

## **Study as to Formative Characteristics of High Tech Furniture Design -Laying Stress on Correlation between Technology Art and Furniture Design-**

**Kyoung-Soo Kim<sup>1</sup>**

### **ABSTRACT**

High Tech Design manner is a design concept that had been constantly discussed in constitution process of the West art history and modern ideology and had been experimented in industry, having started from futurism and structuralism in the early 20th century through Kinetic Art & Technology Art and up to now. High Tech Design had a great influence also on Post Modernism and more important is that this manner of design will be existing continually in the future too. From the modern times when machine civilization started, the artist and designers expressed a utopia will showing the future world with help of High Tech Design and modern people are realizing technology images as a utopia, in the space and material presented by this high tech design. And this utopia imply the images of dynamic power, speed making a voyage in universe, dream of future, hope, mass production, earth's environment, wealth etc. High Tech furniture was lightly designed by using thin steel wire, structure stressing the metallic characteristic and tempered glass, and it was used for presenting a convenient interior space visually, and with that it can make a unified sense in High Tech interior space, and a contrary effect compared with minimal space. High Tech Design equipped with glass and metal materials looking inappropriate for our interior space due to their sharp and cold image has been regularly used as living furniture, not only decoration function, and then there must be reasons for that. This study intends to research how High Tech Design has been changed and developed in the design history & West art history from the early 20th century, and to present it's value of development as data orienting, namely a direction for the industry of the next-generation and furniture design.

**Key words:** Technology Art, high tech design, furniture style, utopia image.

### **INTRODUCTION**

#### *The Purpose and Necessity of the Study*

In the special edition of the Italian design publication *Domus*, 'D.E.' (Driade Edizioni 1998), the designs of the 20<sup>th</sup> century regarding furniture and interior were classified in 4 manners, -Minimalism as mixed design of functionalism and geometric form, Organic design being free from functionalism in terms of form & shape, Pop design restored traditional decoration & folk image and High Tech Design recreated scientific technology as design-, and it was forecasted herein that the designs of same manners will be repeated also in the 21<sup>st</sup> century (Pont 1998). Among these High Tech Designs is a design concept that had been experimented and proved in the formation process of the modern industry with the West art manners from the early 20<sup>th</sup> century up to the present age. Technology Art intending the dream of future and High Tech Design promising a utopia have been constantly expressed in the West art & design history with the same values despite of their different forms. And they are expected to exist continually

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Received for publication: October 2, 2008.

1) Department of Interior Design, Jeju College of Technology. Email: kimks\_ia@jeju.ac.kr.

also in the future. This study hereupon intends to forecast a direction of furniture design of next-generation being available to exist also in the future, on the basis of the research how Technology Art and High Tech Design had been changed from the early 20<sup>th</sup> century in wave of the West art & design history and which value was pursued in this development process.

### *The Method and Scope of the Study*

The design trend showed on world-wide furniture exhibition and/or presented in the design-specialized publications inside & outside of Korea has being diversely developed under the name of Post-modernism design. In case of interior construction and furniture design, Minimal design having a simply repeated attraction is dominant, but Pop Design and High Tech Design also have been steadily presented. While Pop design has a tendency to prefer a parody of the past style, acceptance of popular taste, compromise with the 3<sup>rd</sup> manner and decorative colors, and High Tech Design is still showing a cold & lucid and urban image due to using steel and glass material. High Tech Design borrowed from machine technology represents an affluent utopian image still up to now despite of the cold characteristics of materials and very popular (Jin 2000). In order to research the characteristics of High Tech Design, high tech design and the related art manners and interior & furniture design respectively are here investigated, compared and analyzed and the development process, the pursued image and the special qualities of High Tech Design are arranged. The objects for that are main household care products presented by global furniture fairs, domestic & international design-technical journal, catalogs of domestic furniture exhibition and pamphlets of furniture company, and also the 20<sup>th</sup> century's art-, design-, and architecture history are here included.

## TECHNOLOGY ART

Kinetic Art is an art manner setting a high value on movement and making it as main subject. Unlike Optical Art regarding visual changes as important, it is the moving work itself or an assembly of the parts moving, and this tendency is derived from 'Futurism' and 'Dada' (Kim 2003). The first work is "Mobile" of Marcel Duchamp 1913 (Fig.1) and "Kinetic Sculpture" of Naum Gabo 1922, and after that a chain of the moving works were named as Kinetic Art by Laszlo Moholy Nagy. A kinetic work of Laszlo Moholy Nagy, <Light-Space Modulator> (Fig. 2) is that a structure body made from perforated metal plate, steel wire, glass and wood is moved by motor and it makes shine. Kinetic Art is roughly classified into the system moved by wind, motive power and energy source by audience and the system of the mental dynamic expression (Monthly Art 1999).

