THE NEW MONTAGE:
DIGITAL COMPOSITING AND ITS GENERATIVE ROLE IN ARCHITECTURE

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ABSTRACT

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This thesis is an investigation on the changing concept of space and its production, through a reconsideration of montage in the digital environment. Since the beginning of the twentieth century, collage and montage have been one of the key terms that lead the movements of art and architecture. Towards the end of the 80s, however, as a result of the introduction of the digital environment, the quality and quantity of methods of production and transfer of knowledge have increased and the flow of information has gained a noticeable importance. Through recent developments, the digital environment offers many opportunities for representation in architectural field as well as other professions.

Montage, which is a technique for construction of a new meaning or entity throughout its history, now changes its character with the infinitely many opportunities digital environment proposes as well. Therefore, this thesis tries to examine the changing scope and formulation of montage in this specific environment through the example of digital compositing which is a recent design and production technique used in the field of photography and cinema.

Digital compositing provides layering, editing and merging numerous elements in one frame. Through its inherent potential of decomposing time and juxtaposing different modes of realities, the concept of space and production and visualization techniques in the digital medium change also affecting the roles of the designer and the user in the process. Thus, this new formulation brings forward a new understanding of design process that acts as an interface both spatially and temporally.

Keywords: montage, digital compositing, interface, design process.

ÖZ

YENİ MONTAJ:
SAYISAL BİLEŞTİRME VE MİMARLIKTAKİ ÜRETİCİ ROLÜ

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Bu tez, montajın sayısal ortam üzerinden irdelenmesi aracılığıyla, değişen mekan kavramı ve üretimi üzerine bir incelemedir. Yirminci yüzyıl başından bu yana, kolaj ve montaj sanat ve mimarlık alanlarında öne çıkan terimler olarak süregelmişlerdir. Ancak 80'lerin sonlarına doğru, sayısal ortamın devreye girmesi ile birlikte, bilgi üretme ve aktarma yöntemlerinin çeşit ve kalitesi hızla artmış, bilgi aktarımı önem kazanmıştır. Bu sebeple, özellikle son dönem gelişmeleri ile, sayısal ortam diğer birçok alanda olduğu gibi mimari temsil alanında da çeşitli yeni imkanlar sağlamıştır.

Tarihsel gelişimi içerisinde yeni bir anlam ya da varlığın üretim tekniği olarak var olan montaj, sayısal ortamın sunduğu sayısız imkanla birlikte bir değişim sürecine girmiştir. Bu sebeple, bu çalışma son dönem fotoğrafçılık ve sinemasında kullanılan bir tasarım ve üretim yöntemi olan sayısal bileştirme tekniği üzerinden montaj kavramının sayısal ortamdaki yeni oluşumu ve değişen kapsamını incelemektedir.

Sayısal bileştirme tekniği, farklı öğelerin tek bir çerçevede katmanlanmasına, düzenlenmesine ve bir araya gelerek iç içe geçmesine olanak sağlar. Bu şekilde bünyesinde barındırdığı zamanı farklı kurgulama

ve farklı gerçeklikleri bir araya getirme potansiyeliyle, dijital ortamdaki mekan kavramı, prensipleri ve üretim ve görselleştirme teknikleri üzerinden süreçteki tasarımcı ve kullanıcı ilişkisi de çeşitlenmeye başladığından, bu yeni oluşum, mekansal ve zamansal bir arayüz olarak varolan yeni bir tasarım sürecini öne çıkarmıştır.

Anahtar kelimeler: montaj, sayısal bileştirme, arayüz, tasarım süreci.

To My Family

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CHAPTER 1

INTRODUCTION

The creation of an architecture which incorporates the new technologies entails breaking away from the platonic idea of a static world, expressed by the perfect finite object to which nothing can be added or taken away, a concept which has dominated architecture since its beginning. Instead of Schelling's description of architecture as frozen music, we are looking for an architecture more like some modern music, jazz or poetry, where improvisation plays a part, an indeterminate architecture containing both permanence and transformation.[1]

Richard Rogers

Architecture is directly affected by the changes in society and culture as well as affecting the social life consequently. Thus the changes and improvements in technology or any medium directly become a concern for architecture as well as a great tool to improve its merits.

Since the first times that the drawings, sketches, models have been used to fill the gap between the architect's mind to the material world, through different media, architecture has gone through a progress in the scope of discussions and production processes which includes both (re)presentation and application.

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[1] Richard Rogers, Architecture: A Modern View, (London: Thames & Hudson, 1991), pg: 46.

Especially from the beginning of the second half of the twentieth century on, as a result of the rapid increase in the quality and quantity of methods of production and transfer of knowledge, the flow of information has gained a noticeable importance. This rapid development that can be observed in many professions as in the case of architecture, forced designers to search for different technologies of design as the traditional methods were not sufficient anymore throughout the process from the initial state of design to the realization process of the project.

On the strength of the complexity of established relations during the production and sharing process of knowledge, the medium that we share as architects, with the effect of its inner dynamics for a common and basic language, is also in need of and is searching for methods that have simple and legible systems but hold the convenience for that complexity if needed.

Montage, although not created and used exactly for this aim and for architectural profession at the very beginning, is one of these methods to create a new entity, to represent a concept or to construct a meaning with its simple formulation but also wide capability to reach or manage complex situations.

Therefore, montage has a specific role in the history of art and architecture from beginning of the century on. Here, it will not be misleading to quote from Harriet Janis and Rudi Blesh, although they used the word “collage” which is a specific formulation in accordance with medium within the scope of montage:

> *Today, fifty years after its first serious use, collage is a major art medium whose techniques have expanded, range of materials immeasurably broadened, and its use become almost universal. Collage, together with its many off-shoots emerges today not only as a major*

> *medium, but as a germinative idea that, once planted, has pointed and even led to some of the most significant, as well as astonishing developments in the astonishing art of our time.*[2]

To understand its generative role, it is important to look at the characteristics of montage within the scope of historical development of technologies, as montage has a great potential to adapt itself to the principles of technology and used media by bringing forward new ways of interpretetion in each case.

The way to the actual use of montage can be said to be opened with the invention of the printing press that gave way to reach masses besides making it possible to multiply works mechanically. After the invention of photography which created a new era for the representation and simulation of reality, towards the end of the 19th century, the photograph stills began to be put in motion. These movement-images[3] were multiplied and shown to public "who were facing an increasingly dense information environment outside the theater, an environment that no longer could be adequately handled by their own sampling and data processing systems (i.e., their brains)."[4] Now, the capabilities and the areas of exploration are at their climax with the introduction of digital media, idea of cyberspace and the introduction of the ordinary user to the process, instead of the classical understanding of public which was not more than a spectator.

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[2] Harriet Janis and Rudi Blesh, Collage: personalities, concepts and techniques. (Philedelphia: Chilton, 1967) Pg: 3.

[3] Gilles Deleuze, "*Theses on Movement: First Commentary on Bergson*," Cinema 1: The Movement Image. (Minneapolis: University of Minnesota Press, 1991, third ed. Original in 1986) Pg: 2.

[4] Lev Manovich, "*How Media Became New*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 36.

Thus, this thesis tries to find out how the idea of space and the design process change within the scope of digital environment discussions, through a reconsideration of montage, which may become a key principle for the production of space in architectural discourse. It searches for the new formation of space where the designing activity becomes an interface within the system this production process proposes. It focuses on the role of montage in the creation and visualization processes of architectural space as a principle that allows multiple ways of interactions through which it proposes a diversity of alternatives and flexibility; as well as a technique that creates hybrid worlds, bringing forward a new meaning, a new totality or a new format from a "collision of ideas"[5] or elements.

To discuss the topic in the following chapters, firstly, the characteristics and principles of the digital medium will be discussed. It is a fact that digital technology proposes comparatively new tools with new capabilities, constraints and possibilities which were not achieved to that extent before. Stan Allen suggests that theoretical and conceptual reevaluation of the "new types of geometrical description, spatial modeling, simulation of program and use, the generation of formal and organizational systems, or prototyping" in this environment may help to explore and examine architecture's "persistent paradigms of order, geometry and organization" opening out new expansions. [6]

In the digital environment, the concepts of scale or displacement or any kind of physical property that produce different kinds of relations as in the case of the real world start changing. It is the place where architecture of information takes place instead of the architecture of physical entities.

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[5] Lev Manovich "*Eisenstein: A Soviet Artist*," Richard Taylor ed. The Eisenstein Reader. (London: British Film Institute Publishing, 1998), pg: 15.

[6] Stan Allen. "*Terminal Velocities: the Computer in Design Studio*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 148.

Thus, digital media has a specific role in the way architectural thinking proceeds. With the inherent characteristic of translating, transferring, storing and manipulating any kind of media into a single and unique system, it has the potential to reestablish the links and relations between different media and different modes of realities. Besides, through the layered and hyperlinked nature of the digital environment, the concept of space and relations of different realms are reconsidered and reconstructed.

Furthermore, digital media provides an optimum environment that allows many entities from different modes of realities come together, exist and collide in a specific realm by putting the user at the center both as an author and the reader. The user, with the digital media, has now the chance to compose, decompose and recompose any object to create a new one. Similarly Pier Levy argues that there are three main concerns while handling the digital environment and what it has brought with: [7]

1) “Messages are invoked, transmitted, sent back, expelled, drawn in, given this or that scenario” in various ways according to the situations of the “receptors,” which are now just at the center.

2) The difference between “author and reader, performer and spectator, creator and interpreter” become blurred giving way to the continuous act of reading and writing stems from the use of the same technology by both the designer and the user, “each one contributing to the activity of the other.”

[7] Pierre Levy, “*The Art of Cyberspace*,” Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 366.

3) The strict line that separates “the messages or works, which appear as micro-territorries attributed to authors” are erased as all the “final” works are still subject to “sampling, mixing, re-utilization and so forth.”

In this way, digital media creates a multiplication, magnification, acceleration and expansion of the possibilities that montage proposes, rediscovering the role of the reader and user in the process.

Montage, as defined in Stan Allen’s words, is a “construction with intervals,”[8] presenting a form of liquid spatiality that means open to change and different ways of reading.

It is not a coincidence that Archigram and Superstudio mostly used montage - which now has multiplied possibilities with the introduction of digital media - as their main tool to express their vision for mobile and experimental architecture. In his essay “Non-verbal Essays on Cyberspace” Julio Bermudez argues:

> *A mobile architecture is a real or virtual artifact under a mutation process that responds to functional, aesthetic, contextual, or informational demands. This kind of architecture is concerned with dynamic order, movement, transformation, and time, things that only the arrival of cyberspace has made possible to describe, visualize, simulate, and design.*[9]

As both the digital environment and montage work in modules, bring different data together or are able to manipulate existing to create new, it is possible to match these two media to understand their systems. Thus, this thesis claims that digital compositing as a very recent technique used

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[8] Stan Allen, “*Constructing with Lines: on Projection*,” Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 26.

[9] Julio Bermudez, “*Architectural Visions: Non-verbal Essays on Cyberspace*,” ADDRESS: http://faculty.arch.utah.edu/people/faculty/julio/visions.htm (accessed: 10 Nov 2007)

in the field of cinematic production, might be a good example that provides us an area of inquiry for rethinking montage as a tool to search for architectural space and its production process as an interface in digital environment, as this technique is located just at the intersection of the digital environment and montage concepts. Therefore, a reading of compositing to explore the characteristics of montage in digital environment will be beneficial to understand and exemplify the alternative ways for thinking on and designing architectural space with the possibilities this specific environment proposes.

Compositing is a digital design technique used in the field of cinema, and it provides an interface for layering, editing and merging numerous elements belonging to different sources or modes of realities into one single frame. Beyond that, through its structure that makes non-linear editing possible, it offers a new way of formation in relation to space and time continuum.

In this way, through the infinitely many possibilities digital environment proposes, montage which had been one of the key methods for architectural production as principle and for representation as a technique gains elasticity and gives way to new ways of conceptualization of the design process. The digital improvements and new methods of montage propose new dimensions, where different kinds of data and different modes of realities from different sources come together, intersect, clash and produce a new kind of totality, a new meaning and a new structure, where the design process becomes programmable and rule-based.

Manovich mentions that in compositing “the elements are not juxtaposed but blended, their boundaries erased rather than foregrounded.” [10] Parallel

[10] Lev Manovich, “*Compositing*,” The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 155.

to that, this technique with the help of the opportunities that digital environment presents, opens a new perspective for architects to handle complex situations. While the technique promotes layering and different levels of abstractions, bringing forth a new way of thinking that makes it easier to analyze and produce new types of relationships from contexts having many different aspects to cope with, the medium offers an automated, generative, principle-based and computational process in the production of architectural space.

CHAPTER 2

THE DIGITAL MEDIUM AND CYBERSPACE

Cyberspace is the juncture of digital information and human perception, the "matrix" of civilization where banks exchange money and information seekers navigate layers of data stored and represented in virtual space. Buildings in cyberspace may have more dimensions than physical buildings do, and cyberspace may reflect different laws of existence. It has been said that cyberspace is where you are having a phone conversation or where your ATM money exists. It is where electronic mail travels, and it resembles the Toontown in the movie Roger Rabbit.[11]

Michael Heim

In order to deeply understand the discussions about interface and conceptualize space as a transition element; concepts of cyberspace, virtual reality and digital media should be clarified first with their tools, opportunities and principles.

There is a mis-conceptualization of the existence of computer in the architectural production process that Stan Allen puts as follows:

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[11] Michael Heim, "*Useful Vocabulary for the Metaphysics of Virtual Reality*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 150.

> *There is a strong tendency, in architecture as well as other disciplines, to see the computer as a part of a more general shift from the physical to the virtual: the banal utopia of the paperless office, the virtual realm of the World Wide Web and the Internet, or the vague promise of interactive "environments."* [12]

Although this is a part of the process and a great area of research and trial, it is also possible to get in a frustrated mood of this experimentation and forget the main issues that architecture had been involved in for centuries and still has to deal with. Thus, the computer should be considered as the instrument for rethinking on architectural space and its production, beyond its being an interface to access a new territory – cyberspace- which also without doubt offers infinitely many opportunities.

2.1. Cyberspace

Cyberspace is a "new and parallel universe" that is possible to access from any geographical location through a computer, television, telephone or any electronic element which is a part of an interconnected system of electronic devices and communication lines.[13]

The word was first used by William Gibson in his science fiction novel Neuromancer, dated 1984:

> *A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphic representation of data abstracted from banks of every computer in the human system. Unthinkable*

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[12] Stan Allen. "*Terminal Velocities: the Computer in Design Studio*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 153.

[13] Michael Benedikt, "*Introduction*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 1.

> *complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data...*[14]

In contrast to the general pessimistic and fearful description of Gibson, cyberspace provides new expansions for the idealization of space as a "territory swarming with data,"[15] regardless of any physical limits such as physical boundaries, forces or time.

This is the reason why this medium is always transitory in principle and exposed to change. Abstracted from all physical concerns, it proposes a new world of information through a new language and new system that is free from the formation of space in the real world. The organizers and users of this new medium thus have much more opportunities and freedom but also have more responsibility while re-conceptualizing space as Michael Benedikt mentions as follows:

> *Theirs will be the task of visualizing the intrinsically nonphysical and giving inhabitable visible form to society's most intricate abstractions, processes, and organisms of information. And all the while such designers will be re-realizing in a virtual world many vital aspects of the physical world, in particular those orderings and pleasures that have always belonged to architecture.*[16]

Heim, similarly defines cyberspace as a place that electronically makes it possible to represent not only the physical world we live in, but also the possible and imagined worlds.[17] Furthermore, within cyberspace, "reality"

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[14] William Gibson, "Neuromancer" Pg: 69. ADDRESS: http://en.wikipedia.org/wiki/Cyberspace (accessed: 08.11.2007)

[15] Michael Benedikt, "*Introduction*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 2.

[16] Ibid Pg: 18.

[17] Michael Heim, "*From Interface to Cyberspace*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 80.

is created not in one-to-one correspondence to the physical world but through data from different sources and different modes of realities. “In this territory, information is the raw material” argues Schmidt and adds “the computer is at the same time instrument, infrastructure and design environment.”[18] Thus, digital environment proposes a multi-dimensional, limitless, artificial and most important alternative medium for thinking on and searching for characteristics and qualities of architectural space that is also mentioned by Julio Bermudez in his paper Architectural Visions: Non-verbal Essays on Cyberspace:

> *Considering that no other medium or technique of architectural representation and design may have ever offered so many architectural opportunities as cyberspace, this situation is at the very least amusing.*[19]

2.2. Principles of digital media

In his book *Language of the New Media*, Lev Manovich defines main principles for the new media which is a new territory for production. As he denotes that new media is created on computers, distributed via computers, and stored and archived on computers,[20] it will not be misleading to map new media’s principles directly to digital media.

