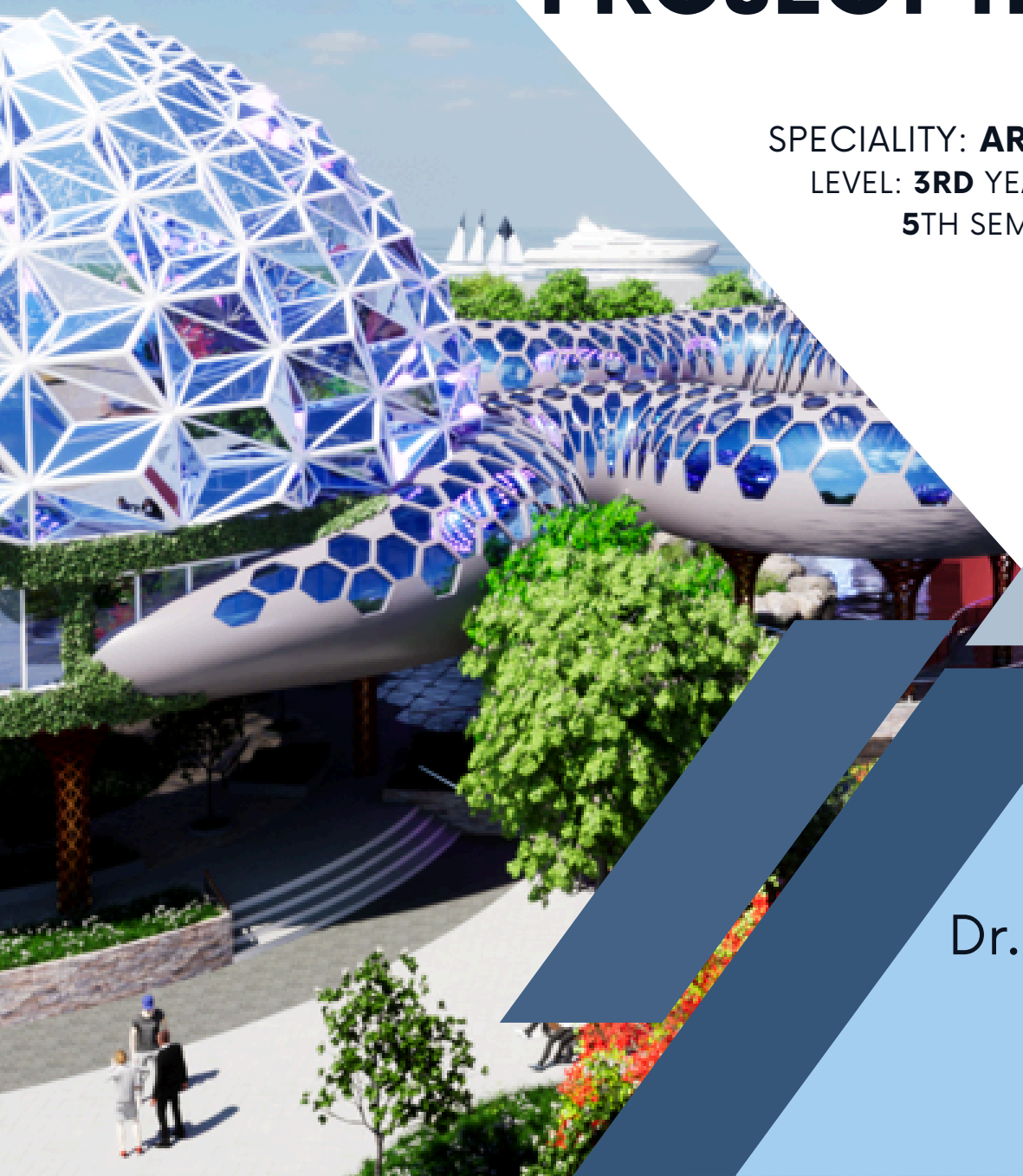
People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
University of 8 May 1945, Guelma
Faculty of science and technology
Department of Architecture