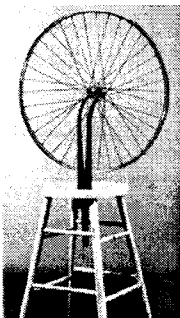


Fig.1. Marcel Duchamp, Mobile, 1913.

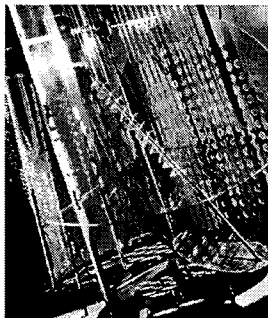


Fig.2. Laszlo Moholy Nagy, Light-Space Modulator, 1923~30.

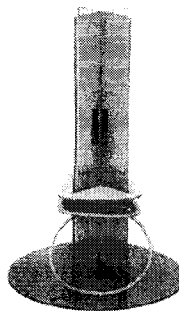


Fig.3. Naum Gabo, Model for column, 1922.

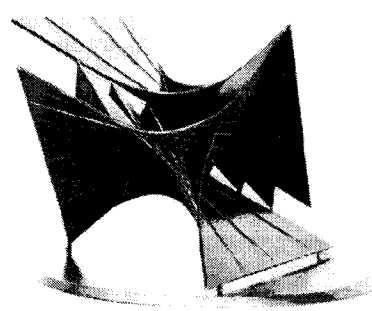


Fig.4. A. Pevsner, Construction for on Airport.

The former is derived from ‘futurism’ and ‘constructivism’ as like Giacomo Balla, Fortunato Depero, Alexander Calder, George Rickey, Laszlo Moholy Nagy etc., and the other is the genealogy derived from ‘Dada’ and ‘surrealism’ like Man Ray, Kurt Schwitters, Pol Bury, Jean Tinguely etc. (Monthly Art 1999) <Speed of Automobile + Light> (Fig. 5) of Giacomo Balla is the work reproduced the motion of thing purely like abstract art, and the origin of the word ‘Merz’ appearing often in the works of Kurt Schwitters means ‘night soil’ and it had been used as an instrument to deny the tradition and to make a satire on the old generation. The images being read in these 2 lines of genealogies are the cult of the machine civilization being speedy, dynamic and powerful, and the denial of traditional civilization and the liberation from the old society. Kinetic Art that was represented as light, movement and sound in the 1960s and had a prosperous period turned its spotlights on ecological methodology and fell into a rapid decline while approaching to high technology like video art, laser art and holography.

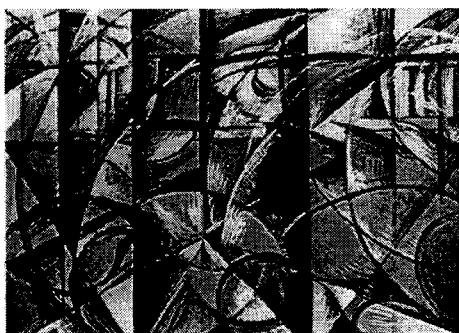


Fig. 5. Giacomo Balla,  
Speed of Automobile + Light, 1913

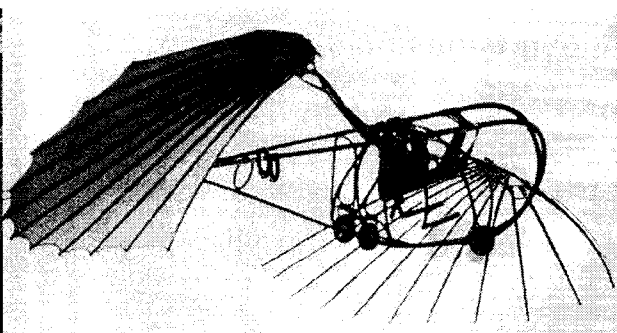


Fig. 6. V. Tatlin, Letatlin, 1932

Technology Art has been developed from Kinetic Art and there is no clear distinction between these accordingly, and has been active from the beginning of the 1970s. Compared with Kinetic Art pursued the technical complication, Technology Art showed a tendency to intend the simple and stable, and the works were made easily to be understood by the mass of people. Although Technology Art has problems in characteristic in case of its treatment and supply, it is, however, necessary tendency that the contact of Art with Technology and the works of coexistence between them is increasing, because the scientific technology is penetrated deeply into the sense of modern persons.