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[18] Gerhard Schmidt, “*Virtual Architecture: the Computer as Partner and Its Impact on Future Architecture*,” Information Architecture: Basis and Future of CAAD. (Basel: Birkhäuser, 1999) Pg: 59.

[19] Julio Bermudez, “*Architectural Visions: Non-verbal Essays on Cyberspace*,” ADDRESS: http://faculty.arch.utah.edu/people/faculty/julio/visions.htm (accessed: 10 Nov 2007)

[20] Lev Manovich, “*Principles of New Media*,” The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 46.

Manovich divides these principles into five headings which are numerical representation, modularity, automation, variability and transcoding.[21] The first two are the basics of the system and the following three are consequences of the first two. However, it is beneficial to analyze them separately as each one is a key concept for processing and managing data in this medium.[22]

2.2.1. Numerical representation

As the digital medium is the place where information from many different sources comes together, there need to be a system for achieving a single format. Within this environment, any kind of data - either previously created in the digital media from scratch or converted from different analog media sources or modes of realities- is represented in digital code.[23]

Here the term digitization comes forth as it denotes the main process of the transformation from any mode of reality to the realm of digital environment. Manovich defines digitization as "converting continuous data into numerical representation"[24] by means of dividing it into discrete pieces assuming the original piece as continuous. In this way, a total of

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[21] Ibid. Pp: 27-48.

[22] Luigi Prestinenza Puglisi also defines four main transformations to understand the mechanism of computerization –translation, atomization, logicization, metaphorization- which may overlap with the descriptions of Manovich. See Luigi Prestinenza Puglisi, "*Mutation*," Hyper-architecture: Spaces in the Electronic Age. (Turin: Birkhauser Publishers, 1998) Pg: 54.

[23] Lev Manovich, "*Principles of New Media*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 27.

[24] Ibid. Pg: 28.

information emerges or becomes a site, which will bring forth a "discourse relevant to the reality of data space."[25]

Digitization consists of two steps which are sampling and quantization. Sampling is the process of breaking the data into regular intervals, as in the case of the grid of pixels that build up the digital image while quantization is assigning a numerical value to each unit from an established range to define the characteristics of the unit such as 0-255 for an 8-bit grey-scale image.[26]

The simplest form for this digitization process was used at the beginning of the 19th century, when J.M. Jacquard invented a loom that is controlled by punch cards. It had the mechanism to read the punch cards and convert them to mechanical codes to create the desired result.

In 1833, Charles Babbage started designing the "analytical engine" for which he also preferred to use punch cards but this time to enter data/instruction/command for numerical calculations instead of having graphical products. [27]

According to Manovich, this "analytical engine" had most of the key features of the modern digital computers.[28] In fact, the punch cards used in both Jacquard's loom and Babbage's analytical engine (for graphical production in the first case and for mathematical calculation in the second)

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[25] Kathy Rae Huffman, "*Video, Networks, and Architecture: Some Physical Realities of Electronic Space*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 200.

[26] Lev Manovich, "*Principles of New Media*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 28.

[27] Lev Manovich, "*How Media Became New*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 21.

[28] Ibid. Pg: 21.

can be considered to be the primitive versions of the binary code. The logic is to have a common and general system of language to code a different type of act. After that, the same year Alan Turing wrote his paper "On Computable Numbers" (which led to the use of binary code); Konrad Zuse built the first working digital computer which used 35mm movie film instead of the punchcard.

However, it took almost a century to translate any kind of media product into numerical data that can be used by the computer. Manovich considers this as a threshold which will establish computer as a "media processor"[29]. He continues:

> *The result: graphics, moving images, sounds, shapes, spaces, and texts become computable, that is, simply sets of computer data. In short, media become new media.*[30]

2.2.2. Modularity

Each element of the digital environment is represented in collections of discrete units which has the same structural formation due to the principle of numerical representation. Lev Manovich calls this formation as the "fractal structure" of this media.[31]

Within the digital environment, all elements, be they images, sounds, shapes, behaviors; consist of smaller samples such as pixels, polygons, scripts, each again represented by the digital code. These elements preserve their separate identities even if they come together to form up

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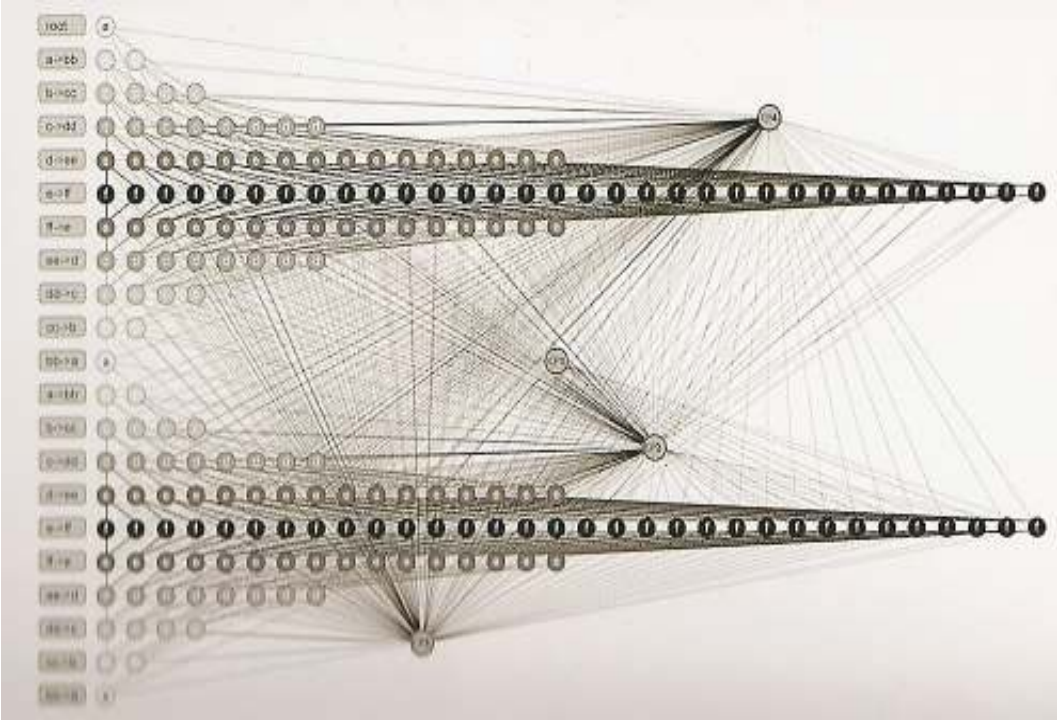
[29] Ibid. Pg: 25.

[30] Ibid. Pg: 25.

[31] Ibid. Pg: 30.

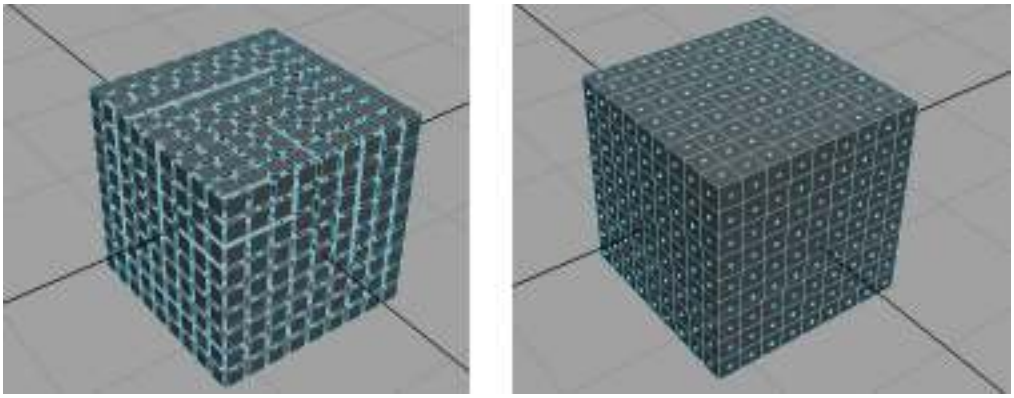
larger-scaled entities.[32] These entities will also be able to be combined for an upper level of product, but they will continue to keep their inner independent structures and so on. (Figures 2.1 – 2.2)

This fragmented structure of the digital environment also brings out many advantages for storage and manipulation as it provides with a hierarchical organization of the database. Each module, being able to be saved independently, makes it possible to modify elements free from the total, creating an upper level of manipulation.



2.1. A screenshot from Generative Components software that shows the reciprocal relations between the elements of the created objects. (source: Emerging Talents, Emerging Technologies: Students- Architectural Biennial Beijing, ed. Neil Leach and Xu Wei-Guo [Beijing: NSFC, 2006] pg: 91.)

[32] Lev Manovich, "*Principles of New Media*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 30.



2.2. A cube defined by its vertexes in Maya software, in accordance with the principle of modularity in digital environment. (Screenshots from Maya software, created by Işıl Sencar, November 2007)

2.2.3. Automation

The numerical representation and the modular structure of the digital environment "allow for the automation of many operations involved in media creation, manipulation, and access."[33] As any kind of operation is defined through a similar system formulated through numerical coding and consists of a modular structured scripting, it is possible to create algorithms which formulate a task and its process from the initial state on progressively, or manipulate entities at any level automatically.

Most software that aims at the utilization by the "ordinary user," already offers a low-level automation through algorithms or templates. (Figure 2.3) The further steps will be trying to achieve a higher-level automation where a computer can respond to some input to a certain limit which can be exemplified by computer games played against computer. Finally, this will lead up to artificial intelligence which means total interactivity in accordance with the actions of the user.

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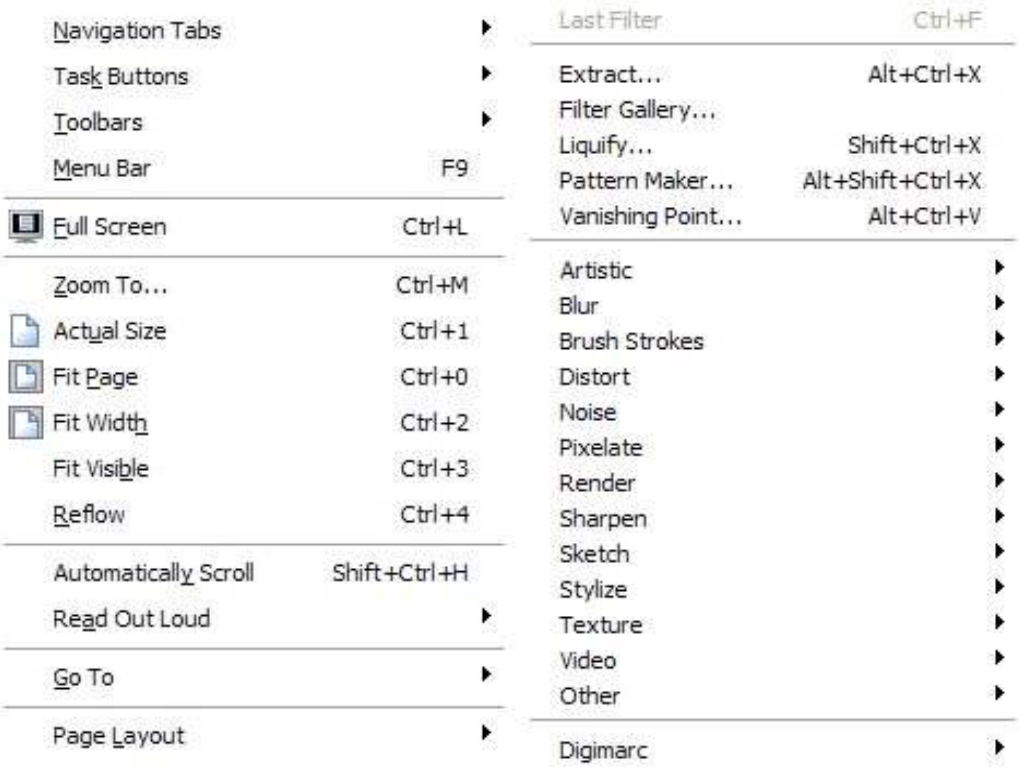
[33] Ibid. Pg: 32.



2.3. Examples for low-level automation tools provided by different software where pre-defined actions with pre-written algorithms are ready to be used. (Screenshot from image editing software, created by Işıl Sencar, November 2007)

2.2.4. Variability

Another result of the digital coding and modularity principles is the rich possibility for variability. Although a digital media object is absolutely defined and fixed through the numerical code or parametrical definition and has its exact position within the non-hierarchical structure of the database, it can be modified into "different and potentially infinite versions".[34] Instead of achieving identical copies that can be assumed to be the main characteristic of mass media and industrial society, digital

[34] Ibid. Pg: 36.

(and new in terms of Manovich) media has now the capability to have different versions.[35] This is achieved through the capability of continuously changing or updating the necessary data as it is the main element of the system that defines every single element.

> *Stored digitally, rather than in a fixed medium, media elements maintain their separate identities and can be assembled into numerous sequences under program control. In addition, because the elements themselves are broken into discrete samples (for instance, an image is represented as an array of pixels), they can be created and customized on the fly.*[36]

In this environment, the ordinary user can also edit and manipulate objects or create new products in infinitely many ways thanks to the mentioned principles of the media. Enzensberger points out that any use of media, houses manipulation within the production process, at different levels from the choice of the medium to operations like shooting, cutting, synchronization, dubbing, etc. but emphasizes that with the new media the question who manipulates them comes forward.[37] Similarly, Manovich argues that the old media corresponds to the logic of industrial mass society, comparing to the new media that fits the logic of postindustrial society promoting individuality.[38]

One typical example may be the websites that offer different levels of resolution qualities for users with devices that have different connection speeds. In these websites, users are able to choose the best option to

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[35] Ibid. Pg: 36.

[36] Ibid. Pg: 36.

[37] Hans Magnus Enzensberger, trans. Stuart Hood, "*Constituents of a Theory of Media*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 68.

[38] Lev Manovich, "*Principles of New Media*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 41.

have the most efficient access. Beyond this, most of the websites offer visitors freedom to choose their own path within the site through branch-type interactivity. This system offers the visitors the chance to choose the sequential options. An alternative to that is the hypermedia[39] which again works through links between different elements and proposes freedom to a certain extent.

2.2.5. Transcoding

Manovich mentions in new media language, transcoding refers to "translating into another format".[40] Thus, this last principle is related with the way an object of media -which is perceptually in the level of representation or human culture-, is translated into an object of digital media both in representational and the computer language levels becoming an element using terminology of a computer culture. Because of this formation of digital media there is always a two-sided translation between these two layers, which makes the software an interface.

2.3. Virtual Reality and Mixed Reality

Michael Heim defines virtual reality as "an event or entity that is real in effect but not in fact"[41] by using the dictionary definitions of the words "virtual" and "reality." In a more detailed expression, virtual reality is

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[39] The prefix hyper means "extended." Hypersystems are nonlinear linked systems in which one link may route directly to a link on an entirely different plane or dimension. Hypermedia is crosslink information in text, graphics, audio, or video. See Michael Heim, "*Useful Vocabulary for the Metaphysics of Virtual Reality*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 154.

[40] Lev Manovich, "*Principles of New Media*," The Language of New Media. (Massachusetts: MIT Press, 2001) Pg: 45.

[41] Michael Heim, "*The Essence of VR*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 109.

convincing a participant to his being in an environment different than he actually is in, "by substituting the normal sensory input received, with information produced by a computer."[42] Similarly, Daniela Bertol defines virtual reality as "a computer-generated world created in real-time by the participant's actions." [43] Thus, it is an illusionary occasion, where another world is created by simulation:

> *This virtual world is either generated in real time by the computer, or it is preprocessed and stored, or it exists physically elsewhere and is "videographed" and transmitted in stereo, digital form.*[44]

Kevin Robin in his essay argues that in the virtual reality systems a multi-sensory and interactive display environment simulates the experience of "being there" [45] which puts "immersion" forward as the keyword when virtual reality systems are concerned. Heim mentions that immersion is usually achieved through "three-dimensional graphics and input-output devices that closely resemble the participant's normal interface with the physical world." [46] (Figures 2.4 – 2.5)

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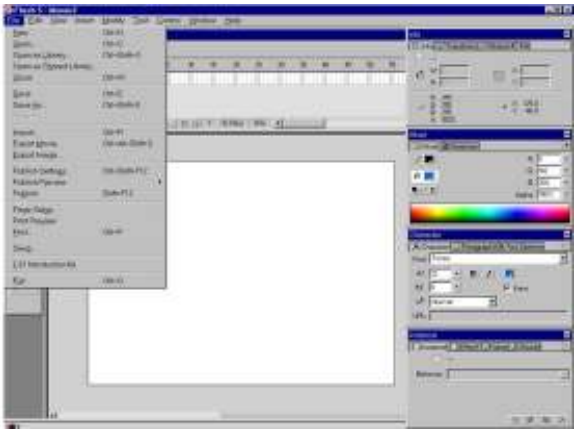
[42] Michael Heim, "*From Interface to Cyberspace*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 160.