COURSE HANDOUT

PROJECT THEORY 5

SPECIALITY: **ARCHITECTURE**
LEVEL: **3RD** YEAR LICENCE
5TH SEMESTER



EDITED BY :
Dr. ZERTI Mouna

2023 - 2024

Information on the subject

Extract from the Outline
Field: Architecture and urban professions.
Stream: Architecture and urban planning.
Specialisation: Architecture.
Course: Licence.
Semester : 05.
Teaching unit : UEF 5
Subject : Project Theory 5
Coefficient : 2
Credit : 2

Objectives of the subject
The third year of the course is the culmination of a training process that culminates in the award of a bachelor's degree. Its aim will be to synthesise all the knowledge acquired in terms of architectural know-how and skills.

Its fundamental objective will be to focus teaching on access to the methodological tools of design and their mastery in the practice of architectural design.

In addition to the 'object', the urban dimension will be included as an objective constraint to any preliminary projection. The relevance will lie in the 'contextualisation' of the 'object' and the dialectic that it will maintain with its environment: impact, integration, scale, accessibility, etc.

Recommended prior knowledge:
Project theory 1, 2, 3 & 4 / Project workshop 1, 2, 3 & 4 / HCA 1, 2, 3 & 4

Content:

- The concept of the architectural project.
- Parameters of urban and architectural analysis: historical, morphological, functional, landscape.
- Comparative analysis of contemporary and historical projects (siting context, programme, genesis).
- Analysis of programmes.
- Different conceptual approaches.

Assessment method :
100% Examination

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PREFACE

Architectural design is a rich and complex discipline, combining science, art and technique. This handout, intended for 3rd year architecture students, aims to explore project theory and the various design methods that stem from it. It provides a solid basis for understanding the creative and analytical processes involved in producing innovative and functional architectural projects.

Project theory in architecture is a multidimensional approach that integrates various aspects such as ergonomics, aesthetics, sustainability and socio-cultural contextualisation. It enables future architects to design spaces that meet the needs and aspirations of users while respecting technical and environmental constraints.

This course is structured around 3 main themes:

1. Introduction to project theory and an understanding of architectural space as a raw material for design.

2. Creative process: an exploration of the stages in the design process, from the initial idea and the different aspects of creativity through to the genesis of the project.

3. The different design methods: a presentation of the different methodological approaches used in architecture. We will analyse traditional and modern methods, focusing on their practical application and their advantages and disadvantages.

This handbook is designed to be a dynamic learning tool, encouraging interaction and critical reflection. It is the fruit of many years of teaching in architecture, and is intended as a guide for future architects in their academic and professional careers.

Dr. ZERTI Mouna

Lesson 1. Architectural design

INTRODUCTION

Architectural project theory is a field of study that explores the principles, methods and philosophies underlying the design and realisation of architectural projects. It is based on a combination of technical knowledge, creative innovation, contextual analysis and consideration of human and environmental needs.

Architectural design theory provides an intellectual and practical framework for architects to guide their decisions throughout the design process. It encompasses concepts ranging from the use of building materials and technologies to aesthetic, social and cultural issues. The theory enables architects to develop projects that are not only functional but also meaningful and sustainable.

1. Architectural theory or project theory?

1.1 Theory:

A set of laws, rules, opinions, ideas, concepts, etc. on a particular subject. A conceptual system developed in an attempt to explain certain "hypothesis" phenomena.

1.2. Project:

A project is a finalised set of activities and actions of activities and actions undertaken with the to meet a defined need within a set timeframe and within an allocated budget.

1.3. Architectural theory

Covers the why? of things. It is in the theory and through the theory that an author's thinking must be brought up to date. Today, architectural theory is polysemous.

1.4. Project theory

Covers the how? Project theory is on the one hand, the method or methodology of the study of the elements of architecture and of architecture and composition.

2. Defining the architectural project

The concept of the project has relationship with architecture, not only from an etymological point of view but also from a not only from an etymological point of view, but also from a historical perspective.

We can speak of the emergence of the architectural project in the sense of an initial division between we can only speak of the emergence of the architectural project, in the sense of an initial division between planning and execution, from the Quattrocento onwards with Brunelleschi and Alberti.

