Rubber floor Mats			√				√				√																		√				√			√	√			
					CEILING COVERING	Steel			√				√					√		√															√	√		√					√			
8	CARDIOVASCULAR AREA	√		67 M²	WALL COVERING	Paint + Mirrors			√					√					√					√	√			√		√	√		√		√			√					√			
					FLOOR COVERING	Wooden Floor					√		√				√																		√			√					√	√		
					CEILING COVERING	Paint			√					√						√															√			√					√			
9	CHANGING AREA	√		35 M² M + 35 M² F	WALL COVERING	Paint	√					√		√					√							√		√		√		√		√	√									√		
					FLOOR COVERING	Large Tiles			√				√				√																		√								√		√	
					CEILING COVERING	Paint			√				√				√			√															√								√			
10	SHOWERS	√		2M + 2 F	WALL COVERING	Small Tiles	√					√	√				√		√							√		√		√		√		√	√									√		
					FLOOR COVERING	Wooden Floor			√				√				√																		√								√		√	
					CEILING COVERING	Paint			√				√				√			√		√													√								√			
11	WC	√		2M + 2 F	WALL COVERING	Large Tiles	√					√	√				√		√							√		√		√		√		√	√									√		- Urinals not exists
					FLOOR COVERING	Medium Tiles			√				√				√																		√								√		√	
					CEILING COVERING	Paint			√				√				√			√		√													√								√			
12	LOCKERS	√		35M + 30 F	WALL COVERING	Large Tiles	√					√	√				√		√							√		√		√		√		√	√									√		- Medium tier lockers
					FLOOR COVERING	Medium Tiles			√				√				√																		√								√		√	
					CEILING COVERING	Paint			√				√				√			√															√								√			

Appendix L: Observation Notes of Fitness Centers.

New Form Fitness Center & Gym

Observation Notes:

Three different levels exist in this facility, Ground floor which includes lobby, studio space, free weight area, and machine area.

Lobby provided with seating waiting area and access control point. Task and ambient lighting fixed on the ceiling above the reception desk. Next to the reception studio space found to be used as multi-functional space: dance or TRX class. The studio flooring covered with wood, mirrors on the walls, and a steel structure system from the ceiling.

Free weight supported with three free weight racks, four fixed benches, and three Rogue Adjustable Benches. Steel structure found on the ceiling without any covering material, small windows on walls to provide natural light and air ventilation, and rubber floor tiles covering the floor. Lighting was fixed on the steel ceiling considered to be general lighting.

Moving to the mezzanine floor, 10 treadmills, 8 spine bikes, and three ARC trainers found. Wood flooring, painted ceiling, and walls. No HVAC system found. General lighting fixed on the ceiling.

Stairs were located next to the lobby leading to the mezzanine floor. The changing area found with painted walls and ceiling and large tiles flooring. Including, 74 single and double tier lockers for male and 52 for the female area. Three showers and two bathroom cabinets for each male and females. One large bench and one mirror found in the changing area.

After the observation, no HVAC system, café and bar, a stretching area, and spinning are not found in this facility. Space requirements found to be less than the minimum in the cardiovascular area, lobby, and changing area.

Appendix M: Observation Table of Fitness Centers.