[43] Daniela Bertol, "*Virtual Reality*," Designing Digital Space: An Architect's Guide to Virtual Reality. (New York: John Wiley & Sons, 1997) Pg: 67.

[44] Michael Benedikt, "*Introduction*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 11.

[45] Kevin Robins, "*The Virtual Unconcious in Postphotography*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 159.

[46] Michael Heim, "*From Interface to Cyberspace*," Metaphysics of Virtual Reality. (New York: Oxford University Press, 1993) Pg: 160.



2.4. (left) Haptic immersion through dataglows, headsets. (source: http://www.inition.co.uk/inition/product.php?URL_=product_glove_immersion_hapticworkstation&SubCatID_=37 accessed : nov 2007)

2.5. (right) Screen interface of a software. (source: Chapman,Nigel and Chapman Jenny. Digital Media Tools CD-ROM. (NY: John Wiley & Sons, 2002)

Although "immersion" denotes a meaning of "being involved," it is does not necessarily mean activating more than one sense of the participant through helmet-mounted display panels, head-sets, data-gloves or data-suits. Instead, involving, through screen, only one sense –which is the sight in this case- might be enough, as cyberspace need not to be experienced as physical environment is experienced.

However, it is also possible to have a complete simulation of the physical. Virilio, in his example, argues that simulation is a moment that leads to cyberspace, and will make us have two "bottles" instead of one. He mentions that even if he doesn't see the "bottle" he can feel it as it is "settled within reality."[47]

[47] Louise K. Wilson, "*Cyberwar, God and Television: Interview with Paul Virilio*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 323.

Virilio's statement brings forward a situation where real and virtual come together and overlap. Therefore, it may not be necessary to completely differentiate one realm from the other, which may be supported with the following statement of Hansen from his book "Bodies in Code: Interfaces with Digital Media":

> *...Having tired of the clichés of embodied transcendence as well as the glacial pace of progress in head mounted-display and other interface technology, today's artists and engineers envision a fluid interpenetration of realms. Central in this re-imagining of VR as a mixed reality stag is a certain specification of the virtual. No longer a wholly distinct, if largely amorphous realm with rules all its own, the virtual now denotes a "space full of information" that can be "activated, revealed, reorganized and recombined, added to and transformed as the user navigates."* [48]

In the daily life, Huffman argues in her essay *Video, Networks, and Architecture: Some Physical Realities of Electronic Space*, even the expanded definition of "virtual as real" is reconstructed by traditional communication practices like radio, telephone and television, and their contemporaries in the digital media. She mentions that "the physical, navigable properties of electronic data space itself are redefined."[49] At this point, Michael Benedikt asks "Which reality is the primary one?" answering his own question "Actually, why choose?"[50]

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[48] Mark B. N. Hansen, "*Introduction: from the Image to the Power of Imaging: Virtual Reality and the 'Originary' Specularity of Embodiment*," Bodies in Code: Interfaces with Digital Media. (New York: Routledge, 2006) Pg: 2.

[49] Kathy Rae Huffman, "*Video, Networks, and Architecture: Some Physical Realities of Electronic Space*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 200.

[50] Michael Benedikt, "*Introduction*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 21.

> *Today, using a database to get data during a meeting, comparing two-dimensional architectural drawing with a real-time three-dimensional simulation or similar examples are exact proofs that there is no need to a total immersion. Besides, the line between real and virtual is so blurred that "passage from one realm to another is so seamless, so unnoticeable, so believable."*[51]

Thus, with the introduction of the digital and virtual environment, different modes of realities are merged into each other, erasing the strict borders between them. As Kevin Robins mentions "the virtual world is a container in which 'reality' is made tractable and composable,"[52] bringing out a new totality more complex but creating much more opportunities.

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[51] Mark B. N. Hansen, "*Introduction: from the Image to the Power of Imaging: Virtual Reality and the 'Originary' Specularity of Embodiment*," Bodies in Code: Interfaces with Digital Media. (New York: Routledge, 2006) Pg: 8.

[52] Kevin Robins, "*The Virtual Unconcious in Postphotography*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 160.

CHAPTER 3

MONTAGE: A REVEALED CONSTRUCTION *

> *I am kino-eye. I am a builder. I have placed you, whom I've created today, in an extraordinary room which did not exist until just now when I also created it. In this room there are twelve walls shot by me in various parts of the world. In bringing together shots of walls and details, I've managed to arrange them in an order that is pleasing and to construct with intervals, correctly, a film phrase, which is the room.*[53]
>
> *Dziga Vertov*

Montage is a principle that allows for constructing new entities, meanings, spaces or realities. Thus it has due importance to deeply investigate the role of digital environment for the new character of montage and how this production technique creates its own realm of space in that medium.

Therefore, in the following sections, first the idea of montage will be discussed as a general term and then, the use of cinematic montage will be examined to track the argument on its way to digital compositing in the following chapter.

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* Stan Allen, "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 27.

[53] As quoted in: Stan Allen. "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 26.

3.1. Montage

Jonathan Hill mentions that montage may be defined as "discrete, material fragments brought together in a new site" [54] where Bill Nichols describes it as "connecting of dissimilars."[55] Starting from this point, it can be defined as the act of creating a new totality, meaning, entity from a collection of elements by forming different kinds of relations between them.

In his lecture notes, Davide Deriu argues that "architecture consists of assembling materials and elements" and continues by asking if it involves "any type of visual or spatial montage."[56] For understanding the role of montage in architectural production, it is quite beneficial to look for the media that architecture is closely in relation with. In the same way, Michael Heim's explanation for modern representations in different professions may be useful.

> *Hybrids, mixing physical, energic or spatiotemporal, coordinates with abstract, mathematical ones, mixing histories with geographies, simple intervallic scales with exponential ones and so on.*[57]

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[54] Jonathan Hill, "*The Montage Of Gaps*," Actions of Architecture: Architects and Creative Users. (London: Routledge, 2003) Pg: 110.

[55] Terry Eagleton, Marxism and Literary Criticism (Berkeley: University of California Press, 1976) Pg: 63. as quoted in Bill Nichols, "*The Work of Culture in the Age of Cybernetic Systems*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 125.

[56] Deriu continues "We will engage with examples from the realms of literature, photography, film, and visual arts in order to understand what it means to produce an emotional response in the viewer/reader by colliding heterogeneous fragments into a new whole. Against this background, we will question the multiple ways in which montage operates in the field of architecture, not only as a design principle but also as the basis of our perception and experience of space." Architecture and Montage Seminar Program Description in Faculty of Built Environment, Bartlett School of Architecture ADDRESS: http://www.bartlett.ucl.ac.uk/history_theory/programmes/bsc/sg2.htm (accessed: 10 Nov 2007)

[57] Michael Benedikt, "*Introduction*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 21.

However, it might be misleading to consider montage only as a tool for representation instead of a principle for production which may be a proliferating guide for creation of a new meaning, a new realm or a new entity.

Jonathan Hill mentions that montage is a "language and technique associated by the medium in which it operates."[58] Therefore, it can be applied to any medium with its inner dynamics of producing "new" by bringing any kind of fragments, discretes, or entities together.

> *The importance of montage since the beginning of the twentieth century depends upon its dual character as the principal artistic strategy of the avant-garde and the technical procedure of mass-production, including film.*[59]

As a consequence, montage has been used in many professions through many media -such as painting, literature, photography and finally cinema- sometimes being named differently and always showing different characteristics due to the medium.

3.1.1. Collage:

Collage can be defined as an assemblage and bringing together of different forms especially in visual arts creating a new whole. It is considered that "The Dream" by Picasso is the first step taken on the way that leads collage in painting where used a waste paper on the backside of a cardboard and used also drawings. (Figure 3.1)

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[58] Jonathan Hill, "*The Montage Of Fragments*," Actions of Architecture: Architects and Creative Users. (London: Routledge, 2003) Pg: 96.

[59] Ibid. Pg: 95.

3.1. The Dream by Pablo Picasso, 1908. (Source: Brandon Taylor, Collage: the Making of Modern Art. [London: Thames & Hudson, 2006] Pg: 6.)

Brandon Tylor mentions the transfer of an object to "join another surface where it does not strictly belong" and continues emphasizing two important things happen during this process, first of which is the creation of a new relationship between the imported piece and the surface itself, where the second is the feeling of "inappropriateness" in that relationship.[60] In this way, a space or emptiness is created to be filled by the viewer's participation.

The same evolution took part in photography in a parallel way, actually breaking the strict borders between painting and photography. After 1910s, artists started to use different materials for collages and installations introducing a volumetric organization to their products and

[60] Brandon Taylor, "*Inventing Collage*," Collage: the Making of Modern Art. (London: Thames & Hudson, 2006] Pg: 8.

giving it a freedom from the two dimensional formation of the painting but especially from its narrativity, and symbolism.

Collage provided a new realm with its new way of construction. It is also used in architectural representations of Archigram or Superstudio, where an architecture of experience, motion and change is in the foreground. (Figure 3.2)

3.2. A collage by Superstudio – Twelve Ideal Cities, 1972 (source: http://www.designmuseum.org/design/superstudio, accessed: nov 2007)

3.1.2. Literary montage:

Montage had found its place also in writing. In literature, it is created by the writer's juxtaposition of pieces of texts that gives way to reader's choosing the path to construct his own meaning and order. In this type of montage, the active editor is not the author as in the case of collage, although he is the one to bring fragments together, but the reader as he is the one to organize the relation and therefore the meaning from the collection of texts.

Arcades Project, the unfinished work of Walter Benjamin, is considered to be one of the most important examples of literary montage, where he was planning to bring together all the collection of texts –a mosaic of fragments, quotations and commentaries- he drafted between 1927 and 1940.[61] It is a work where Benjamin gives notes and examples on his experiences of the life in 19th century Paris.

3.1.3. Cinematic Montage:

The use of montage to create a new meaning or to sitimulate the viewer instead of a mechanical tool to produce, showed itself first in the Soviet cinema. Specially called "Russian Cut," montage was used to create a psychological effect. Orlton West states that as psychological processes of symbolisation and association are achieved mostly through visualisation, Russian film construction uses that opportunity to the end to convey a certain state of mind.[62]

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[61] Christopher Rollason, "*The Passageways of Paris: Walter Benjamin's Arcades Project and Contemporary Cultural Debate in the West*." ADDRESS: http://www.wbenjamin.org/passageways.html accessed: 25 nov 2007.

[62] West, Orlton. "*Russian Cutting*," Close Up 1927-1933: Cinema and Modernism. (London: Princeton University Press: 1998) Pg: 278.

Parallel to that, Eisenstein puts forth the idea of "intellectual montage" where "collision and conflict" are the key terms claiming that intellectual montage should be the principle for all arts.[63] He gives the example of Japanese hieroglyphics where two different characters are juxtaposed to create a new concept that may not be possible to represent graphically, such as:

> *A dog and a mouth mean 'to bark'*
> *A mouth and a baby mean 'to scream'*
> *A knife and a heart mean 'sorrow', and so on.*
> *But – this is montage!!*[64]

Scott McQuire explaines Eisenstein's understanding of montage as creation of a new mode of reality through the use of "visual disjunctions, desynchronized movements, differential rhytms and strategic repetitions" and continues:

> *Eisenstein was not interested in the deconstruction of appearances for its own sake, but instead sought the means to engineer a new map of reality, or rather the map of a hitherto unexpressed (and perhaps inexpressible) reality.*[65]

In this way, montage becomes a tool to construct a new mode of reality.

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[63] Roemer van Toorn, "*Architecture Against Architecture*," ADDRESS: http://www.ctheory.net/articles.aspx?id=94 accessed: december 2005.

[64] Taylor, Richard. "Eisenstein: A Soviet Artist," The Eisenstein Reader. (London: British Film Institute Publishing, 1998) Pg: 13.

[65] Scott McQuire, "*Flickering in Eclipses*," Visions of Modernity: Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998) pg: 87.

3.2. Construction through montage

Stan Allen argues that a very important aspect of montage is its being "a revealed construction."[66] The viewer is exposed to a set of data related to each other in a way –no matter spatially or temporally[67]- and expected to derive a meaning of that. David Tomas, quotes from Serres' essay "Language and Space: From Oedipus to Zola:"

> *The body, in fact, "works in Euclidean space, but it only works there. It sees in a projective space; it touches, caresses, and feels in a topological space; it suffers in another; hears and communicates in a third; and so forth, as far as one wishes to go."* [68]

In a parallel way, the general idea of a city is constructed through perceptual montage of the citizens, where information from many sources, images, ideas come together and form a concept in the mind, while the architectural experience becomes a way of reading and correlating. (Figure 3.3)

> *The early modern metropolis produced a new subject: the montage eye, capable of constructing a new reality out of the barrage of fragmentary, contradictory, and obsolete information that characterizes the modern city.*[69]

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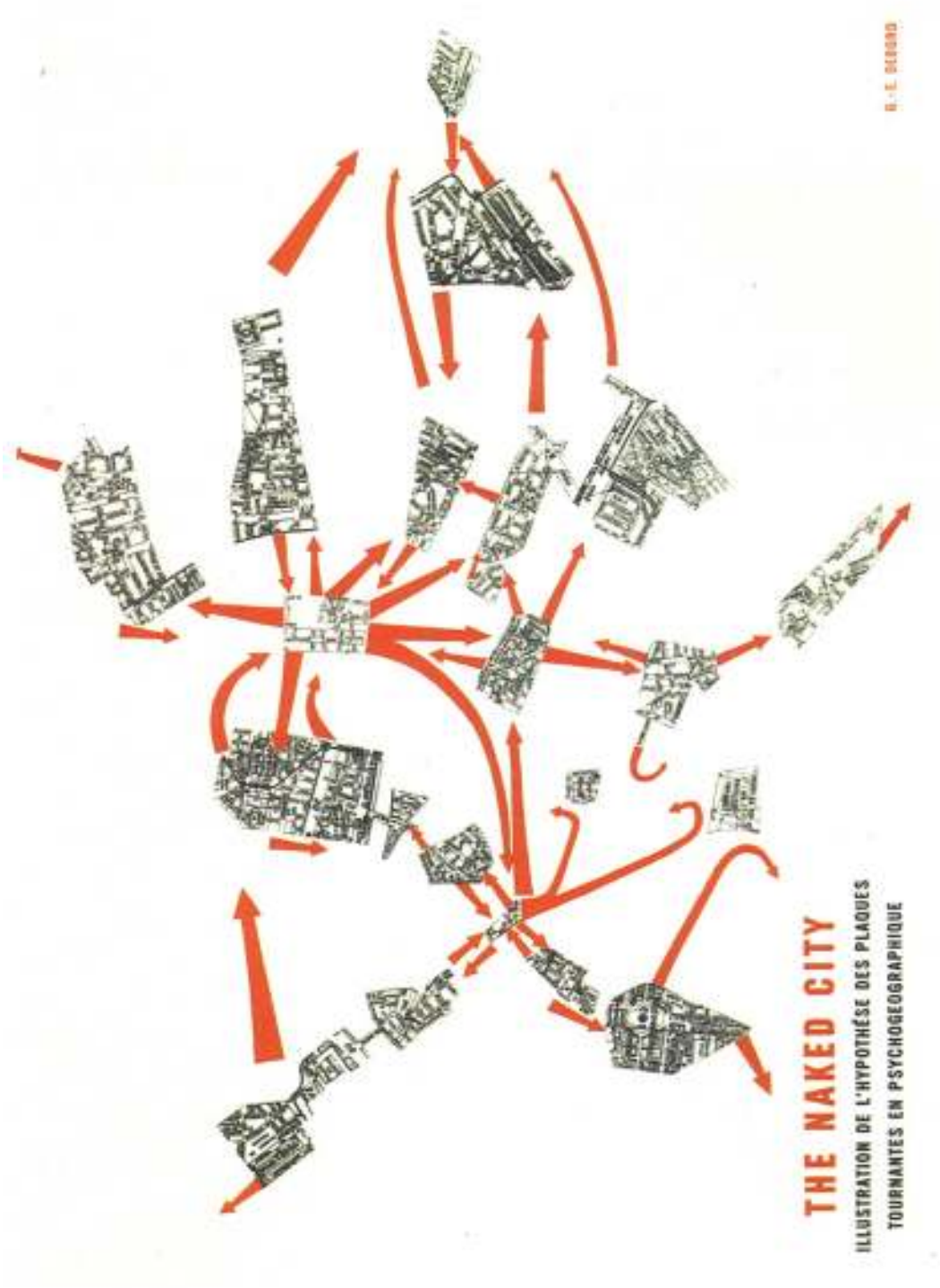
[66] Stan Allen, "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 27.

