

# “Free Form Interior Design: Analysis and Criticism for a Modern Trend”

Hala Mohsen Mahmoud

Assistant Professor at Interior design and furniture, Faculty of Applied arts - 6 October University

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## KEYWORDS:

The concept of free form, The fourth dimension, Parametric formation, Minimalist formation, visual complexity.

## ABSTRACT:

The concept of free-form interior design as a modern trend is a topic worth to study. That recently designers have an attempt to get out of the concept of the inner cubic space, which depends in its design on geometric shapes and sharp lines, to a space outside the box that depends in its design on imagination and free vision. Free form using the irregular lines and the curves lines to create a new language in design by new formations that are not belongs to the recognized standard rules of design. This change in the form of the inner void has a different and perceptible impact on the users' psychology and visual perception. Within the diverse spaces, the form may conflict with the void function requirements. So, the paper discusses the relationship of the free form with the function of interior spaces by analyzing and criticizing diverse examples of the interior spaces designed with free formation to verify its impact on the reaction or response of users.

## 1- Introduction

The paper deals with a modern trend in interior design that has recently begun to appear and spread clearly with several types of interior spaces, whether public or private, which is the design with free forms. The concept of space is no longer just a traditional cube because it doesn't suit modern design thought, where diversity in the use of shapes and materials is a necessity, especially with the high technological development where all tools are available for free imagination in design, starting from advanced computer programs to 3D printing. Free form is a different concept of the visual perception of space So we can discuss this philosophy through analysis and criticism.

The research is divided into the following points:

First: Philosophy of formation with free form and its impact on the fourth dimension (time).

Second: Free form relationship with both parametric and minimalist trends.

Third: Analysis of free form applications in interior design which represents the following:

1- Free form materials and its available capabilities.

2-The role of modern technology and its systems in achieving the required designs of free form.

Fourth: Criticisms directed at this trend according to the researcher's vision.

## 2- First: Philosophy of free form design and its impact on the fourth dimension (time).

Formation by different lines, shapes and compositions is the basis for the visual perception of the inner space determinants, which are the ceiling, the floor and the walls, as well as the design idea that links these determinants, whether through the aesthetic formation or the functional requirements for that inner space.

The visual relationship created by the different shapes of the free forms connects these determinants to make the space different as it can be perceived with only

two or one determinant while canceling the rest of the determinants. This trend is an invitation to change the idea of the interior design inside the cube towards interior design without limits.

So, what is the free form concept? How can it be used in interior design?

### 2-1 The concept of free form

Free formation in the interior space design is the use of irregular shapes (broken or curved) to make free formations by repeating them in different sizes and angles. Design with free forms make an integrated set of free lines without referring to the stander rules of interior design. Free forms effects on different dimensions to be seen inside the space, and thus results in changing the shape of the space determinants (walls, ceiling, and floor).

Picture no. (1) shows the configuration of the space for an unconventional meeting room, designed by Frank Gehry. Free form design with irregular and expressive shapes and a variety of materials, the strange design is an example of how to utilize earlier studies of material, construction, skin, and shape into an architectural language of form and space.



Pic no. 1(1): Horse-Head Conference Room

### 2-2 Free form and its impact on the fourth dimension

The fourth dimension in design: is an organized process that begins by realizing the needs and ends with the formulation of the requirements of construction. The effects on design have three factors: nature, people, and place. There may be two sides to the formulation of the final product either: The final product construct deals with physical construction as a range of variables or the final product is a physical

form, which has three basic dimensions. so, time has a role in shaping the formation of the space that Both perspectives see time as a fourth dimension, and the physical structure of the place is the result of the design process of elements of interior design.

Free form as a special case of formation with free lines or shapes changes all dimensions of interior space which in turn changes the fourth dimension, the effect it has on visual and concept of perception is what gives a sense of time, so it considered new vision in design formation. Picture no. (2) shows a part of interior design living room designed by free form concept, curved lines, free mass and unlimited shape. people who use the space are affected by change and their perspective on time varies.