## TECHNOLOGY AND DESIGN

High Tech Design was directly associated with Technology Art and influenced by ‘futurism’ and ‘constructivism’ in the art history. The ‘futurism’ of Italy was fascinated at the speed of machine, and ‘constructivism’ of Russia paid attention to productive capacity of machine and the exaggerated image (Monthly Art 1999). The beginning of these 2 manners is also the introduction of the industry society and the starting time to praise machine aesthetic. In this period the concept to create a new environment on the basis of Technology had been spread. Also in this period the modern design based on machine aesthetic had been definitely arranged in its theory as well as in its form. The machine period had started from the interval between the 2 World Wars and went into our daily life through 1920s and 1930s. The machine aesthetic represented by machine technology let ‘cloning technology’ start and praised

'avant-garde' art likely a design reflection by machine logic and mechanical rationalism.

High Tech, an abbreviation of High Technology means the up-to-date technology and it is defined in design aspect as 'using the high technology and material and at the same time showing the characteristic of the technology and material without any hiding as a pattern'. The original form of High Tech design could be the 'technological functionalism' or 'functionalism' in the 19<sup>th</sup> century, and under the meaning "high tech" it can be understood as an extension of modern design, but the symbolic power of the word 'high tech' was strongly expressed and therefore it could be included into Post-modernism in a wide sense (An 2000). It presents an optimism with help of utopian symbolism, but imply at the same time inhuman, cold and fear internally. The beginning of High Tech Architecture in the early 19<sup>th</sup> century were <Crystal Place> in UK and <Eiffel Tower> in France and these were built by steel frames and glasses and their inside were seen accordingly, and they were made from steel that was ahead in those days.

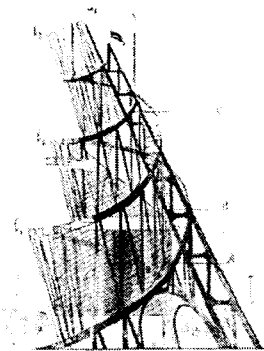


Fig.7. V. Tatlin, A Monument to The Third International, 1920.

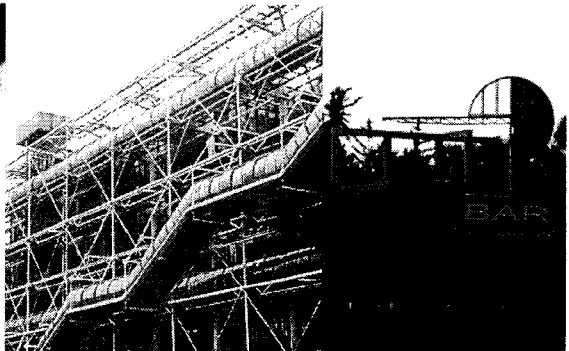


Fig.9. R. Rogers and R. Piano, Pompidou Center, 1976.

While Technology Art and Kinetic Art were concentrated on three dimensional form like sculpture, High Tech design means the modern art installed with high tech equipments like computer, laser, hologram, satellite relay, copy machine, fax and scanner and it does not mean simple approach to hardware, but means that High Tech artist choose the appropriate technology to convey his message as like a painter does the material and main subject. High Tech Art in it's early phase took optimistic stance to modernism, but after 1970s ran through dual standpoint of the optimistic and at the same time pessimistic view (Kim 2003).

It is no wonder to recognize the starting point of the modern design having a firm position in the machine aesthetic period in theory and form as Bauhaus. Gropius who is the originator of Bauhaus has ever thought a mechanical system at planning housing estates like accumulating wooden boxes (Kashiwagi 1999), and ever denied the environment where the human relation is analyzed by machine technology, and object, knowledge and labor is changed according to the united economic system. The paradox of Bauhaus lies in that the introduction of system is based on machine technology and pursuit of the past tradition are acted as the same time, namely the technical-environment future based on machine and rural environment co-exist.