[67] It can be stated that in collage elements are related to each other spatially by the author by means of bringing together and juxtaposing them within a certain frame, while in literary montage this is obtained temporally buy placing the pieces one after the other. However, in both cases the viewer or reader is supposed to reach to a final construction by relating fragments semantically.

[68] David Tomas, "*Old Rituals for New Space: Rites de Passage and William Gibson's Cultural Model of Cyberspace*," Michael Benedikt ed. Cyberspace: First Steps. (Massachusetts: MIT Press, 1991) Pg: 34.

[69] Stan Allen, "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 27.



3.3. The city of Paris reevaluated with its discontinuities and divisions in contrast to the seemingly homogeneous urban space - The Naked City by Guy Debord and Asger Jorn, 1957. (Source: Catherine de Zegher and Mark Wigley ed., The Activist Drawing: Retracing Situationist Architectures from Constant's New Babylon to Beyond. [Massachusetts: MIT Press, 2001] Pg: 96.)

While bringing forward a new concept, meaning or realm, the relations of the fragments to their previous settings are kept to some extent. Eisenstein in his description of intellectual montage states that the idea is not composed through successive reading of shots but it is derived from the collision of the two, independent of each other.[70] Stan Allen puts the situation in a similar way:

> *Montage deploys all the techniques of allegory: the depletion of previous meanings and the formulation of new ones by the appropriation and dialectical juxtaposition of fragments set in a new context. It is a procedure in which one 'text' is read through another.*[71]

Thus, even if there is not a strict rupture with the previous context, Bill Nichols mentions that "montage has a liberating potential" in the production of the new.[72]

To carry the argument from a semantic level to a spatial one, it is better to consider montage consisting of three elements –fragments, gaps and site- where the gap comes forth as the key element for the understanding of space. Jonathan Hill defines the gap as an "opening, possibly for a period of time, between seemingly more substantial conditions" and mentions that this gap denotes something unnoticed or missing[73] which is supposed to be filled by the viewer. In a parallel way, Stan Allen defines the realm of space created through montage as follows:

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[70] Richard Taylor. "*Eisenstein: A Soviet Artist*," The Eisenstein Reader. (London: British Film Institute Publishing, 1998) Pg: 15.

[71] Jonathan Hill, "*The Montage Of Fragments*," Actions of Architecture: Architects and Creative Users. (London: Routledge, 2003) Pg: 95.

[72] Bill Nichols, "*The Work of Culture in the Age of Cybernetic Systems*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 124.

[73] Jonathan Hill, "*The Montage Of Gaps*," Actions of Architecture: Architects and Creative Users. (London: Routledge, 2003) Pg: 110.

> *Montage practices challenge the conceptual and perceptual model of space in depth. Yet space does not disappear. On the contrary, these surfaces imply a new kind of space. Construction "with intervals" suggests that in montage, it is not the elements that are significant, but the space in-between them that defines the potential depth.*[74]

However, beyond the semantic and sensual construction through montage as indicated in visual arts, literature and cinema as indicated as intellectual montage; the use of montage in cinema as a technical production method gave the way for montage to deconstruct the linear formation of space and time experience.

3.3. Montage in Cinema

Through the infinitely many possibilities the camera proposed in contrast to the limited capacity of the human sight (zooming in, zooming out, playing backwards, speeding up, slowing down, etc.); beyond being able to simulate or represent spatial experience in a way that is closest to the real one, the introduction of the moving-image into the field of vision also caused a transformation in the perception of space.

> *The movement of the image, the insistence of the cut, the ex-centiricity of the frame, all ensured that cinema not only departed the shores of painting, but unmoored the traditional co-ordinates of mimesis itself, inscribing a new instability in the relation between representation and reality.*[75]

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[74] Stan Allen, "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 27.

[75] Scott McQuire, "*Flickering in Eclipses*," Visions of Modernity: Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998) pg: 72

Before cinema began to be used widely in public, "simulation was limited to the construction of a fake space inside a real space visible to the viewer,"[76] as in the case of theatre scenes, panoramas and dioramas. "These simulation technologies were limited by the materiality of a viewer's body, existing in a particular point in space and time"[77], as the spectator shared the exact physicality of the scene instead of experiencing it through an interface which is the screen in the case of cinema. Through this medium, conventional moving spectator gave its role to the static one, while the static space turned out to be a dynamic image.

> *As much as "actualities" and "scenes from life" were in vogue, it was the cine-camera's capacity to destructure space and time which drew its initial crowds.*[78]

3.3.1. Cinematic cut

At the beginning of the cinematic discourse, montage was not more than a technique to cut and add different sequences to each other to produce the final one. Repetitions, flashbacks or inverted narratives were used to some extent, but this was not any further than simple modifications of the linear formation of the sequence.[79]

In the field of architecture, however, the narration in the spatial experience has a one-to-one correspondence with the use of montage in cinema technically. Rem Koolhaas, who is experienced in script-writing as well, is one of the leading architects that uses this idea in his projects, as well as

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[76] Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 147.

[77] Ibid. Pg: 148.

[78] Scott McQuire. "*Flickering in Eclipses*," Visions of Modernity: Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998) pg: 73.

[79] Ibid. Pg: 84.

in representations. One of the best exemplifying projects is the Jussieu Library in Paris although it is not realized.

In the project, the conventional formation of floors stacked on top of each other, a continuous pathway is constructed "much like an interior boulevard that winds its way through the entire building."[80] With reference to the overall network of the university campus, this schema lets the user to experience all parts of the building on one single trajectory but through many opportunities created by the relation of each section with above and below parts. The all building becomes a warped interior boulevard with its programmatic elements interpreted as different parts of an urban experience - plaza`s, parks, monumental staircases, cafes, shops. (Figure 3.4)

The Dutch Embassy in Berlin, which has been completed in 2003, also carries the characteristics of the "internal structural and functional mazes of the Jussieu Library in Paris." [81] The building, breaking up the planning laws of Berlin creates a narrow but totally open courtyard between the office block and the L-shaped apartment block. What Koolhaas calls "trajectory" starts with entering to the courtyard from the street and leads the visitor to the entrance of the office block. From that point on, a 200m-long strip consisting of the "succession of staircases, ramps and corridors"[82] continues through the building linking each floor to the other. (Figures 3.5 – 3.6)

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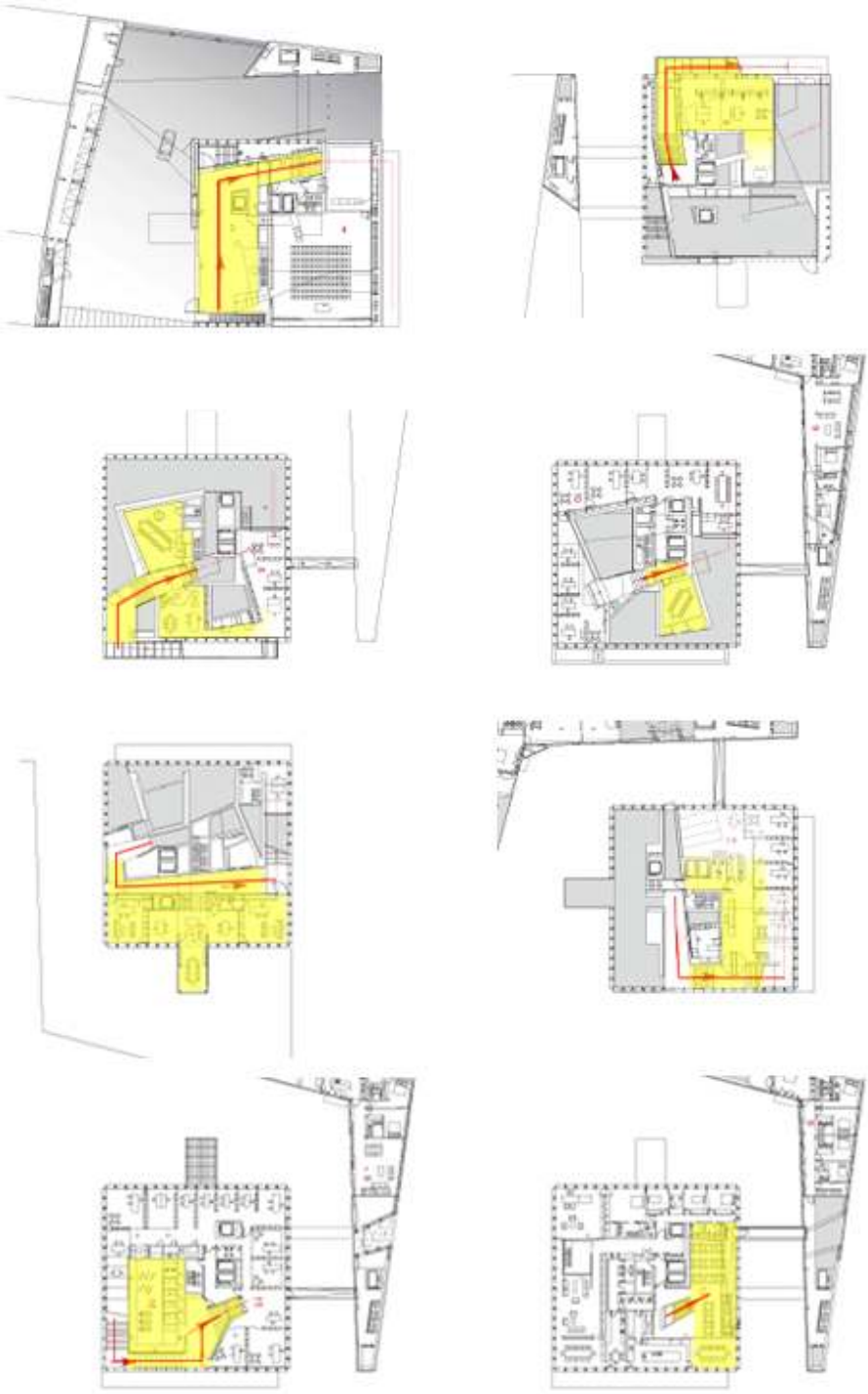
[80] Rem Koolhaas, The Jussieu Library, ADDRESS: www.oma.eu, accessed: Dec 2007.

[81] Christian Brensing, "*The Cabinet of Dr. Koolhaas*," Architectural Review May 2004. ADDRESS: http://www.arplus.com/broch/articles/armay04/armay04koolhaas.pdf accessed: November 2007.

[82] İbid.

3.4. Rem Koolhaas/OMA - Tres Grande Bibliotheque, Jussieu, France, at the Content Exhibition in Rotterdam (Photograph by Michiel van Raaij, source: http://www.eikongraphia.com/?p=1430, accessed: Nov 2007)

3.5. The Dutch Embassy in Berlin, conceptual presentation of the continuous circulation experience, by adding up each floor plan. (source: "The Cabinet of Dr. Koolhaas," Architectural Review May 2004. ADDRESS: http://www.arplus.com/broch/articles/armay04/armay04koolhaas.pdf accessed: November 2007.)



3.6. The Dutch Embassy in Berlin, floor plans (source: "The Cabinet of Dr. Koolhaas," Architectural Review May 2004. ADDRESS: http://www.arplus.com/broch/articles/armay04/armay04koolhaas.pdf accessed: November 2007.)

> *A crucial threshold was crossed in the first decades of this century as film makers progressively fragmented both the proscenium space and the continuity of action which characterized early cinema. Instead of a fixed camera recording a single, continuous shot with all action taking place center "stage", enabling the screen to form a stable "theatrical" space from which actors made entrances and exits in real time, a more complex orchestration of shots, camera positions and film sequences emerged.*[83]

As film overcame the classical understanding of space and movement obliged by the physical realities and capabilities of human body, cinematic space became one of the main focuses of the architectural discourse starting from the last years of the 19th century on. Through montage, "images that could have been shot in different geographic locations or at different times create the illusion of a contiguous space and time"[84] proposing a view of a non-existent world.

Stan Allen similarly mentions Vertov's using "the language of a builder to describe the operations of montage" adding that the editor is a kind of architect who builds with images. Allen continues stating that cinematic montage constructs new objects and subjects from the relations of images to each other on the surface instead of imitating the actual vision.[85]

> *..Therefore if the older simulation technologies were limited by the materiality of a viewer's body, existing in a particular point in space and time, film overcomes this spatial and temporal limitation. It achieves this by*

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[83] Scott McQuire. "*Flickering in Eclipses*," Visions of Modernity: Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998) pg: 73.

[84] Lev Manovich."Compositing," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 148.

[85] Stan Allen, "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 27.

> *substituting recorded images for unmediated human sight and by editing these images together.*[86]

Similarly it is formulated by Scott McQuire as camera and cinema in more general terms provides with "not only seeing the real world differently, but of really seeing a different world." [87]

3.3.2. Types and Development of Montage

Apart from the intellectual montage defined by Eisenstein which relates elements semantically, the term montage involves many different aspects within the filmic discourse that construct relations spatially or temporally. Therefore, theoreticians have distinguished several types of it through different aspects, explaining two of which is crucial for the following discussions -the temporal montage, and the montage within a shot.

Temporal montage in an immediate sense is the advantage obtained by the use of montage as the general technique of cinema that refers to cutting and bringing together separate fragments consecutively in time to form a new film sequence. By deconstructing the linearity and continuity of the film sequence, a new geography, a new person or a new sum of actions is possible to create.

> *I am a kino-eye. From one person I take the hands, the strongest and most dexterous; from another I take the legs, the swiftest and most shapely; from third, the most beautiful and expressive head –and through montage I create a new, perfect man.*[88]

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[86] Lev Manovich."Compositing," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 148.

[87] Scott McQuire, "*Flickering in Eclipses*," Visions of Modernity:Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998), pg: 73.

[88] As quoted from Dziga Vertov in: Stan Allen. "*Constructing with Lines: on Projection*," Practice: Architecture, Technique and Representation. (London: Routledge, 2000) Pg: 26.

Montage within a shot, however, is a more rarely used technique that provides complex images by overlapping separate ones to produce a single totality within a frame, thus creating the new not through successive relations of frames but from their juxtaposition. That is, while the first one relates different fragments temporally, the second attains this spatially by creating a new reality.

> *In the absence of a necessary referent, cinema exposes us to the deep psychic uncertainties of experiencing "real perceptions" which don't really exist. We see things which never happened. Or rather, we see them according to a temporality and spatiality.*[89]

Beyond the possible classification of temporal montage versus montage within a shot, from the first time it was used till today, with the technological developments montage has passed through different phases which were directly influenced by the inherent potentials of the media that the technology of the time offered, .

Traditional editing is applied in the analog media. By cutting the celluloid filmstrip, the movie is separated into fragments and by pasting them consecutively with a new order, a new sequence is obtained. As fragments not necessarily taken consecutively in space and time came together, a new spatial experience which was not time bounded was achieved. The main advantage offered is unfolding of time. Montage within a shot, however, is hard to achieve in this analog technique although not impossible.

Electronic editing showed itself towards the mids of the 20th century, with the technological developments when there occurred a shift from manual film editing to electronic image recording and editing which also brought

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[89] Scott McQuire. "*Flickering in Eclipses*," Visions of Modernity: Representation, Memory, Time and Space in the Age of Camera (London: SAGE, 1998) pg: 86.

the new term “keying” to the field. By carrying montage within a shot a step further, this new method made possible combining two different images from different sources in a single frame. With this new technique an image cut out of a video image may be placed on another image whether a live video image, a prerecorded tape or a computer-generated graphics. The weatherman in front of a map or the singer in front of an animation in a music video may be the examples that show how widely this technique is used.