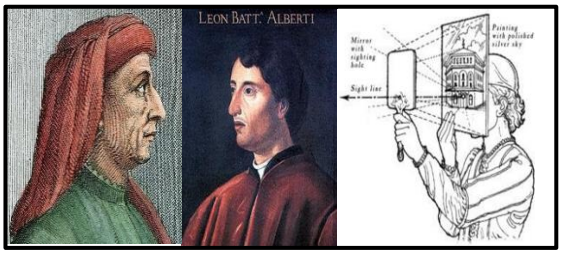

Fig.1.1. Brunelleschi and Alberti
Source : sparedicaro.com (luminograf)

Philippe Boudon insists that the project is a generic term that designates "the prefiguration of architectural reality (or) more generally [...] the work of elaboration that precedes the construction of a building". (BOUDON, 1990, P.54 Mazouz,S, 2004) The author considers this word too general and rejects its use; he finds it preferable, firstly, to speak in terms of design, and secondly, to designate the completed building that is the product of this design as an "architectural object".

Fig.1.2. Dominique Perrault
Source :https://www.pointdevue.fr/culture/arts/rencontre-avec-dominique-perrault-architecte-de-la-bnf

According to Dominique Perrault, it is more precisely "An act that either establishes a situation because there is nothing there, or complements or develops a given configuration". (PERRAULT, 1992, P.14 in Mazouz,S, 2004) Other authors, such as Donald Schön, prefer to talk about a project situation, which they see as a situation of "uncertainty, instability, singularity and conflict of values". (SCHÖN, 1994, P.75 Mazouz,S, 2004). The project is the first stage in a project. This is why it is part of specific social, cultural and economic timeframes. It lies at the intersection of a forward-looking vision and social support, and this duality makes it interesting and complex to manage.

Of course, the development of an architectural project is aimed at a single objective in a future context, which prevents it from being repeated identically, as each project has its own context and history. An architectural project is never a simple reproduction of a pre-existing model. However, similarities may appear between projects during their different phases and stages. The participants, the context and the budget may vary, but certain stages remain constant and each project must follow them.

3. The journey of the architectural project:

The architectural project is trained along a marked out path, in which the following are practised successively and simultaneously:

3.1. The theme:

Reflection on a theme, the space in question, the experience and knowledge acquired on a theme or another theme: domestic space, space for exchange, teaching space, etc.

3.2. The subject :

An author's critical position. The thesis he wants to support and defend. The "architectural bias".

3.3. The area :

As an uninterrupted series of constructions and developments that the project extends or opposes/confronts. "The land constraint

3.4. The conceptual statement

Where theme, purpose and territory are transmuted into a constructed hypothesis, the conceptual statement has the value of a schema (concept) where all meaning is concentrated and "crushed" (J.-P. Sartre in Mazouz,S , 2004),

3.5. The projectual statement

Where form, light, light and view, spatial structure and constructive structure, distributive systems and materials are supported by geometry so that gradually, "the elements brought into play, interacting with one another, create a necessity or an internal logic that gives the work its meaning".

4. The main phases of an architectural project :

"The development of an architectural project can be identified in two stages, the first is a preparatory stage focused on the design and preparation of the site, and the second is operative consisting of the completion of the site." (BOBROFF et al., 1993, P.35, quoted by ANGO-OBIANG, 2007, P.15 in Mazouz,S, 2004)

The two main stages of project development are :

4.1. The preparatory phase,

This initial stage, which is essential in architecture, focuses on the design and negotiation of the work. It enables the client's needs to be translated into a programme, the work to be designed and the consultation of contractors to be organised. This phase is carried out by the client and the project management team.

4.2. The construction phase,

Devoted to the construction of the work, this phase includes the preparation, deployment of the necessary resources and execution of the worksite. It is carried out by the construction companies, who must comply with cost, deadline and quality requirements.

5. Architectural training :

The architect's training is multi-disciplinary, integrating a variety of skills from many fields such as art, social sciences, technology, etc.... It covers not only the technical and artistic aspects of design and construction, but also knowledge of history, urban planning, sociology and the environment. This diversity enables architects to meet the many demands of their profession and to take a holistic approach to projects.