Table 32: Power Gym Fitness & Gym Center

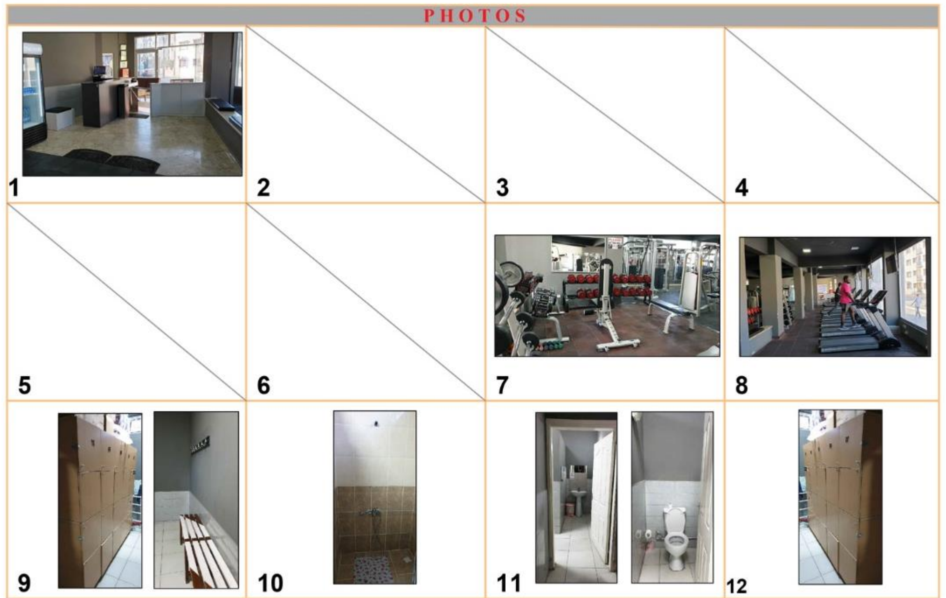
NAME: POWER GYM FITNESS AND GYM CENTER

LOCATION ON MAP

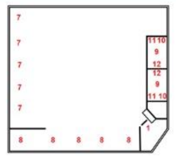
PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
		√		

PHOTOS



PLANS



FIVE SENSE

SIGHT — SMELL — HEARING — TOUCH — Extra

SPACES	LOCATION	EXIST	NOT EXIST	M²		MATERIAL
1	LOBBY	√		20 M²	WALL COVERING	Paint + Tiles
					FLOOR COVERING	Tiles
					CEILING COVERING	Paint
2	CAFE & BAR		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
3	STRETCHING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
4	Studio 1		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
5	SPINNING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
6	Studio 2		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
7	FREE WEIGHT	√		100 M²	WALL COVERING	Paint + Mirrors
					FLOOR COVERING	Rubber floor Mats
					CEILING COVERING	Paint
8	CARDIOVASCULAR AREA	√		87 M²	WALL COVERING	Paint
					FLOOR COVERING	Rubber floor Mats
					CEILING COVERING	Paint
9	CHANGING AREA	√		18 M² M + 18 M² F	WALL COVERING	Paint + Medium Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
10	SHOWERS	√		1M + 1 F	WALL COVERING	Large Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
11	WC	√		2M + 2 F	WALL COVERING	Paint + Medium Tiles
					FLOOR COVERING	Large Tiles
					CEILING COVERING	Paint
12	LOCKERS	√		20M + 20 F	WALL COVERING	Paint + Large Tiles
					FLOOR COVERING	Tiles
					CEILING COVERING	Paint

COLOR (Group: Warm, Cool; Scheme) — TEXTURE (Exist, Not Exist, Artificial, Natural, Flat, Bumpy) — LIGHT (Natural; Artificial: General, Ambient, Task) — Sport Accessories (Exist, Not Exist) — CLEANLESS (Clean, Not Clean) — HVAC (Exist, Not Exist) — CLEANLESS (Clean, Not Clean) — MUSIC (Exist, Not Exist) — NOISE (Exist, Not Exist) — TEXTURE (Flat, Bumpy, Smooth, Hard, Soft) — MATERIAL (Natural, Artificial, Soft, Hard, Seamless, Synchronous) — Comments

Appendix N: Observation Notes of Fitness Centers.

New Form Fitness Center & Gym

Observation Notes:

The facility consists of only a one-floor plan. The ground floor includes all the facility activates.

Lobby found on the facility entrance provided with a control access point and seating area. Medium size tiles for the floor covering, half painted and small tiles covering the wall, and painted ceiling.

The plan organization found to be a cluster, starting from the lobby, free weight and cardiovascular area are accessible. Nine treadmill, four spine bikes, and two ARC trainers found in the cardiovascular area. Rubber floor tiles covering the floor, windows facing the treadmill to provide natural light and view, and painted walls and ceiling with a fixed lighting system.

Two small sets of free weight racks found to create a free weight area provided with one Rogue Adjustable bench and one fixed bench. No gym accessories found in the area. Mirror was fixed on a high level from the floor. Painted wall and ceiling with a fixed lighting system.

