



**D-GENE POOL AND COOP HIMMELB(L)AU**

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**BY  
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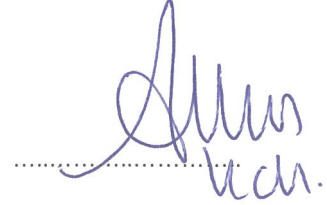
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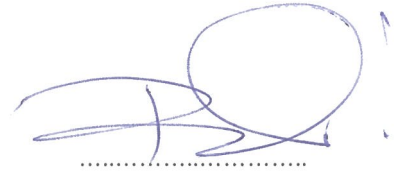
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## D-GENE POOL AND COOP HIMMELB(L)AU

(M. Sc. Thesis)

Amira Ismahane BEDAIDA

GAZİ UNIVERSITY

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## ABSTRACT

Because today's architecture is characterized with various concepts and numerous designs instead of a unique architectural style, it is heavily described by the identity of the architect. However, according to the d-gene pool theory of Karina Moraes Zarzar, this identity is in general created according to a basic gene, which is extracted from the experiences of the architect. In this dissertation, the design process and identity of Coop Himmelb(l)au was chosen to be studied. Specifically, this research answers the question of how Wolf Prix as the founder of Coop Himmelb(l)au (CH) and his partners have chosen the cloud gene as their basic concept and applied it in all of their projects but with mutations. By using analogy and metaphors, either visually or semantically, the dissertation searches if the mutations of the cloud concept are associated with the site where the design is located. The results have shown that the mutations of the cloud concept, which is the shell of the building, cannot be fully integrated in its surroundings as Wolf Prix gives more importance to the mutation of the concept that can be located everywhere. This last means that most of the projects are actually placeless. Wolf Prix managed to create his own identity by developing his d-gene pool but generally he could not yet realized the integration of this identity in practice into the place.

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GEN HAVUZU VE COOP HIMMELB(L)AU  
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ÖZET

Günümüz mimarisi, özgün bir mimari tarz yerine çeşitli kavramlar ve sayısız tasarımlarla kurgulandığı için, artık mimarın kimliği ile tarif edilmektedir. Bununla birlikte, Karina Moraes Zarzar'ın d-gene havuzu teorisine göre bu kimlik, genellikle mimarın deneyimleri ile oluşan bir ana "gen"e göre şekillenmektedir. Bu araştırmada, Coop Himmelb(l)au'nun tasarım süreci ve kimliği irdelenerek, özellikle firmanın kurucusu olan Wolf Prix'in temel kavram olarak ele aldığı "bulut gen"i fikrini nasıl seçtiği ve tüm projelerinde mutasyonlarla nasıl uyguladığı sorgulanmaktadır. Analoji ve metaforların, görsel veya anlamsal olarak kullanılması ile, bulut kavramının mutasyonlarının tasarımın uygulandığı yer ile ilişkili olup olmadığı çalışmanın ana tartışma konusudur. Elde edilen veriler, Wolf Prix'in yersiz, her yere uygulanabilir proje yaklaşım tavrı nedeni ile, yapı kabuğunu oluşturan bulut fikrinin, genel olarak çevreyle tam olarak uyum sağlayamadığını göstermiştir. Wolf Prix kendi d-gen havuzunu geliştirerek bir mimari kimlik oluşturmayı başarmış, fakat bu kimliğin uygulamalarında genel olarak yer'le bütünleştirmeyi henüz gerçekleştirmemiştir.

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## **SYMBOLS AND ABBREVIATION**

In this study, the used symbols and abbreviations are explained bellow.

<b>Abbreviation</b>	<b>Definition</b>
<b>CH:</b>	Coop Himmelb(l)au
<b>D-gene:</b>	Design-gene
<b>P.O.M system:</b>	Performance, Operation and Morphology reasoning system

## 1. INTRODUCTION

Architecture is a complex field that joins several kind of sciences at a time i.e. philosophy, mathematics, art, biology etc. Every kind of science affects it differently, sometimes in a negative way and other times in a positive one, but it always helps to develop it. Architecture reflects and contributes, as well, in the development of human being and their way of living. In fact, in the last decades, architecture has faced several changes that affected in the first place the architect, which has always adapted with its environment in order to create a harmony or a difference. Today the technological developments along with new materials, discoveries, methods of construction techniques and structures allow for the imagination and the creation of new forms and aesthetics. During the last century, different architectural movements appeared due to the enormous industrial and technological developments that made it easy for the designer to free his design from the old architectural rules. Along with the new technological innovations architecture passed to a new level of development. The new computer technologies, 3D modelling, material science and developed structures and advanced techniques represent the new demands of contemporary architecture because they contribute in the facility of form making and allow the architect to conceive and design freely. These new facilities helped in the birth of what is called iconic building.

Iconic architecture is a type of architecture in which the designer gives more attention to the aesthetic and the symbolic effect that the design will bring with it. This type of architecture came up in order to feed the needs of the capitalist class of the society, which is influenced, more from the shape then from the content [1]. Architects started to think more about what the user want, and how he wants it and then mix it with his own architectural identity to realise at the end a landmark building that attracts people's attention. In fact, architecture itself could provide an icon for a place as the Statue of Liberty has become for the USA and the Sydney Opera House for Australia. It becomes the place that when its name is mentioned the city as well comes to the memory. However, when saying iconic, it should not be something repeated from other design, it should represents something new, different and unique.

Architects all over the world tries to come up with their own architectural style and show up their identity by creating those iconic buildings. To do so, they started to take more risks,



break the usual rules and in fact compete between them. Looking to the contemporary architects of this time, we can see clearly the fact that they challenge themselves to create unique designs. The architecture of Zaha Hadid, Frank Gehry, Tshumi, Eero Saarinen and others represents what iconic architecture means. They aim to satisfy the users' needs by creating buildings as mark of their designs. This make of their iconic buildings, signature building and a landmark building, which make of it an innovative architecture that, holds a symbolic meaning in order to attract the viewer's attention. Frank Gehry, for instance, is considered more as an iconic architect who conceive his designs according to his principals in order to create landmarks in the city without giving any importance to the surroundings. He stated, "Architecture should speak of its time, but yearn for timelessness" [2]. And the result is that he managed to take the attention of people from different places and ages. His building of Disney Concert Hall at Los Angeles was classified by the critics in America, Europe and Asia as "victory for creative risk" [3].



Figure 1.1. Walt Disney concert hall [4]

Charles Jencks thinks that these new landmark buildings are replacing the monuments that lost their power in the city because of the modernization and the new architectural marketplace [3]. However, not only the modernization that effected architecture, economy, fashion, literature and even politics changed and influenced the contexts in which the buildings will be designed.

In this dissertation, Coop Himmelb(l)au who is mostly considered as an iconic architect will be studied. After the MoMa exhibition for deconstructivist architecture, Bernard Tschumi stated that it should be called instead "iconic". As for Coop Himmelb(l)au the critic seems right on target, they design with analogy and metaphor to create a building that screams,

“Icon! Icon!” [5]. Wolf Prix, as the co-founder of the firm take risks and uses new techniques to create his own identity, as it will be seen through the analysis of the concepts and design techniques used by the firm. But, before having discussion on Coop Himmelb(l)au architecture, the method of the work and the details are introduced.

#### Design gene pool system of Karina Moraes Zarzar and mutations

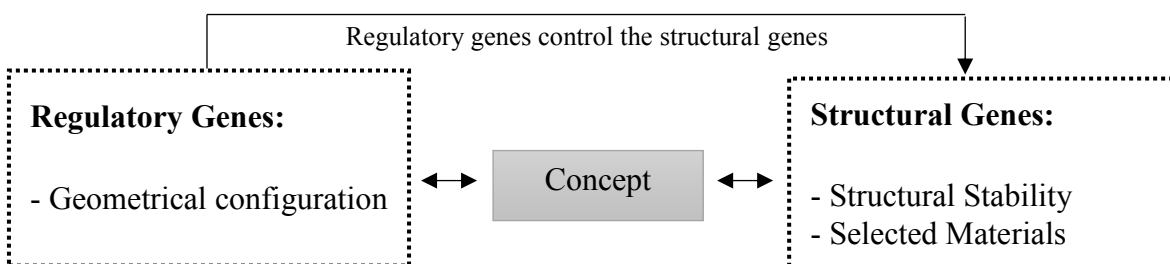
The designer while looking for a concept goes through his memory in order to find the suitable concept that matches his design. This concept is then translated into an idea or a form classified as a personnel human subject, because it consists of private and unshared representations [6]. An unknown problem can be solved by establishing familiarity with the previous one(s) as the use of an object characteristic with other factors helps the architect to generate new and affective designs. In fact, in architecture, designers can consciously design through emulations. There may be little resemblance between sources, but being able to know someone very well gives us a better understanding of the latter. As Martindale mentions new actions and approaches, involving creative thinking can be achieved with new combinations of old ideas. According to Mumford, old ideas in creative thinking consist of new combinations. In this combination, not only the predefined concepts are blended, but also the elements in an existing concept can be rearranged.

A concept can be represented by sketches, architectural details or as a principle, which supports a creative or a routine design. There are two types of basic concept: the knowledge-based and the content-based concept. The knowledge-based concept is called generative system because it creates designs from a set of rules to work it. These rules are extracted from the principals of an object, which will be then transferred and applied in other fields as well. However, the content-based design concept represents the former projects representations. Its characteristics are produced as a reaction for the context of the project [7]. So how are these concepts used? As Zarzar explained in her thesis (2003) “*Use and adaptation of precedents in architectural design*” a concept is chosen according to the need of the designer, after being analysed, it will be stored in the memory. Afterwards, it will be recalled as design knowledge to be used in the project conception. However, this concept can be modified and/or developed to fit the desired result [8]. This adapted/modified concept will lead other modifications over the course of an architect’s career in order to fit the new contexts and create innovations. In fact, the design genes are not innovations themselves

because they represent an already existing element or factor but when transferred, modified and recombined with other factors and situations they may contribute to the generation of innovations.

Zarzar made use of biological understandings to explain the general idea of the use, modification, and the evolution of genes. She got used of the *Phylogeny* (history of lineage) to explain the modification of basic gene over the years, and *Ontogeny* (the development from zygote to adult) to explain the development of the gene in a project. She stated that “*phylogenetic changes are the result of changes in ontogeny*” [8]. Because they consist of embryos, which control the evolution and the development of a fertilized egg to adulthood. Comparing it to architectural application, it represents the characteristics of the original gene, which will undergo mutations.

Zarzar explained also in her PhD thesis “*Uses and Adaptation of precedents in architecture*” (2008) that the *d-gene pool* contains two types of d-genes: “*the regulatory d-gene*”, which holds the conceptual and configurational characteristics of an element or a group of elements that can be transferred easily to another design, and “*the structural d-gene*” that deals with the technique and the materials [8]. The second one represents the settings that describe a construction method, which means that this last is controlled by *the regulatory d-gene*. In another word, *the regulatory d-genes* command and guide, whereas *the structural d-genes* fulfil the orders of the first d-gene type, according to a specific scale, technique and material, it can switch it on or off (schema 1.1). While transferring *the regulatory d-gene* of a concept, the designer should indicate whether the structural d-genes were also transferred or not. He must also take into consideration the context in which the concept will be applied, as well as the requirements and the needs of the users.



Schema 1.1. The framework of the regulatory and structural d-genes

Just like nature, the architectural design goes by several instructions that guide its development, from sketch to the detailed project. To study this design process, first we have to study the conceptual process. Karina Moraes Zarzar has realized a wide research about this subject to come up at the end with the *Design Gene Pool System*. The research that Zarzar made about how the architectural concept is created and chosen by the architect is based on the use of past information to generate new information [9]. This concept resembles a gene that undergoes repetitions with mutations and through each repetition it changes and develops. The term *d-gene pool* is extracted from the real human gene system, which is a segment of DNA that can produce different kind of elements in order to make and maintain our organism. The group of repeated gene concept is called a *d-gene pool*. Once the architect chooses his gene, it will, eventually, be able to be repeated and transformed which gives birth to a *d-gene pool*, which somehow, represents the identity of the architect because its d-gene can be transformed from one design to the other. However, the re-use of gene in architecture does not only include the physical structure but also the meaning related/not related to the context.

During the concept formulation process that Zarzar (2008) explained, the architect chooses a method to develop his/her basic gene. These methods start generally by imitating an existing object or by using philosophical idea [8]. In another word, it can be defined as mimetically translated gene, and not-mimetically translated gene. Mimesis is a Greek word that means imitation; it could be by copying or by transferring a specific characteristic to a new design. But generally, Zarzar defends the fact that the mutation of a form in the concept formulation process is generally done by element based mutations by giving examples about the conceptual design of Le Corbusier, J.J.P Oud and Santiago Calatrava [8]. An element-based mutation refers to a specific visual characteristic of an object. Taking for example the basic concept of Le Corbusier representing the element-based mutation, as he wanted a gene that fulfils his desire to ensure the continuity of the site into the building. Therefore, he searched through his memory and found the “*savage hut*” from which he only took its stilts (piloti), because it responds to his needs. (Figure 1.2) Thus, people now remember it as one of the “five points for a modern architecture” and not as the savage hut. Actually, what Le Corbusier transferred from the chosen gene was its configuration and not its material nor its technique and scale. Thereby, not all the information contained in the gene is transferred to the design. Sometimes, only its configuration is used. In this case, *the regulatory d-gene* refers only to the transformed information [8].

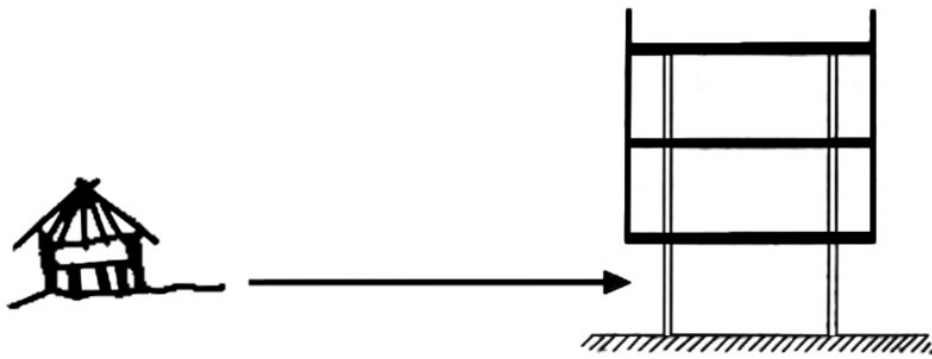


Figure 1.2. The basic concept used by Le Corbusier [8]


However, this dissertation will concentrate on the form-based mutations of contemporary architects who use new technologies with the help of new software's to generate new mutations. The form-based mutation refers to the whole shape of an object mutated. In this type of mutation, the architect focus on the global form of an object and mutates in his/her new designs by keeping some traces of the basic form. The new one is not the exact copy of the previous one(s), but has some resemblances. Before questioning mutation-context relationships better to explain the mimetic approach in relation to mutations.

#### The mimetic approach of Hans Welling and mutations

In *Architecture is a Mimetic Discipline*, Hilde Heynen (1999) argues that there are innumerable messages, especially about a critical moment. According to her, if someone thinks mimesis as a representation or a reflection of a certain reality; it is difficult to recognize its presence in architecture. Mimesis is no longer a direct copying, but rather refers general affinities and differences. Therefore, there is no reason to exclude the architecture from the field of mimesis anymore [10].

By saying mimetically mutated forms means transferring a specific characteristic or the form of an object to another form, which resembles the previous one(s). As Hans Welling (2007) defined, this transfer is realised according to four cognitive operations which are; application, analogy, combination and abstraction. The comments are min with application and max with abstraction. **Application**: use the existing information in the usual context. **Analogy**: describe one-to-one relationships. **Abstraction (Metaphor)**: there are parallel relations and these relations are abstract. An architectural form / environment might be

connotated to various objects by the observer and is understood in certain forms and these four categories are called “mimesis” in general [11].

Comment min				Comment max
Application	Analogy	Combination	Abstraction	
MIMESIS				

Schema 1.2. Welling’s cognitive operations

Analogy is a creative technique in the conceptual process. Zarzar defined it as follows “One thing is the analogue of the other if they are similar in some ways” [8]. According to her, analogy represents transference of specific characteristics from the source to the target object. Abel (2000) also explained the analogy process as a way that shows the designer how and what to build, it represents a source of inspiration to him. While looking to the result, one can understand why the architect chose this specific analogy for his design [12]. Taking for example, the Sydney Opera House designed by Jorn Utzon and takes the form of the sails of a yacht in Sydney (Figure 1.3). However, Jenks from the other side interprets it as “fish swallowing each other” [13]. The shape of the building represents a reworking of an existing thought, form that led to an innovation that can be interpreted differently, and these resemblances are captured from the physical appearances of the object and the named building.



Figure 1.3. The Sydney opera house, by Jorn Utzon, 1957 [14]

Another example is TWA Terminal at New York designed by Eero Saarinen, a project that represents an analogy of a bird in flight (Figure 1.4). The analogy of the bird’s shape can be

easily read to the naked eye, which leads us to classify it under the category of form based-mutation.

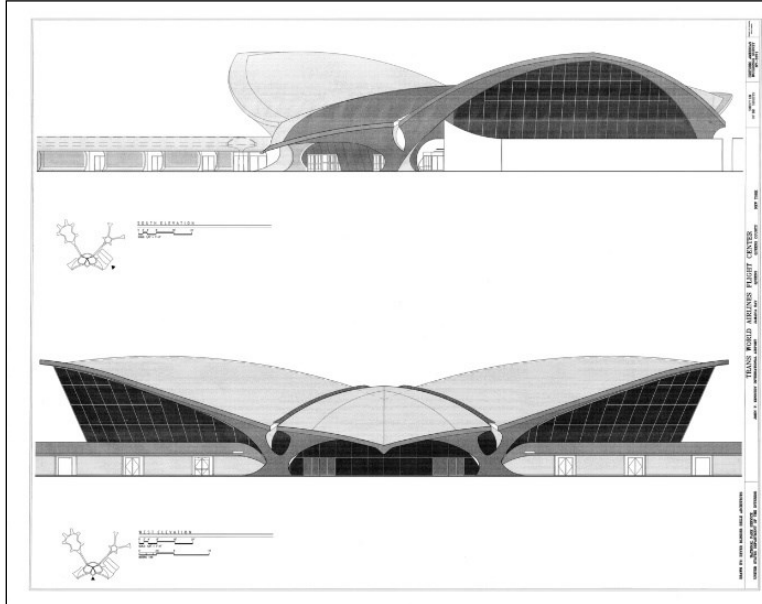


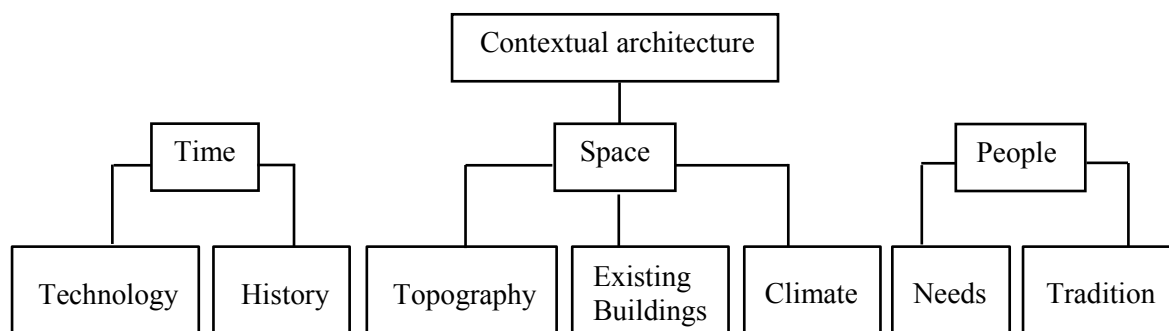
Figure 1.4. A view of the TWA passenger terminal [15]

Metaphor represents a term that was first used by Aristotle in order to explain its important role for creative processes. “Ordinary words convey only what we know already: it is from metaphor that we best get hold of something fresh... It is a great thing by far to be master of metaphor,” explained Aristotle [16]. Johnson and Lakoff explained the metaphor as a way to “conceive something in terms of another”. However, the metaphor is not limited only by language and thoughts; it also touches other dimensions like colour, texture, shape etc. [17]. Yet these cognitive operations are realised in order to satisfy, somehow, the demands of the user and to be integrated in its site.