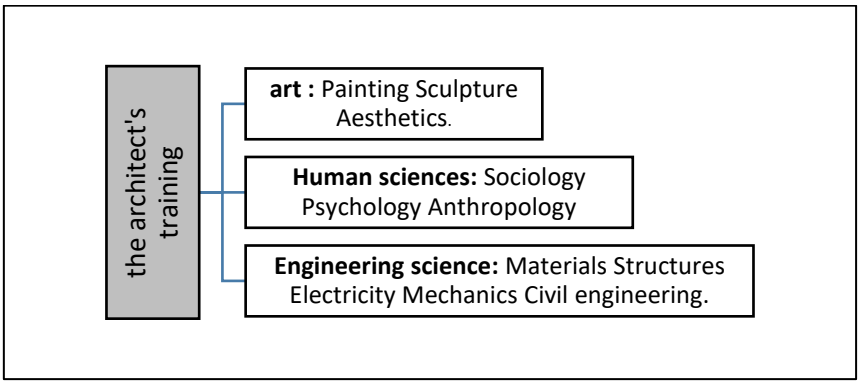

Fig.1.3. architects are trained in a multi-disciplinary approach
Source : Author, 2021

5.1. Direct stakeholders :

There are three main families of direct players defined by three main functions

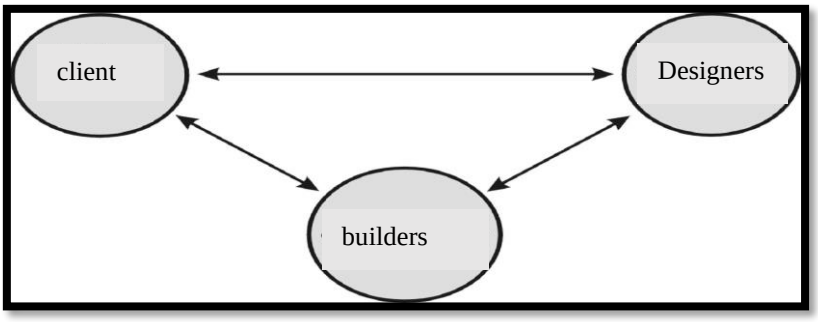

Fig.1.4. Direct players involved in the architectural project
Source PROST, 2005

- the client,
- the designers (project managers, architects, engineers),
- builders (structural and finishing contractors, subcontractors and suppliers) have a decisive influence not only on the quality, cost and time taken to build structures, but also on the capacity for innovation of these players themselves. (PROST, 2005, P.14).

The client may entrust the project manager with some or all of the following design and assistance tasks:

1. Sketch studies,
2. Pre-project studies,
3. Project studies,
4. Assistance to the project owner in awarding the works,

5. Execution studies or examination of conformity with the project and approval of that carried out by the contractor,

6. Managing the execution of the works contract,

7. Scheduling, managing and coordinating the site,

8. Assisting the client during the acceptance process.

We can say that this mission (basic mission) comprises three parts:

1. Design studies

- ✓ Sketch studies
- ✓ Pre-project studies
- ✓ Project studies
- ✓ Assistance to the project owner for the award of the works contract
- ✓ Execution studies or examination of conformity with the project and approval of those studies that have been carried out by the contractor

2. Monitoring the work

- ✓ Directing the performance of the works contract
- ✓ Scheduling, control and supervision

3. Acceptance :

- ✓ Assistance provided to the client during the acceptance process and during the period of the guarantee of perfect completion.

6. The impact of architectural design on human behaviour:

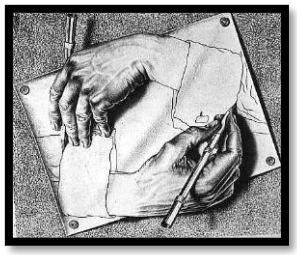

Fig.1.5. drawing hands by M C Escher
Sourcehttps://dokumen.tips/documents/ejemplos-muy-buenos-de-imcaaiscpdf.html?page=1

Winston Churchill's quote "We shape our projects and our projects shape us" states that we first create and define our projects according to our ideas, values and objectives. We invest time and energy in designing, planning and implementing them. However, once these projects take shape and develop, they begin to exert an influence on us.