Pic no(2) gallery of advanced composites shape shell freeform

### 3-Second: Free form relationship with both parametric and minimalist trends.

#### 3-1 Parametric and Free form

Parametric design has its morphological features formed by the dynamism of component curved lines, which resulted from the continuous and connected formations of its various elements, computer visualizations and techniques determine characteristics of this design direction where parametric is built on filling space with organic forms.

Parametric effect on interior design in morphological terms:

- From static to motion
- From stalemate to consensus.

Software used in parametric design are ((Rhino) Rhinoceros, Digital Project (CATIA), Revit, Dynamo,3D Max, Inventor and Maya).

Designing by free form in interior design may be achieved through parametric principals using specific technology. picture (3) shows Parametric Wood

Domes which are private space within the main space, composed of steel framing and 117 apple wood contour cut blades, the free form was inspired by the symmetrical fractal geometry, found in natural elements. Each blade has a different contour to create movement and allows the form to be engaging from various angles.



Pic no.(3) The parametric dome. Lounge or co-working space by Dillon Works

picture (4) shows 330-metre-long free form table, framing wood-lined nooks and corridors beneath its surface. The surface of the table rises into arches and wraps around pre-existing columns in the space to form pathways, seating areas and storage. Table is made from plywood, with an egg-box style construction, CNC machines were used to cut to the curving shape which is made up of 870 unique components. The pieces were bonded together on site.



Pic no.(4)Table's egg-box structure by Clive Wilkinson

Parametric design is considered one of free formation types, its organic free lines with accurate calculations which applied with computer technology create a motion which effects on the fourth dimension. Each of them has the same general idea which is how to change the interior design determines by using free form shapes.

### 3-2 Minimalist and Free form

Minimalist advocates “less is more”, it shows a simple and pure framework, brings the viewer into the thought of contemplation by very little decoration, so that it shows the space for thinking without limitation. Principles of minimalist are Simplicity in form, Asymmetrical balance, Pattern repetition, Scale & Proportion but the most important is Unity & Har-

mony. Design with this style reduces form, material, connection, texture, and color to their most basic levels.

Nowadays there are many flexible minimalist free form interiors and furniture designs. Some of famous architectures use free form to express their minimalist designs, Zaha Hadid and Frank Gehry designed great projects with free form concept. For example, the Opus in Dubai, it is one of four projects by Zaha Hadid Architects shortlisted for the World Architecture Festival 2019 WAF Awards. The design achieves the balance between solid and void, interior, and exterior. Picture no. (5) shows the ME Dubai hotel bedroom, Zaha Hadid-designed bed, with a mattress that sits on a sculptural frame projecting from the wall.



Pic no. (5) the ME Dubai hotel bedroom, the Opus hotel by Zaha Hadid.

The unity is achieved in the inner space that all surfaces (walls, ceiling and furniture) have the same curved form with great harmony. One shape, one line and one final form it is a perfect example for minimalist. Unity is the main target when the inner space designed with free form of curved or triangled lines which included the furniture among.

### 3-3 As a result, there are two criteria for Free form interior design:

- 1-Motion which relates to time, achieved through parametric.
- 2-Unity which relates to the harmony of design lines, achieved through minimalist.

#### 4-Third: Analysis of free form applications in interior design which represents the following:

- Free form materials and its available capabilities.
- The role of modern technology and its systems in achieving the required designs of free form.

#### 4-1 Free form Materials and Construction Technology

Using technology to create complicated shapes that cannot be manufactured by conventional processes. Using machines that translate the coded instructions into a real object produce quite small components and creating prototyping new products as part of the design process.