Compositing is the last step in the development process of montage with the medium digital environment offers. As the digital environment already maximizes the possibilities and opportunities for the use of montage, as well as proposing new ones, it takes the concept of montage a step further, which will be examined in the following chapter.

CHAPTER 4

DIGITAL COMPOSITING: THE NEW MONTAGE

> *Whose vision is it? It is the vision of a computer, a cyborg, an automatic missile. It is a realistic representation of human vision in the future when it will be augmented by computer graphics and cleansed of noise. It is the vision of a digital grid. Synthetic computer-generated imagery is not an inferior representation of our reality, but a realistic representation of a different reality.*[90]
>
> *Lev Manovich*

Digital medium has the principle to translate any analog media to a unique coding system, which also enables rich possibilities of manipulation, editing, modification and calculation. Therefore, it proposes a valuable environment for applying montage and even taking it a few steps further. Beyond being able to imitate the exact act of montage seen in older technologies or any analog media –due to the ability to transfer analog to digital- it is also possible to create new modes of realities through use of montage because of the inherent nature of the digital environment.

Thus, it will be important to search for the characteristics of montage in the digital environment with reference to older technologies and media, keeping the principles of digital medium in mind.

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[90] Lev Manovich."*The Synthetic Image and Its Subject*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 202.

In order to unify the digital environment with the idea of montage, where a user and creation through an interface is the main concern, image or video editing programs will be helpful to examine as a tool, to understand montage as a principle for the creation of space in this specific medium.

Although image or video editing software do not differ much when considered through their capacities or use of properties of the medium,[91] for the expansion of the scope of the material and actions used, video editing programs may be better to exemplify, as they have images or videos converted from analog media, music, 3D animations or renderings created in the virtual environment and many tools to simulate the physical world when compared to image editing software. Beyond that, the representation of motion or the aspect of time in movies puts video editing software to a specific position within the scope of the discussion.

4.1. Compositing

With the introduction of computer technology into the field of cinema in 1980s, a new technique "compositing" came into account, which Manovich defines as a process of combining a number of moving image sequences, and stills, into a single sequence with the help of special compositing software.[92] This process may be compositing of newly produced fragments as well as of database stock material be it a video or a film shot, a two-

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[91] Roy Ascott mentions "This postphotographic technology captures images ("seen" images from still video and other cameras), constructs images ("unseen" data from remote sensors and databanks), and generates images (from raw numbers); it treats them, stores them, associates them, disburses them, transmits them, into a media-flow which is, in every serious sense, unending and ubiquitous." See Roy Ascott, "*Photography at the Interface*," Timothy Druckrey ed. Electronic Culture: Technology and Visual representation, (Canada: Quebecor Printing, 1996), pg:166.

[92] Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 136.

dimensional image, a sound track or a three-dimensional virtual environment.

Manovich gives the example of a scene in the movie Wag the Dog[93] where a series of news about a fake war is created by a Hollywood producer to hide some scandals of the president just before the elections. Beyond the main theme of the movie that gives a critique of the role of the mass media which is a great tool to create a fake reality, Manovich emphasizes one of the scenes, where a girl with a cat in her arms is running through a destroyed village which is totally a fiction -a virtually created world.

> *If a few decades earlier creating such a shot would have required staging and then filming the whole thing on location, computer tools make it possible today to create it in real time. Now the only live element is the girl, played by a professional actress. The actress is videotaped against a blue screen. The other two elements in the shot, the destroyed village and the cat, come from a database of stock footage.*[94]

At first impression, it may seem to be that digital compositing provides nothing more than expanding the possibilities in quantity that the older cinematic montage methods were not able to manage. However, unlike other techniques, digital compositing proposes an aesthetic of smoothness and continuity. Sequences or images gathered from different sources as well as belonging to different contexts are combined to a final product in which the boundaries are no more able to be seen.

> *In the course of production, some elements are created specifically for the project; others are selected from databases of stock material. Once all the elements are ready, they are composited together into a single*

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[93] Barry Levinson, 1997

[94] Lev Manovich."Compositing," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 136.

> *object; that is, they are fitted together and adjusted in such a way that their separate identities become invisible. The fact that they come from diverse sources and were created by different people at different times is hidden. The result is a single seamless image, sound, space, or scene.*[95]

In this way, compositing makes it possible to hide the fact that the elements come from different sources. The new image is a whole virtual reality which does not exist in real.

It may be argued that the reality created through the sequence consisting of temporally related images by use of cinematic montage or the hybrid reality achieved through electronic editing also virtual. The point is that, in contrast to the formation of a reality created through fragmented pieces of the former or the obvious visualization of different identities in the latter; compositing offers a reality of smoothness or at least a reality which is seemingly smooth.

As a consequence, with the introduction of digital compositing, what cinema as a representation technique houses in itself within its history, the cinematic space, now leaves its place to a new understanding of creation of a space that a filmic production technique brings out.

4.2. Digital Compositing Software

Providing both temporal montage and montage within a shot at the same time, compositing software "erase the strict conceptual and technical separation between the two."[96] In this way, they open the way for linear

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[95] Ibid. Pg: 136.

[96] Ibid. Pg: 155.

formation in traditional film sequence to give its role to layering of fragments. However, as the filmic narration holds in itself the temporal linearity whatever the production method is, the contribution of compositing to the linear structure of formulation of movie is still questionable. What is coming forth instead is the possibility of overlapping images from different sources to create new, which is the main concept and aim of montage in any medium.

To exemplify, we may think of several digital compositing software such as Adobe After Effects, Adobe Premiere, Alias|Wavefront Compositor or Kodak Cineon.[97]

Nigel and Jenny Chapman define editing process as "arranging a set of individual clips in order to end up with a complete video."[98] It is possible to import any video clips, audio, sequence of stills, images, texts by changing their settings. The interface of the editing software consists of several windows in contrast to many other software interfaces which use a single document window –such as tool palettes, timeline window, project window and the film window. (Figures 4.1 – 4.2)

User can control the editing process of the movie by choosing the windows he will use. Beside the original film window, the timeline window shows the imaginary cross-section of the film to show the temporal and spatial relations of the fragments (or the layers that make up the movie) where "the horizontal dimension represents time and vertical one represents the order of different layers making up the image."[99]

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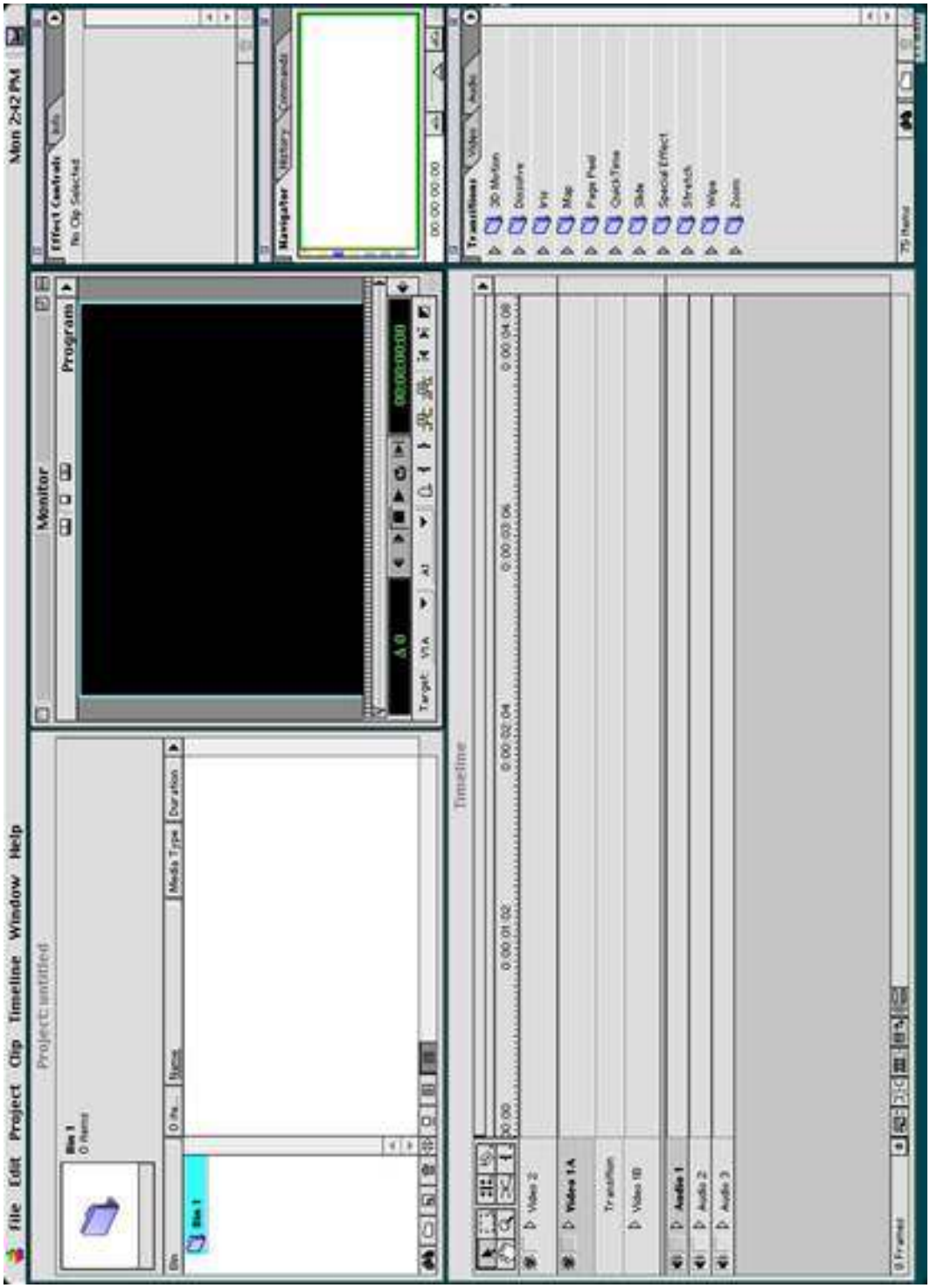
[97] There are also several image editing software like Adobe Photoshop, Adobe Illustrator which operate through similar principles.

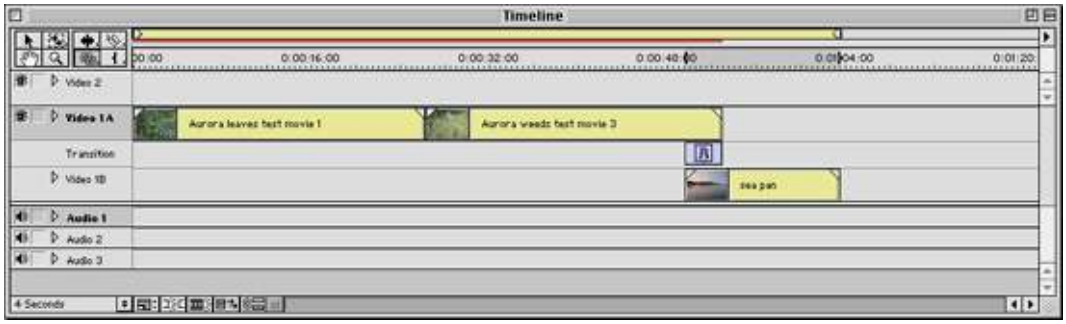
[98] Chapman,Nigel and Chapman Jenny. "*Premiere: Video and Audio*," Digital Media Tools. (New York: John Wiley & Sons, 2002) Pg: 396.

[99] Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 155.



4.1. Digital Compositing software interface (source: Chapman,Nigel and Chapman Jenny. Digital Media Tools CD-ROM. (NY: John Wiley & Sons, 2002)

As can be seen in the timeline and project windows, digital compositing software works in modules. The image is separated into fragments which eases managing and saves enormous time. Actually it is rather correct to say that the fragments brought together to produce the final image still maintain their individual characters.



4.2. Timeline window (source: Chapman,Nigel and Chapman Jenny. Digital Media Tools CD-ROM. (NY: John Wiley & Sons, 2002)

This fragmented formation continues all through the process, even while the parts are being saved. Similarly Manovich quotes from Thomas Porter and Tom Duff:[100]

> *Experience has taught us to break down large bodies of source code into separate modules in order to save compilation time. An error in one routine forces only the recompilation of its module and the relatively quick reloading of the entire program.*[101]

[100] Thomas Porter and Tom Duff are two scientists working for Lucasfilm, who formally defined compositing in their paper for the first time in 1984.

[101] Thomas Porter and Tom Duff, "*Compositing Digital Images*" Computer graphics18, no:3 (July 1984) Pg: 253-259 as quoted in Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 137.

What is possible to do through the software is to have the information of the location of each fragment and save only the system. In this way, the direct relation between the database and the system continues during the editing process which causes any possible change in the database or an element of it directly affect the product. With the possibility of editing each fragment independent of the software (small edits in coloring or design of the pieces) this operating system gives way to an upper level of variability beyond the modularity and variability the layering of fragments proposes.

By layering different fragments, a seamless 3-dimensional virtual space is constructed. The fragments each represented by a block on a line in the timeline window can be modified that will give way to coexistence of theirs multiples as far as making them appear, disappear, move, rotate, trim, zoom in-out or change proportions through time.

Beside many elements such as videos, 3-dimensional virtual environments, texts or 2-dimensional images, light attributions or camera simulations may also be used.

4.3. Principles of digital media and compositing

To understand how digital media contributes to the application of montage, it may be useful to reconsider the main principles of digital media that were examined in the second chapter, within the systemic formation of the compositing.

Numerical representation: The main principle of digital media which is converting any kind of data from any source to a simple coding language is the first contribution of this realm to the concept. As any data converted from analog media can be used together with digitally created data, digital

compositing brings more possibilities with its use.

Modularity: Compositing as mentioned before makes use of modular structure which makes the system easy to control, manipulate and manage. Beyond keeping the elements separate all through to process, each element still has its inner modular structure. For example, in the case of video, where it is possible to control the frame per second or edit one of the stills on an other image-editing software which will directly change the result in the compositing software.

Automation: Owing to the principle of digital coding, there is a level of automation within the compositing software. The user is allowed to modify the object using predefined algorithms such as transitions from one still to the other, coloring-contrast settings in a single frame and so on. These predefined algorithms also supply with an upper level of abstraction with the help of modular structure of the medium. As not only the elements but also the actions are modularized, the total act of editing is differentiated into levels which makes it easier to manage, by giving the chance for abstraction of different aspects of the work.

Variability: The predefined algorithms and the modular structure gives the user the chance to have an almost infinite number of various ways of final versions. Beyond the variability that the compositing proposes, due to the modular system of the software each element is ready to be manipulated separately which creates an upper level of variability as it directly effects the data of the element used in the composition.

Transcoding: Finally, because of the general principle of the interface in digital media, all the data appearing in different ways on the screen (images, abstract shapes, texts or numbers) are in a continuous translation from visuals to abstract data of coding back and forth.

4.4. Compositing Space

When the virtual environment is considered, because of its multi-layered structure, the concept of space changes its characteristics and becomes interrupted and fragmented but still keeping the possibility for creation of continuity.

> *The combination of complexity in capturing, constructing, storing and accessing data, combining that data at various levels of resolution, in a variety of sensory and semantic modes –images, text, sound- places digital photography in a kind of virtual space, on the road to hypermedia.*[102]

The formation of compositing software is also an example to this characteristic of digital media as it gives way to hypermedia in the way various elements from different sources as well as various acts are layered through the software -in the film window, project window or timeline window- that makes it easier for the user to control and manipulate. Lev Manovich mentions that compositing consists of three conceptual steps:

> *- construction of a seamless 3-D virtual space from different elements.*
> *- simulation of a camera move through this space (optional).*
> *- simulation of the artifacts of a particular media (optional).*[103]

In this new mode of space, what we have experienced in the course of traditional montage by temporal relation (the consecutive relation of the frames) has now becomes spatial through the multi-layered structure

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[102] Ibid. Pg: 167.

[103] Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 137.

which not only created through composition of different elements but also different acts, constraints or algorithms.

Lev Manovich thus compares traditional montage, which only breaks the space and time continuum to compositing which produces a hybrid and mixed space. He mentions that montage throughout the twentieth century has given its place to compositing through which aesthetics of continuity is achieved.