Russian design as developed by so-called avant-garde artists. Their design was a political question and they thought that art was expressive innovation and political revolution. Kazimir S. Malevich said " Cubism and Futurism are revolution movement in art and forecasting already the probable revolution in politic and economy rises in 1917 ". The artists like Malevich, Tatlin,

Rodchenko had a tendency to seeing the expressive innovation and political changing as same context. Also, they interpreted design as political ideology. Malevich made the square-shaped “Suprematism” and geometrical tea set, and Tatlin schemed for a monument <A Monument to The Thirs International>(Fig.7) and designed a flying device, <Letatlin>(Fig. 6). The constructivism artists,-avant-garde designer-, in Russia wanted to design the world after revolution, deviating from the past mode of living. It means that they painted the purely ideologized dream or constructed big space and desired the mass & mass production or imaged an extension of act as innovation of work & instrument. The each design proposed by them could be understood as utopian dream by innovation.

The ‘first-generation’ of industrial designers in USA forecasting exactly and practicing the strong power by machine technology gained different opportunities to design usual products like car & refrigerator etc. and in other side to innovate the images of the future life environment. Through ‘A Century Progress Exposition (CPE)’ from 1933 to 1934 and New York World’s Fair (NYWF), the future utopia by machine technology was presented and also the sense of future was showed. The future world that science and technology will bring, namely, the power of future consumer city, democratic and capitalism was displayed. Normal Bel Geddes assumed in his writings ‘Horizons’(1932) “ we entered in new generation” and predicted the enormous changes based on strong machine technology (Kashiwagi 1999). His work, “Aeriale Restaurant’ is a round construction as like a artificial island having the area of 566,000 m<sup>2</sup> and the 3<sup>rd</sup> story height, and this is a restaurant floating in the air and a fantastic building similar to <construction in the air> (Fig. 8) of Tchernichow, a Russian avant-garde designer. The period of machine Technology in USA accepted European utopian image and suggested the future dream being competitive as ideological fighting compared with communism and fascism, and designed a optimistic future.

## ARCHITECTURE AND HIGH-TECH DESIGN

The two sectors that Technology Art and High Tech Art focused on showed a clear difference also in design field. Technology Art has spreaded throughout architecture and industrial design and High Tech Art has approached to Graphic and Interior sector per computer. The construction of Bernard Tschumi <Poli> (Fig. 10) located in La Bilette park in Paris, France remind us of Technology Art. Industrial design influenced by Technology Art and High Tech Art was classified under the category of High Tech Design, and it manufactures mainly building and furniture with industrial material & machine parts of all sorts and covers interior space by computer graphic pattern.

The function of modern building is highly industrialized and requesting technological sensibility and changed visual environment. These changes are the High Tech Design space seen often in the buildings today and they are light and metallic and produce the systemized complicated image, on the contrary of noisy color & confused form of Pop Design. The expression way of high tech space is exposure of the exaggerated structure,-mechanical factors composed of truss, pipe, metal, steel beam-, facility, piping work and intends with this way decorative effects. The representative constructions of High Tech Design are <Pompidou Center> (Fig. 9) planed by Richard & Renzo Piano, and <Hongkong and Shanghai Bank>(Fig. 11) designed by Norman Foster. <Pompidou Center> located in Paris, France is remind of an massive oil refinery due to the steel wire like scaffold and connection path looks like air duct, and <Hongkong Shanghai Bank> seen from the Hongkong bay looks like a space station due to exposure of steel construction.

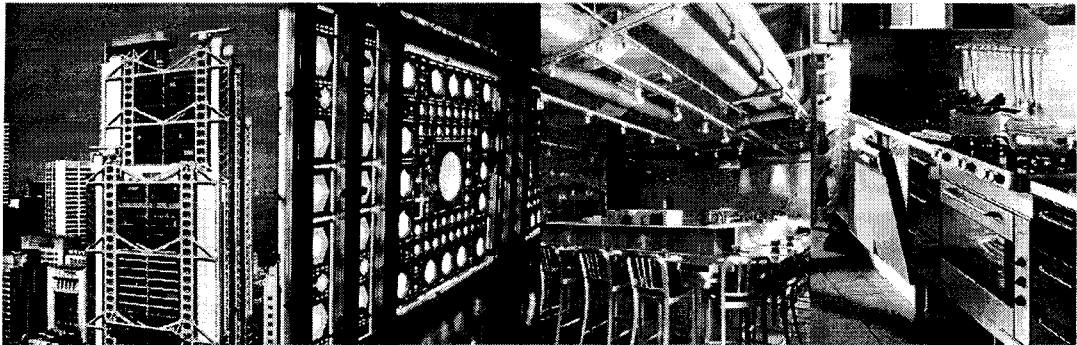


Fig.11. Poster, Hongkong and Fig. 12. J. Nouvel, du Fig.13. Japanese Fig.14. Kitchen  
 Sanghai Bank. monde Arabe, 1974. Restaurant, Bisi Furniture.  
 Hanako.