Changing cabinets were not found, six large and 12 small tiers lockers, two bathrooms, and two-shower cabinet for each male and female are. Floor and walls covered with large tiles while in changing area half of the wall painted while the other half covered with small tiles. The ceiling was covered with gray paint.

After the observation, no HVAC system, café and bar, a stretching area, studios, and spinning are not found in this facility. Space requirements found to be less than the minimum in the cardiovascular area, lobby, free weight, and changing area.

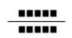
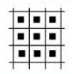
Appendix O: Observation Table of Fitness Centers.

Table 33: Super Body Fitness Center

NAME: SUPER BODY FITNESS CENTER

LOCATION ON MAP

PLAN ORGANIZATION

Centralized	Linear	Radial	Cluster	Grid
				
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PHOTOS

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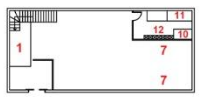
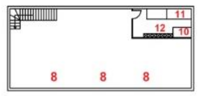
PLANS





SPACES

No.	LOCATION	EXIST	NOT EXIST	M²	Covering	MATERIAL
1	LOBBY	√		18 M²	WALL COVERING	Paint
					FLOOR COVERING	Wood
					CEILING COVERING	Paint
2	CAFE & BAR		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
3	STRETCHING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
4	Studio 1		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
5	SPINNING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
6	Studio 2		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
7	FREE WEIGHT	√		40 M²	WALL COVERING	Paint + Mirrors
					FLOOR COVERING	Rubber Flooring Tiles
					CEILING COVERING	Paint
8	CARDIOVASCULAR AREA	√		61M²	WALL COVERING	Paint
					FLOOR COVERING	Wood
					CEILING COVERING	Paint
9	CHANGING AREA		√		WALL COVERING	
					FLOOR COVERING	
					CEILING COVERING	
10	SHOWERS	√		1M + 1 F	WALL COVERING	Large + Small Tiles
					FLOOR COVERING	Large Tiles.
					CEILING COVERING	Paint
11	WC	√		1M + 1 F	WALL COVERING	Large + Small Tiles
					FLOOR COVERING	Large Tiles.
					CEILING COVERING	Paint
12	LOCKERS	√		33M + 33 F	WALL COVERING	Paint
					FLOOR COVERING	Large Tiles.
					CEILING COVERING	Paint

FIVE SENSE

SIGHT — COLOR, TEXTURE, LIGHT

Space	Covering	Color Group: Warm	Cool	Scheme: A chromatic	mono chromatic	Analogous	complementary	Texture: EXIST	NOT EXIST	ARTIFICIAL	NATURAL	Flat	Bumpy	Light: NATURAL	Artificial: General	Ambient	Task
1 LOBBY	WALL COVERING			√					√					√			
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		
2 CAFE & BAR	WALL / FLOOR / CEILING COVERING																
3 STRETCHING AREA	WALL / FLOOR / CEILING COVERING																
4 Studio 1	WALL / FLOOR / CEILING COVERING																
5 SPINNING AREA	WALL / FLOOR / CEILING COVERING																
6 Studio 2	WALL / FLOOR / CEILING COVERING																
7 FREE WEIGHT	WALL COVERING			√					√					√			
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		
8 CARDIOVASCULAR AREA	WALL COVERING			√					√					√			
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		
9 CHANGING AREA	WALL / FLOOR / CEILING COVERING																
10 SHOWERS	WALL COVERING			√				√					√				
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		
11 WC	WALL COVERING			√				√					√	√			
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		
12 LOCKERS	WALL COVERING			√					√								
	FLOOR COVERING			√				√				√					
	CEILING COVERING			√					√						√		

SIGHT (Sport Accessories, CLEANLESS) — SMELL (HVAC, CLEANLESS) — HEARING (MUSIC, NOISE)

Space	Sport Accessories: EXIST	NOT EXIST	Cleanless: CLEAN	NOT CLEAN	HVAC: EXIST	NOT EXIST	Cleanless: CLEAN	NOT CLEAN	Music: EXIST	NOT EXIST	Noise: EXIST	NOT EXIST
1 LOBBY			√			√		√	√		√	
2 CAFE & BAR												
3 STRETCHING AREA												
4 Studio 1												
5 SPINNING AREA												
6 Studio 2												
7 FREE WEIGHT		√		√		√		√	√		√	
8 CARDIOVASCULAR AREA		√	√			√		√	√			√
9 CHANGING AREA												
10 SHOWERS			√			√		√		√		√
11 WC			√			√		√		√		√
12 LOCKERS			√			√		√		√		√