#### The contextual formulation of the mimetic approach.

Contextual formulation is not an easy task, a hard work to develop a context that can appropriately join things that were not previously brought together. Even experienced designers often find it hard to follow the design process, because creativity aims to find approaches that will be original, aesthetically satisfying, and a valid solution to the problem. The contextual architecture is related to the place which was being built in by responding to the place’s conditions and respecting what is already there, but at the same time should stand

out and show its uniqueness. However, responding to the place's condition means responding to the different types of context that consists of time, which represents the history of the place along with the new inventions i.e. technological integration that fits it. The space, which represents on the other hand the physical context of the space including the topography, the already existing buildings and the climate. Finally, the people, which refers to the social-cultural contextualism regarding their needs and traditions protects the traditional and cultural ethics of the place. (Schema 1.3).



Schema 1.3. Types of context

In other words, contextualism is the emplacement of a new construction in a historical environment regarding harmony and unity with the surroundings. In an interview during the opening of Louvre Abu Dhabi, Jean Nouvel explained the fact that he is a contextualist architect and that for him; every building belongs to a place, a culture, and an era [18]. With these terms, contextualism aims to create balance and harmony between the architecture and the urban context (historical buildings and environment) which creates visual continuity. For this reason, an accomplished design is actually the one that is coherent with its environment.

In the last decades, a new definition of this context related design called the “Place Theory”. has been defined. Uraz and Balamir defined the place theory as follows:

The concept of place entered into architectural thinking during the 1960's with the growing awareness toward the lack of identity in new towns shaped according to abstract notions. It was argued that a space becomes place when people attach meaning to it, and that the architect needs a degree of modesty intervening in areas that is considered to have a strong sense of place [19].



This theory has helped to create relation between the new architectural buildings and the site it is located in, which made of it a part of the whole. Norberg-Schulz (1976) from the other hand explained the fact that a place, which cannot integrate itself in the environment, will have an incomplete meaning. According to him, architectural space represents a concretization of an existent space and this last refers to the psychological and physical concepts that connects men with the environment [20]. This last, represents the abstract aspects that gives sense to the place, which is called by Norberg-Schulz the “Genius Loci” [21]. This concept is extracted from the Roman time, in which they believed that everyone/thing, people and places, have guardian spirits, and the qualities of that place are coming from that spirit. Based on this concept, Norberg-Schulz connected it with architecture by explaining the fact that every spirit of a place has physical characteristics. Therefore, the designer must take into consideration the locality of the place by defining some tangible values that can protect the environmental characters and gain meaning to the place such as material, texture, and colour. However, the character transfer to a space will not make of it “a place” until “the atmosphere” will be transferred as well because without the spirit, the space will be only a 3 dimensional composition of elements that can form a place.

The interaction between men and environment that Norberg-Schulz called the “existential space” is what structure the place theory. Taking example of the architecture of Robert Venturi or Peter Zumthor who contributed in giving sense to this theory in the architectural field. However, this interaction may also have contradictions and loses its sense of belonging because the aim of architecture is first to improve the living conditions and satisfy the user’s needs. Yet for Norberg-Schulz, when history, environmental characters and atmosphere are not connected to the space it becomes meaningless [20].

During the conceptual process, the designer either can take advantage of the context in order to create a strong connection with the place or create his/her own context regardless of the existing context (Schema 1.4).

can be located anywhere	APPLICATION visual	belongs to the place
	ANALOGY visual	
	COMBINATION visual- semantical	
	METAPHOR ABSTRACTION semantical	

Schema 1.4. Mimetical dialog with the place

Besides the contextual architecture, a new architectural trend called contemporary contextualism that showed up in the 21st century has contributed in the dis-attachment of the building's form from its original environment. With this approach, the design is proposed with the architects' own scenario (called event architecture) that is unconscious (partly or completely) from its context. This gives the architect a chance to apply the mutations of the design elsewhere. It is somehow placeless. Edward Relph used the term in his book "Place and Placelessness" (1976) to define an inauthentic place that have the ability to create his own story [22]. Relph defined the place according to the physical settings, the social activities and the memory and meanings it holds for the community and for the person "The meanings of places may be rooted in the physical setting and objects and activities, but they are not the property of them rather they are a property of human intention and experiences [23].

Therefore, the modernistic developments and increasing globalizations have changed the place identity, which led to the creation of placeless spaces. Relph (1997) explained that if an architect thinks that there is no more need for the geography and physical context, then this will result in designs that can be applicable anywhere. Thereby, placelessness is a place in which people are not able to define the existential relation between the space and its environment [24]. This approach was realized because the architects started to focus on the object (building) more than the city (environment) by this way; the new buildings lost their sense of belonging to the place in which they are found.

According to Jon May (2004), conceiving spaces different from the context is what attract people nowadays. The architects create more curiosity and attention in the city, for this reason, they got acceptance from the local resident of the city [25]. Relph also refuses to think that places from the past are good but present placelessness are bad. Because placelessness represents a new identity, which when people will use and live in, will gain a meaning. Looking at the architecture of Zaha Hadid, we can clearly see the concept of placelessness that she used in her project. Every design was conceived separately from its environmental context. She tries through those designs to realise functional buildings that describes much more her architecture. The projects realised over the world are considered as iconic building that recalls directly for Hadid. However, looking to the number of projects realised over the world we can confirm the point of view of Relph that a placelessness space can bring new identity through living in it [22].

Contemporary contextual attitudes deal with context, with a common set of concepts such as reality, innovation and event. Real refers to the validity and functioning of the moment and the place. New, refers the produced and / or independently reproduced one. The event, which is a new reality, is a fiction created with environmental and programmatic data. The event from Gilles Deleuze's concepts predicts difference and creation. According to Deleuze who claims a philosophy of being in the flow or differentiation of reality, environmental qualities are regarded as the process of being [26]. For Deleuze, the outside is not a definite limitation, but a dynamic situation revived by the movements and folds that form together inside [27]. Therefore, the concept of "fold" in addition to the event has created an effective system of thinking in the 20th century philosophy and has enabled contemporary architecture to acquire a new theoretical content by directly relating to philosophy.

Zaha Hadid has talked about the context in her interview with CNN Turk in Istanbul and mentions that a contextual design should not necessarily be local. Zaha Hadid has mentioned that the architects used to consider contextualism as having a new building next to a former building but later it has changed and new concepts of contextual design such as, "fluidity", "multi-layeredness" have been developed. Hadid argues that by moving back and forth at different times, different periods can be brought together and superposed to create a "fluid" and "multi-layered" design. Thus, a contextual design is a kind of "storyboard" created by "distortions" of references belong to different moments [28]. Hadid deals with different times and different scales in the contextual design process. According to Hadid, the new

contextualism can be able to transform these qualities into a "contemporary core", even if the physical qualities of that place and time are used [29].

### The research problem

The concept in architecture is considered as the main factor that forms the building. It represents the first thing that any architect thinks about during the design process. However, in the last decades, architects started to use different kind of concepts to come up with their personal style and create their own ideology. Nevertheless, the concept can be a simple one that can be read on the design or can be a philosophical thought that a design holds it deep in the form. In both circumstances, the concept will be eventually mutated so that the architect could repeat it with difference in other projects. The question here is how the basic concept is chosen and how the architect repeats it. Specifically, this research answers the question of how Wolf Prix as the founder of Coop Himmelb(l)au (CH) and his partners have chosen the cloud gene as their basic concept and applied it in all of their projects but with mutations. Do they create an identity in the end by repeating a basic concept with mutations? How do they relate it to the context? Does the repetition of their concepts create monotony or generate novelty?

### The research aim

The repetition of one concept with mutation is a design technique used to create and develop an architectural identity. For this reason, this dissertation aims to study the identity of Coop Himmelb(l)au and define how Wolf Prix created his principal concepts (gene) which are considered - through its repetition in other designs- as the original gene that allows for the production of what is called the "design-gene pool". At the same time, the dissertation searches whether the mutations of the cloud concept are associated with the physical / historical context of the place by using metaphors and analogy or have no sense of belonging to the place

### Methodology of the study

Overall, this research deals with analogical and metaphorical (combination if exist) operations as application is not the case applied in architectural design concepts. In the chart

below, a development of a basic concept is explained. As explained before, each architect, after defining his gene chooses a method to apply it either mimetically or not mimetically. However, each interpretation goes by mutation (visually or semantically) in order to create new information that sometimes suits the physical / historical context and other times does not. However, in this dissertation, only the mimetical mutations of the basic concept will be concerned and for the analysis, the column “nothing mimetical” is removed from the charts.

Table 1.1. The development of a basic concept / gene

A BASIC CONCEPT / GENE							
mimetical						nothing mimetical	
MUTATIONS							
can be located anywhere (general)			belongs to the place (local/regional)			BELONGs TO THE PLACE visual	CAN BE LOCATE D ANYWHERE visual
ANALOGY visual	COMBINATION	METAPHOR semantical	ANALOGY visual	COMBINATION	METAPHOR semantical		

In the context of the above described objectives, the identity of Coop Himmelb(l)au (CH) has been analysed through the extraction of the concepts and the design methods that CH follows. However, before that, some research is carried out on the mutation of a principal gene through analogy and metaphor in the name of creating identity. For this reason, this thesis thus comprises two parts;

- The second part contains the theoretical part in which the mutations of the form based gene (which leads to the creation of the d-gene pool) in architecture is analysed based on the evaluated theory of Karina Moraes Zarzar by analysing the architectures of Snøhetta and Massimiliano Fuksas. It is to show which one of them is close to Coop Himmelb(l)au’s approach.
- The results of the first and second part led to the third part in which the concepts used by Wolf Prix and his team in their projects were examined through the literature and also through the interviews and records made with Wolf Prix as the founder of Coop

Himmelb(l)au. The basic gene that Wolf Prix used is extracted as a principal design concepts in order to understand the development of his d-gene pool. Thereby, the different use of the basic concept (gene) and the birth of every concept after that were studied and explained more in the analysis of the projects that comes after. The main argument is around the basic concepts of CH in order to understand whether the gene pool created with repeated mutations in conjunction with metaphors and analogy are associated with the physical / historical context or have nothing to do with the context, but just to create an architectural identity/mark.



## 2. EXAMPLES OF DESIGN MUTATIONS TOWARD IDENTITY CREATION

Modernists were against the traditional style, because they can no more represent our modern society. However, they started to use concepts from the past but in a way, that makes its use different from the original previous style. They also combined it with other elements, which render it unfamiliar. Some of the architects also started using quotations that carries hidden messages in it. Zarzar explained that architects who use quotation are architects who transferred both of the regulatory d-gene and the structural d-gene for this reason it is called quotation.

The use of basic gene in the design process might be considered as a way to create an identity, which is a word that describes the work of an architect and can be extracted and recognized as a style. However, this identity does not lock itself in a constant and unchanging condition, contrarily; identity is all about change and continuation [8]. Manuel Castell in his book called “*The Power of Identity*” defined identity as “people’s source of meaning and experience” [30]. He defined identity as a factor that characterizes something or someone. However, he classified the personal architectural identity as the “*project identity*” in which the actor seeks to build a new identity that can define his position in the society [30].

The re-use of a basic gene is a hard work, as it needs a continuous evaluation of the concept. However, as Zarzar explains the fact that by analogy or metaphor the design concept become the expression of the design genes [9]. Therefore, the analogy/metaphor used to express a design contributes in developing it. Even though this concept is re-used individually or merged with other concepts over time, its origin does not disappear. In this chapter, Snøhetta Architecture and Massimiliano Fuksas Architecture were chosen because they state every time the fact that they create buildings in harmony with their environment by taking into consideration the belonging to the site. They are explained below in detail to show how they applied mutations of their basic gene, which led to the creation of an identity from one hand, and to study how they integrated them in the located site from the other hand.



## 2.1. Snøhetta Architecture

Snøhetta is a Norwegian architecture, landscape and interior design office founded in 1989 in Oslo by the Norwegian Kjetil Thorsen and the American Craig Dykers. Through its remarkable architecture, it aims to create a strong relation between the architecture and the landscape in each of its designs by integrating them into their context. The designs of Snøhetta “are samples in a series of contextual examinations rather than isolated masterpieces” [31]. The key concepts of Snøhetta can be resumed in sustainability, quality, social and environmental responsibility, ethical design, openness, and transparency. From the other hand, Kjetil Thorsen explained the fact that they got their inspirations from the climate, the history and the culture of the site, “We are like 'contextual conceptualists' who take inspiration from the climate, the culture and the history of the place, to make the presence of our project natural and inherent” but of course by preserving their own idea and style [32].

The two architects under the name of Snøhetta gained their position in the design field through their first project, which was the Bibliotheca Alexandrina in Egypt opened in 2002. (Figure 2.1) The design of this building was a recall for the spirit of the ancient library built in 284 BC. The ancient library was considered as the first universal library that contained books of different languages, and was open to everyone who sought knowledge. For this reason, the new library was a challenge for Snøhetta to design new universal building but a one that is related to an ancient one.



Figure 2.1. The bibliotheca Alexandrina, Egypt [33].

In this project, Snøhetta designed the building semantically in order to integrate it in its environment. The main philosophy of the design was a passage of time. Snøhetta designed it as a rotating disc form rising from water to express the past, which come from the ground, the future, with the elevation of the inclined form, and the present, which is represented by the ground floor. As Snøhetta explained:

To express the passage of time, the building appears as a gently rotated disc passing into the earth and simultaneously above it. As it passes into the earth, it enters the world we understand as the past. When it passes above the ground, it enters the future. The rotation point is upon the ground at the present [34].

At the same time, the building form evokes the sun, which already considered as an important thing for the ancient Egyptian civilization. In addition to the philosophical concept of the building, the wall of the library is made of 4,000 granite tiles carved with alphabets of different languages to express its universality. The project consists of two parts: the library (with a reading room of 2,000 readers of capacity, and six specialist libraries, three museums and seven research centres), and the planetarium, which is a suspended sphere, and between this two buildings comes the pedestrian bridge (Figure 2.2). Since Snøhetta gives importance to the landscape as well, the architects designed an external plaza of 8,500m<sup>2</sup> in order to provide openness to the surroundings. At the same time, the whole building is surrounded by a water pool, which expresses the continuity and the reflection of the sea to the building [35].

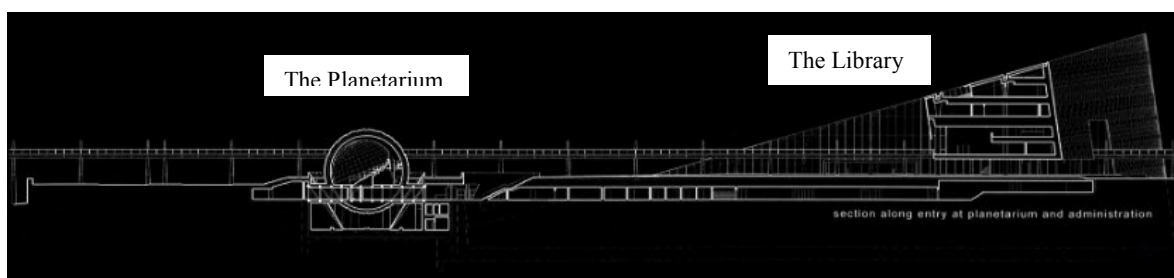


Figure 2.2. A longitudinal section on the bibliotheca Alexandrina [34]



Figure 2.3. A view of the water pond [36]

Another remarkable design of the firm is the iceberg-like National Opera House of Norway in Oslo, which represents effectively a landmark with its unique form and landscape design opened in 2008. It was conceived to reflect the contemporary Norwegian character. “It is a social monument,” says Craig Dykers the Snøhetta founder partner that was realized through provocative forms and a minimal palette of materials. The building shall stand as a representative institution presenting both Norway’s cultural traditions and the Norwegian National Opera’s significance in the Nation’s culture and society [37].



Figure 2.4. The national opera house of Norway, Oslo [37]

The architect designed what he called the “opera street”, which is an internal boulevard that splits the building in two: the public and stage areas in the west and the production area in the east. However, the general organization of the building was grouped in a number of sections, which are the public area (consists of the foyer, the main auditorium for up to 1,350

seats, scene 2, the rehearsal room for up to 200 seats), the stage area (consists of a 35metre high stage tower, a main stage and back stages), the production section (consists of workshops, stores, cloakrooms, offices and audition rooms), and the roof landscape (Figure 2.5). In the public area, the architect designed the foyer and the theatres as two sections separated with a high, wave-curved wall of oak. The roof landscape was designed as a natural building more than a building with its slope rising from water and the large roof along with the right choice of materials. The roof, the forecourt and the foyer floor were covered with marble. As for the façades, Snøhetta chose the granite stone “Ice Green”. In another words, the main elements that forms the design were the wave wall, the factory and the carpet which represents the horizontal and the sloping surfaces on top of the building [38].

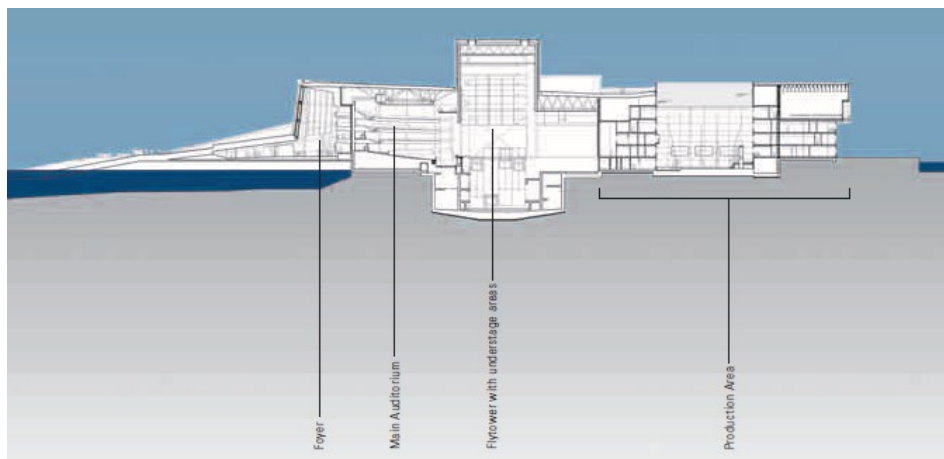


Figure 2.5. A section of the Oslo opera house [38]

The Haier Global Creative Research Centre opened in 2016 in China represents another example of the development of the d-genes of Snøhetta with their inspiration from nature. The architects applied in this project what is called “the hill top” concept that was inspired from the natural landscape of Qingdao characterized with the Lao Mountain. Three of the buildings’ corners were lifted up like the summit of a mountain in order to provide a view to the ocean. However, one corner was softly inclined to the street so that it fits people’s scale. The interior organization of the building was made according to a free open plan in order to ensure continuity between the spaces. In the middle of the building, a landscape was designed so that it creates connection between the interior and the exterior and at the same time provides sunlight and fresh air to the interior.