In construction space of High Tech Design machine technology image is noticeably expressed in it's appearance, but such high tech image is expressively designed also from interior details, furniture to decorative factors. The window of <Institut du monde Arabe> (Fig. 12), the work of Jean Nouvel 1974, was designed to be automatically opened & closed according to volume of sunlight and the interior of <Hongkong and Shanghai Bank> of Norman Foster was designed with furniture <Nomos> (Fig. 16) made from steel framework & glass, and it showed an unified match with the High Tech exterior of the building. The decorative factors in interior space are system furniture, standardized parts, light glass & metallic material and refined details and they have been organized as constructive & technological image reminding us of utopian nostalgia.

## FURNITURE AND HIGH-TECH DESIGN

The first furniture design of High Tech image are <Wassily Chair> (Fig. 15) and <Modern replica of a couch table> (Fig. 16) designed by Marcel Breuer and Mies Van Der Rohe belonging to Bauhaus (Sembach 1991). These furniture are inside-empty and the first furniture made from glitter metal material and glass thanks to the chromium plating metal bar as basic structure. Bending the metal bar at that time was not simple process as like present, but high technology. Such furniture worked as one of the interior-making formative factors presenting convenient atmosphere, in the background of the mostly wood-finished interior space at that time. The furniture made from glass and/or perforating board or metal and/or mixed board offer more convenience visually than that made from square board and look so heavy & uneasy.

The metallic chair of Mario Botta <Second> (Fig. 21) and the table of Norman Foster <Nomos> (Fig 17) showed metallic characteristics of material very well and a sense of unify with high technical constructions designed by themselves (Jeon 1999). System furniture <Nomos> (Fig. 17) presents a clean & modern space with help of the transparent & smooth material-structure and monotone colors of industrial material like aluminum structure, metallic screw, steel pipe, tempered glass etc. <Nomos> was designed to be modifiable and extensible according to the related space & function (Dormer 1995). <Steel Shelves> (Fig. 18) designed by Studio DDL and A. Citerio's Wagon <Oxo> (Fig. 19) have innovatively changed the image of traditional living room & kitchen by using timber on a large scale. It could be a way to inspire vitality & freshness in the minimal interior space, if furniture like shelf and cupboard etc. having no direct contact with the human body would be designed by steel material with metallic characteristic and that itself could be utilized as a formative

factor.

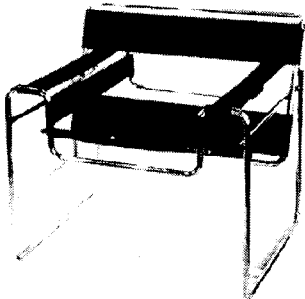


Fig. 15. M. Breuer, Wassily Chair. 1925.

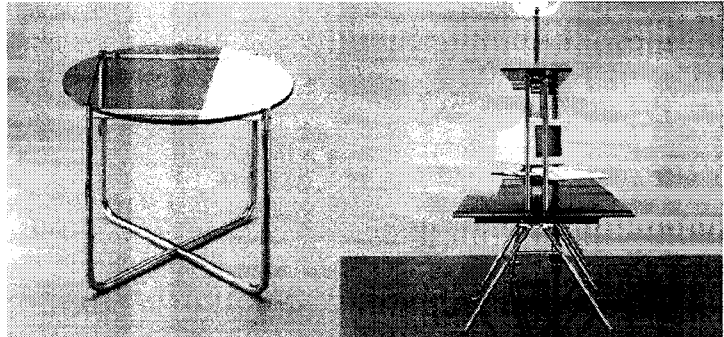


Fig. 16. L. Mies Van Der Rohe, Modern replica of a Furniture 'Nomos' 1986. couch table, 1927.