> *Digital compositing, in which different spaces are combined into a single seamless virtual space, is a good example of the alternative aesthetics of continuity; moreover, compositing in general can be understood as a counterpart to montage aesthetics. Montage aims to create visual, stylistic, semantic, and emotional dissonance between different elements In contrast; compositing aims to blend them into a seamless whole, a single gestalt.*[104]

4.5. Space as an interface

Cinematic montage, produced by the arrangement of frames one by one to form a sequence, offers a fragmented totality, a fictional space by interrupting the continuity of space and time. On the contrary, compositing is juxtaposition of elements within a frame by hiding their separate identities. Therefore, with the introduction of compositing, the cinema screen went beyond being a representation of the real or digital space, but it created its own realm of space which acts as an interface.

Similarly; Manovich, making a comparison between the traditional film practice and computer technology, states that film practice accommodates

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[104] Ibid. Pg. 144.

"temporal development of a moving image" while computer technology has many "spatial dimensions" and defines the new spatial dimensions that computer technology proposes:

> *- spatial order of layers in a composite (21/2-D space),*
> *- virtual space constructed through compositing (3-D space)*
> *- 2-D movement of layers in relation to the image frame (2-D space)*
> *- relationship between the moving image and linked information in the adjustment windows (2-D space)*[105]

By offering a logical use of these dimensions, he brings out a new term, "spatial montage" which is one of many opportunities that the use of digital compositing offers. As an alternative to the sequential and linear formation of cinematic (temporal) montage; spatial montage proposes a field for the use of two or more images within layers in a single shot that also dissolves in time. Thus it produces a different spatial quality and informational background which carries the discussions a step further creating a new hybrid and virtual product.

However, the main point is that, although this discussion of space seems to concern cinematic space, this is achieved through the multi-layered structure of the software. With the digital compositing software, the spatial and temporal relations of frames, stills and other elements are separated from each other due to the multi-windowed formulation of the system.

Through the abstract representation of the software interface (with different windows and actions for specific dimensions and aspects of the work), compositing software proposes a different process, creating

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[105] Lev Manovich."*Compositing*," The Language of New Media, (Cambridge: MIT Press, 2001), pg: 157.

different types of relations giving way to another perspective for seeing the architectural production in digital medium.

In its simplest sense, the separation of the film window and time-line window makes it possible to control different dimensions of the movie. Thus, what seems to exist in one dimension –in time-line window- is hidden or revealed in other one –film window- drawing the idea of existence and spatial relations of elements to a more complex situation in relation with time.

> *The object of digital photography lies in a virtual space, and in an implicit world which evolves within the flow of hypermedia –layered, relational, and constantly shifting in content and context, depending on the behaviour and consciousness of the viewer.*[106]

In this way, digital compositing software becomes more than a two-dimensional design for a command window to appear on screen. It becomes a medium, which lets user edit, merge, bring together or overlap different elements from different modes of realities, thus becoming a space which acts as an interface for the collision of different medium. The structure of the software gives way to the coexistence of the modules in the timeline window, where it is possible for the user to hide a still or a piece of movie by increasing its transparency in the film window without totally deleting it. As this piece cannot be seen in the film window but does exist in the timeline window, this kind of situations take the concept of co-existence into a higher level of complexity.

During the last century, visual media presented us –the spectators- new modes of perceptions, new ways to experience space, and most important new spaces to experience. With the introduction of moving-image,

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[106] Roy Ascott, "*Photography at the Interface*," Timothy Druckey ed. Electronic Culture: Technology and Visual representation, ed. by Timothy Druckrey, (Canada: Quebecor Printing, 1996), pg: 171.

architecture as a discipline concerning space is in deep relation with cinema which was once a search for representing the narration of continuous space and time, but has gone far beyond that and now became a discipline for production of space.

In this way, by just dividing into pieces and reconstructing them in a new sequence, thanks to the interrupted and fragmented formation of cinematic montage,[107] the idea of continuity in space and time experience has diversified, which totally affected the dominant attitude in the production of architectural space. The idea of non-linearity has become a key factor in the production of space.

> *…The mechanical tools of filmmaking, the Futurists claimed, would produce the "simultaneity and interpenetration of different times and places," foreshadowing later developments in nonlinear narrative found in interactive media.*[108]

The non-linearity in the production process is achieved by the modular structure of the digital compositing software again due to its multi-windowed formulation, where all the design tools, time-line formation and the final product co-exist and may be used at the same time. This brings the software to a position where correlation of different windows leads to differentiation of the final product. In addition to that it is possible to undo, redo or invert the whole process.

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[107] As compositing supplies with temporal (cinematic) and spatial montage at the same time, not to confuse the reader for the role of the technique, in its simplest sense, the term "cinematic montage" is used for achieving non-linear formation of time.

[108] F.T.Marinetti, B. Corra, E. Settimelli, A. Ginna, G. Balla, R. Chiti, "*The Futurist Cinema*," Multimedia from Wagner to Virtual Realitty, ed. By R.Packer, K. Jordan, (New York: W.W. Norton, 2001), pg: 11.

Thus, in the way that it manages time and brings process to the focus, digital compositing becomes a temporal interface or in other words it becomes an inter-phase. Through this characteristic of the tool –the software- a new understanding of space begins to emerge which is a great example to understand how the design process changes with the introduction of digital environment.

CHAPTER 5

CONCLUSION: GENERATIVE PROCESS IN ARCITECTURE

> *Designing architecture of screens means to produce architectural artifacts that change their informational content following functional, aesthetic, or contextual demands. By choosing information over matter, the virtual over the real, the changing over the stable, representation over presentation, this vision fundamentally challenges and finally breaks down the solid, static, enclosing, and semiotic nature of architecture as we have understood it for millennia.*[109]
>
> *Julio Bermudez*

Before any computer software used in drawing and modeling in architectural production, there had been many other representation methods used for this process within the history of –be it may a scaled model, orthographic projections, sketches, diagrams and so on.

To understand how digital technology and its contribution to montage have deeply affected the architectural design process, it is necessary to reinvestigate what role the interface and medium play during the process.

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[109] Julio Bermudez, "*Architectural Visions: Non-verbal Essays on Cyberspace*," ADDRESS: http://faculty.arch.utah.edu/people/faculty/julio/visions.htm (accessed: 10 Nov 2007)

5.1. Interface

In geometry, interface is defined as a "surface forming a boundary between two regions."[110] From that definition, it may be conceptualized to be the intersection of two different entities, keeping in mind that the intersection belongs to both, but has its own formation and boundaries. Analogically, it is used for a medium that serves as a bridge between different media. For the use of digital media and reaching cyberspace, Kevin Robins, quoting from Timothy Binkley, defines interfaces as bridges between real and virtual, which are strange places as being "both concrete and abstract." He emphasizes the strange phase when the user is holding a real sensor –the mouse- and a virtual paint brush at the same time.[111]

As an instrument or tool on the way to complete a task, interfaces define the limits of production with their capabilities. Thus Michael Heim mentions a software interface's being a two-way street where computers enhance and modify the user's thinking power:

> *Interface means more than video hardware, more than a screen we look at. Interface refers also to software or to the way we actively alter the computer's operations and consequently alter the world controlled by the computer. Interface denotes a contact point where software links the human user to processors… It is our interaction with software that creates an interface.*[112]

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[110] Meredith Bricken. "*Virtual Worlds: No Interface to Design,"* Michael Benedikt ed. Cyberspace: First Steps, (Cambridge: MIT Press, third ed: 1992), pg: 364.

[111] Timothy Binkley, "*Digital Dilemmas*," Leonardo Supplemental Issue, 1990. Pg: 18. As quoted in Kevin Robins, "*The Virtual Unconcious in Postphotography*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 159.

[112] Michael Heim, "*From Interface to Cyberspace*," The Metaphysics of Virtual Reality, (New York: Oxford University Press, 1993), pg: 78.

Similarly, the word “interface” does not only denote the digital environment but also any other media used throughout the process. Any medium and technique used creates a different way to approach the problem in the way that it points to a different aspect of it. This is the reason why the media used during the design process directly affects the way architects think and design and leads up to different final products.

When the design process is reconsidered through this point of view, it can be said that, before the end of the 19th century, the architect’s main tools were mostly drawings and sometimes models. Similarly in the visual arts, the aim was mostly imitating or reinterpreting the existing with certain techniques. At the beginning of the 20th century, in contrast to the conventional methods, collage began to be used as a new method in art to convey meaning and to question the role and classical formation of art.

Parallel to that, with the effect of the industrial revolution and related social changes, the role and meaning of architecture has been questioned. This was followed by the idea of Modernism which reevaluated the function of architecture and its form in relation to function.

To simply visualize and work on ideas on function and form, architects began to use simple drawings, sketches and similar techniques referred to as “diagrams”. At the beginning of the century, this was mostly used for functional organization (bubble diagrams) and circulation schema. Xu Wei-Guo describes diagram as a “process of converting narrative concepts into visual form.” [113] In this sense, diagrams describe the essence of the building. Actually, “the set of lines stands for the least, the most

[113] Xu Wei-Guo, “*Non-linear Volume: Expressing Complexity*,” Neil Leach and Xu Wei-Guo ed. Emerging Talents, Emerging Technologies: Architects (Beijing: Architectural Biennial, 2006:) Pg: 17.

economical and restrained delineation of the architectural idea."[114] The observer fills the gaps between these abstract and simple lines within a diagram. However, "another simple role of the diagram is to analyze various factors in order to develop analytical sketches."[115] Therefore, use of diagrams supplies the designer with visuals to check some key aspects of a problem –be it may the circulation paths, structure, vista, geometry or any kind of physical relation. By simply separating each aspect, this method allows going through each step over and over. With this method, while working on each aspect, it is also possible to correlate one with other to evaluate and reconsider their relations.

In the design process, the use of diagrams makes it possible to visually analyze the overall situation by giving the chance to the designer to go back to the main decisions while starting to design.

In the case of Oshry Residence by Zoltan Poli, the produced plan of a small residence is visually reevaluated through the diagrams. (Figures 5.1 – 5.2) By separating the main aspects of the project such as circulation, closure, function, structure, operation and visualizing them, the architect starts to generate different solutions for each case but always considers the others. This state of correlating different aspects gives the freedom for the designer to handle many problems but always relating the situation to one-step above. Overlapping these separate analyses is in a way mentally compositing them to each other. The designer decides which parts should be brought forth during the design process or what kind of manipulations can be done to reach to the final state.

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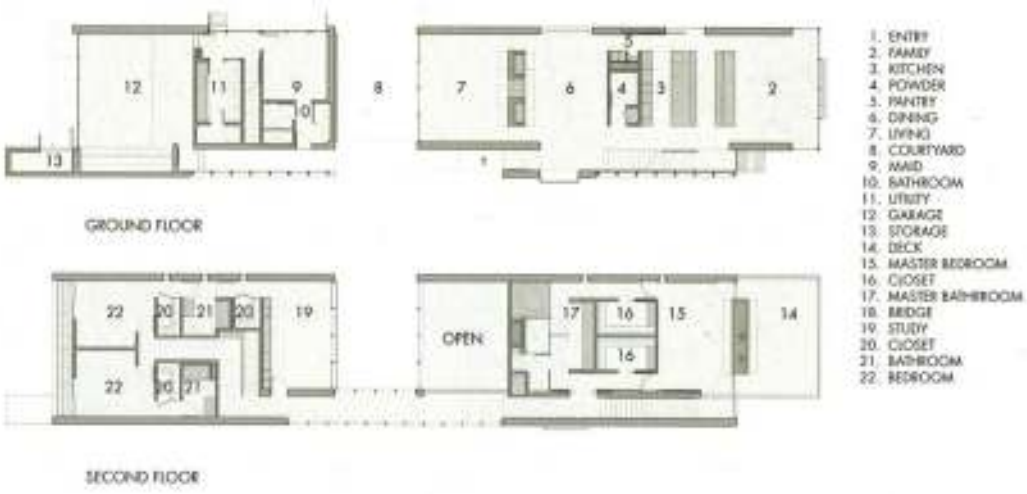
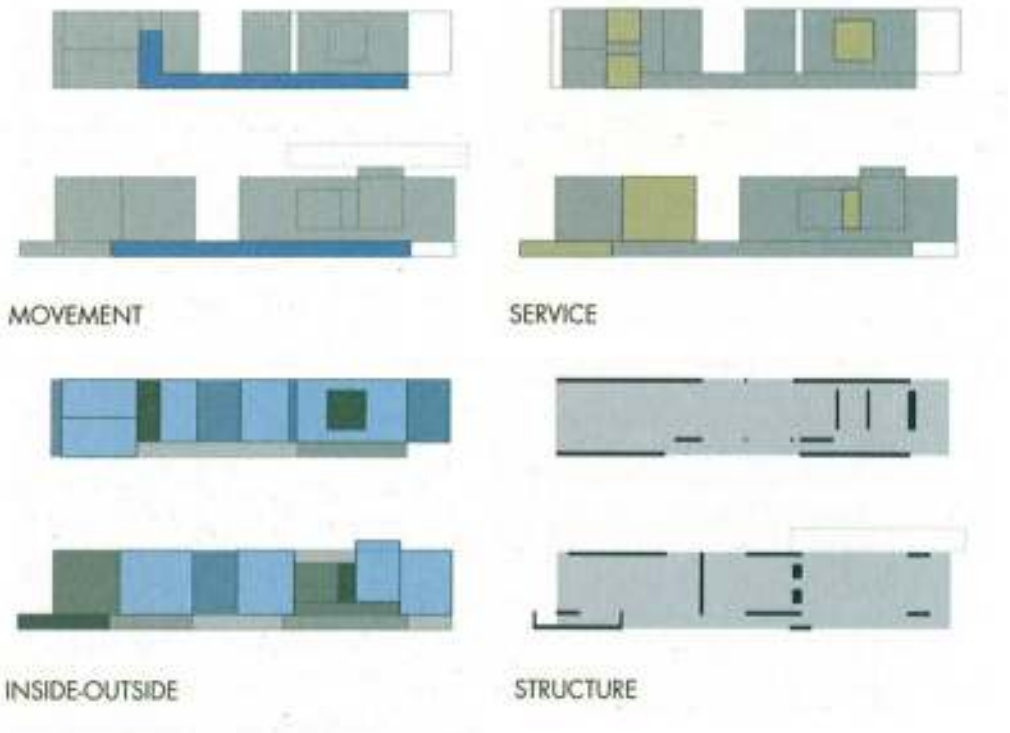
[114] David Dunster, "*Design Essence: Charting the Role of the Diagram in Architects' Work*," Architectural Review, Vol: 1307 Issue January 2006. Pg: 28.

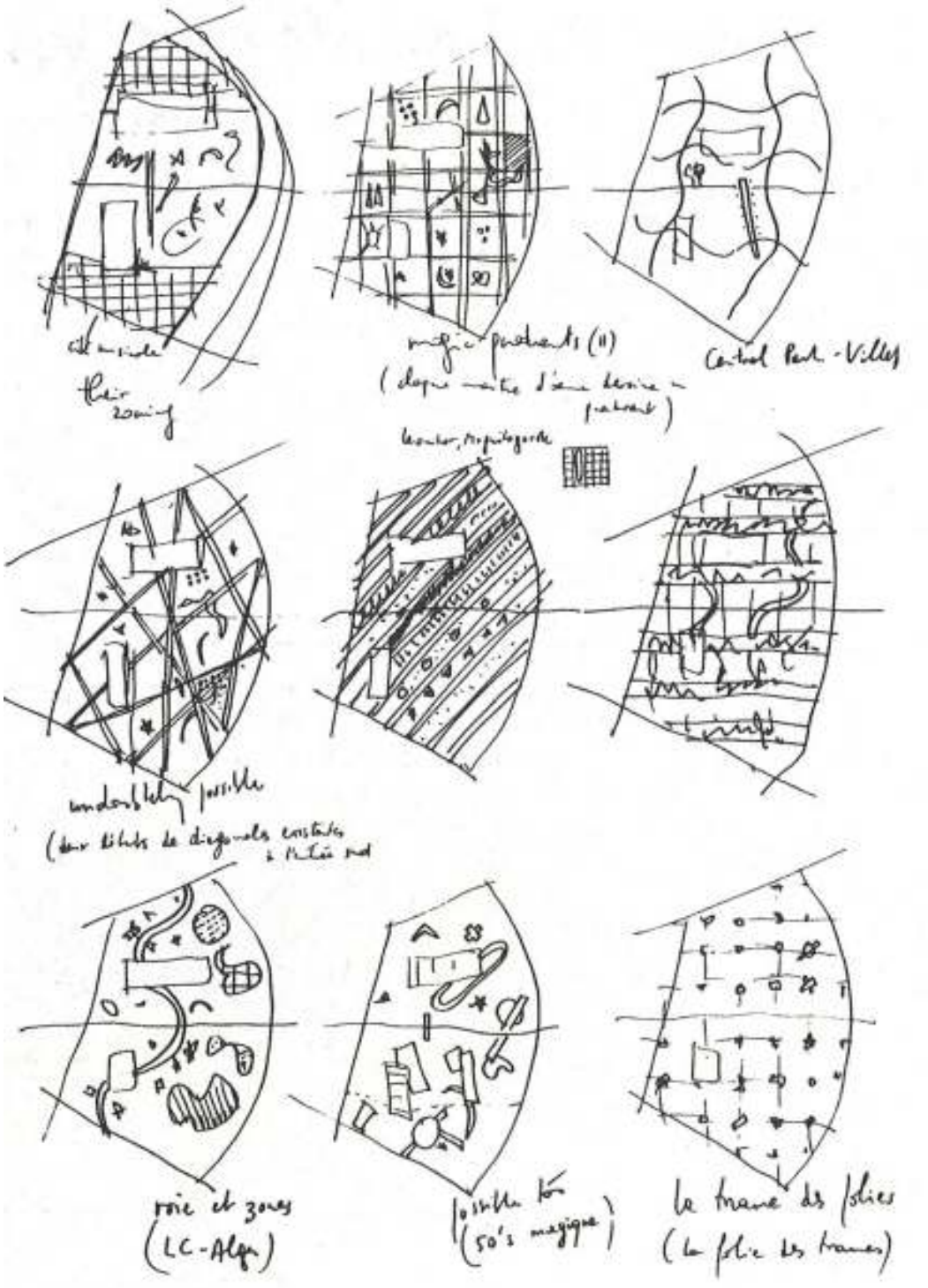
[115] Xu Wei-Guo, "*Non-linear Volume: Expressing Complexity*," Neil Leach and Xu Wei-Guo ed. Emerging Talents, Emerging Technologies: Architects (Beijing: Architectural Biennial, 2006:) Pg: 17.