Figure 2.6. The Haier global creative research centre [39]

One of the last projects of the firm is called the Solobservatoriet in the forests of Harestua. This project will represent the largest astronomical facility located 580 meters above the sea. The purpose behind such a remarkable design is to create a sense of wonder and curiosity. To do so, the architects represented a different mutation of the basic concept. Here, they chose analogy to express their idea. Since the project will house scientific activities related to astronomy, the architects first studied the principals of astronomy, and the result was a planetarium surrounded by cabins of different sizes and design, shaped like small planets. This last represents an analogy of how the planets orbit around the sun. From the other hand, the planetarium is characterized with the “living roof” which is planted with grass and other vegetation in order to ensure the integrity of the building in the surrounded landscape. An a dome-shaped orb that acts like a theatre is placed in the middle of the planetarium and shows up gradually like a sun as visitors walk toward the building [40].



Figure 2.7. A top view of the Solobservatoriet project [41]

According to the analysis made previously about the projects of Snøhetta, it is clear that his d-gene pool is related to the context of the site. This last helped the architects to develop their philosophy. However, the most important even more than the building itself was the landscape. For Dykers and Thorsen architecture is not just architecture by itself, it is a group work between different disciplines, however, architecture and landscape should work together since the beginning in order to create a coherent design for people to use. For this reason, while designing a new project, the architects mutate their basic concept, in general analogically or metaphorically, but always connected to the context. This factor is actually reinforcing their identity and helping them to develop more the first gene.

## **2.2. Massimiliano Fuksas**

Massimiliano Fuksas is an Italian architect who started his architectural career in 1967 in Italy. Then he opened his office named “Studio Fuksas” office in Paris, France. He wanted to be an artist rather than an architect but finally he found what he was looking for in architecture because he thinks that architecture is a part of art. However, according to Fuksas, architecture can be “the most esoteric and the most banal of arts” it is actually both, simultaneously [42].

The Italian architect got his inspirations from the natural landscape. For this reason, his projects are known due to the organic forms and the common use of the vortex-like forms in his projects. From the other hand, he gives a lot of importance to the relation between the building and its exterior environment as the two of them are completing each other. However, to complete one another, the new construction should be integrated in the context. For this reason, Fuksas think a lot about the context that the project is situated in, the inhabitants and how they will use the space, the materials, all of them can contribute in defining the form of the building.

In addition, he manages to take people’s attention to the building first by feeding their curiosity through the majesty of his facades. He explained this step while describing the project of San Paolo Church in Foligno; “You enter after being attracted by a great staircase, a great facade, by the dynamism, by the majesty of the facade and by [its] great power” [43].

The Fiera Milano Complex built in 1994 was designed as a “city in itself” says Fuksas. (Figure 2.8) Because it is too big, some 50,000 people could live inside of it [44]. It is an eye-catching building with a 1,500m long glass canopy named “Vela” (which means sail in Italian) that takes a central position in order to continually direct the user’s attention. The canopy is characterized by a group of triangular glass and steel vortex-like parabolas that was placed along it for aesthetic reasons in order to give the impression of floating. Terry Peterson the vice-president of sales for Mero Structures INC. the engineering firm for the project said that the canopy consists of a glazed surface with “an architectural form that took on the shape of the God-given tapestry represented by the Alps mountain range in the background” [45]. The use of glass has also contributed in the reflection and refraction of light, which helped to create luminous spaces everywhere.

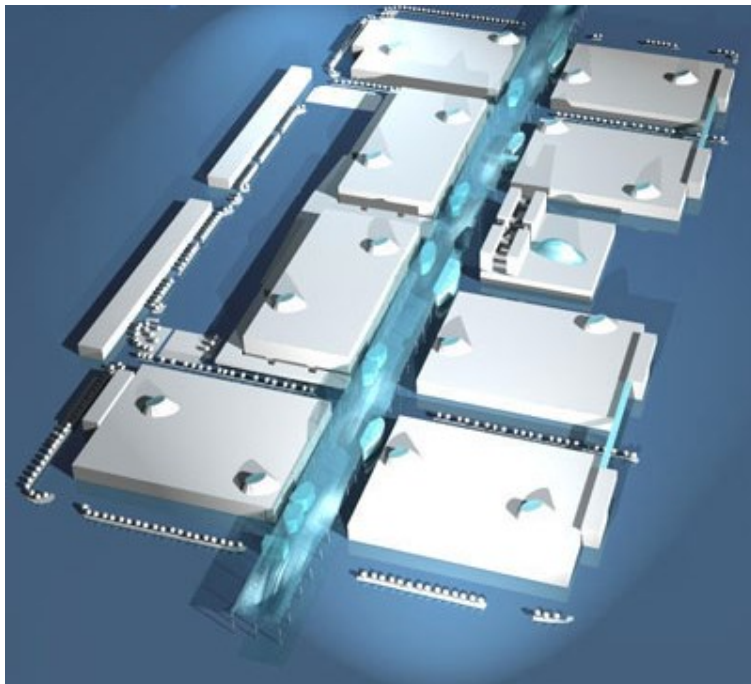


Figure 2.8. The new Fiera Milano trade centre [46]

Along this main street, Fuksas planned the buildings that house the complex activities such as exhibition halls block, service centre block as huge rectangular boxes. In order to ensure harmony and unity of the design between the buildings and the central canopy, Fuksas designed nozzle-like protrusions in the roof of those boxes. The actual reason of using ascents and descent on the form goes back to the natural landscape influence on the architect. For this reason, he tried to mutate the hills, waves, craters, and dunes [44]. Despite the large scale of the building and the complex look it has, the architect managed to integrate the



legibility concept in it. All of the surrounding buildings are oriented to the canopy, which made it as a kind of main street. In addition, every building has its own landscape so it will be easily understandable.



Figure 2.9. The view under the canopy of Milano trade fair [47]

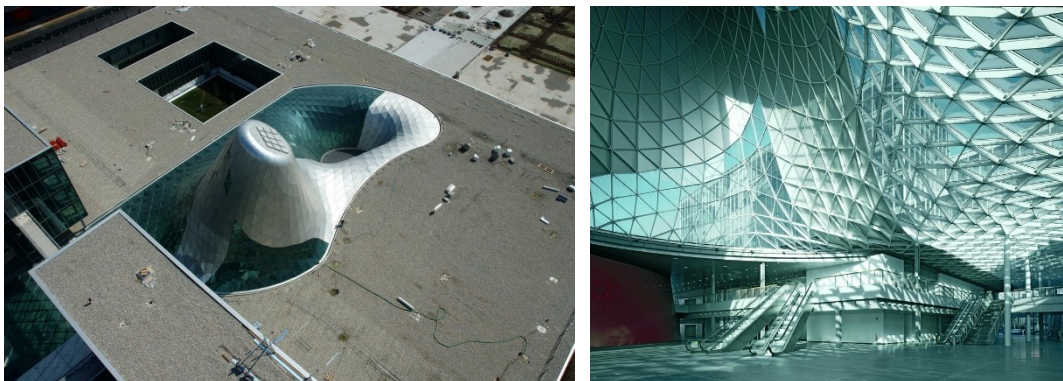


Figure 2.10. A view on the protrusions made on the roofs of the exhibition buildings [47]

Another remarkable design of Fuksas named MyZeil shopping centre was realized in 2009 (Figure 2.11). The 77,000m<sup>2</sup> structure includes shops, leisure spaces, kid's areas, restaurants, fitness centre and parking. It is spread over six floors and includes a square and meeting places. An interior public plaza is also integrated in the program of the building. Generally, the shopping centre is famous for the sculptural glass facade (which creates impressive and dynamic spaces within the public atriums), steel and glass panels on the shell roof, and the longest escalators in Frankfurt (46m) that can take directly to the fourth floor. In addition to the formal characteristics, the building's rainwater from nearly 6,000 square meters large roof areas is collected, cleaned and returned to the water cycle of the building to be used in it.





Figure 2.11. MyZeil shopping centre, Frankfurt, 2009 [48]

The conception of such a remarkable form is devised to three elements. First, it was inspired from geography and topography. Second, the facade is conceived as a river that has different depths reaching into the Earth. The fluid shape comes from the connection of The Zeil, a shopping boulevard in the heart of Frankfurt, and the Thurn and Taxis palace. The two facades on opposite ends of the building are designed to evoke the two distinct senses of the city. The modern city on the facade running along the Zeil expresses leisure, entertainment and relaxation. The historic-facing facade maintains a formal appearance. Third, the structure is inspired from the historical context of the site. “The striking design is so extraordinary that it is another Frankfurt landmark (...) Massimiliano Fuksas has designed a building that attracts every eye like a magnet” [49].

The captivating façade that running along The Zeil creates a continuous relation between the outside and the inside by its transparency that floods all the levels of the shopping centre with the natural sunlight. At the same time, the attractive void, which is pulled into the atrium while looking like a vortex (Figure 2.12), has contributed in giving the building a different aspect and identity.



Figure 2.12. View of the interior of the shopping mall [50]

At the end, a highly optimized structure was achieved which not only marks the state of the art for grid shells but which is also an architectural landmark in the city of Frankfurt [51]. The idea of the roof was like a carpet thrown above the cubic building and embracing all its angles as well as the two voids created to add an aesthetic side to the shopping mall. After the building's form and roofs form design has finished the next move was on Knippers Helbig Advances Engineering to create its structure. Before, the creation of complex grid shells was highly difficult and limited. However, with the existence of Computer aided manufacturing any form became easy to be achieved.

Therefore, in trying to design the structural shape, in order to avoid additional structural elements, first the engineer transformed the two horns that were used as an aesthetic element into mega columns to support the roof themselves. One of the horns is supported by the ground floor as for the other one by the façade. Thereafter, the sharp edges were smoothed to allow a flow of forces as seen in Figure 2.13, which enables shell-behaviour and reduces the bending moments in the steel members. This allowed spanning with steel cross-sections of 65x120mm without any additional support and creating a column free shopping mall [52].

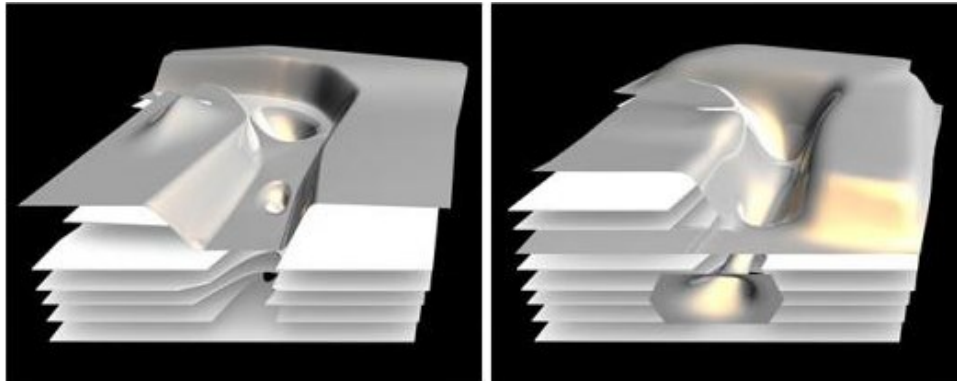


Figure 2.13. Initial shape of the architect (left), shape after modification (right) [51]

As for the grid shell of this project, Knippers and Massimiliano worked together to find a solution without effecting the shape of the free form glass roof and the rhombus shaped façade. To realize this type of grid, Knippers developed new methods and tools that were able to manage it. Because the existed meshing tools start from the boundaries and create meshes zone-by-zone arriving to the centre, which will lead to an irregular mesh that changes the aesthetic value of the façade and the roof. To create the complex roof shape, they followed Buckminster Fuller's sphere division principle [53]. Therefore, he divided the surface into big triangles and then each of these last triangles were subdivided into smaller ones to form a triangulated mesh to smooth its control. The same method was used to create Expo Boulevard in Shanghai since it was almost the same form as the roofs void. (Figure 2.14)



Figure 2.1. The design process of the EXPO Shanghai sun valleys, from large triangles (Left) their division (Middle) to relaxation of the grid (Right) [53]

The new Terminal 3 of Shenzhen International Airport is an architecturally outstanding building built in 2013 in China (Figure 2.15). The purpose was to build an iconic landmark that reflects the development of China and contributes in its economic development. The final form of the building was the result of a detailed study of various living creatures shapes “The concept of the plan for Terminal 3 of Shenzhen Bao’an international airport evokes the



image of a manta ray, a fish that breathes and changes its own shape, undergoes variations, turns into a bird to celebrate the emotion and fantasy of a flight” explained Fuksas in his Project description [54]. An organic-shaped building with a 1250m long steel structure designed as a free-formed envelope perforated with vortex-like parabolas that provides lighting and good atmosphere to the inside. In addition, Fuksas managed to realize and integrate this organic form by taking into consideration the natural landscape, which affected the form through the variation of height on the roof and the conical supporting columns that looks like chunky trees (Figure 2.16). In addition to the mentioned concepts, the architect applied another motif on the internal and external skin of the roof and the interior design of the building, which is the “Honeycomb Motif” [55].



Figure 2.15. Shenzhen Bao'an international airport – Terminal 3 [54]

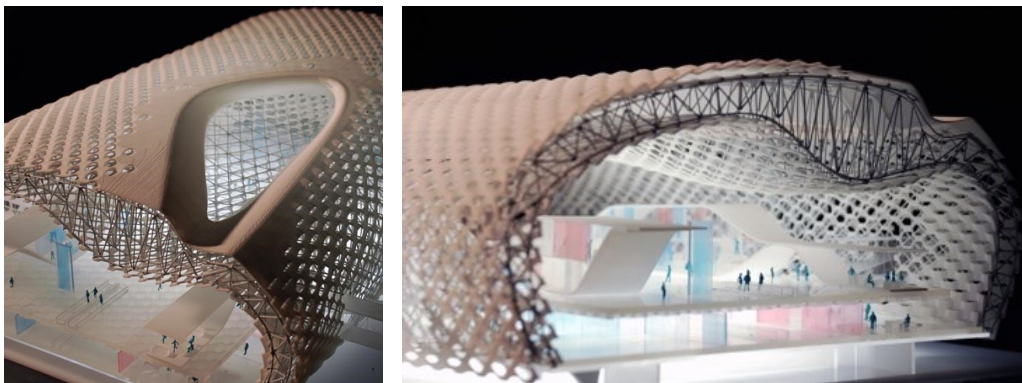


Figure 2.16. An interior view of the airport [54]

Even though Fuksas refuses to accept the fact that he created his own identity and architectural style through his works, we can notice through his projects that he is actually creating one. The use of metaphor each time in his projects helped also in the creation and the development of his d-gen pool, as Zarzar explained the importance of metaphor in

creating, and developing identities, Massimiliano Fuksas is an example of that [8]. Along with metaphor, the respect of the site's concept led the architect to integrate it in all of his designs in addition to the idea of a shell that envelops the interior function are actually, what Fuksas is repeating in his designs [56].

### **2.3. Evaluation**

Based on the analysed example, we can clearly see that the concept development cannot be a fixed process. It always changes according to the type of the building and the surrounding of its site. However, the belonging of the building into the site contributes more in the reinforcement of the architect's identity. Looking back to the examples, Snøhetta is an architectural firm that takes first into its consideration the landscape of the site. Therefore, what is important for the architects is the integration of the building in the surrounding. However, the mutation of their basic-concept depends on the function of the building but in general, the designers prefer mimetic approach in the design process. These interpretations are sometimes visually connected to the site, like the use of landscape or a specific type of material, colour to ensure a visual continuity between the site and the project, and other times philosophically related to the history of the site like the Bibliotheca Alexandrina that holds in it a philosophical interpretation of the old library. This last leads as to the definition of the place theory, which means that Snøhetta applies the theory of the new contextualism by creating new places according to the character and atmosphere of the original environment. However, Massimiliano Fuksas uses analogy of organic forms of different creatures or a certain landscape factors to mutate his basic-concept. Therefore, the idea behind this process is first to put forward the function of the building, and then to integrate it in its landscape. However, the concentration on the organic forms led to the creation of buildings that can be located everywhere because they are detached from the original site. Therefore, Massimiliano Fuksas Architecture mimetically mutates the basic concept through analogy in order to create a relation between the object and its function.

Table 2.1. A classification of the project of Massimiliano and Snøhetta according to their mutation.

	A BASIC CONCEPT / GENE					
	Mimetical					
	MUTATIONS					
	can locate anywhere (general)			belong to the place (local/regional)		
	ANALOGY visual	COMBINATION	METAPHOR semantically	ANALOGY visual	COMBINATION	METAPHOR semantically
Massimiliano Fuksas	* The new fiero Milano trade centre * Shenzhen Bao'an International Airport		MyZeil shopping centre			
Snøhetta Architecture	Solobservatoriet		The national opera house of Norway	The Haier Global Creative Research Centre		The bibliotheca Alexandrina



### 3. UNDERSTANDING THE CONCEPTS OF COOP HIMMELB(L)AU

#### 3.1. Coop Himmelb(l)au and Design Gene Pool System

According to Vitruvius, successful conceptions in architecture have to group 3 virtues: durability, convenience and beauty. Based on that, Coop Himmelb(l)au<sup>1</sup> which is the main case studied in this dissertation, aims to create not beautiful buildings, but functional, identifiable and distinctive buildings that can be recognized as “the bones within the meat of the city” [57]. The architecture of Coop Himmelb(l)au can be read both as a technological innovation -due to the development of the materials they use and the technique of design in which the designers always come up with new programs- and as a new aesthetic expression. In that manner, this expression is not the result of a random action, on the contrary, it represents a sequence of continuous work that started with a concept and the development of this concept with mutations gave birth to that new aesthetic expression. Coop Himmelb(l)au declares the architecture is a piece of art, that needs to be exploited in order to rise and prove its importance. Thus the architecture produced by Coop Himmelb(l)au was always known as the architecture of fantasy which inspired a generation of architects. Yet the architects took their designs from a speculative fantasy to a large-scale buildings with their fascinating design process and the powerful form they create challenging all kind of technologies.

Wolf Prix as the founder of Coop Himmelb(l)au (CH) wants to create his own identity and leave his signature wherever he creates a building, an aspect that calls directly his architecture. By looking to the history of CH’s designs, one can see that most of the projects have something in common. Even though the forms are not the same and the technique has nothing to do with the afterward designs, the remarkable shape of the projects contains a common factor, which is the principal concept.

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<sup>1</sup> Coop Himmelb(l)au is an architectural office that was founded in 1968 in Austria. Wolf D. Prix, Helmut Swiczinsky and Michael Holzer (which leaves the group in 1971) created Coop Himmelb(l)au in 1968, in order to share their new ideas that support futuristic and innovative designs. Wolf Prix, Helmut Swiczinsky, and Michael Holzer represent the triangle that is considered as the beginning of a technological revolution in architecture under the name of Coop Himmelb(l)au. Even after Helmut Swiczinsky (left CH in 2001) and Michael Holzer quit the company, Wolf Prix continued to chase his dream in order to arrive to his purpose by creating different technologies and methods in his designs. Wolf D. Prix as a co-founder, design principal and CEO of Coop Himmelb(l)au, studied architecture at the Vienna University of Technology, the Architectural Association of London as well as at the Southern California Institute of Architecture (SCI-Arc) in Los Angeles.