Until the appearance of CAD/CAM1 technologies complex forms were big problem but 3D digital modeling software based on NURBS (Non-Uniform Rational B-Splines) has opened a universe of that were. In this context the production of complex panels is possible by computer numerically controlled (CNC) manufacturing processes. Forming processes include CNC punching, CNC folding, CNC bending, Hydroforming, Linear flow splitting, Flexible roll forming and bending, Thermoforming, Injection molding, Welding and Multi-point forming.<sup>10</sup>

Using new ways to produce organic shapes from natural materials is even more complicated. Table no (1) shows the computation and modeling technology of structures with different systems applications for freeform materials.

Material Example	Technology	Construction system
 Steel with concrete layer <sup>11</sup>	Digital design and fabrication technologies	Formwork system consisting of a net of steel cables and a polymer fabric stretched into a reusable scaffolding structure.
 Concrete <sup>12</sup>	3D Concrete Printing, using reinforcement techniques	3DCP, an additive manufacturing process capable of producing full scale construction.
 Laminated Wood <sup>13</sup>	Sculpt form used steam-bending technologies	Steam Bending with high temperature, when it reaches 99 ° C, the lignin loses resistance, allowing the wood to be curved. Using click on battens system, by push-clicked onto the specifically designed mounting tracks and allow installers to fix battens into place quickly. <sup>14</sup>
 Timber <sup>15</sup>	Digital fabrication technology, manufacturing technology with computer science.	Digital Timber Construction DTC system. using digital design and production methods for more efficient structures, using less material, smart geometry, as well as rapid assembly for simple, fast and precise construction processes.
	Parametric modeling software	SentryGlas system, a high-strength tempered glass manufactured by DuPoint. glass sheets were curved by Sunglass in custom robotic bending ovens.

Glass "Double curved glass sails" <sup>16</sup>		
	Free form origami software is used to design and fabrication processes	The foldable construction system used in architecture for designing temporary spaces using foldable and deployable structures. the transition of two-dimensional surfaces to three-dimensional spaces formed by the folding technique.
Paper and Bamboo 17		

Table no(1) the most important free form materials, technologies and construction systems in interior design.<sup>18</sup>

parametric planning and programming technology which designers can successfully make any free design without consequences, harmonize almost every form, function and construction.

#### 4-2 Analysis of Interior Design Free form projects

Table no (2) shows (Description, Concept, Materials, Technology and Analysis) for many applications of freeform interior design.

Project no.1	
	
<b>Project description</b>	The Florescence in Guangzhou, China by Karv One Design. <sup>19</sup>
<b>Free form concept</b>	Curved shapes and open-space layout. The whole space is shaped like a blooming flower.
<b>Materials</b>	The transparent glass curtain walls. Wooden strips
<b>Technology</b>	parametric planning and programming. the Free Form timber constructions are a combination of timber framework and prefabricated timber construction. digital 3D models that define all elements, joints and connections of an architectural project precisely with parameters.
<b>Analysis</b>	create a wholistic atmosphere for living, allowing people to immerse in it and

	unconsciously con- cleave the real-life scenes of the future. The large white flower petals in the reception area is the statement piece of the design while other elements such as the themed pendants and the background wall in the sandbox area are different interpretations of the flower theme. Free form effects on the users feeling, motion and change of the space determines make a new vision for the future of the interior design.
Project no.2	
	
<b>Project description</b>	undulating virtual installation in London by architect Sou Fujimoto. <sup>20</sup>
<b>Free form concept</b>	The dynamic structure "changes and evolves based on the movement of its admirers". The mythological figure Medusa as well as the zoological term for a jellyfish. Inspiration from natural light structures.
<b>Materials</b>	a series of abstract bookshelves made from thin steel rods for Design Miami/Basel. The designer used spotlights, mirrors and sound to create an immersive installation that responds to visitors' movements.
<b>Technology</b>	Continuous digital process chains create a direct connection between the CAD design of the building to computer-aided CAM production. The result is precise individual components that fit together perfectly.
<b>Analysis</b>	Medusa was designed to provoke individuals to play, interact and follow the lights as they walk through the virtual installation. What's exciting for all of us is this idea that you could construct structures that had no physical form and existed only as light being projected into the eyes," said Monk.  "We get the sense of a space that has a design structure that exists in a spatially explorable sense – that has the ability to change our perceived environment and the way that we feel and explore while having no physical form."
Project no.3	