5.1. Plans of the Oshry Residence by Zoltan Poli (source: Architectural Review, Vol: 1307 Issue January 2006. Pg: 51)



5.2. Movement, service, inside-outside and structure diagrams of the Oshry Residence by Zoltan Poli (source: Architectural Review, Vol: 1307 Issue January 2006. Pg: 50)



5.3. Diagrams of different layers, Le Parc de la Villette by Bernard Tschumi
(source: Architectural Review, Vol: 1307 Issue January 2006. Pg: 74)

This attitude also makes it easier to manage large-scaled projects, overloaded programs and complex situations. In his project for Le Parc de la Villette, Bernard Tschumi prefers to conceptualize the situation and program in different layers that will make it easier to handle with. He mentions that in such an urbanistic project, an architect may propose a totally new composition as an "architectural gesture," or analyze the existing situation and "fill in the gaps," or deconstruct it adding new elements as well as proposing an intermediary system to work between what exists and what is asked for.[116] He uses diagrams to analyze the existing and propose a solution. (Figure 5.3)

In this case layering and schematization of the situation within layers helps to develop an overall understanding of the whole where the design "propose[s] a strong conceptual framework while simultaneously suggesting multiple combinations and substitutions"[117] In this way through the use of diagrams the design process becomes an intermediary one –an interface- where different ideas, concepts and data from different sources come into a new unification.

This schematizing of the situation within layers is used for developing strategies for cities as well. Cities as a collection of many different networks are most likely to become readable when separated into different fragments or different layers. (Figure 5.4) Thus, in contemporary city planning studies and public building design processes, this layered system is widely used to deeply understand and evaluate the existing which will help to conclude up with a more satisfying solution in a larger scale.

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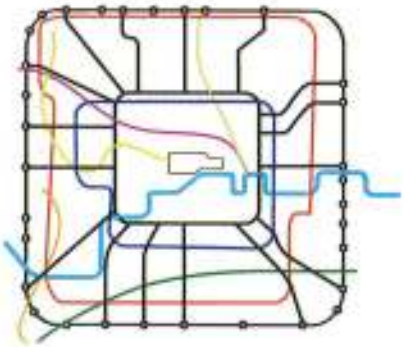
[116] Bernard Tschumi, Architectural Review, Vol: 1307 Issue January 2006. Pg: 74.

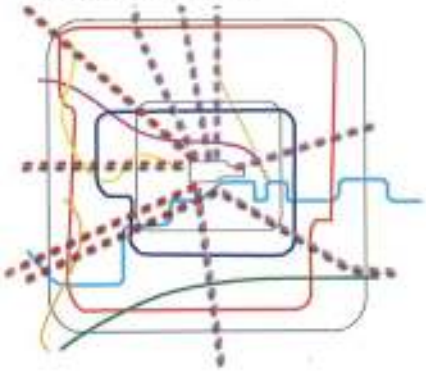
[117] Ibid. Pg: 74.

Metropolitan walks.

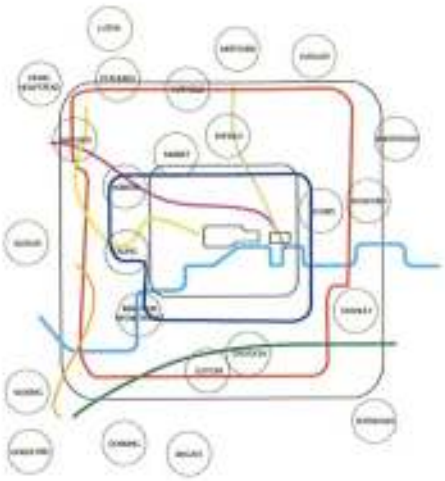
Metropolitan walks overland on Metropolitan open space.



Metropolitan walks and main road network.



Metropolitan walks and main bus and train lines.



Metropolitan walks and the satellite towns.

Composite layers.

5.4. Diagrams for the evaluation of the public utilities of London. (source: Architectural Review, Vol: 1327 Issue September 2007. Pg: 50-51)

5.2. Inter-phase

As can be seen in the examples, the design process, where juxtaposition, substitution and conflict of different ideas come into being, becomes a new phase of its own in the architectural production process. Thus the "interface" refers to the technique used while "inter-phase" denotes the whole period that technique is used. Michael Heim in Metaphysics of Virtual Reality mentions "prosopon" as a similar term for "interface" which is spoken in old Greek. He defines the word as:

> *A face facing another face. Two opposite faces make up a mutual relationship. One face reacts to the other, and the other face reacts to the other's reaction, and the other reacts to that reaction, and so on ad infinitum. The relationship then lives on as a third thing or state of being.*[118]

The intermediary process – the final case of relationship that lives as a "third state of being"- is the key point where the idea of inter-phase comes forth, as in the case of the design process.

With the developments in architectural presentation and production techniques as well as the increase in the flow of information, the digital environment offers a diversity of possibilities for this intermediary process. This puts the digital environment to a critical position which affects the overall research and design methods of the architect. Through the use of the digital environment, this intermediary process –the interphase- that was handled manually before, now gives its place to a new medium. The classical medium was mostly used for a narration where the new technologies offer many other perspectives.

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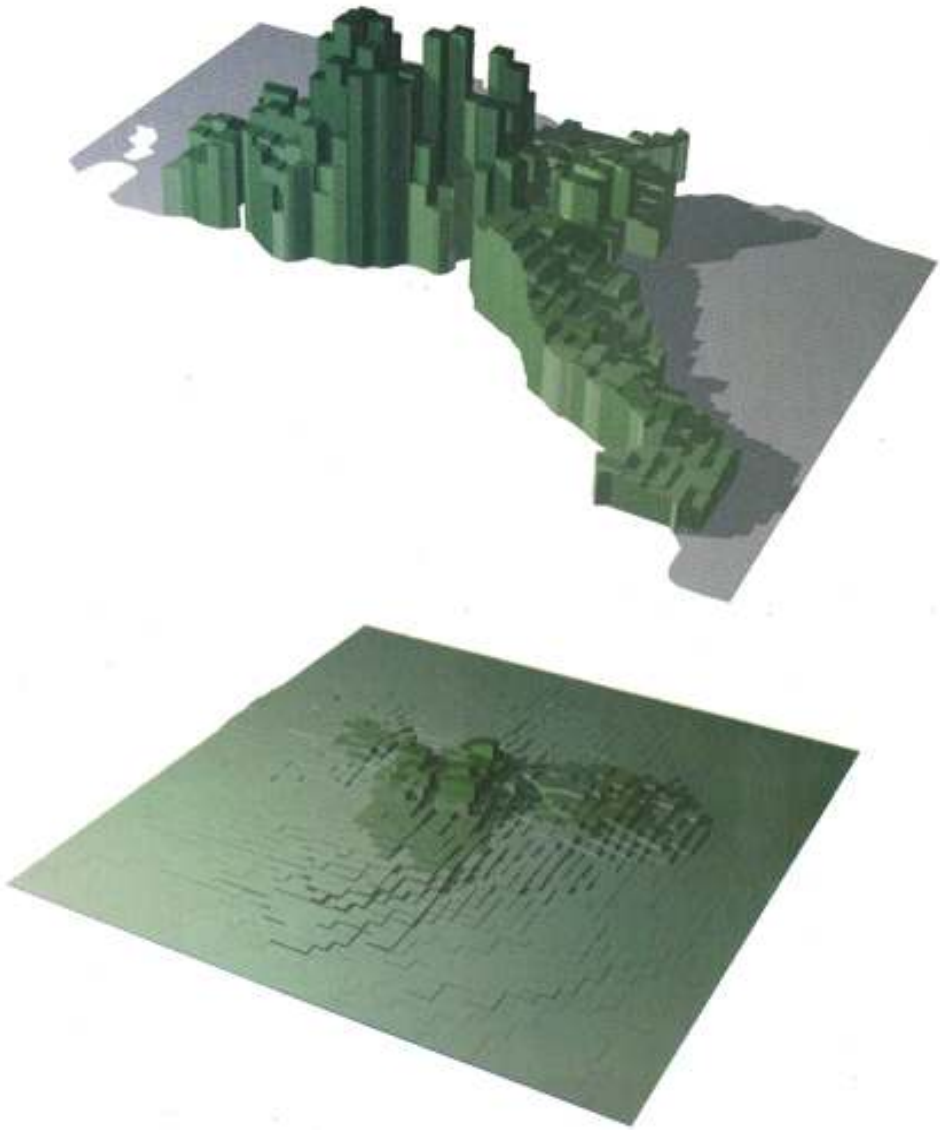
[118] Michael Heim, "*From Interface to Cyberspace*," The Metaphysics of Virtual Reality, (New York: Oxford University Press, 1993), pg: 78.

For instance, in contrast to the classical understanding of montage which allowed only for bringing out a new final product without any focus on the process, digital compositing provides the designer with new tools, new abstractions and new paradigms to deal with by also enriching the design process which will directly affect the final product. Due to the principles of modularity and automation, digital environment offers already defined algorithms as well as graphics that makes it easier to relate different parameters to each other.

The general issues investigated in the previous chapter through digital compositing, also become the essence for the digital production methods in the architectural profession. The formation of the compositing software is not much different from the other software used for architectural production from representation to production. In this way, the multi-windowed appearance opens a new perspective for dealing with different aspects of the situation, where abstraction of some levels makes it easier to cope with complex problems. This not only speeds up the design process but also puts it into the center of the whole production cycle by bringing out new visions and back and forths for re-handling the situation.

In this way the use of computer technology makes it easier to analyze and visualize the existing situations and to produce new materials by combination of the evaluated data. This allows the designer to be aware of the facts and gives the necessary clues to cope with the facts. Especially in urban projects, by separating the data into its components as well as combining different aspects into one, the process becomes “visible” and “legible.”



5.5. 3-D graphics for residential densities of Istanbul (above) and Berlin (below) where the distribution of the population is obviously visualized. (source: Architectural Review, Vol: 1315 Issue September 2006. Pp: 39-41)

In its simplest sense, although it is quite common to use visual graphics and charts, visualization of numeric data of residential density through three-dimensional blocks on a city map, is totally a “new” perspective introduced by the new openings of digital media and compositing for designing abilities of architects. (Figure 5.5)

5.3. Process design

With the awareness of the fact that the medium and the process are key factors for the final product, designers have developed new perspectives to approach a design problem. Therefore, rather than considering process as a way to reach the final product, the design of the process came into account. In this way, a solution method with well-defined rules proposes a generative design process easy to cope with.

A recent example to conceptualize the effect of digital environment is the design of Federation Square in Melbourne by Donald Bates. The project's main concern is defined as to have an architecture of difference and coherence in the website of the architectural office[119] and is one of the recent examples where it is important to have a rule-based design process to cope with the numerous problems of a large-scaled project having many different programmatic demands with a number of buildings

As the project requires "distinct elements and activities that form a complex ensemble based upon the collective and the unique" the difference in the program is tried to be created through the differentiation of the geometry, but still "maintaining a visual and formal coherence across the site."[120] Some outer forces concerning the site, construction and completion of the project also "meant that the design had to operate as a relational matrix of future consolidations."[121] Thus creation of a system was necessary and this system was deeply taking the façade organization of the buildings as the main concern.

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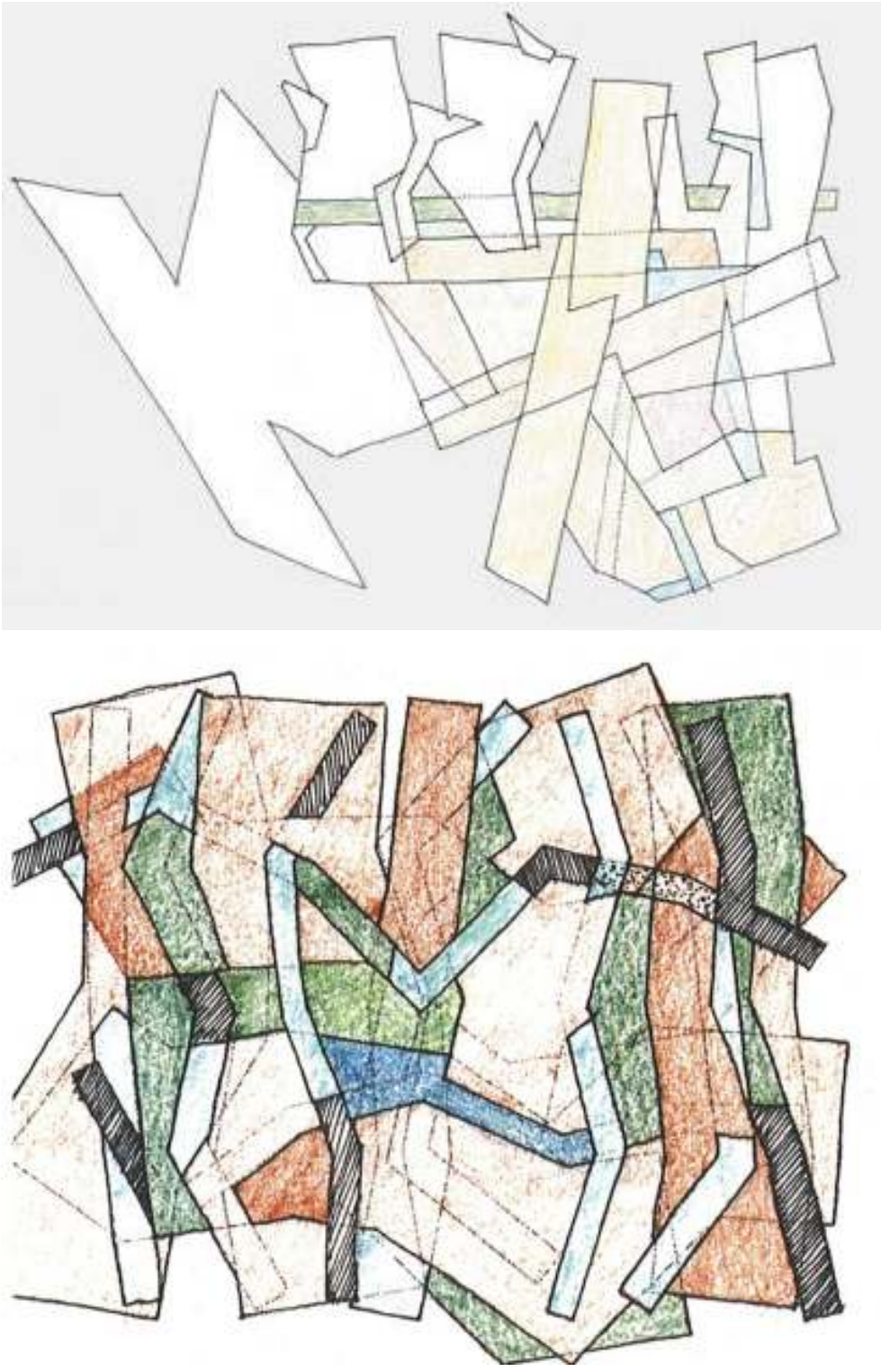
[119] Donald Bates, "Federation Square: Overview," The website of Lab Architecture, ADDRESS: http://www.labarchitecture.com (accessed: December 2007)

[120] Ibid.