The company of CH interprets its architecture as an architecture that "will mirror the complexity of our intellectual and cultural life, as the expression of our urban culture" [58]. The company believes that people live in a complex society and need a complex solution that can respond to their special and social needs. Wolf D. Prix explained his design process as the one that focuses on the "...complex, spatially entangled volumes, transitions, situations, and their possible transformation. As if one could see the building with X-ray eyes, we begin to draw our views and sections on top of one another" [59]. He stated several times that their aim is to create an identifiable and a distinctive building that can influence people life. They have chosen complexity because it represented the reflex of our society and the people's life. Moreover, this complexity has to be solved by the architects through creating new designs that meet people's needs. Their architecture is an architecture that approaches architecture as art; encompassing visually wild dreams and streams of innovative ideas captured by a new aesthetic. Today still, Wolf Prix concentrates on staying away from the Euclidean geometry and uses fragmentations and non-linear forms to realize his designs. He goes beyond the orthogonal system to the crash of masses in the three-dimensional direction. This crash results in the complex design of forms that penetrate into each other to create sometimes fragmented lines and sharp angles and in other times organic forms. From another side, he expresses the coincidence of order and chaos, and the heterogeneity of urban space, through an iterative design method that incorporates both graphical and philosophical operations [60]. The projects of the company, in general, resist interpretations due to the complexity of the form. From its earliest experiments with exploding spaces and kinesthetic clothing to its most recent completed buildings, CH has pursued its architectural agenda with an intensity bordering on obsession.

It is true that a building is a series of wordless metaphors; each element is linked to a larger class of symbolism. However, Wolf Prix uses metaphors in his projects' conception because it adds more ambiguity and complexity to the building. Prix argues that their architecture does not rely on traditional perceptions in confining how a building would look, but in searching less obvious new ways to enrich it, CH aims to reach a level of obscurity that is extracted in the first place from metaphor:

When we speak of ships, others think of ship wreckage. We, however, think of wind inflated white sails. When we speak of eagles, the others think of a bird. We, however, are talking about the wingspan. When we speak of black panthers, the others think of predatory animals. We, however, think of the untamed dangerousness of architecture.

When we speak of leaping whales, the others think of saurian. We, however, think of 30 tons of flying weight. We will not find architecture in an encyclopaedia. Our architecture can be found where thoughts move faster than hands to grasp it [62].

CH's manifesto about the relationship between architecture and fear is setting in Bob Dylan's Desolation Rows's lyrics and images, where he used images of faces twisted, blurred and spliced together to express the loss of identity. This last evokes Wolf Prix's 1993 polemic of "The Tower of Babel Revisited" (1993) in which Prix emphasizes that most of his projects was refused because of fear [63]. Actually, he accepts fear as a natural reaction to his designs, because his designs are daring ones. However, Wolf Prix thinks that people should forget about their fears and give the architecture the chance to show up without limits. Because once architecture is faded, "...spaces become neutral, bland and meaningless and civilization soon follows" as in the example of the Ronacher Theater in Vienna (Figure 3.1) (Figure 3.2) [58].



Figure 3.1. Coop Himmelb(l)au's proposed project [64]



Figure 3.2. The realized ronacher theater [65]

In architecture, novelty frees people from the tight view and takes them to a new and high level of comprehension. The architecture and the development of design ideas led us to a time where we can convince the client to try things they originally did not want or even

sometimes where against it. Wolf Prix declares that only complex architectural solutions should be involved for big architectural problems. He delivered the words:

Step by step, architecture is becoming one of the most controversial topics of our time and is beginning to replace the fine arts as the thorn in the flesh of society. This discussion disregards society's loss of three-dimensional forms of expression through the rejection of contemporary architecture, which not only results in the horrifying destruction of creativity and energy but also, sooner or later, in the speechlessness of the third dimension [60].

Wolf Prix always intends to build the first sketches he realize and then fights to retain it whatever the consequences. Because, Prix believes that the secret behind building complex forms is to disobey the fixed rules, to deny the client and to never think about the cost [66]. According to him, architecture is dead and its extermination will lead to the stagnation of the society [60]. That is why they use the people's fear of change as a catalyst to create new and complex forms in order to change the old city's appearance. In another words, they intend to revive the architecture and give it a new aspect. CH prefers to design complex buildings, by applying metaphors on the mutations of one unique concept (for instance the cloud concept) with the idea of building against fear which cannot be understood neither translated, the same as our nowadays' life. Overall, the presented solutions contain the stamp of CH that allows the company to create an identity in the middle of the monotony that architecture is facing today. In the fact, this identity is what makes of CH's architecture such an impressive and a memorable one.

Wolf Prix has been influenced by different architects ranging from Le Corbusier to the lyrics of Keith Richards of the Rolling Stones. He is so attached to the music, rhythm and to the principals and thinks, which architecture has to reflect our daily life, which is a hard, and a complex one. For this reason, in the beginning, Wolf prix and his partners decided to make a difference in the architectural field, to design buildings that can live for more than 50 years without getting old. They decided, "Architects should deal principally with the future" [66]. For this reason, they realized self-confident designs that stand for this assertion.

The designs of Wolf Prix are chosen to be studied and analysed in order to extract the basic concept that affected the architect and bring up the coming-after concepts of his *d-gene pool*. However to extract it first we have to study the beginning of CH's work. The company of

Coop Himmelb(l)au produced for more than forty years a series of complex and poetic projects starting from exploding spaces, kinaesthetic clothing until its recently developed project. The company followed different architectural styles along their career and it has remarkable concepts that cannot be interpreted or understood to the naked eye. At the beginning, they designed projects following the pneumatic architecture, which is a lightweight, mobile form made of air and fully transparent. The group made many experiments for example “Villa Rosa” (Figure 3.3), in order to create the ideal space for the human being to live in by giving more importance to the user. As the firm stated: “it is not we who must change in order to live in architecture, but architecture must react to our movements, feelings, moods and emotions in such a way that we want to live in it” [67]. In order to effect the user, the Villa Rosa reacts emotionally, inflates, and imitates the colours, the sounds and even smells. The object of its design was to dematerialize the space [68].



Figure 3.3. Villa rosa, pneumatic living unit [68]

Simultaneously, in 1980, CH released their manifesto “*Architecture must Blaze*”, a treatise that claims that the architectural and decorative styles of Palladio and Biedermeier are the antithesis of CH’s philosophy of architecture as the architect was against the historical masks of the building. Wolf Prix explained their philosophy as follows: We want an architecture that has more. Architecture that bleeds that exhausts, that whirls, and even breaks. Architecture that lights up, stings, rips, and tears under stress” [69].

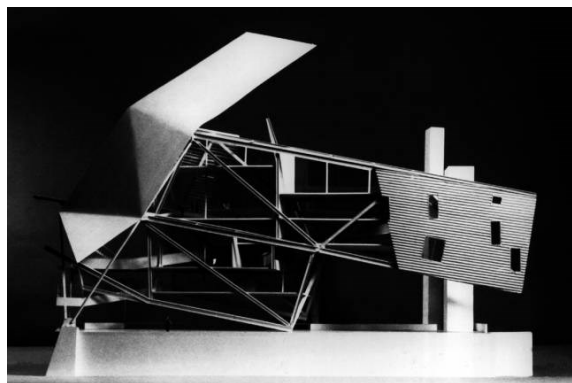
Coop Himmelb(l)au's team expressed the idea of blazing architecture after their manifesto with the project of "*The blazing wing*" at the Technical University in Graz. The idea took the form of a distorted steel construction of 15m high. In order to express how their architectural structures go beyond the boiling point [70]. According to Wolf D. Prix,

Architecture must be cavernous, fiery, smooth, hard, angular, brutal, round, delicate, colourful, obscene, sexy, dreamy, intimate, remote, wet, dry and heart-beating, living or dead. If it is cold, then as cold as ice, if it is hot then as hot as a tongue of fire. Architecture must burn [69].

After this manifesto, CH started to follow a different form of design. The 1980<sup>th</sup> were famous with a new movement called the deconstructivist movement. This last spread so fast after the exhibition of MoMA in 1988 in which CH was one of the participants. Actually, CH had its international breakthrough with the invitation to the exhibition named "*Deconstructivist Architecture*" at MoMA. Coop Himmelb(l)au is considered as an architecture office that imposed its style of conception and created a difference in the building design subject. The company participated in the exhibition with three of their projects: The rooftop remodelling in Vienna (1988), Apartment building in Vienna (1983) and Hamburg Skyline (1985). One of them namely "*the rooftop remodelling*" was completed in the exhibition year (Figure 3.4). Wolf Prix described the project of the rooftop remodelling as follows; "it is a lightning bolt reversed and a space-creating taut arc" [71]. The company designed the project by using not a circular form but a fragmented one that does not have any clear structure neither a 90° angle. The fragmentations, the complex form that generates a kind of uncertainty and uncanny is considered among the principals of deconstruction.



a)



b)

Figure 3.4. a) Rooftop remodelling falkenstrasse [72], b) The apartment complex Wien [73]

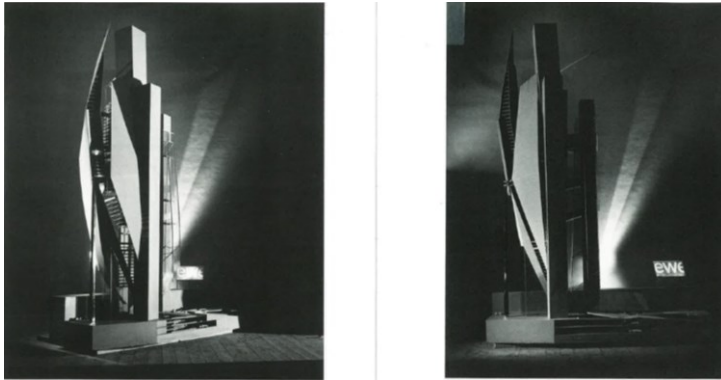


Figure 3.5. Hamburg skyline [74]

According to Prix, the most important moment for a designer to change the architectural language is the first moment of design where all decisions are given. As he explained:

It is kind of a black hole of the moment of designing it. We have to introduce another language into architecture in order to create a new aesthetic, which is much more advanced than aesthetics at the time; it is an intellectual point of view – understanding ahead of the time and seeing into the coming future - in the moment you are designing it [59].

In this context, to create a project, Wolf Prix thinks that one have to deny the architectural traditional laws, not to think about how much money you will get, to stop thinking too much about the client and finally to never think about the cost [66]. Wolf Prix and his crew connected their hands to their feelings to draw emotionally the wanted forms, plans, sections and perspectives and then build models as interpretations of the early sketches to get a better image of the form, however, the first sketch remains absolute. This design method is called “the psychogram” as CH defined it as “the first capturing of feeling on paper” [75]. In another words, it is the realization of sketches with the eyes closed. Scribbles based on squiggles [58].

The purpose behind this technique is actually to have the ability to define the feelings and the emotions that the future space will reflect. For this reason, the final result always presents the first psychogram. The Groninger Museum is an enlarged example of this technique. Wolf Prix have physically etched the initial sketch on the steel façade of the building. Therefore, when the steel rusts away the sketch will show up. That was their method to relate the building to its origin [76]. Anthony Vidler defined this technique as “operating through blind gesture translated into line and three-dimensional form” [77]. This action is actually a

connection between body space and mind. Because, it gives the architect an opportunity to live in the space through his mind before conceiving it. Michael Ostwald and Michael Chapman in their researches about the psychogram of CH they came out with the fact that the ambiguity in CH's design methodology can be translated as "bodily vehicle or chaotic metaphor" [76].

### **3.2. Defining the Basic Gene and Mutations of Coop Himmelb(l)au:**

Some of the architects stated that the true and beautiful architecture has to be organized according to some pre-selected rules that are, in general, supported by the idea of the enclosure for example, closed square, closed house etc. However, these statements are opposite to what Prix thinks. Because Wolf Prix stands up for the idea of open spaces because we do not want closed houses or closed-up streets and we definitely do not want a closed worldview as closed places distant us from what surrounds us [78]. As he mentions, "Our architecture has no physical ground plan, but a psychic one... Walls no longer exist. Our spaces are pulsating balloons. Our heartbeat becomes space and our face is the façade" [79].

Coop Himmelb(l)au has used the concept of "*open architecture*" to describe their efforts to produce an architecture that is "not for a specific purpose". These are "self-sufficient structures that form differentiated spaces, spaces that do not pin down the future user" but promote the idea that the exact use of any space is indeterminate at any given moment in time [80]. Assume that architecture not have meaning, it is the three-dimensional presentation of a building problem, and thus the solution. To make the usable areas as large and economical as possible, projects are conceived first as a basic shell, which users can appropriate and improve.

We do not view existing structures as fixed realities in terms of content or form. We see them as empty shells, as spaces that no longer need to be built because they are already there. Interventions are thereby neither playful nor dialectical; instead, they merely serve the purpose of the spatial organization [82].

The main philosophy that CH states is that, the mutations of space through sculpturing and form mutations, are one of the aspects of open architecture. The possibility of mutation of a form is not through circles but though using spirals you gain the powerful sensual and

tangible transitions for a form to mutate. The Open House project in Malibu designed in 1983 is also an example of applying the open architecture concept on a small scale project (Figure 3.6). The house consists of 100m<sup>2</sup> of usable space. Here, the formal mutation can easily be read on the project. As being "infected by an unstable biomorphic structure, a skeletal winged organism which distorts the form that houses it". Michael Sorkin wrote that the open house is the first standing incarnation of open architecture and it expresses the beginning of the famous eyes closed sketch technique of Coop Himmelb(l)au [83]. Significantly, he describes the project by focusing on the detailed wing that recalls "the butterfly effect". So, he stated that the house is not only formed of an insect wing suggesting "a means of flight" or "a source of lift" but the wing is also "a cutting edge, a blade- which slices through the corner and springs outside" [60]. As for the interior of the design, the designer maintained the interior spaces free and open without any divisions by following the open architecture concept. In this manner, the user will be able to define the space according to his desires.



Figure 3.6. Open house [84]

In the BMW Welt building (completed in 2007), the context of the project allowed for an easy application of the open space concept that gives more free space and offers the user the opportunity to change the spaces inside following his desire. Through the concept of open architecture, Wolf Prix created a room in a room space for maximum flexibility. This room is designed in a way that allows receiving 1,200 for the conference and event rooms at the



same time. Besides, a long hanged footbridge was placed to connect all of the restaurant, the exhibition room, the forum and the double cone.

The space concept of Coop Himmelb(l)au completely gives up on traditionally recognized elements such as the wall, pillar, and roof, and tries new concepts with which an architectural space can still be created. In those spaces, walls become roofs, floors and sometimes columns. Just like the “Groninger Museum” and the “Rooftop Remodeling” projects which is similar to Frederick J. Kiesler's endless space. Such space consists of various elements that are not at all related to the architectural elements of functionalism and tries to get out of all traditions and customs of the existing thoughts. As Kiesler explained his concept of endless space where, instead of “*the eternity of time*”, in architecture it means, “*There is no corner*” in an aspect of a space. The core of this space is that its structure does not have any pillar or frame, but it still maintains its form. In particular, Kiesler's space concept has a similarity with the informal space and the non-territorial space expressions of Coop Himmelb(l)au [85]. However, Coop Himmelb(l)au expressed dynamism in the three-dimensional space adding the concept of deconstruction to the non-territorial space of Kiesler. This way, he tried to express the space concept by analysing space based on the three-dimension thought from a stage of architectural designing, rather than understanding the architectural space based on horizontal and vertical planes. Prix suggests the ‘open’ strategy, which means creating a framework for free design with an emphasis on imagination rather than the limitation of pre-conceived objectives [59].

To conclude, open architecture concept is an architectural system of space within space, which aims to connect some functional and special unities into a logical organization [86]. Besides that, it gives the user a free mode of use so he can change the space according to his needs. Open architecture concept brings to the space flexibility and creates –along with its original function- new ways of use, new functions. This means that space is not set up by its function but it is created by its free form. And the form in expression of space is infinite. Below the details of cloud concept in connection with open architecture are given as the most important genes of CH.

### 3.2.1. The Cloud Concept.

Prix searched through his memory and observed what surrounded it to find a precedent that would fulfil his intention and here came the contribution of art. He saw the Tower of Babel painting and he decided to finish building it since it was left as a complex but an unfinished business. Therefore, he started from the simplest detail in that piece of art (Figure 3.7), which was the cloud, as a basic concept to become after that the basic idea of their work. Because clouds are actually elements that could suit other purposes as well, they are symbols for rapidly changing states. They form and transform themselves through the complex interaction of changing conditions, viewed in slow motion. The Austrian architect wanted a free and a lightweight architecture and explained his choice with the following declaration:

We think that the process of finishing the construction of the Tower of Babel – the fundamental symbol of architecture – should be interpreted by replacing the language diversity with the multitude of possible solutions (...) we began with the artifact called the cloud. The cloud interpreted in 1968 as a pneumatic form could change depending on movement and emotional condition of its users [60].



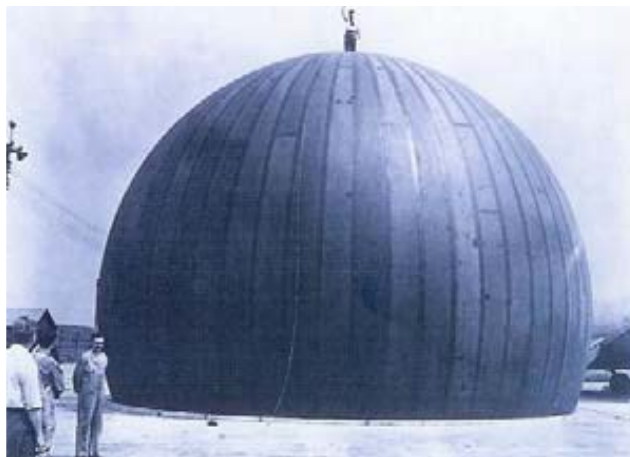
Figure 3.7. The tower of Babel [87]

Wolf Prix and his partners in their beginnings chose the cloud as a basic concept of their design pool. This concept experienced a variety of changes and repetitions to produce each time something new and different. Even though Prix draws sketches with the eyes closed to feel the aura, all his sketches end up similar somehow to the cloud. The design of CH intends to create architecture of clouds in which complexity, ambiguity and uncertainty are involved.