This quote highlights the reciprocal dynamic between the individual and his or her projects. It highlights the fact that projects are not just external works that we create, but interactive processes that have the power to change us profoundly.

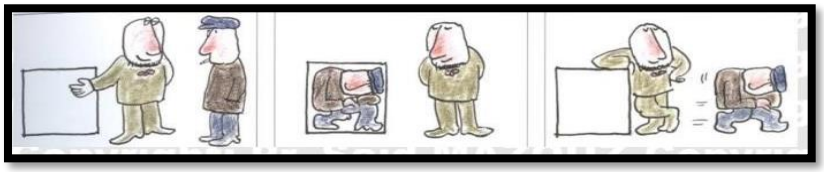

Fig1.6. The architect intends to change the world through design
Source: Handout, Pr.Mazouz.S

CONCLUSION :

Architectural design theory is an essential discipline that helps guide architects in the creation of innovative, functional and aesthetically pleasing buildings. It involves a deep understanding of fundamental principles, rigorous working methods and sensitivity to the specific contexts of each project. By combining these elements, architects can create spaces that enrich the human experience and respect the environment.

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Lesson 2. Space as a raw material in architectural design

INTRODUCTION

Space is a central concept in architecture, defining not only the physical structure of a building, but also the sensory and emotional experience it provides for its users. It is a field that explores how volumes, forms, materials and light interact to create environments where people live, work and interact. Architectural space can be defined as the three-dimensional environment created by built elements such as walls, roofs, floors and openings. It encompasses both tangible physical aspects and intangible qualities that influence the perception of occupants, such as scale, proportion, light, acoustics and atmosphere.

1. Definition of architectural space:

Space: this term originates from the Latin word spatĭum.

"it is a more or less delimited place, where something can be located". dictionary Larousse

The notion of architectural space: refers to the place whose production is the object of architecture. The concept is constantly debated by specialists because it implies different concepts.

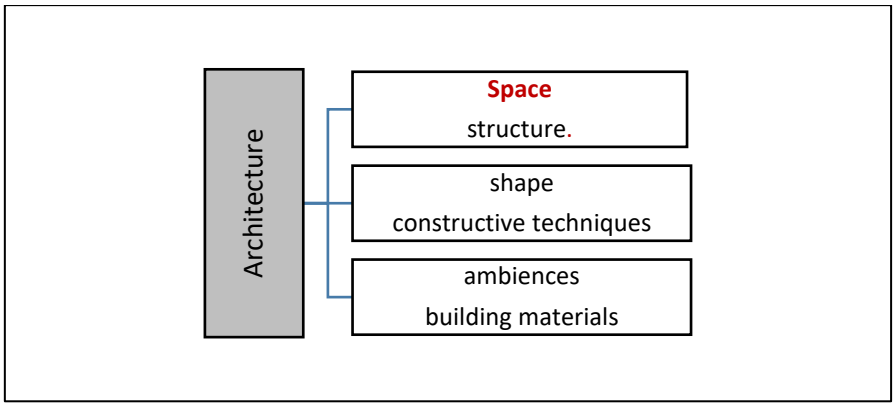

Fig.2.1 space is architecture's primary tool
Source Author, 2021

In Architecture a three-dimensional element, a volume is defined as a solid "mass" containing a void, which is space.