[121] Ibid.



5.6. Compositional studies for the competition process. (source: http://www.labarchitecture.com/, accessed : November 2007.)

Donald Bates mentions that the general diagram of the project was an outcome of the "search for notation of new types of spatial ordering" in contrast to the general systems "based on the grid, the axis, or geometric symmetries" and describes that the produced one is "purely graphic."[122] Through an iterative process of re-drawing, re-generating and overlapping the created organizational lines, a fractal matrix is created. (Figure 5.6)

For the facades, the main attitude is to have a geometrical matrix that will be the base for all buildings with different functions but maintaining the possibility to differentiate each. Thus, a triangle based system is produced to solve the problem, and this system allows for breaking down the traditional geometrical formation of the buildings. (Figure 5.7)

> *This fractally incremental system uses a single triangle, whose proportion is maintained across the single tile shape, the panel composed of five tiles and the construction module of the mega-panel composed of five panels.* [123]

With this system, construction of facades are industrialized which speeds up the production process. Bates mentions that industrialization no more means standardization and adds that it gives chance to differentiation.[124] As in the case of digital environment where due to the principles of modularity and automation; though the use of a fractal module with only three cladding materials –sandstones, zinc (perforated and solid) and glass- all facades are differentiated. (Figure 5.8) The set of rules in the design process act exactly as the pre-defined algorithms in digital software, which perform the same action but come-up with different product whatever the input is.

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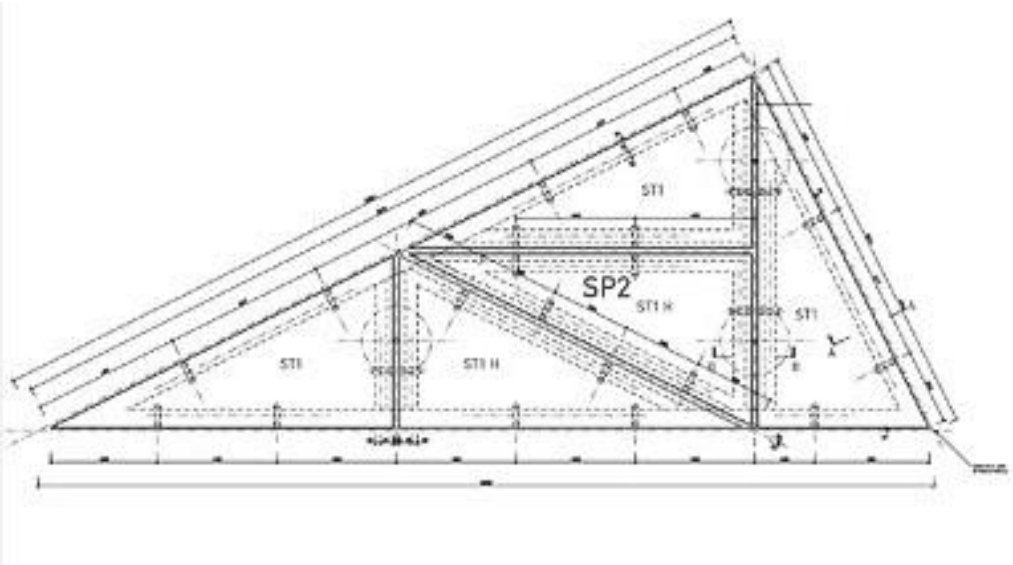
[122] Donald Bates, Architectural Review, Vol: 1307 Issue January 2006. Pg: 38.

[123] Donald Bates, "Federation Square: Fractal Facade," The website of Lab Architecture, ADDRESS: http://www.labarchitecture.com (accessed: December 2007)

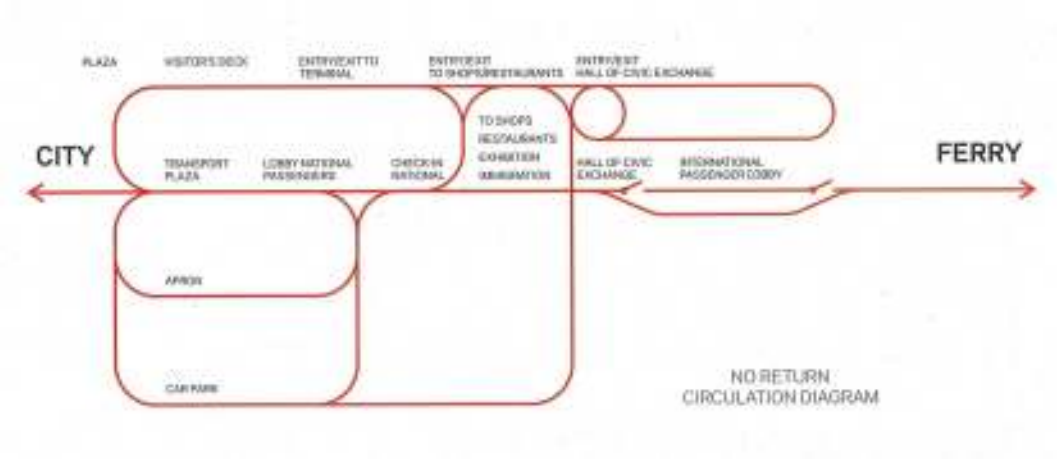
[124] Ibid



5.7. Façade panel consisting of five identical triangular tiles. (source: http://www.labarchitecture.com/, accessed : November 2007.)

5.8. One of the built façades in sandstone, zinc and glass with the use of triangular matrix. (source: http://www.labarchitecture.com/, accessed : November 2007.)

A similar attitude for solution of complex geometries as well as complex systems may be fragmentation and reconsideration of the relations between different aspects of a problem. One significant example for that is the Yokohama Port Terminal by Foreign Office Architects. As it is the most important aspect during the design period to have a clearly defined circulation system in such a large-scaled port terminal, the designers start with a circulation diagram that brings all the programmatic requirements together. (Figure 5.9)

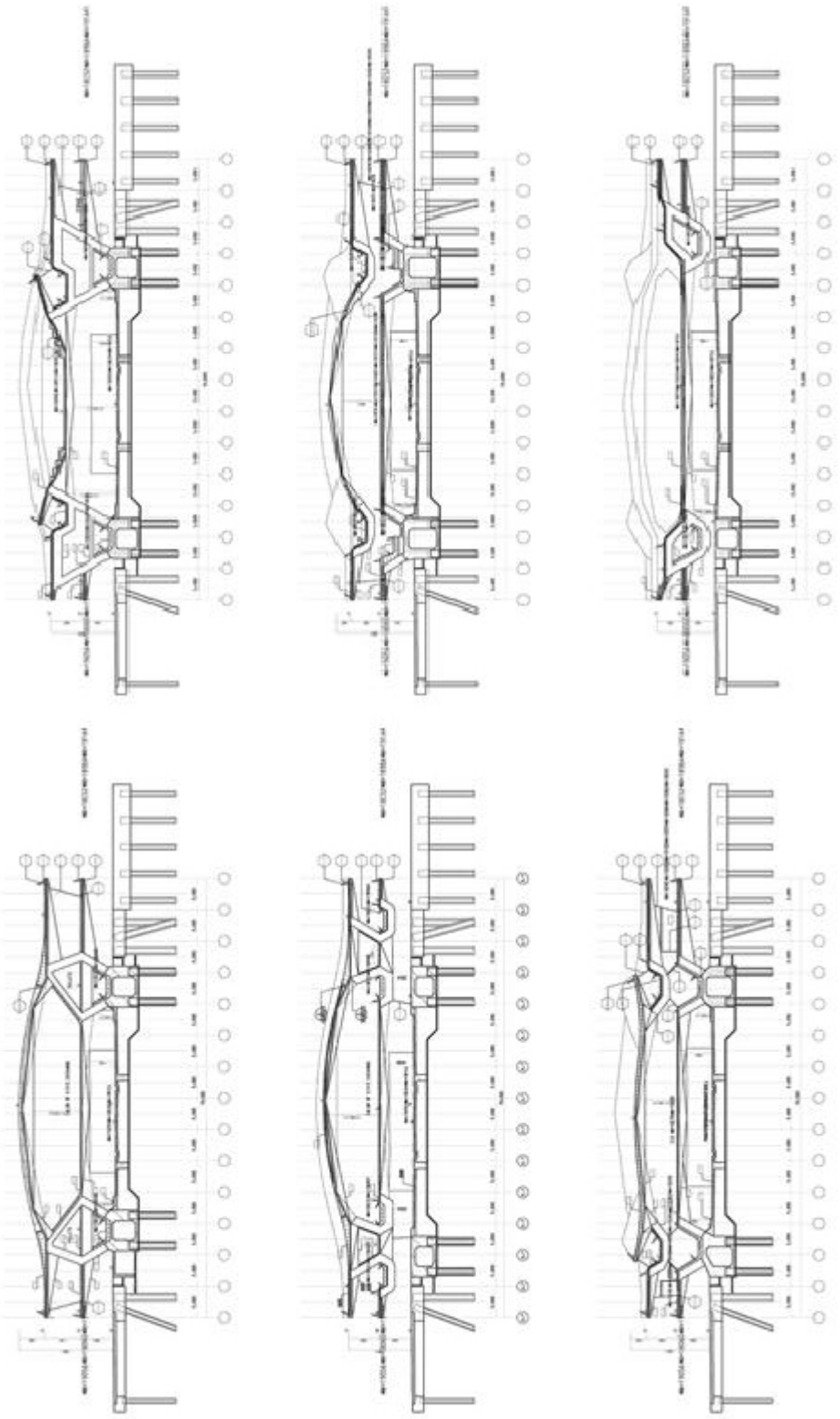


5.9. Circulation diagram for Yokohama Port Terminal by FOA. (source: Architectural Review, Vol: 1307 Issue January 2006. Pg: 61)

However, beyond the programmatic needs the designers had demands such as the use of the roof as an urban park, culture and leisure facilities, and flow of circulation elements and so on. (Figures 5.10 – 5.11) Thus, to have practical solutions and to be able to manage such kind of a large-scaled project, the designers searched for a systematic method that will guide all the process from the beginning till the end, and they used a series of sections to diagrammatize the situation. (Figure 5.12)

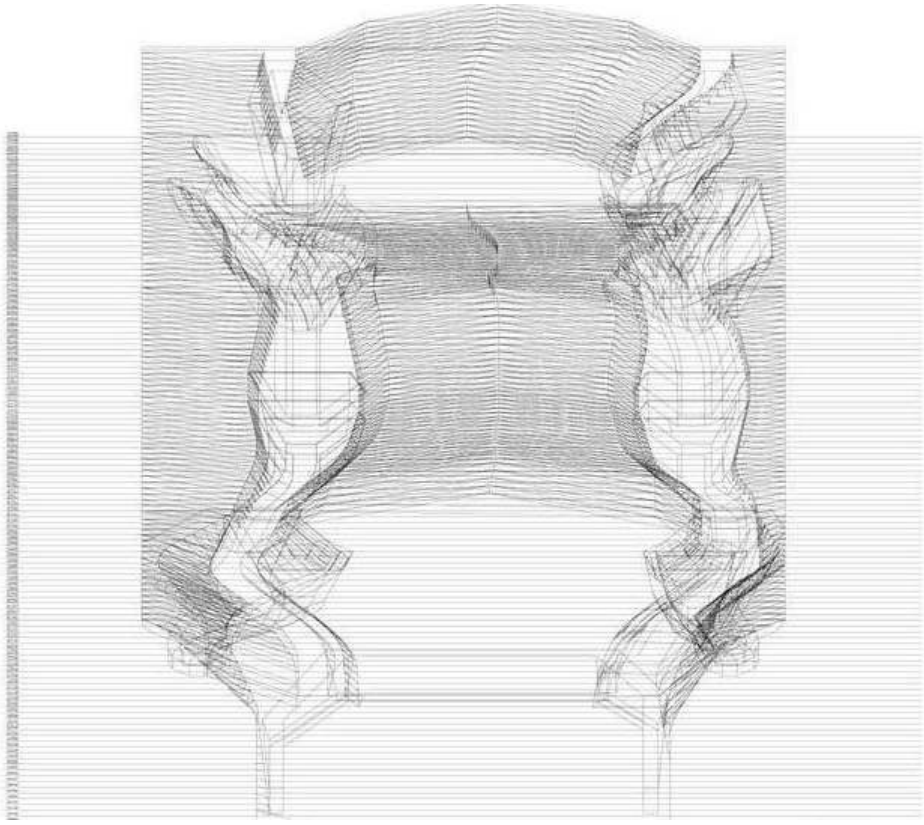
5.10. Aerial view of the urban park and main vehicle entrance to the port. (source: http://www.f-o-a.net, accessed : November 2007.)

5.11. Non-orthogonal circulation paths of Yokohama Port Terminal. (source: http://www.f-o-a.net, accessed : November 2007.)



5.12. Serial sections of Yokohama Port Terminal by FOA. (source: http://www.f-o-a.net, accessed : November 2007.)

These serial sections propose the fragmented formation of the cinematic montage where successive reading of them supplies with the geometrical idea of the space. (Figure 5.13) Beyond becoming a system to solve the structural, organizational and technical occasions that is possible to be faced during the process, it becomes the medium to obtain weaving spaces that flow into each other.



5.13. Successive reading of the serial sections proposes the overall perception of the geometry. (source: http://www.f-o-a.net, accessed : November 2007.)

In both constructional and representational levels, the successive reading of the produced sections makes it possible to grasp the flow of space, its formation and narration. In this system, the continuous circulation as well as the geometry, abstracted from the planometric representation of the project is controlled and guided by this series of sections. In the computational level, the information of the sections is easily transferred to the three-dimensional model of the whole design, thus any change in one of these parts directly affects the final product in different aspects. The reverse case is also valid where the change in the three-dimensional model is ended by the changes in the sections. In this way, the whole design process becomes a systemic one, where through the pre-determined methods or media, feedbacks are created from different aspects of the project.

5.4. Generative Process

The digital environment providing a domain completely freed from the limiting properties of the physical world, has its characteristic properties which makes it special for thinking on architecture.

Beyond that, through compositing or any other method, the system of digital environment with the inherent principles and potentials becomes an interface where many layers come together to create a hybrid product. At the same time, it acts as an inter-phase through which the production and experience of space goes beyond the process that used to be for thousand years. Digital environment brings the concept of space and its production process to a threshold where architectural design and production methods diversify.

> *The new territory is media information…… this space, a potential new shared platform for collaborative art-making and communication, demands an entirely new*

> *use of language, space, and time. And, if we believe Wittgenstein –that language is also a fundamental technology, and not merely a vehicle for expressing thought but the driver of thought- then the new information technologies are doubly important for our future understanding of space and information…. As a working space, electronic architecture impacts our creative practices and physical reality –which certainly will bring about new social practices and observed realities.*[125]

Thus, through an understanding of space as an interface where real and virtual interactions and connections come into an inseparable unity, whereas still ready for any sort of modification; there occurs a re-conceptualization of space as a co-existence of elusive, ready to change layers of spatial experience creating its own context of reality in its non-linear formation providing a new territory for understanding architecture.

With this new understanding, the evaluation and interpretation as well as designing processes become a progressive and generative period with back and forths, where it is obligatory to design the process itself to reach to a completely efficient result.

Thus, this thesis through a reading of montage as a method for creation and presentation of "new", relates the medium of design to the final product. In the study, the digital medium and its effect on the design process is reevaluated with an understanding of digital compositing where an intersection of montage as a "modern" production practice and the specific environment of digital technology come into being.

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[125] Huffman, Kathy Rae. "*Video, Networks, and Architecture: Some Physical Realities of Electronic Space*," Timothy Druckey ed. Electronic Culture: Technology and Visual Representation. (Canada: Quebecor Printing, 1996) Pg: 206.

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