	
<b>Project description</b>	Wellington Airport Passenger Terminal , designed in collaboration between Studio Pacific and Warren and Mahoney Architects <sup>21</sup>
<b>Free form concept</b>	Its oscillating outline was derived from the indentations of aeroplane docks into the triangular site The organic irregularity references the area's geological past, recalling the rocky, sea-battered Wellington coast.
<b>Materials</b>	The 0.6mm KME TECU folded copper sheet cladding Honey-colored macrocarpa ply Glass for the skylight dark-stained panels fissured with light
<b>Technology</b>	the 0.6mm KME TECU folded copper sheet cladding was the ideal material that could be formed to the complex geometries of the building form. The oxidising patina that has developed over time has further reinforced metaphorical references to the rocky geology of the region that the project is inspired by.
<b>Analysis</b>	the project involved the expansion of interior open lounge floor area, new retailing, linkages from the new passenger processing area and an increase to eight aerobridge-capable gates. The main purpose of the design was to create aesthetics with a strong sense of place and offer a memorable experience to international passengers. Crucially, the brief also demanded the creation of a memorable visitor experience through a unique, edgy aesthetic that embodied a strong sense of place.
<b>Project no.4</b>	
	

<b>Project description</b>	Cave-like gift shops created by Koichi Takada Architects inside National Museum of Qatar <sup>22</sup>
<b>Free form concept</b>	Atelier Jean Nouvel's National Museum of Qatar is recognised for its dramatic facade comprising a series of colliding discs, modelled on a mineral formation called the "desert rose". A famous 40-metre-deep cavern in central Qatar – known for its glowing walls of gypsum crystals.
<b>Materials</b>	wood Gypsum
<b>Technology</b>	parametric planning and programming The five-axle CNC trimming line, for example, is the centerpiece of Free Form timber production, enabling even the most complex components to be processed. The gift shop interiors are characterized by soaring wooden walls that create a series of cavernous enclosures from stacked wooden profiles. A total of 40,000 pieces of wood, designed using 3D modelling, were used to construct the space. Each piece is unique to its position in the structure and fits flush only with its complementary segment.
<b>Analysis</b>	Each interior space offers a fragment of the Qatari history, that aims to enhance and fulfil both a cultural and memorable experience for museum visitors." The layers of wood that make up the shops' interiors extend down like stalagmites in a cave to form columns and display shelves. light trickles from skylights that puncture the ceilings, also giving glimpses of the walls outside.
<b>Project no.5</b>	
	
<b>Project description</b>	The Cambridge Mosque Project, England by Marks Barfield <sup>23</sup>
<b>Free form concept</b>	The idea of design is a "calm oasis of contemplation" situated within a grove of trees and informed by the garden of paradise. The structure aims to create tree-like pillars that join to form an interwoven, octagonal canopy that holds up its roof.
<b>Materials</b>	Timber wood

	cross-laminated timber (CLT) clad in masonry tiles.
<b>Technology</b>	digital planning tools and modern, in-house CNC production make it all possible. a 3D digital model, also known as a parametric model, enables different versions of highly complex construction projects to be digitally programmed and tested. a pre-fabrication and assembly strategy and develop a comprehensive 3-D model of the project. The truss system was digitally optimized to streamline the geometric design.
<b>Analysis</b>	Fascinating Free Form timber supporting frameworks and shell structures create timber constructions, timber was chosen as the main material for the building because of its sustainability credentials, and the mosque was designed with a minimal carbon footprint. State-of-the-art planning and production methods open up new possibilities and redefine the limits of what can be achieved. Ideas for complex constructions and dynamic forms become tangible and are expressed through distinctive timber architecture. Making extraordinary timber construction a reality from visionary to amazingly simple.