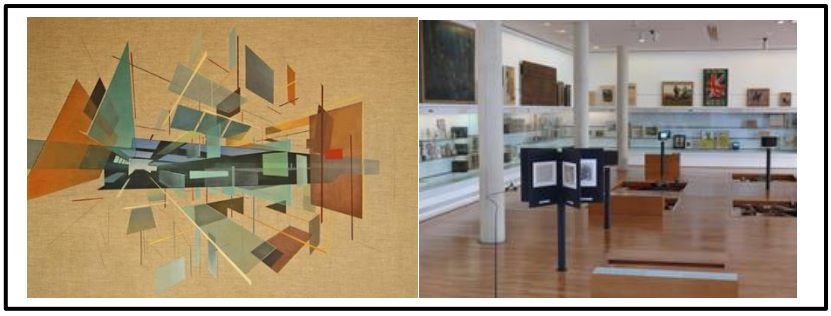

Fig2.2. architectural representation by Daniel Mullen
Source: https://medium.com/@marlauro/the-macaques-thread-d156517ebc56

In Architecture, form is the point of contact between mass and space. Space can be closed, open, limited or fragmented.

2. Space and place :

Form is defined by its visual and relational properties (objective, palpable perceptual aspect).
Space is not only defined and delimited by form, it is also a subjective quality defined by our experience, our culture, our language and our previous experience.
Space changes to the rhythm of the sun, but place changes to the rhythm of man.

Fig2.3. different space and place
Source: https://www.pinterest.com/

3. Sensory and emotional experiences

Architectural space is deeply linked to people's sensory and emotional experiences:
Visual Perception: How space is seen and interpreted, influenced by light, colour and form.
Sense of Touch: The texture of surfaces and how they interact with the human body.
Sound: The acoustics of the space affect the perception of calm or dynamism.
Emotions and Atmospheres: Architecture can evoke a range of emotions, from serenity to excitement, depending on the spatial design.

4. The perception of space :

4.1. The supplementary effect :

A space is created as soon as we start to psychologically (not physically) construct a cell enclosed by four walls, because we tend to complete the imperfect space due to the domination of the visual world. For example, we can shape a cubic space in several ways by imagining it mentally through experience: either four posts, or a wall and two posts, or two walls running at an angle and diagonally opposite, or two walls facing each other, or a floor and ceiling, etc. fig. a rectangular volume completes itself, if it is incomplete, this is called the "supplementary effect".

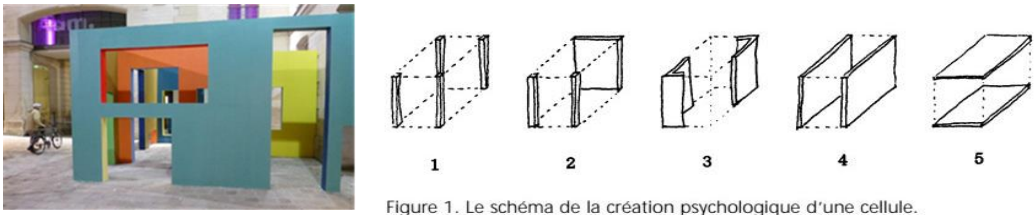

Fig2.4. diagram of the psychological creation of a cell
Source:inferno-magazine.com/ handout Pr Rehailia Hassib

4.2. Colour and spaces

Colour plays a crucial role in the sensory and psychological dimension of architecture. Understanding how colours affect space and its occupants is therefore essential to designing harmonious and functional spaces.

Colours can alter the perception of the dimensions of a space. Light colours, such as white, beige and pastels, tend to visually enlarge a space, making it brighter and airier. Conversely, dark colours, such as black, navy blue or dark green, can make a space feel more intimate and warm, but also smaller and more enclosed.

Fig.2.5. colours and in the sensory and psychological dimension of architecture
Source: https://www.pinterest.com/

4.3. Depths of space

The two most common and effective cues to depth perception are the perspective effect, particularly the texture gradient, and the phenomenon that tells us that an object that partially hides another should be in front of it.

For interior performance spaces and urban squares and avenues, classical architecture accentuates the deep perspective not only through its receding lines, but also through its modenature, which adds a gradient of texture.

4.4. Space density

For the architect, space is not only deep; it is also more or less dense. When greater density seems appropriate, he seeks to modulate distances by intermediate and close "depth stages". This is generally the case when we work with shallow space, but we can also create density

with deep space: the Cordoba mosque with its 'forest' of columns is a deep space of extraordinary density.