The Cloud idea is formally attached to the pneumatic architecture, which marks the beginning of CH firm. It is a discipline that allows the designer to get closer to the free plan buildings. Therefore, to understand this concept first, we have to go back and explain the pneumatic architecture. The history of the pneumatic architecture started with the first invention of hot air and hydrogen balloons in 1780 in France, by the French brothers Montgolfier. Decades after that, the first pneumatic building was realized by Walter Bird in 1948. Which was a prototype of a radar dome called The *Radome* for military use (Figure 3.8). The architect used the pneumatic structure due to its feasibility to build a form that has to be strong enough to protect the antenna it contains in extreme weather conditions. The concept of the *radome* project realized by Bird has evaluated towards more complex and sophisticated systems, especially during the mid -60s and mid -70s. Designers started to use it in order to create spaces lighter than the air and provide flexibility in the buildings' form [88].



a)



b)

Fig 3.8. a) The first radome prototype (1948) with Walter Bird stands on top [89], b) Montgolfier Brothers' hot air balloon (1783) [89]

The pneumatic architecture, at that time, became the interest of architects that seek for a lightweight architecture, dynamism and maximum efficiency in constructions. After many researchers in pneumatic architecture, in 1962, one of the architects, Frei Otto, has found the ideal form using soap bubbles experiments. The German architect and scientist Frei Otto spent his entire life studying the form-finding processes of nature, and established the basic idea to realize lightweight buildings using pneumatic architecture. As an architect, he used these processes to develop and build many structures. He eventually carried out

experimentation in form finding using lightweight structural materials. He worked on tents and soap films, pneus and hydros, suspended constructions, grid shells, and branching structures. Frei Otto worked on the principles to reduce the mass of the material and at the same time provide structural efficiency [90]. Therefore, the principals of lightweight and mobile architecture that was developed by Frei Otto, Buckminster Fuller, and Walter Birdair have become the centre of interest for CH who established his ideology through pneumatic architecture. Otto's researches have affected Wolf Prix and Helmut Swiczinsky as they realized that architecture is no longer inherently tied down to the ground but it becomes a three-dimensional material that can float above it. Prix forces architecture to perform like a demiurgic Hercules who insists on nothing less than subduing the cloud, conflating its fluidity with the rigidity of building to form a single impossible medium [91]. This may be seen in the early works of CH, in particular, the pneumatic living unit prototypes such as White Suit and Villa Rosa. "It is not that we should change to live within architecture, but architecture has to react to our movements, feelings, moods, emotions so that we want to live in it" [92].

The cloud concept becomes a popular concept because it represents an element that changes according to what surrounds it, and takes different shapes, levels, and dimensions. This concept is used in different projects to express different purposes; mobility, dynamicity, change, transparency, and lightness or sometimes just metaphor. The concept goes with the pneumatic architecture and works according to its basis [93]. So, what do clouds do for architects? It seems like they allow architects to realize two very different aims at the same time: that is, to create designs as anti-essentialist, provisional, shifting and dynamic work, and at the same time enjoying a weightlessness and a transcendental purity [90].

In the architecture of CH, a morphologic continuity is noticed since 1968 until the present time according to the global definition of their projects, wherein, in general, the cloud, the wing, and the base are found. One of the first projects of the firm was named Wolke (Figure 3.9) designed in 1968 as a flying cloud attached to the ground with a camion which contains a circulation arm to ensure a free movement to the upper volume. The result is a floating habitation made of air and dynamics, which provides a free displacement of the user away from the outside. In this project, the non-linear form of the cloud that the architect applied can be seen. This last shows how CH's team were influenced by the cloud itself that they

tried to build an actual one, raised from the ground floor to give the illusion of floating and contains no walls or roof all represented as one element.

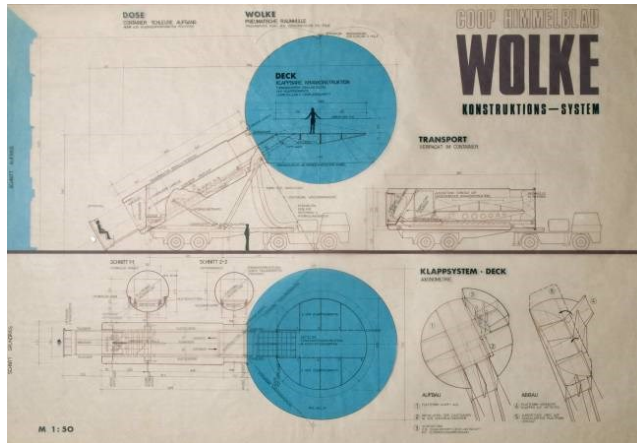


Figure 3.9. Wolke project [94]

Since Wolf Prix adopted the idea of the “cloud” in his projects, the resulted shape always varies but still attached to the basic concept. As Sylvia Lavin expressed while analysing Wolf Prix works about the fact that he always tried to build the cloud itself and not to attach a cloud form to his projects as many designers do to express it [91]. This process is realized through metaphor and mutation. His projects stand on the idea of metaphor as he considers the creation of complex forms an important factor. The principal concept is always the cloud, however, every time it mutates to fit its environment. From the other hand, other structural and regulatory design systems are added as well to complete the needed result. As Wolf Prix explained;

Our projects' complex constructions are laid out in a similar way. In order to be able to calculate them, they are simply dismantled into individual parts, which only attain a certain complexity when combined. In this way, Richards' guitar playing can be metaphorically, not literally transferred to our work... Also his body posture [78].

One of Prix’s last projects, for example, called PANEUM is a living example of the cloud building (Figure 3.10). The PANEUM is a small museum for bread located in Austin and was completed in 2017. The client of this project wanted an unusual building that will adopt the collection he had about bread and everything it concerns it. Wolf Prix suggested building

a Wunderkammer<sup>2</sup>, which represents a cabinet of wonder knowing in the baroque period. Therefore, he created a building that consists of two elements: the base, which takes the form of a full transparent box and the exhibition block, which floats above the base and take a cloud-like shape around a curvy room made of a metal-clad loaf. These two elements are connected with what Prix calls generally the wing, in our case the stairs. Wolf Prix calls the Wunderkammer the cloud ship due to the free form of the exhibition space above the base [95]. Again, Prix used the metaphor of the cloud to express his idea along with the Wunderkammer concept which represents here a new regulatory design gene that was added to the original concept to express the client request and from the other hand to attract the passengers' eye to wonder and question what that form keeps inside it. In this project, Prix also changed the characteristic that he always used on with the cloud form, which is the transparency. Here, he used it as an opaque form above a geometrical cube. From this point, we can say that the obscurity and the curiosity that this form carries on are at the end the identity keys of Wolf Prix designs.



Figure 3.10. House of bread II, 2017 [95]

From one hand the psychogram from the other hand the cloud, these two keys represents the design methods of CH. The cloud's concept development realized through mutation and metaphor contributed in the variation of the resulted deign. Looking to the other designs of the firm, we can detect more examples of metaphor with the naked-eye: in The BMW Welt in Munich for example (Figure3.11) with its crystalline-like double cone that resembles the tornado lifts a cloud-like floating roof, The Musée des Confluences in Lyon (Figure 3.12),

<sup>2</sup> Wunderkammer is called the cabinets of curiosities, arose in mid-sixteenth-century Europe as repositories for all manner of wondrous and exotic objects. (Jackson, 2008)



floating like a cloud over the confluence of the Rhône and Saône, and The Dalian International Conference Centre in China, (Figure 3.13) resembling a melting iceberg [69].



Figure 3.11. The BMW Welt, Munich 2007 [96]



Figure 3.12. The musée des confluences, Lyon [97]



Figure 3.13. The Dalian international conference centre, China [98]

The cloud is an intelligent element that allows the architect to repeat it again and again without copying the same form. Because the cloud holds in it its definition, which means it changes to adapt. The change is what we call mutation. Prix in every project mutate the cloud concept differently to produce a new design. Here, the mutation is actually a term used to describe the changes occurred in cities. This mutation influences the morphology and the physiology of the whole concept [99]. Wolf Prix produces with his designs what is called a sudden mutation not an evolutionary transformation of a logical process. With this last he is creating his identity by designing unique buildings in the middle of a monotone urban tissue.

To resume, the cloud concept represents the key concept of the firm since the beginning starting from the pneumatic architecture, passing by the fragmentations of deconstructivism and coming to free non-linear but unclassified architecture. Wolf Prix, by applying the cloud concept, intends to realize three principals that characterize it, namely; Lightweight, Movement, and Transparency.

### Lightweight

The Cloud is a natural element that is characterized with its lightweight due to its components. Wolf D. Prix and Helmut Swiczinsky opened their office with the idea of making “architecture light and changeable like clouds” [79]. The Cloud was designed for the study of “*Living forms for the future*” and was planned as a realization for the Documenta V. It was developed down to the smallest detail in terms of concrete form and structure. According to Wolf Prix, the cloud is an element of a huge importance in the architectural concepts. It is because of its capacity to adapt to the surrounding under different circumstances. At the same time, the interpretation of the clouds in CH’s projects was similar to the real one as Wolf Prix always tries to bring the clouds’ lightness and complex forms into the real life through building of different scales.

Technological innovations from the invention of steel to the new structural systems had helped as well to reduce weight and increase the interior space size, to help people take more advantage of the place they live in. the combination of the technology improvements and the wise design decisions is constantly evolving architectural discipline. Most of the designers adopted this concept for two reasons either to create a low-cost building –by using fewer



materials in construction- or to obtain bigger space with no obstacle to allowing the user to benefit from the space according to his desire.

The fascination with new technology and the inflatable sphere as a utopian structure is revealed in most of CH projects as shown in a series of short films documenting various performances and architectural prototypes that explore the possibilities of architecture of the future. Astro Balloon project (Figure 3.14) realized first in 1969 according to a small-scale prototype and then revisited in 2008 to become a combination of two spheres that changes form according to the visitors' heartbeat and body. It changes, transforms and mutates in various colourful ways in accordance with the flux of the pulsation recorded by its sensorial system. At the same time, it was designed to fit the lightweight building that focuses on the main points of the system of buildings supported by air and dynamics. The idea of the project was based also, on “Not architecture is changing the human being, but the human being is able to change architecture.” as Wolf Prix declared [100].

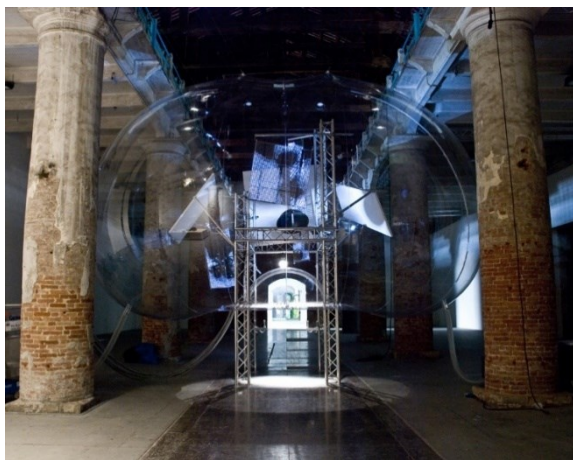


Figure 3.14. The astro balloon 1969 - revisited, feedback space [100]

Wolf Prix had used the cloud in his projects to describe the global form of the building or sometimes just the roof, combined with other elements to form the body of the building. At the same time, during the design, the clouds' basic characteristic has been applied on the buildings' core or on the roof to which Wolf Prix gives more importance. Because designing a building is thinking about all its parts at the same time, from the bottom to the top. However, unfortunately, peoples' concentration has always been in the building itself but never on its top.

If you have a person describe what they saw first in a room, you'll see that their gaze is not directed a priori towards the ceiling but all the more so towards perceiving wall and floor as a unit or the contrast between the wall, ceiling, and floor [101].

That is how Wolf D. Prix describes the perception of a room in architecture according to a small scale. Therefore, to take peoples' attention to the top, Wolf Prix started to give more importance to the roof, that he thinks we should not just consider it as an element for protection but as an architectural element that has to be thought about and designed by itself in order to complete the existing form. Here the proximity of the cloud to a modern thematic of lightness and detachment from the ground can be recognized. In another words, the design of CH. is always characterized with the antigravitational structures, in which they break all kind of natural laws of gravity in order to build a unique structure that fights the typical structures from one side, and give the building a lightweight effect from the other side. Their antigravitational dynamic architecture makes watchers feel the insecurity and tension and gives a visual impression of moving.

Taking the BMW Welt in Munich (Figure 3.15) as an example of a floating-like roof, the idea behind this remarkable shape is to design a futuristic architecture that has to be unique as the BMW materials and brings sense in its surroundings. So here, Wolf Prix prefers to go with the context and realize a building that fits its function but of course by using his signature. The project of the BMW Welt is a cloud-like building created by the grouping of a double cone form and a roof supported on just eleven hinged columns and support points. Wolf Prix always compares the lightweight of his projects with projects of the baroque for example the Doric temple. The temple has a surface of  $1.311\text{m}^2$  supported by 36 columns. However, BMW Welt has a surface of  $14.278\text{m}^2$  supported by just 11 columns. This lightweight gave the visitors the feeling of a floating building. Wolf Prix in this project applied the cloud concept in such an impressive way that he did connect it to a tornado by adding the double cone form at the corner [102].



Figure 3.15. BMW Welt, Munich [96]

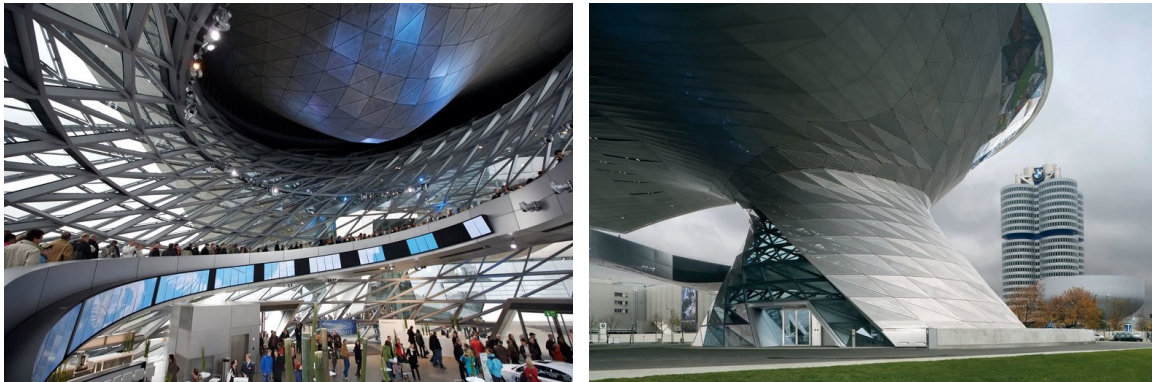


Figure 3.16. view of the inside of the double cone form that supports the cloud [96]

### Movement

The concept of “movement” has become one of the inspiring issues for the 20th-century philosophers such as Gilles Deleuze, theorists such as Paul Virilio and sociologists such as Manuel Castells. It is one of the principle concepts of design used to create and embody the illusion or/and the feeling of action on a building form that is not moving. As pointed out by Adrian Forty, “The notion that architecture represents implied movement within forms that are not themselves in motion has been a conventional part of modernist thinking” [103].

Movement can be expressed literally by actual moving parts of a building. This is different from a non-expressive, purely utilitarian, but actual, movement of part or of the whole of a work of architecture. It is when the used element or curb describes fluidity and continuity, which call for an illusion of movement. Further, even when movement is expressed literally,

it can be for the expression or representation of another idea, which is being symbolized, or it can be for its own sake. This last is called now the kinetic architecture and is taking a huge interest because of the computational development. In the case of the former movement, it is used in a narrative sense to express an idea like Change, Chaos, Growth, and Effort and so on [104].

According to this last, movement concept can mean different things, but in general, it can be devised into two categories: “*Presented Movement*”, which is a motion, manipulated with forces, captured with the eye, and can be seen directly. It is a physical movement works according to a specific system in order to accomplish a specific goal. The second category is the “*Imagined Movement*” which is an illusion of movements represented by using different technics and in which everybody knows, of course, that they all stay still: it is the eye and the mind that rise or run, or maybe perceive a visual force. Taking as an example of the Monument to the Third International of Vladimir Tatlin designed in 1919 (Figure 3.17). The use of the rotation already expressed the concept. The designer used twin helix, which spiraled up to 400 m in height and gave the building the sense of a continuous movement while rising up to the sky.

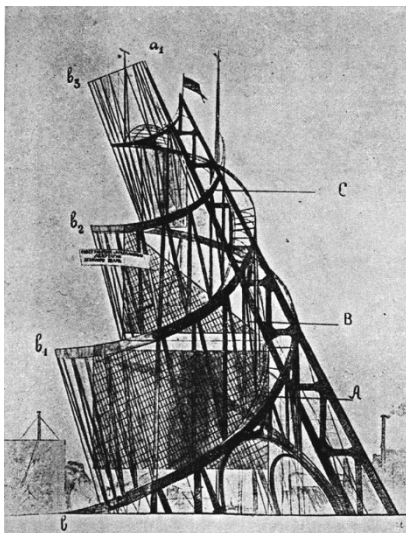


Figure 3.17 Sketch of the monument to the third international 1919-20 [105]

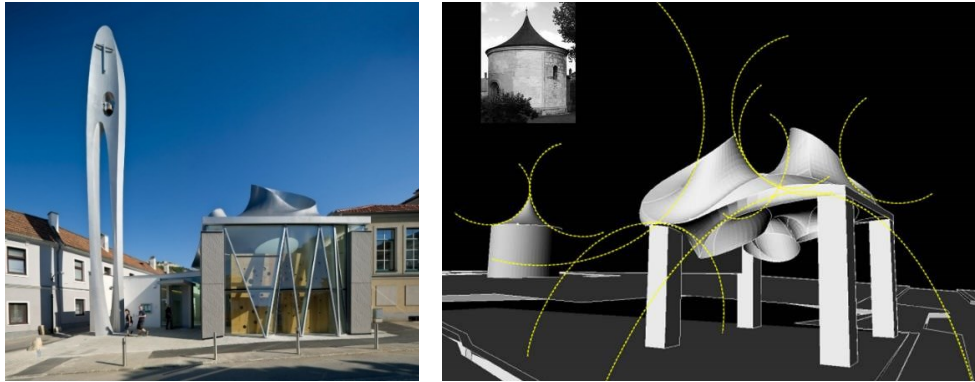
Many architects had adapted this concept because of its ability to capture the attention of the client. As for Frank Gehry, an architect that always worked with movement concept explained as following: “because I like the sense of movement. They feel genuine,

accessible, and joyful. If I do a lot of buildings with curves, and people enjoy them, then clients will begin demanding them, and more architects may follow” [62].

On the other hand, the clouds move and with every movement they make, they change, taking into consideration the weather and other effects. Their form gets bigger and sometimes smaller, but always a non-geometric form. This is exactly what the projects of Coop Himmelb(l)au look, buildings that change their forms on a different scale according to the region (climate, culture, the functional program etc.) that will host it. This form takes a new aspect from a project to another or in one project at the same time such as the Astro Balloon Project mentioned before. Wolf Prix defined the cloud when he said; “The cloud interpreted in 1968 as a pneumatic form could change depending on movement and emotional condition of its users” [60].

However, expressing this kind of movement was almost impossible before, because of the lack of programs. But now, the key aspect of the design is the employment of developed computer programs which, increased by searchlights, created on the great expanse of glass flowing, floating illusions recalling clouds or rolling waves. These effects produced an impressive contrast between dynamic statics and a continual flux of movement, which justified Coop Himmelblau in speaking of the principle of “*liquid architecture*” in connection with the structure [107]. These programs as well provided an easy way –if I may say- to create fluid forms using curves and nonlinear forms. The circle and the elliptic for example are defined for the continuity they carry on in their geometrical meaning; this last provided the continuous form concept. Yet at the same time, we would have to admit that the cloud presents us a formless thing that ascends in all senses of the word.