Table no.(2) shows Analysis of projects as free form applications in interior design.<sup>24</sup>

### 5-Fourth: Criticisms directed at free form trend according to the researcher's vision.

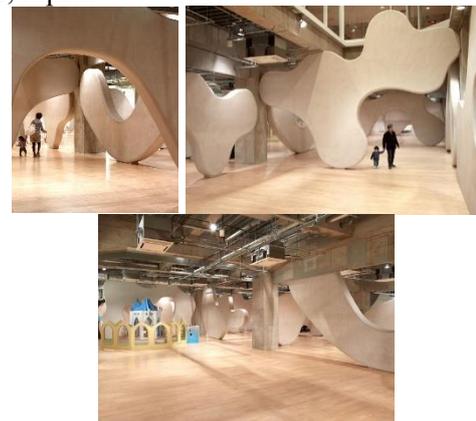
The most successful professional interior designers understand the relationship between form & function and how form follows function in the interior design process. Form is the backbone of any interior design, which helps to create an external impact on things like patterns, colors, and textures. Using Inorganic or Geometric form gives a clean and controlled look, but it is artificial and uses geometric shapes and designs to give a modern, sophisticated & elegant look. However, using Organic form is more inspired by nature. The function of the space is considered the first factor we need to realize to decide how to choose the formation.<sup>25</sup>

As an interior designer, you decide what goes where to make the space usable according to its functional requirements. Sometimes your desire to create the perfect aesthetic can get in the way of its function. Using free forms as a new trend maybe have bad effects on people, As the function of some inner spaces may require the design of a regular formation.

Through some examples, we can discuss the importance of choosing the Suitable formation for the space function, which in turn suits the users.

#### 5-1 Example no.1.... Cloud Garden nursery by Architect Junya Ishigami

Pic no. (6) shows nursery with cloud-shaped walls inside a high-rise block, located inside a high-rise in Atsugi, Japan.



Pic no. (6) Cloud Garden nursery by Architect Junya Ishigami.

The nursery interiors designed with free form minimalist using organic shapes and curved lines. The walls are irregular partitions which have a cement finish, offering a warmer tone than the grey concrete of the exposed ceiling slab and columns, while the floor surface is wooden, which create unity in materials and colors. the design concept is the feeling of walking in the clouds.<sup>26</sup>

#### ➤ Criticism for Example no.1

According to many studies in interior design for child we can discuss the suitable design formation for the nursery spaces. The children's creativity is more affected by the environment so the domain of environmental psychology and the physical role of the

residential space where children spend most of their lifetime cannot be neglected. The psychology of shapes suggests that shapes can evoke different feelings. circles, triangles, and hexagons are geometric form which is the most suitable choice to stimulate a baby's environment. Four to six different styles in the colors that match walls and design elements are required. Also multicolored stripes, animal prints and solids are indeed a wise choice. Each design element will foster their imagination and intellect. Nursery's learning zone is for being active and inquisitive, In the first few months, space must be very simple. It may contain a rocking chair, a small bookshelf, a few toys and an end table. Later, as they grow, the stage of discover and explore starting with the basic shapes and forms.<sup>27</sup>

In this case designing a nursery with free form may not correspond to baby's interests and needs. The interior depends on the age of the child so the need to create a simple and understandable interior should be considered.

### 5-2 Example no.2.... Morgan Sindall Group Offices – London by Designer Morgan Lovell

Pic no. (7) shows unique free form workspaces design which all zones and corridors are included.