Spatial density is not only due to the concrete layering of depth, as in Cordoba. It may be enough to suggest subdivisions implicitly through the modenature of the floors, walls or ceilings for the same unitary space to appear rather "full" or, on the contrary, rather "hollow and empty".

There are no inherent advantages to dense space over sparse, unitary space. What is important is that the architect's choice of means is in keeping with the site and the programme, of course, but also with philosophical objectives. By looking at historical examples, he may discover that sparse, unitary spaces have the capacity to establish an unprecedented tension between the place of the observer and the limits of the space, which then coincide with the limits of a reproduction of the universe - a bridge between the real and the virtual.

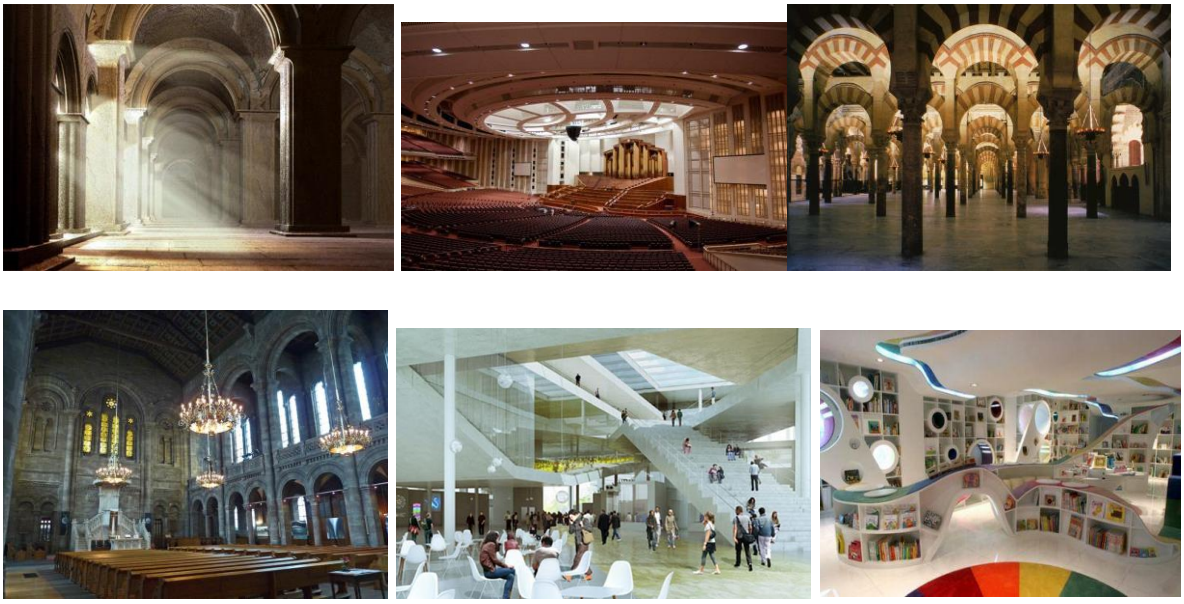

Fig.2.6. illustrations to explain depth and space density
Source: https://www.pinterest.com/

5. Concepts relating to the structuring of space :

5.1. The concept of boundaries:

They define the place and delimit the space to which the rules of passage and use apply.

The boundary of a place implies the control of a person, a group or a community over what happens inside, at home. The boundary gives birth to inside and outside.

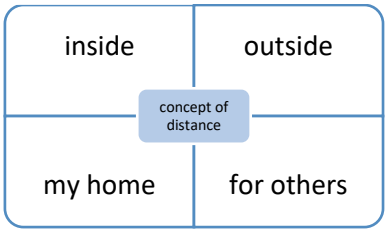

Fig2.7. the concept of boundaries
Source Author,2021

5.2. The threshold concept :

Pierre BOURDIEU: "the place where the world is turned upside down".

PIERRE VON MEISS: "it is the threshold that reveals the nature of the limit and announces the nature of places" The threshold controls the permeability of the limit, confirms the spatial discontinuity while offering the possibility of crossing it.