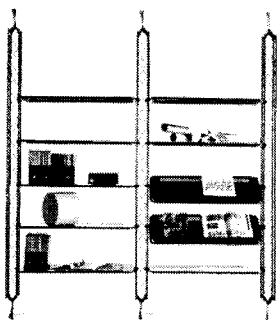


Fig.18. Studio DDL, Steel Shelves.

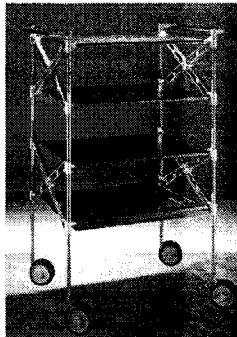


Fig.19. A. Citerio, wagon 'Oxo'.

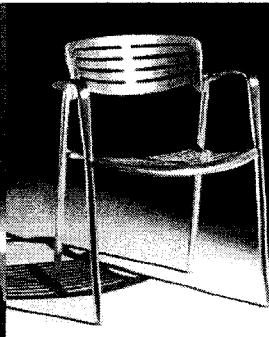


Fig.20. J. Pensi. Toledo chair, 1988.

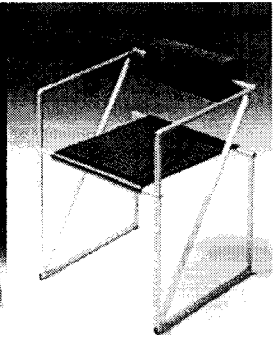


Fig.21. M. Botta, Seconda., 1982.

Such High Tech design was rapidly extended to furniture and lighting devices design. Instead of chandelier in family the big light like in operating room was hanged and in dining room the exposure light like in factory was hanged instead of pendant light (Jeong 1991). In the space of big construction the ceiling is exposed and the dizzying complicated air duct and pipe-laying appear accordingly uncovered and furthermore a bookstand like steel shelf seen in factory and furniture like solar battery of artificial satellite and supporting bar in spaceship have been showed. In the interior ceiling in Japanese Restaurant <Bisi Hanako> (Fig. 13) the air duct & pipe-laying are seen uncovered and it remind us of a spaceship, and the kitchen utensil (Fig. 14) and Jorge Pensi's Toledo chair, Model No. 2604 (Fig. 20) are furniture expressed the cool characteristic of metal as it is, without exaggeration. Design of High Tech Furniture expresses rather formative nature in space than ergonomic approach, and regards the function of space and visual effect as more important than human's convenience. Also the image decorated by such furniture represents 'power, speed, energy, mass production, refinement, convenience, modern, clearness and utopia' etc. and achieves the intended visual effect by Technology Art.

## CONCLUSION

High Tech Design belongs to Post-Modernism in a wide sense is image-making the symbol

of future utopia. The parent of High Tech Design are futurism, constructivism, Kinetic Art and Technology Art. The image pursued by these manners is the liberation from the old-society and the praise for the machine civilization having a speedy & dynamic power. They forecast that the scientific technology is deeply placed in consciousness of modern people and the coexistence of art & technology will be forever. While the negative side of machine civilization, like inhuman, cold and fearful aspect was mentioned, the symbolic power of utopia that machine civilization will bring was strongly expressed.

Technology Art was extended to architecture and industrial design area, and High Tech Design approached to Graphic and Interior design per computer. The space of High Tech is usually expressed complicatedly by exaggerated structure and mechanical equipment due to the characteristics of material. Material, equipment and mechanical structure themselves are utilized as decorative factors. The constructed space designs all decorative factors including furniture and interior space under High Tech atmosphere. The decorative objects expressed gladly by this manner are metal & glass being light images and the systemized furniture and standardized parts and refined details and they were organized as Technology Image reminding us of utopian nostalgia.

High Tech furniture was lightly designed by using thin steel wire, structure stressing the metallic characteristic and tempered glass, and it was used for presenting a convenient interior space visually, and with that it can make a unified sense in High Tech interior space, and a contrary effect compared with minimal space. The majority of High Tech furniture's structure was systemized and designed to be modifiable itself and to be extensible according to the space. High Tech design have solutions already in it's characteristics of structure & material to be able to solve the environmental problems that future society has to find out, and therefore it is regarded as suitable furniture style for 'design rule for sustainable manner of living' maintained by Sano Hiroshi. A sustainable design means the request to connect environmental problems of earth, human, consumption & production and needs & desires with design activities (Sano 1998). Therefore High Tech furniture is a formative factor preferred by human in living space and a style will very probably be exist also in future thanks to the utopian future image and it's value.

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