Pic no.(7) Morgan Sindall Group Offices

Design concept is a tree that guides employees to various spaces of collaboration and connection. Great central free form covering work desks head and extending to different areas within the workspace. The whole space promotes a fluid sense of movement because of free form design, so staff are encouraged to move to different spaces that support their current task. The office plan layout is small, so the free form clearly dominates the void. Spaces were designed for pure

casual working; with a desk bench encircling one side of the office, flanked by cafe-style seating. This provides a mix of environments for staff to work from at a permanent workstation. Small zones were specifically designed to provide a retreat from the open plan. The natural timber chosen as a material for the free form design and every surface in the office has a biophilic (natural features and finishes) connection.<sup>28</sup>

#### ➤ Criticism for Example no.2

Some studies have proven that it is hard to separate the human behavior and the form of spaces that human lives in.

the functional efficiency of the inner space affected by the user's psychological and mental status. Some activities need special mental statuses for example attention, and activity in office spaces. the human brain has shown its ability to respond to space formation effects and the possibility to enter required consciousness brain status. Designers in identifying appropriate geometric forms to suit the required uses and functions that need particular consciousness statuses. there is an obvious relationship between the geometric forms of spaces and their construction materials and the users' consciousness. Each geometric form (square, circle, cylinder and cone) resonates with a specific resonance frequency. for example, staying in a square space help in moderation and mental stability, also staying in a cone space change the user's consciousness to attention, concentration or conscious thinking which are required in workspaces.<sup>29</sup>

Workspaces consists of areas for work like desks, offices or meeting rooms which its main goal is make decisions. The designing of office forms should ensure principles of use, design with standardization which is regular geometric forms increases the efficiency of the workers. So, I think free form is not the suitable choice to design workspaces. Maybe it suits the other areas of lunch break or workers relaxation zones.

### 5-3 Example no.3 and Example no.4 .... Free form Retail design

#### ➤ Example no.3... Jeans West , Suzhou , China by Architect Sako



Picture no(8) shows ... Jeans West shop design

'Jeans West' is a casual wear brand having 2500 shops in mainland China. The sales target of the shop is the young people. A 'dynamic' space is created by unusual form. Therefore, the shop should be designed to drag the attraction of young people directing them from the street into the shop.<sup>30</sup>

Design with free form using sharp lines with rotation and irregular angles to make a squeeze sense of trapezoid shape which change the perception of the space. The effect of white color, mirrors reflection and lighting play a vital role in the inner final form and the form affects customers' perception of the products.

➤ Example no.4... Lucien Pellat-Finet ,Osaka, Tokyo by Kengo Kuma



Picture no (9) shows Lucien Pellat-Finet shop design.

The design concept for this shop was inspired from the pattern formed on the surface of a plant. Designer used a honeycomb structure comprised of Lauan-made plywood to envelope the space. With a repeating pattern of pentagons and parallelogram, extending further in the interior like a cave. Structure made of plywood layered in a thinly sliced veneer in combination with aluminum connectors. By changing the section's cutting, each cell in the wall has acquired a practical application either as shelf or box to place products. The wall texture, growing upwards and spreading like a plant, an unusual space in which the customer's senses are wrapped up by the roots of the "plant".<sup>31</sup>

Walls and ceiling were designed with curved organic patterns, free form shape include the products display units. unusual form dominates the inner space, where the attraction of customers has become dividing between design and product.

➤ Criticism for the examples no.3 and no.4

Forms must be properly designed to serve the purpose already stated. In designing store interior design forms, it is necessary to observe certain principles which suits customer's interest. Consumers has to deliver a big effort to find products they want to buy, that should be considered.

Interior design form has a positive or negative influence on the consumers' perception of product attractiveness. Also, the position of product displays has a great influence on purchasing effectiveness.<sup>32</sup>

Some studies have defined the visual complexity of physical stores and examined customer responses. Using free form with complicated details may difficulty processing the information that consumers receive and not feel any positive response.

A store's visual complexity negatively influences consumer behavioral response that when decorative patterns are applied to the walls, floor, ceiling, and fixtures of a store and when environmental factors are freely arranged, consumers who enter the store perceive a high level of visual complexity. In contrast, visual complexity perceived by consumers becomes lower when a store environment consists of a single color with no decorative patterns and when environmental elements are arranged in a fixed line.<sup>33</sup>

So, choose the design with free form relates to the inner space function and Depends on the activities of the users of the space. for example, Free form are good choice for some other stores which are designed by one curved shape, one color and one material so unity and minimalist are achieved.