Even if the basic concept was the cloud, Wolf Prix mixes it with other concepts that increase the building’s richness and ensure its integration to its surrounding in order to follow the context. Taking, for example, The Martin Luther Church (Figure 3.18) situated in Austria. In this project, the form was inspired from the shape of the curved roof of a neighbouring Romanesque ossuary. The geometry of this old building was translated into a form, that suit the future architecture, via today’s digital instruments. Its geometry was digitally twisted and prodded into a contemporary swirl of steel [108]. The design of the roofing system is reflected into the interior through openings that follow the general design pattern. The roof here gained also an importance through its remarkable design and its integration to the site.



a) b)  
Figure 3.18. a) Martin Luther Church, 2011. Austria [108], b) the Geometry of the Church Roof [108]

### Transparency

Transparency, simultaneity, interpenetration, superimposition, ambivalence are all synonyms of the effect that characterized the literature of contemporary architecture [109]. By the dictionary definition, the quality or state of being transparent is a material condition that of being pervious to light and air. As Gyorgy Kepes defined it in his book “*Language of Vision*”:

The figures are endowed with transparency: that is, they are able to interpenetrate without an optical destruction of each other(...) Transparency means a simultaneous perception of different spatial locations. Space not only recedes but fluctuated in a continuous activity [109].

Transparency in architecture showed up with the development of the industry and the advanced techniques that provided to the architect wide choices to express his ideas. As Michael Wigginton notes:

With this development, new conceptual languages in architecture became possible, which are still being developed and explored; from the simple provision of light and view without a loss of warmth to the creation of conceptual and technical masterpieces which derived their essential quality from this wonderful material [110].

Philosophers and architects had found difficulties in declaring the exact definition of transparency. As Ascher (2003) explained in his work, how it is difficult to specify its definition due to the various causes of its use. From another point of view, according to

Anthony Vidler, its definition is considered in the transparency of the soul to nature, the self to others, and the self to the society [111].

Architectural transparency had been used all over the world in different types of projects to express either a dematerialization of the building envelop or to design under the concept of the open space or sometimes to express the confluence of form and meanings. Moreover, transparency since its innovation until now had always recognized different limits; cultural, geographical and sometimes typological. Transparency is a term that is used to express visual continuity from outside and through the interior space. It is, in most of the examples, realized by using glass and steel frames.

Walter Gropius's Dessau Bauhaus of 1926 was a perfect example, as was Mies van der Rohe's glass skin buildings. These buildings were the wonderful interpretation of the architectural expression. In addition to the functional introduction to buildings, the glass surface of the building transformed into a structural building skin that may upset the balance between the inner and outer space. In a transparent building, the interior and exterior spaces are interconnected with intimate influence, and give a visual sense of liberation to space, thus pursuing open space. At the same time, the use of transparency in a building creates some kind of ambiguity within the space, through the feeling of need to focus on the transparent part that takes place between the solid materials to show up in the upper level. Transparent materials call for a continuous interpretation of objects beyond its division. In the mid-twentieth, the method of using a curtain wall had spread to become the first concept of a lot of designers who adopt this concept in their projects namely, Coop Himmelb(l)au, Renzo Piano, Le Corbusier, Zaha Hadid and others. Similarly, the architect Frank Lloyd Wright employed the use of transparency to generate movement throughout his designs. The usage of glass form another hand had contributed in the evaluation of the relationship between human and environment. In addition, the passage of light and view to the outside was a noticeable enhancement on the interior environment, which also helped to increase human comfort.

By looking to the cloud concepts applied by CH in all of the projects, we notice the use of a mixture between the glass facades and solid materials. This last reflects the characteristics that a cloud has. Usually, the basic reason for using transparency is to transmit light to the inside, by using not just the glass but also other transparent materials like a crystal or finely



woven [111]. Another reason for using this concept, and is the one for which CH use this concept, is to conserve the continuity between the interior and the exterior. In addition, today's transparency gained another characteristic, which is the image of power and appeal in the architectural designs. “In the public sphere, the word transparency has become excessive, going well beyond the traditional meaning of openness, and in political or economic settings, implying accountability” [112].

In CH designs, the clouds’ concept became a glass-like net structure that loosely defines a semi-public space. The transparency of this shell makes it possible to look at people moving through the layers of light and colour [93]. Transparency from the other hand liberates the user from the solid materials that surround it and gives him the freedom to connect to the outside. Looking to the BMW Welt (Figure 3.19), for example, Wolf Prix used two materials on the façade and in the public spaces inside the building. These materials changes between perforated panels and glass, which gave the building a different appearance that changes from opaque to partially transparent depending on the light direction. Again, Wolf Prix used the transparency concept of the cloud that covers the double cone in horizontal and diagonal directions to fit the form created from one side and the other parts of the building from the other side. This full height glazed facade allows the interior and the exterior spaces to merge and at the same time ensures the visual continuity created by using stainless steel panels in the volume hall. The use of transparency and opacity on the façade gave the building a unique appearance and helped to merge the interior and the exterior. At the same time, it ensured a visual continuity between the interior spaces as well.



Figure 3.19. BMW Welt, Munich [113]



The transparency applied in the projects of Wolf Prix is considered as an indispensable element. Even when he uses opaque faces –for functional reasons- he manages to provide this transparency through the context of the project. In Martin Luther Church Wolf Prix ensured a full lighting of the place by creating three large winding openings in the roof. Here, the number 3 is a very important number in Christianity and according to this last, the numbers were chosen as Wolf Prix stated:

The correlation of the number Three to the concept of Trinity in the Christian theology can be interpreted as a “deliberate coincidence”. The church interior itself is not only a place of mysticism and quietude-as an antithesis of our rather fast and media-dominated times -but also an open space for the community [114]

To resume, transparency represents a concept that will never disappear. Even though Wolf Prix uses it metaphorically to call for the transparency of the cloud, the actual purpose of using it have a functional side which is lighting up the interior spaces, and from the other side it forbid the separation between the inside and the outside in terms of intimacy, and ensure a visual continuity through it.

### **3.3. Projects of Coop Himmelb(l)au Designed with the Cloud Concept**

Wolf Prix and his team designed around 600 projects from which ten percent were realized [115]. However, in every project the Coop Himmelb(l)au team tries every time to invest all of their forces and ambitions to move the design one step further despite all of the difficulties they face. For this reason in each project, variety of complex visual effects they create. Wolf Prix stated that the aim of their architecture is to be noticed because it is worth it. For them, a good architect is the one who thinks about both the content and the function along the form, but not only fixing himself to the content. In the table below, some of CH’s projects with the cloud concepts have been chronologically ordered.

Table 3.1. The chronology of CH's projects

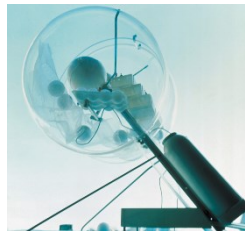

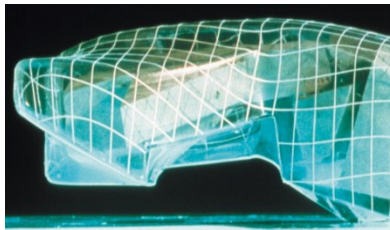

Project Name		Images
<b>The Cloud / Villa Rosa -1968</b> This project was a study of living forms for the future. It reacts emotionally, inflates, and imitates the colours, the sounds and even smells. It represents an analogy of the cloud concept that has no relation with the context.		
Mutation:	Analogy → Cloud	
Context:	Placeless	
<b>Rooftop Remodeling Falkestrasse - 1983/1987</b> This project represents an analogy of a living creature that was actually extracted from the front street' name called Falcon Street. Despite the fact that the building is an extension of an existing building, it have no relation with the visual context It is more a representation of the context defined in the relation between the roof and the street semantically.		
Mutation:	Analogy → Living Creature Metaphor → Relation between the front street and the shape of the building	
Context:	Placeless	
<b>Cloud #9 - UNO Genf - 1995</b> This project is another mutation of the cloud concept. Wolf Prix designed it against the static plan of the city, which means separately from the context. Because he wanted to change the city with a changeable concept as the cloud. (Farrelly, Crowson, 2015)		
Mutation	Metaphor → Cloud	
Context	Placeless	
<b>BMW Welt - 2001</b> The idea behind this design was a mixture of metaphor and analogy of the cloud and a hurricane represented as a double cone form. In this project, the design was more like an advertisement for the brand through the architectural design. For this reason, it has no relation with the context. It is another personal presentation of CH's design.		
Mutation	Metaphor → Mark (BMW) Analogy → Hurricane	
Context	Placeless	

Table 3.1. (continued) The chronology of CH's projects




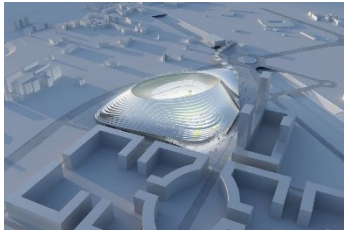
<b>Busan Cinema Centre - 2005/2012</b>  In this project, Wolf Prix gave a huge importance to the roof, as he considers it as an architectural element that can stand for itself. Therefore, the result was a metaphor of a mountain-like form and a cloud-like floating roof with no relation to the context, but built to be a landmark in the city.		
Mutation	Metaphor → Mountain + Cloud	
Context	Placeless	
<b>Museum of Contemporary Art &amp; Planning Exhibition (MOCAPE) – 2007/2016</b>  The MOCAPE design was based on the idea of filling the gap of the cultural district in the site. In addition, The mutation of the cloud was metaphorically applied. However, the first priority in this project was the integration of the building in the context. So, just like the other buildings of the district, the cloud was conceived 10m above the ground with a plaza in front that actually unifies it with the other buildings. Along with the choice and colour of materials that reinforced its integration.		
Mutation	Metaphor → Cloud	
Context	Belongs to the place	
<b>Martin Luther Church – 2008</b>  The form was inspired from the shape of the curved roof of a neighboring Romanesque ossuary. This last was then translated into a form, in line with our time, via today's digital instruments. Due to the use of analogy extracted from the surrounding, this building was visually integrated into the context.		
Mutation	Analogy → Romanesque ossuary	
Context	Belongs to the place	
<b>Soccer Stadium Zaragoza - 2008</b>  This project was designed to reflect the future city extension. Its concept was a mixture of an umbrella and a stadium. Prix calls it umbrella concept, because its roof will act as an umbrella that will protect the visitors in the tribune. Because Wolf Prix intended to reflect the future, he did not integrate the building into its context.		
Mutation	Analogy → Umbrella	
Context	Placeless	

Table 3.1. (continued) The chronology of CH's projects



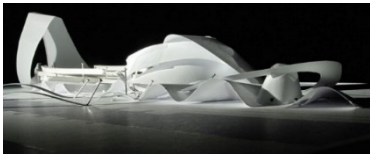

<b>Chess Academy Baku - 2010</b>  The idea behind this building was a metaphor of the cloud applied in a way that allows the building to become the visible icon for the chess community coming from the city side or the seaside. The shape of the building was lifted from the ground to give the sense of floating. However, Prix did not take the context of the site into consideration during the design. He mostly thought about the function in order to attract the chess community to come.		
Mutation	Metaphor → Cloud	
Context	Placeless	
<b>National Art Museum – 2010</b>  The museum represents another metaphor of the cloud concept realized according to the Chinese tradition that Wolf Prix calls it the 3 dimensional Chinese garden. Here, the floating cloud will house in the centre the black flower, which is a space that groups the media and digital art. The interior circulation is also realized through bridges ramps and stairs that connects all the spaces.		
Mutation	Metaphor → 3D Chinese Garden + Cloud	
Context	Belongs to the place	
<b>Culture and Art Centre Changsha – 2011</b>  Another project proposition of Prix in China, in which he always tries to integrate the Chinese garden elements (water, stones, hills, bridges, etc.) in the project to create a significant urban shape. Through this design, Prix transformed the art centre into a public space by integrating leisure facilities and landscape roof with pedestrian walkways like the sweeping bridge that provides a promenade besides the waterfront.		
Mutation	Metaphor → Cloud + Chinese gardens	
Context	Belongs to the place	
<b>Silk Leaf Stadium – 2012</b>  Wolf prix explained his idea in this project as a modern Greek acropolis, by positioning the stadium on an elevated plinth covered with a shell-roof that falls above the building like a falling silk and meets the ground in four points. The interpretation of the basic gene was realized analogically in this project. It could not be said that it is related to the context since Prix did not consider the Japanese traditions.		
Mutation	Analogy → Leaf Metaphor → Greek acropolis	
Context	Placeless	

Table 3.1. (continued) The chronology of CH's projects






<p>The Dalian International Conference Centre – 2012</p> <p>This project was designed by taking into consideration the Chinese traditions. It is semantically related to the context, as it will be explained in the coming analysis.</p>		
Mutation	Analogy + Metaphor → Cloud and Traditional Chinese city	
Context	Belongs to the place	
<p>Musée des Confluences - 2014</p> <p>The project is a representation of the metaphor of two elements that represents knowledge, the cloud and the crystal, the known and the unknown. However, its integration into the context was failed because Prix did not take into his consideration the city nor the surrounding building's history.</p>		
Mutation	Metaphor → Cloud + Crystal	
Context	Placeless	
<p>Arvo Pärt Sound Cloud - 2014</p> <p>This project represent another idea extracted from the design-gene pool of Wolf Prix. The cloud concept is applied with a different method, which is a group of musical notes inspired from the song named "Spiegel im Spiegel". The design is then effected by transforming the main sequence spectrogram of the song into the curves of a roof.</p>		
Mutation	Metaphor → Semantical translation of Arvo Part's song	
Context	Placeless	
<p>The Pearl of the Emirates - Expo Dubai 2020 - 2015</p> <p>The reason behind using the metaphor of the pearl in this project was the past of the city that once used pearls in time where oil was not discovered yet. Consequently, the building is related visually to the context. However, this pearl was kinetically designed according to the path of the sun. This way, the exhibition building actually changes its shape many times during the day. Along with the pearl, the landscape also was designed by using native mangroves.</p>		
Mutation	Metaphor + Analogy → The Pearl (Connection with the history of the city)	
Context	Belongs to the place	



Table 3.1. (continued) The chronology of CH's projects

<p>The 5th World, Russell Means Library - 2015-2017</p> <p>This building is designed in memory of Russel Means, an Oglala Lakota patriot that served the American Indian people. The basic concept in this project was mutated semantically in order to represent the traditions of the American Indian community. Three elements were used; a round bowl that represents the traditional Kiva structures, a transparent dome, and a series of horizontal planes that express the horizon.</p>		
Mutation	Metaphor → The traditional Kiva structures	
Context	Belongs to the place	

According to table 3.1, a study of the projects of CH was held according to the mutation of the basic concept (the cloud). Through this classification, the method of mutation and the connection of each project with its context has been explained in the next table.

Table 3.2. A general study of some projects realized by CH (The author)

COOP HIMMELB(L)AU	A BASIC CONCEPT / GENE					
	Mimetical					
	MUTATIONS					
	can locate anywhere (general)			belong to the place (local/regional)		
	ANALOGY	COMBINATION	METAPHOR semantically	ANALOGY visual	COMBINATION	METAPHOR semantically
The Cloud / Villa Rosa	●					
Rooftop Remodelling Falkestrasse	●					
Cloud #9 - UNO Genf	●					
BMW Welt		●				
Busan Cinema Centre / Busan International Film Festival			●			
Museum of Contemporary Art & Planning Exhibition (MOCAPE)						●
Soccer Stadium Zaragoza	●					
Martin Luther Church					●	
Chess Academy Baku		●				
National Art Museum						●
Culture and Art Centre Changsha						●
Silk Leaf Stadium		●				
The Dalian International Conference Centre					●	
Musée des Confluences			●			
Arvo Pärt Sound Cloud	●					
The Pearl of the Emirates - Expo Dubai 2020					●	
The 5th World, Russell Means Library					●	

From those examples, The Dalian International Conference Centre (2012) (related to the context) and Les Confluences Museum (2014) (not related to the context) have been analysed to understand the design methods that Prix used through the repetition of the cloud concept with mutations. The two projects were chosen because of the huge formal similarities between the two of them that, Wolf Prix in many interviews admitted the use of the cloud concept in both of them. For this reason, an analysis was held on the examples to discuss the cloud concept as a basic gene and to see how the architect was able to apply it in two different contexts. At the same time to see whether he used the cloud concept relating to the context or just it was his cloud passion.

### **3.2.1. The Dalian international conference centre, Dalian, China (2012)**

The urbanistic task for the design of the Dalian International Conference Centre (Figure 3.20) is to create an instantly recognizable landmark of the urban development in Dalian that connects the modern life with the Chinese traditions. At first, it was going to be a hotel with a conference centre, but then, the hotel idea was replaced by an opera house. With this change, the architect used a common and a popular building type organization, where several cultural venues (theatres, conference spaces) are covered by one big shell.



Figure 3.20. The Dalian international conference centre, China [116]

To start the study of this project, first the shell will be analysed. In this project, Prix applied his basic concept differently. First, he started by studying the surroundings of the site in



order to decide the way the cloud will be applied. After this study, the Dalian Centre's main form was extracted from the intersection of the two main axes, which takes the form of a triangle (Figure 3.21). The footprint of the building on the site is therefore arranged in accordance to the orientation of the two major urban axes, which merge in front of the building. Following this intersection, Prix shaped the program of the building as a shell that covers several cultural venues by following roughly triangular shapes, unlike other architects that start with Euclidean geometry. The designer used forms that are stretching and pushing the building counter to the outside as explained Wolf Prix, "you have the feeling the inside pushes on the skin" [117]. This technique was first used by CH in the project of Malibu House. This last allowed him to create a sculptural shape and a new geometry. Remarkably, the created shell takes the form of a huge cloud that transforms in some places to fit the plans' functional ideas, and at the same time, preserves and represents the building's complexity opposite to the surroundings. Wolf Prix designed the building as omnidirectional forces that deform inside out. Its façade is shaped by using forms that wrap and spaces that bend out of sight. From another point of view, the building is lifted from the ground plan at 7m, which gives it as well the appearance of a flying cloud. The architect chose a distinctive mutation of the cloud again in order to create a symbol in the city that people will be capable to remember and describe, which means that they can take an emotional position from the building [117].

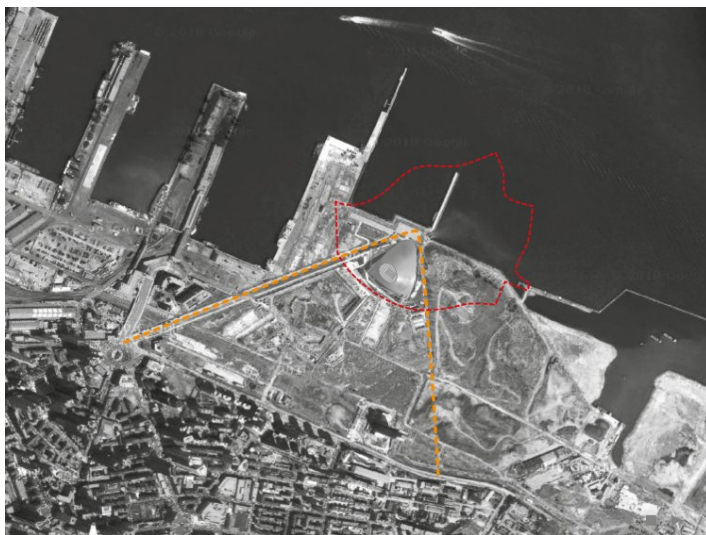


Figure 3.21. The situation of the building according to the major axis [116]

Passing to the interior organization of the project, the building is conceived to receive up to 6.000 persons at a time. For this reason, the architect merged different other concepts extracted from the context to express his idea. He designed the building urbanistically by conceiving the gaps as streets, avenues, and plaza and completed with bridges, ramps, stairway and dead ends just like a real town. (Figure 3.22) The building is an artistic complexity with forms that wrap and spaces that bend out of sight. Forms and spaces that are extremely interlocked through fluidity, continuity, and dynamism, as Wolf Prix stated, "liquid, fluid, dynamic, continues spaces are the new space of our century." Still, the building is "complex without being complicated" Prix said, and the interior is easy to navigate due to its logical organization around the opera house and the open space concept that allows for a free movement from a space to another [117]. Prix designed the inside in a way that allows the people to never get lost inside: "we have created a liquid, animated building – a little city for 6.000 people" [118]. The use of same material aspect in the interior as well as on the façade created a continuity of the city to the inside. Cui Yan the chief architect at the Dalian Architectural Design & Research Institute explained the feeling inside the building as "you are walking around the city" [118]. So here, Prix did not get this characteristic from the cloud, but from the traditional Chinese city, in order to create an organization of large space surrounded by small ones. Because, by looking to the old Chinese city (Figure 3.23) we can clearly see the palace that takes the centre place of the organization surrounded by small-scaled spaces.