TOUCH

Space	Covering	Texture: Flat	Bumpy	Smooth	Hard	Soft	Material: NATURAL	ARTIFICIAL	Soft	Hard	SEAMLESS	SEMI POROUS
1 LOBBY	WALL COVERING	√								√	√	
	FLOOR COVERING	√								√	√	
	CEILING COVERING	√								√	√	
2 CAFE & BAR	WALL / FLOOR / CEILING COVERING											
3 STRETCHING AREA	WALL / FLOOR / CEILING COVERING											
4 Studio 1	WALL / FLOOR / CEILING COVERING											
5 SPINNING AREA	WALL / FLOOR / CEILING COVERING											
6 Studio 2	WALL / FLOOR / CEILING COVERING											
7 FREE WEIGHT	WALL COVERING	√								√		
	FLOOR COVERING	√			√				√	√		
	CEILING COVERING	√								√		
8 CARDIOVASCULAR AREA	WALL COVERING	√								√		
	FLOOR COVERING	√								√		
	CEILING COVERING	√								√		
9 CHANGING AREA	WALL / FLOOR / CEILING COVERING											
10 SHOWERS	WALL COVERING		√	√						√		
	FLOOR COVERING	√		√						√		
	CEILING COVERING	√		√						√		
11 WC	WALL COVERING		√		√					√		
	FLOOR COVERING	√			√					√		
	CEILING COVERING	√			√					√		
12 LOCKERS	WALL COVERING	√			√					√		
	FLOOR COVERING	√			√					√		
	CEILING COVERING	√			√					√		

Extra

Space	Comments
1 LOBBY	
2 CAFE & BAR	
3 STRETCHING AREA	
4 Studio 1	
5 SPINNING AREA	
6 Studio 2	
7 FREE WEIGHT	
8 CARDIOVASCULAR AREA	
9 CHANGING AREA	
10 SHOWERS	
11 WC	
12 LOCKERS	

Appendix P: Observation Notes of Fitness Centers.

Super Body Gym.

Observation Notes:

The facility consists of two different floor levels. The ground floor which contains: lobby, free weight area, male's lockers, and WC, and machine area. The mezzanine floor plan contains Cardiovascular area, Female's WC, showers, and lockers.

Access control points found in the lobby, wooden covering material covering the floor, white and gray paint covering the walls, and the ceiling. General lighting fixed on the ceiling and natural daylight from windows.

Going through the free weight area, floor covering material change to Rubber flooring covering tiles. Mirrors fixed on the walls. Moreover, the ceiling painted with white paint. Lighting and sound system fixed in the ceiling. Windows exist in the main and sidewall to provide natural daylight for the area. Only one set of free weight racks exists provided with two Rogue Adjustable Benches.

32 Lockers small tier lockers for males. Changing areas did not exist as hangers and bench found in the lockers area. Large tiles are covering the floor painted wall and ceiling. No HVAC system found.

One Shower and one WC was found. Large tiles were covering the floor, small tiles coving the walls, and painted ceiling for both areas. WC provided with a small window to provide air circulation and natural daylight.

Moving to the mezzanine floor level, four treadmills, two spine bikes, and two ARC trainers found to create a cardiovascular area. The floor covered with wood painted walls and ceiling. Windows found to provide natural daylight and view.

25 Lockers small tier lockers for females. Changing areas did not exist as hangers and bench found in the lockers area. Large tiles were covering the floor painted wall and ceiling. No HVAC system found. One Shower and one WC was found. Large tiles are covering the floor, small tiles coving the walls, and painted ceiling for both areas. WC provided with a small window to provide air circulation and natural daylight.

After the observation, no studios, stretching area, changing area, café, and bar, or spinning area found in the facility in the observation process. The facility was missing the ambient factors which can lead the user to be unsatisfied.