## 6- Results and discussion

1-The study shows that there are many styles of free form available to choose when we design diverse inner spaces, but choosing the suitable style depends on two factors: Space function and user's response. Table no (4) shows the relationship between free form styles and this factor.

Example	Style of free form	Space function	User's response
 Pic no(10) a food court in Seoul, South Korea. <sup>34</sup>	Natural free lines, collection of circles, free curves and splines. Using different colors and lights.	hotel's lobby and restaurants	Attraction and high imagination
 Pic no(11) Melia hotel lobby, Dubai <sup>35</sup>	Curved shapes complete each other's, inspiration from nature, using contrast colors and materials. Using different effects of natural and artificial lights.		
 Pic no(12) SYZGY OFFICE, FRANKFURT <sup>36</sup>	One curved form, like wave with long length. lines include ceiling, walls and furniture.	Waiting areas of offices and clinics.	Relaxation, quite thinking and harmony.

 Pic no(12) SYZGY OFFICE, FRANKFURT <sup>36</sup>	free form shapes with geometric elements (circles, squares and cylinder). using bold primary colors.	school's playground and children's libraries.	activity and movement . stimulate exploration
 Pic no(13) the Poplar Library ,Sako architecture ,Japan <sup>37</sup>	Parametric curved lines with natural colors and materials.	Cinema and theater waiting areas, halls and corridors.	Quite movement , Fixability, balance and free imagination
 Pic no() Genexis theater, singapore <sup>38</sup>	Reputation of one connected free line with different measurements using one color and one material	stores, restaurants and coffee shops.	Unity, harmony and visual comfort.
 Pic no() shop design	Slices of curved freeform overlapping and intersecting to form a network. lines connect the ceiling to the wall by using one shape, one color and one material to achieve integration.		

Table no(4) shows the relationship between free form styles , Space function and User's response.

2- free form interior design is a new trend which has several effects that change Whoever the shape of the space, the mood of users and the imagination of design perception either to create movement, achieve unity, or attract attention.

3- There are two criteria for free form interior design: motion and unity

4-According to the researcher's vision the study shows that analyze and criticism for several free form applications in interior design would highlights the importance of critically looking at modern trends in design to improve the quality of design.

### 7- Conclusions

Free form interior design is a new concept for designing internal spaces that has an impact on the fourth dimension. design without borders with free formation changes our thoughts for the interior design towards another vision, this trend is required for the current era. Design with free forms make an integrated set of free lines without referring to the stander rules of interior design and changes all dimensions of interior space which in turn changes the fourth dimension. Free form materials and construction technology have effective role in achieving the required diversity of free form shapes that suits different type of inner spaces. parametric and minimalist have direct relationship with free form which clear in achieving motion and unity in the inner space. We can realize that choosing the suitable style of free form to design any inner space depends on two factors: Space function and user's response. The results of the analysis examples of free form applications in inner spaces showed materials kinds and some advanced technologies and systems that were programmed by the computer to reach the unlimited possibilities of free forms. Also, the results of criticism showed that the free form design in some inner spaces may not suits the function, because of visual complexity. So, the user's response to the free form design should be considered. Finally, the researcher think that the trend of free form has become a philosophy worthy of analysis and criticism.

### 7- Recommendation

- Study the functional and psychological factors that help to choose the appropriate style for design in a free form before starting the design the inner space.
- Study the possibility of achieving free forms with new materials and its impact on the shape and general perception of users.
- Study the impact of the use of 3D printing on free form applications, which may cause a great advance in interior design field.
- Study the pros and cons of modern trends in interior design before applying them in a way that does not fit with the principles of space design.

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