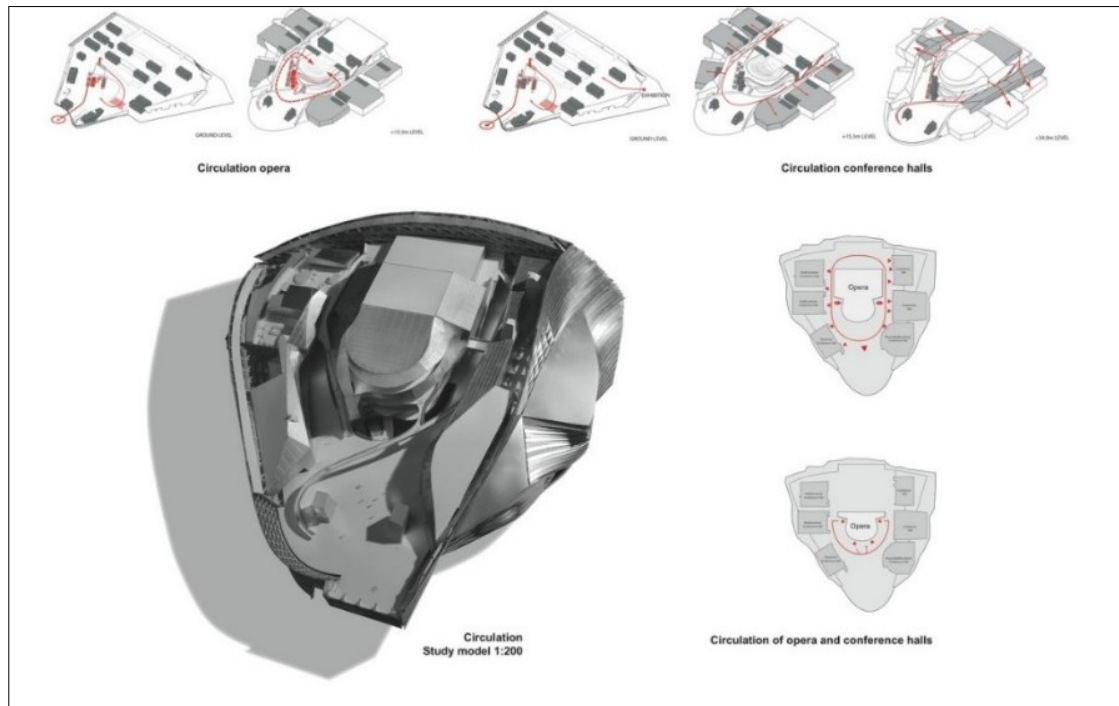


Figure 3.22. The functional plan of the centre [119]



Figure 3.23. The “Forbidden City” from the middle ages in China [120]

As the Figure 3.23 illustrates, the ground level was designed as the main plaza that welcomes the public coming from outside. It contains spaces only for communication like lobbies, catering zones and gardens. However, the conference rooms and the opera are placed in the upper floors and are accessed by the ramps and escalators. At the same time, bridges just

like the Chinese gardens (Figure 3.24) (Figure 3.25) connect these levels. Because of this organization, the heart of the building was given to the opera that consists more than 1.600 seats. The opera covers three levels and is connected to the Banquet Hall. The open plan concept that Prix usually apply in his plans was implemented in this part. The walls that connect these last spaces are flexible walls that could change in order to give space to a flexible multipurpose hall to be created. As for the conference rooms they were arranged around the core (the opera) and their form pushes and penetrates the façade, which made this last looks like the wings of a ship.

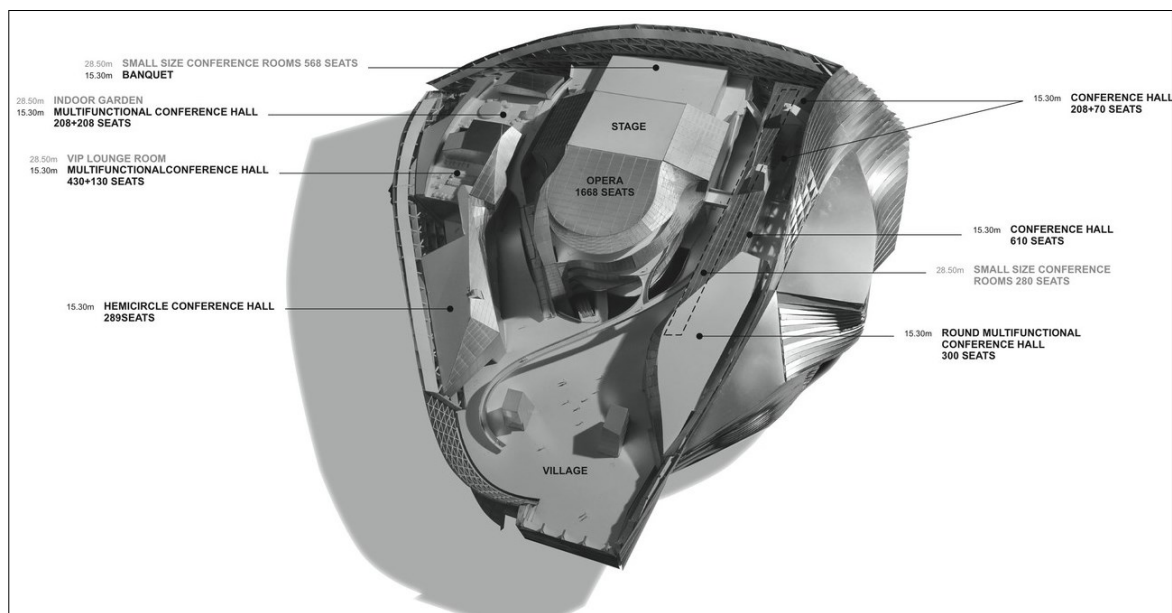


Figure 3.24. The building's interior organization [119]



Figure 3.25. An example of the Chinese gardens (The Humble Administrator's Garden) [120]



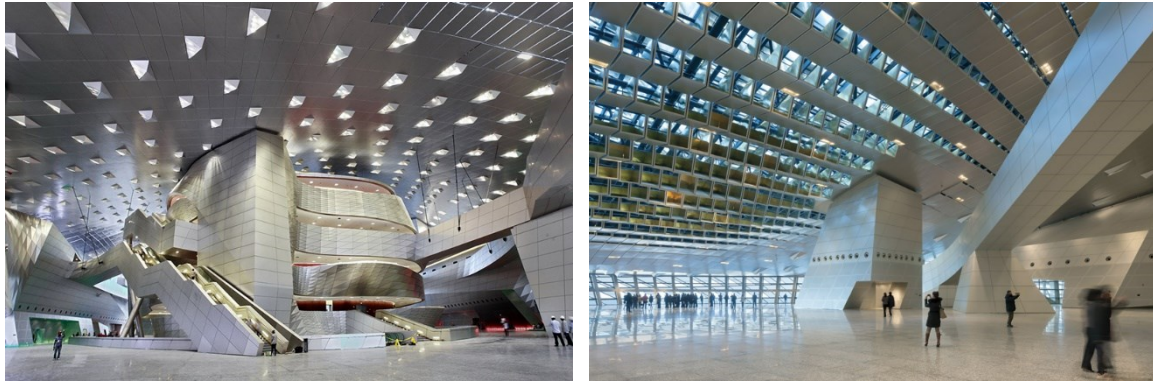


Figure 3.26. The inside circulation of the Dalian conference centre [121]

From the other hand, the main idea behind the creation of such an organization under that building's form was to design a town from the middle ages. Where there is a theatre, which is, in this case the opera house, in the centre surrounded by other cultural spaces. The opera at the same time will be accessible from all the spaces. This idea shows that Wolf Prix created a visually complex building from the outside, but its interior navigation is easy due to its well-planned organization. It is true that Wolf Prix pay more attention to what the building would look like when finished from the outside as much as its interior. In fact, although the project looks complex and ambiguous from the outside, from the inside it is planned according to its function with an easy human mental mapping. According to him, all the spaces are connected and easily accessed.

To conclude, the project of The Dalian Conference Centre represents a challenge to create an instantly recognizable landmark. It seems like Wolf Prix used cloud concept as his basic design combining it with the Chinese traditions, along with new modern technologies. This mixture resulted in a very iconic building with a special richness. Looking to the design concept, the cloud in this project was applied semantically as a huge shell that covers cultural spaces in order to represent the old Chinese city. However, this cloud concept represents only the exterior form of the building and have no relation with the inside conception. In addition, the arrangement of the spaces and the interior circulation follows other concept in this project, which is an old Chinese town from the middle ages. Through this concept, all the spaces became easily accessible and connected to each other with the open space theory. This last, shows how Wolf Prix merges the basic concept (the cloud) in the project to cover another concept, which is a town from the middle ages.

### 3.2.2. The musée des confluences, Lyon, France (2014)

The Confluences Museum sits at the tip of a peninsula on one of the most spectacular sites in France, the confluence of the majestic Rhône and Saône Rivers (Figure 3.27). It offers visitors an approach that sparks our curiosity and desire to learn. From the birth of the universe to biotechnology, from biodiversity to health, from the history of time to the great challenges we are facing today, from genetics to the representation of death, the Museum touches upon all of the major themes involving Mankind and its relationship with the world. The Museum is unique in its modern approach and its lofty ambitions. It links the sciences and humanities in order to understand the world around us and the way it is changing. For this reason, its architecture as well has to be a source of curiosity and wonder.



Figure 3.27. The museum of the confluences, France [122]

The remarkable shape of the museum was extracted from the cloud d-gene, which covers two stories of black-box galleries and resembles a spaceship, and the crystal that marks the entrance with a glass-and-steel shape. The exhibition space floats above a concrete podium that contains two auditoriums, conference rooms, and service areas. In this project, the architectural organization was designed according to the first building program of Coop Himmelb(l)au in the “Wolke” project, which was as follows: the base, crystal / the wing and the cloud / exhibition space (Figure 3.28).

Here the mutation of the cloud concept takes a different shape. As for the wing that covers the circulation of the building in the Wolke project, here it was presented as a crystal put first, to present the main entrance by separating the building’s main core from the outside

and second, to adopt the circulation box, noticing that the crystal contains a long ramp that leads to the cloud. From the other hand, the cloud as well floats behind the crystal in order to give birth to the base, which contains the structure that supports the cloud and at the same time allows for people coming from the river to pass to the city under the building.

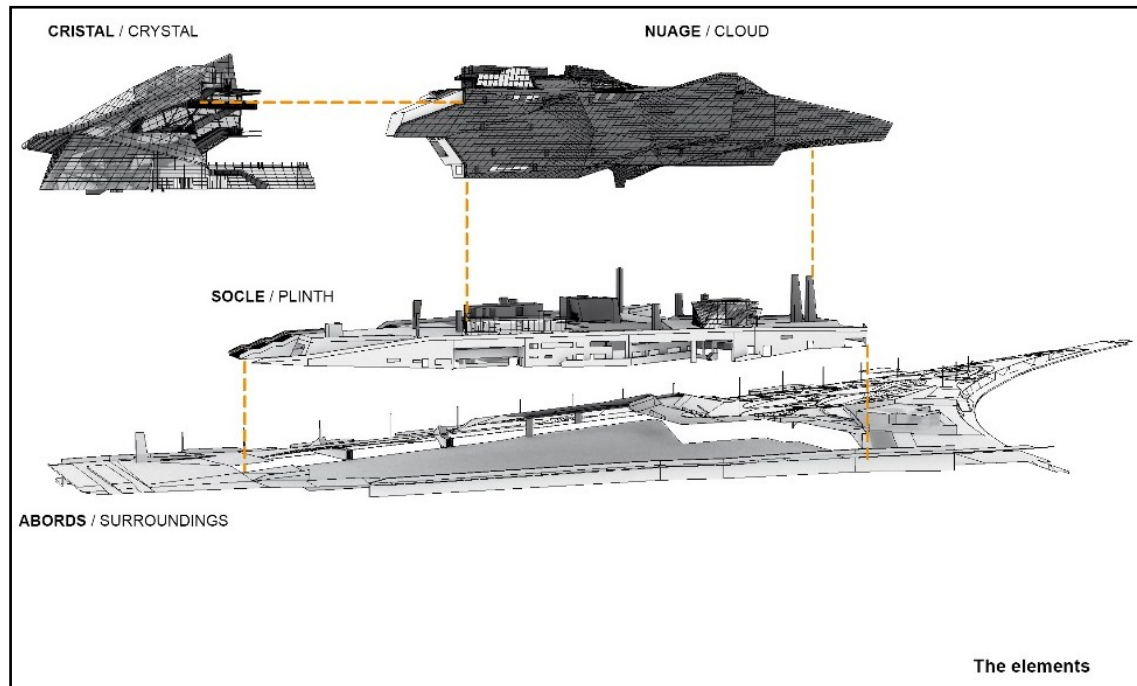


Figure 3.28. The different composers of the building [122]

The design of this project started with the psychogram technique (Figure 3.29). The first sketch and the resulted building are the same just like all the other projects Coop Himmelb(l)au designed. The idea behind the design of such special, rich and complex form was not based just by focusing on architecture. As W. Prix said (2015), the spacesuits, space hamlet, education fascinated them; even music was a source of inspiration for them. They were very important elements, even more then Vitruvius and Palladio, as thinking about architecture will only give architecture. However, thinking about all the psychological sides of the surrounding will result in a functional and dynamic building [123]. Therefore, all the shapes that are found in the building of Musée des Confluences are connected to the content. Every form or move that Himmelb(l)au made was according to a function that suits the content of the building without limiting the freedom of the designer. However, the forms that Wolf Prix chose for this project are noteworthy because one of his principals is to defeat peoples' fear of complex forms. From the other hand he used different elements that have the ability to provoke people to observe, ask, understand and then to accept it. This eye-

catching building holds the signature of CH through the familiar concepts he uses in the design.

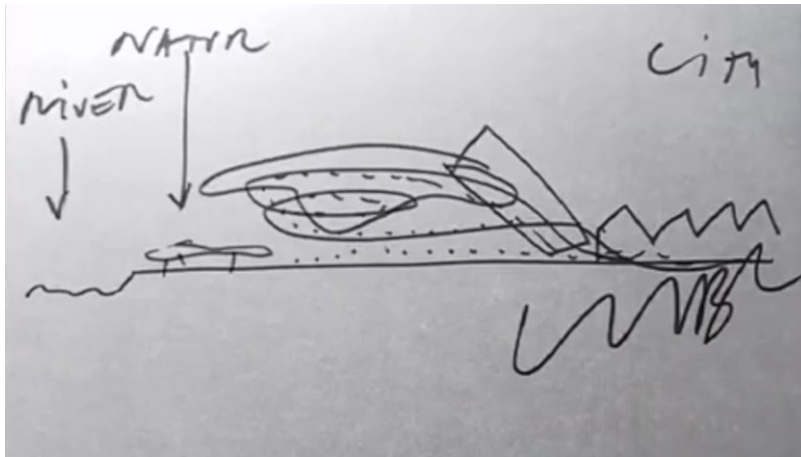


Figure 3.29. The first sketch of the musée des confluences with the eyes closed [122]

The idea behind the design of this museum goes back to metaphor too, which is explained in the use of crystal and clouds. These two elements respectively symbolize the known and the unknown, the clarity of the familiar environment we know today and the hazy uncertainty that the future holds in store. In architecture, these themes are expressed by formal mutation, penetration, deformation, simultaneity, resolution, and changeability. Radiating an aura of constant movement, the shape of the Confluence Museum illustrates the complexity of the themes presented within it. Due to its context, it also suggests the infinite diversity of knowledge and the many uses of this multi-purpose venue, specially created to host all types of audiences thirsty for discovery, culture, and entertainment.

From the other hand, the architecture of the building is based on two important principals: the first is to ensure the continuity between the city and the rivers without creating a view-blocker building. To do so, Wolf Prix designed the building as a floating cloud, which allowed creating a public open space under the building to guarantee a free passage of people coming from and going to the city (Figure 3.30). At the same time, enjoy the special landscape it was designed which Prix explains it as a design that will not block the pathway from the urban fabric to nature, preserving the flexibility of the building and its connection to the environment. The same as he explained in an interview with the Goethe Institute when he said:



What we don't want to do, we don't want to build a box that has a wall here and people can't walk through on. They are blocked, locked out. What we did was; we built a cloud with a pathway so people can pass through it. Below down there, of course, there is a beautiful landscape [124].

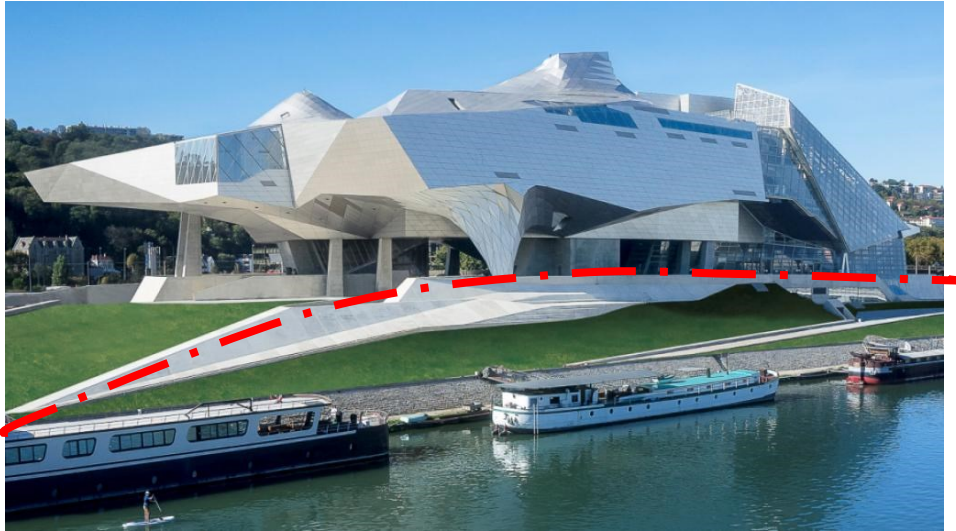


Figure 3.30. View of the confluence museum from the riverside [125]

The second principle is to separate between the entrance and the building's core, to create some kind of public, semi-public and private spaces. For this reason, Wolf Prix created the building as two attached elements: the cloud and the crystal.

The entrance of the building (Figure 3.31) is marked with a metaphorical crystal of steel-glass structure of 30m height that Wolf Prix chose in order to play the role of a calling point to attract people to come over. It is a full transparent building visible to the outside and considered the part of the building the most exposed to the natural daylight. The Crystal performs like an urban square, receiving visitors and preparing them for the museum experience. It is a very luminous pole of meeting and principal distributor of all interior movements through the long ramps that spins to the top passing by the different floors. Remarkably, Wolf Prix used the transparency concept in this project in the entrance precisely to open the building to the city and ensure the continuity between the inside and the outside. However, in winter and summer Crystal's temperature is regulated by its sunscreen and heating and cooling system in the floor. This last ensures its functional side. In addition to the exterior effect of the crystal, its inside also is provoke curiosity with the vortex-like hole that takes part in the middle of it called by the architects as "Gravity Well" [126]. This vortex

is actually used for structural reasons. However, Prix used it also to express the turbulences that occurs at the meeting of the Rhone and Saone.

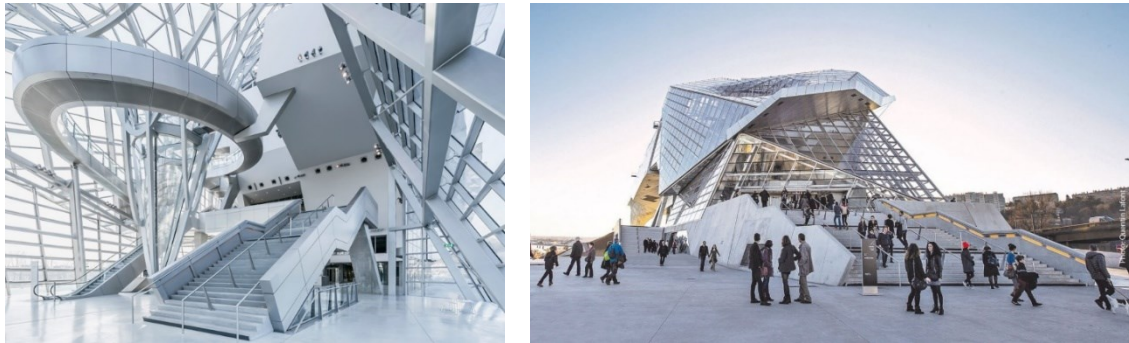


Figure 3.31. The entrance to the museum through the crystal form [122]

The cloud represents the roof of the building. As Oscar Niemeyer said, the roof is the frame for the view of Das Canoas House that completes the concept and not just as an additional element. Le Corbusier as well puts a meaning and a whole development that not just affected the roof's design but also gave it a big importance. Moreover, by following this principle, the architect has used a combination of forms that expressed the Clouds theme. We notice that the cloud is a closed space that does not have many openings, which is also for a reason. The cloud consists of dark boxes, in which all the exhibition rooms are located. The designer wanted to take people to the period in which the exhibition was used. To do so, he preferred a blind space lighted slightly with artificial lights. The connection between all of the exhibition rooms is affected by internal streets, areaways, stairs, and lifts.

The cloud is a combination of approximately 35 geometries that came together in a very dynamic and smoothie way [122]. Since all shapes were taken according to a function, no deformation was randomly made, and the result was a 3D expression of today's society. An expression defies the fear of change and development. From the other side, when looking to the roof we can notice its immense resemblance with the cloud. In this project, Wolf Prix tried to design the cloud itself above the building. A form programmed across three levels, three permanent and seven temporary exhibition galleries are connected with a fluid circulation route. The configuration of the exhibition halls further establishes the themes of variance and complexity, with enclosed black boxes alternating with open gallery areas. Externally, ramps and pathways link the structure with an adjacent park, forming an integrated public square. As Wolf Prix (2015) explained:

We always want to conquer space, since we are not in a space without gravity.... Since we cannot live or move in a place without gravity, they wanted to realize a place where people can move freely. In order to achieve that, the designer ensures the continuity and the fluidity of space by relating the entire interior into each other by long bridges, ramps, and stairs. At the same time, the complex richness of the building is figured out by the absence of straight lines. While walking in the interior, you only see bending and spirals that gathers the spaces to one point, which is at the same time the meaning of the museum's name, "coming together, or flowing together [127]

Summing up his thoughts, Wolf Prix was inspired by the situation of the building, the superposition in urban space of two complexly linked architectural units; crystal, and cloud. Complex in terms of mixed structure but yet simple as two objects that can define so many psychological feelings. The result of this mixture was a unique architecture, which blends the purity of crystal with the softness of clouds. The cloud structure, floating on pillars, contains a spatial sequence of black boxes admitting no daylight, in order to achieve maximum flexibility for exhibition design. By contrast, the crystal, rising towards the city side, functions as a transparent urban forum; it faces the city and receives visitors (Figure 3.32) However, through this analysis we can notice that the application of the cloud in this concept did not consider the located site. Because, despite the tremendous shape of the building, yet it was not integrated in its environment nor with its history. The form were chosen only according the museum definition, in order to generate curiosity and wish to learn and the result was a complex building that can take place everywhere.



Figure 3.32. Section of the museum of confluences (CH, 2010)

### 3.3. Evaluation

Through the analysis made on two of Wolf Prix's projects, and the results of the table 3.2, it has been seen that the actual purpose of Wolf Prix is to create and show in priority his

designs. The Dalian conference centre represents an example about how Wolf Prix integrated the project semantically in the context, so that the population of China could accept the project. The use of element from the Chinese gardens and an internal organization extracted from an ancient Chinese city contributed in increasing the coherence of the building with its context. However, the Museum of Confluences was more like an iconic building, a landmark, in which Wolf Prix gave more importance to the formal shape of the building and function than to the context itself. The use of the cloud and crystal to express knowledge contributed more in generating curiosity of the viewer to ask and then come to learn.

The basic gene that wolf prix chose for his projects has been continually repeated in almost every project. This repetition, from the other hand, contributed in creating the identity of Coop Himmelb(l)au and reinforced their conceptions. However, having an architectural identity does not always help in integrating the building in its context. Because, identity without context creates only unfamiliar buildings that does not belong to their place, however integrating the building into its context creates a coherent architecture. Since the first chapter, we mentioned the fact that Wolf Prix through his firm CH aims to change architecture and to build to the future. Actually, these statements already shows the fact that Wolf Prix through his d-gene pool collected based on the basic gene, aims to create his own identity.



## 4. CONCLUSION

Renzo Piano defined architecture in an interview as follow; “Architecture is not construction. Architecture is art, but art vastly contaminated by many other things. Contaminated in the best sense of the word – fed, fertilized by many things” [128]. This art is also contaminated by other factors, such as philosophy, technological developments, science and even nature, which generates in designs the wish of change, protestation and development. In fact, this contamination also contributes in the creation of an architectural identity, through which an architect can be defined by his own principals extracted from a mutation of a basic gene. Karina Moraes Zarzar has studied the origin of the architectural identity and came up with the *d-gene pool* system that allows the architect to create his own identity by repeating the same concept with mutations. This concept is generally something that the designer was influenced by before, and adopted it through because it expresses his thoughts the most.

In the design process, the mutations of one concept might be applied mimetically, that is either analogically or metaphorically. In addition, these mutations might sometimes be connected to the located site either visually (providing actually a visual relationship to the environment) or philosophically and other time, it might be detached completely from it, which make of it a design that can be realized everywhere. Moreover, the designers have to work thoughtfully while designing public spaces in order to ensure the inherence in the geographic region. As shown in this work in terms of Massimiliano Fuksas, metaphorical use intensely contributes in the creation and the reinforcement of the identity. The way that the Italian architect applied the repetition of his organic concept is unique. He imitates the landscape in priority on the building’s form in order to ensure its integration in the site and at the same time its acceptance from the habitants. However, he only focus on the landscape and not on the history of the city. For this reason, most of his designs can actually be placed everywhere. From the other hand, in the analysis of the architecture of Snøhetta, it was clear that the architects fight in every project for their values and philosophies. Starting from the “Bibliotheca Alexandrina” until their last project Solobservatoriet at Harestua, a remarkable development of their concept with mutations had contributed in the creation of their identity. However, this process did not stop them from creating new architectural forms and integrating it in their located site as well as in the history of the city, which, of course, reinforced their identity

In the study of the concept formulation process of CH, it has been explained how the fact that Wolf Prix got his influences from the cloud, and the successively repetition of this concept with mutation had contributed in the production of a d-gene pool. If repetition is mentioned, then Deleuze theory of repetition and difference is considered as an important argument, which explains the process of creating an architectural identity. Deleuze defends the fact that repetition is a creative way to produce, encourages it because it allows for the production of variation, and holds in it a positive power of transformation. However, the produced repetition would be just a replication, but repeat with a difference is an infinite process that creates an eternal return, every end represents the beginning of the next [129]. Therefore, the cloud concept that Wolf Prix repeated in almost his entire project was a successful approach to create buildings that calls for CH.

Because the application of his design methods remains mysterious, all architects and critics focus only on the visual characteristics of Wolf Prix's conceptions. Michael Sorkin thinks that the architecture of CH is derived from chaos theory and fractal geometry. According to him, the method of work of Wolf Prix based on psychogram is an analogy to automatism, which means designing through the nonlinear process [130]. As for Charles Jencks, he sees it as a violent complication of twisted and wrapped shaped, which CH intend to realize at the first place in his designs [131]. According to him, architecture must express today's way of living, but at the same time, it has to express science, technology, and philosophy. If in the classical period, forms followed tradition and in the modern period forms followed function, then in nowadays forms must follow the worldview. In another argument, Jencks argues that the work of CH can be described as violated perfection as it relies upon the perversion of pure and predictable geometric forms;

The perfect white cube suddenly smashed, skewed and skewered into a frenzy of oppositional forms. Another such crescendo occurs in the adjacent powerhouse where the chimneys suddenly tilt off the right angle. In both cases, a rational predictable solution is partly violated by an expressive outburst and the balance of one and the other is mutually heightening [76]

Anthony Vidler, on the other hand, thinks that CH replaced the Vitruvian understanding of creating buildings by focusing on pure geometry and the ideal body with a new understanding based on generating forms by rearranged or reconstructed body. Despite his psychogram drawing technique that is based on people's feelings inside the space, Vidler

thinks that the architecture of CH represents an architecture anti-humanist that works to break the relation between the body from architecture [80]. Anthony Vidler in his work (1990) explained his comments of separating the body from architecture by stating that architects like Coop Himmelb(l)au, Bernard Tschumi and Daniel Libeskind are concerned to reinscribe the body in their work. However, these architects, by incorporating metaphor in their concepts,<sup>3</sup> they create forms based on a body that is far away from the humanist tradition. He explained the human metaphor from an architectural point of view when he said;

Evoked as referent and as generator of an architecture that stands, as Coop Himmelb(l)au has insisted since the late '60s, against 'Palladian' humanism and Corbusian modernism alike, this body no longer serves to centre, to fix, or to stabilize. Rather, its limits, interior or exterior, seem infinitely ambiguous and extensive; its forms, literal or metaphorical, are no longer confined to the recognizably human but embrace all biological existence from the embryonic to the monstrous; its power lies no longer in the model of unity but in the imitation of the fragmentary, the morselated, the broken [132].

However, in fact, Wolf Prix during his designs gives a huge importance to the relationship between building, human and the continuity of the urban into the building. This last is translated in different projects, for example, the open house, the Astra Balloon project and others. For this reason, Wolf Prix designs with the eyes close, so that he will be able to live the space and make it interact with the future desire of the user.

In the research made by Ostwald (2000), he stated the comments that other architects and critics had against the architecture of Coop Himmelb(l)au [58]. Geoffrey Broadbent for example, noticed the use of insects analogies and metaphors in Coop Himmelb(l)au's work. He explained it through the project of rooftop remodeling in Vienna (Figure 2.5) when he said; "a light, airy and rather joyous thing; as if an insect has settled on a roof made of leaves, eaten all but the stalks and the veins leaving gossamer spiders' webs between them!". This project is considered as the first deconstructivist building, for this reason, other architects such as Jencks who claimed that the building looks like a skeleton of a flying creature. Michael Sorkin from the other side always refers to butterflies in Coop Himmelb(l)au's

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<sup>3</sup> Metaphor and analogy in CH's projects did not take just the formal resemblance since CH was also inspired from the music of The Rolling Stones. However, as Wolf Prix explained, their inspiration had no relation with The Rolling Stones' songs but with their action of singing against all trends as long as they think it was right to do, and in their case creating an image of a new architecture.



presentations. These comments are actually extracted from an analysis made with the naked eye that shows the fact that CH uses metaphors of insects in their design as sub-concept with the cloud. These metaphors are actually the points that reinforce the identity of the architect, and increase the ambiguity of his designs.

Moreover, insects in general, and butterflies in particular, are considered the metaphors in CH's architecture. In his article namely; "Post-rock Propter Rock: A Short History of the Himmelb(l)au" Michael Sorkin emphasize on the fact that the architecture style of CH in the late 60s and early 70s was the pneumatic. It consists of exalting the personal and putting people at the centre of the spheres of the thinnest polystyrene in order to give more importance to sensation and tension, in another word biologizing everything [82].

The architecture researcher Otto Kapfinger stated that the architecture of CH "illustrates the permanent decomposition, contraction, fracturing, and chaos of the urban dynamic." Because, chaos represents the opposite of geometric order that is represented by forms and relationships, which are complex and difficult to describe with the language of classical mathematics [132]. This last is expressed through the fragmentation of simple lines, the combination of different geometric forms, which is classified under the movement of deconstructivism, and which led to a formal chaos in the architectural composition of CH.

Philip Johnson and Mark Wigley classify CH as deconstructivist architects [57]. As Mark Wigley claims, that deconstructivism is a movement that is involved with the extreme fragmentations of diagonal forms such as the ones used by CH. From this remark, it can be said that CH also followed deconstructivism and realized many projects by applying its principals. Philip Johnson saw the unusual forms and techniques that this company along with the other invited architects uses to create their projects. Cook and Llewellyn-Jones think that the conception of Coop Himmelb(l)au can be resumed in the "twisted," "*spiky*" and "*frenzied*" forms they design.

Looking back to the architects and the philosopher's critics, we can see that the aim of CH was achieved, which is creating buildings that resist interpretations. Deleuze defended the fact that repetition is a creative way to produce, as it holds in it a positive power of transformation. The continuous mutation of the cloud concept in each project resulted in a final complex design that everyone translates it according to his thoughts and understanding level. Similar to Deleuze, Coop Himmelb(l)au believes that each repetition represents a new

idea for a different design to be born. The designed projects do not hold any similarity or resemblance between them, but instead, the mutation of the repeated concept hides the actual concept, which proves that architects repeat their concepts to experiment, to reinvent, to transform and finally to have something new that also represents their identity. So Coop Himmelb(l)au takes every design as an opportunity to interpret the concept of the cloud as it explores a new idea that has its own context each time.

By looking to the first and the last project of the firm, we can notice that the mutation of the basic concept progressively getting larger and big but at the same time the main principals did not change. Their first project of the Villa Rosa (Figure 4.1.a), which represents the development of the Cloud project designed for “Living forms for the future” consists of a small-scale habitation that can react to people needs emotionally by imitating colours, sound and smells. In this project, the cloud represents the exterior envelop of the building and the inside is realized according to the open plan principal in order to free the user and to not pin his future actions.

However, the last project, which is the fifth World Russell Means Library (Figure 4.2), is considered another mutation of the cloud in which Wolf Prix merged the traditions of the Kiva structures of the American Indian people but at the same time, it respects the environmental surroundings and ensure the continuity of the exterior by creating fully transparent places. Still, the shell of the building takes the form of the cloud, the interior designed according to the open plan principal with bridges and staircases that connects all the levels. In contrast to the first building, the project presents a large-scale building. So, the mutation of the basic gene of the cloud over time is actually getting bigger in contrast to the first project. Yet, the principal of transparency and open plan was preserved in almost every project but changes sometimes because of the program of the building. In this context, one of the last projects the pearl of Emirate (Figure 4.3) was designed as an opaque building but in fact it is not, because it includes a mechanism that allows for the building up to open up an in that case be almost full transparent in order to hold different exhibitions under the name of Expo Dubai. This characteristic is also seen in the first project of the firm, the rooftop remodelling falkestrasse (Figure 4.1.b) also opens up on the sky in order to open up on the city from one hand and from the other hand to admit natural light that can affect people comfort. Based on these results, it is clear that the transparency and the open architecture principal are always attached to the designs no matter how its scale is nor its function.



a)



b)

Figure 4.1. a) The villa rosa [67], b) Rooftop remodeling falkestrasse [133]

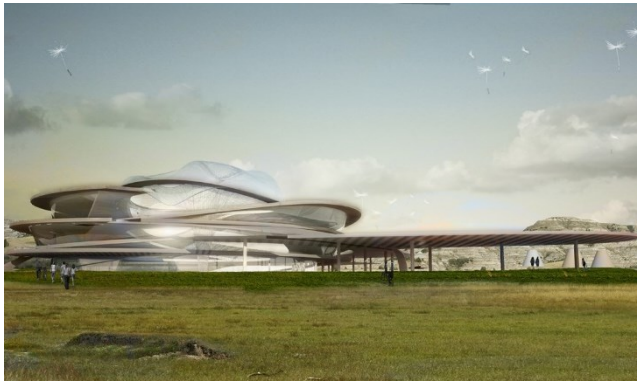


Figure 4.2. The 5<sup>th</sup> world, Russell Means library [134]



Figure 4.3. The Pearl of the Emirates - Expo Dubai 2020 [135]

However, through the analysis made on two of the most important projects of CH to study the integration of the building and its relation to its environment, it has been concluded that unfortunately most of the projects are designs that can be located everywhere. The Dalian conference Centre was not one of them since it was a successful architectural construction form and function, extracted from the Chinese traditions and history. However, the study of the confluences had showed that despite the eye-catching form and the meaningful concepts that Wolf Prix used (Cloud and Crystal) the building had no relation with the history of Lyon nor France. The building stands just as a complex construction that generates curiosity and wish to learn in people. The analysis made on the other projects and explained in the table 3.2 has shown that most of his projects are not related to the context, which lead us to conclude that Wolf Prix's designs represents CH's identity more than the site's identity.

To better understand the design process and the identity of CH, the most important thing is the repetition of the cloud concept that represents a new element ready to change and mutate in order to be placed in different contexts. However, understanding the context and design according it is a complex process that not all architects can achieve. Wolf Prix as the presenter of Coop Himmelb(l)au works much more like Massimiliano Fuksas than like Snøhetta. Both of them, despite the huge focus on the context and the integration of the design, some of their projects focuses more on showing their identity more than integrating the building in his context. Wolf Prix designs building that stands for the development and the new technology that people needs in their daily life. For this reason, eventually, the design will be one day accepted.



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## CURRICULUM VITAE

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### Education

Degree	University/Institute	Year
Master	Gazi University/ Architecture	2018
Bachelor	Hadj Lakhder Univerity/ Architecture	2013
High School	Aicha Oum El-Mouminin/ Experimental Science	2006

### Professional Experiences

Year	Place	Profession
2015-2018	Aymaz Mimarlik	Architect

### Language Skill

English, French, Arabic, Turkish.

### Publications

Bedaïda, A. I. & Akalın, A., (2018). *Repetition For A Different Design To Be Born: D-Gene Pool Of Coop Himmelb(L)au*. Presented at the 1st international Symposium on Innovative Approaches in Scientific Studies. Antalya – Turkey.

### Hobbies

Swimming, trecking, travling, drawing.



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