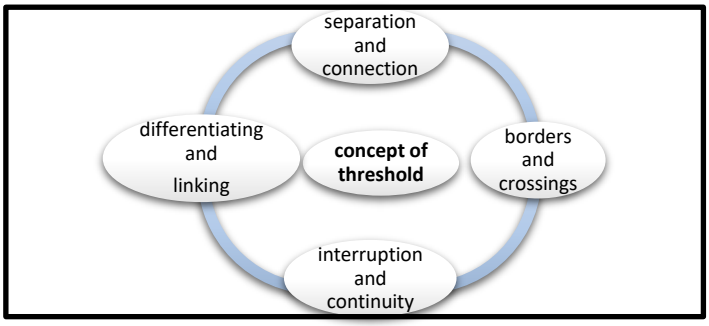

Fig.2.8. the meaning of the threshold
Source : Author, 2021

5.3. The notion of distance:

Social practices are expressed in space and are structured by the idea of distance.

Distance organises the topological field by determining, for example, the type of perception

What is near is more important than what is far.

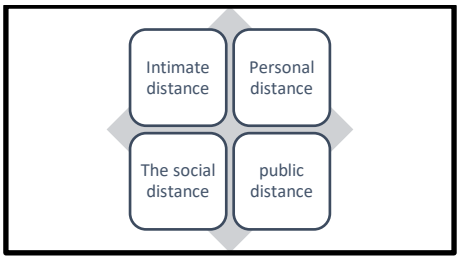

Fig.2.9. The notion of distance
Source : Author, 2021

6. Concepts related to social life:

6.1. Experienced space :

Fremont describes lived space as "all the places frequented by an individual or group, as well as the social interrelationships that develop there".

6.2. Personal space :

This encompasses a portion of the space around the individual that cannot be penetrated by others without provoking defensive reactions.

EDWARD HALL illustrates personal space as a "BUBBLE" which surrounds each of us and within which we live and move.

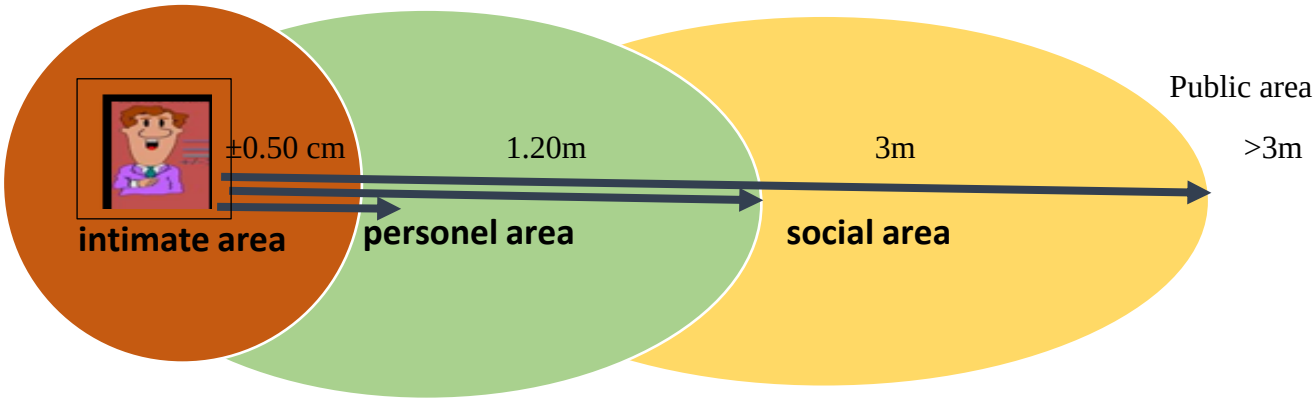

Fig.2.10. the personal bubble, translated by author
Source : https// www.bernard-guevorts.com/article/ comment-la-distance- influence-la-communication/

6.3. Social space ;

The set of specialised social interactions, either for a group or around an individual.

Reflections in this field are based on several axes.

Kevin Lynch: "Not everyone perceives everything in the same way; each of us has our own image of space, which depends on our individual characteristics.

Robert SOMMER, highlighted the role of space in the communication process.

6.4. Positive and negative space

As a starting point, Jean Cousin believes that objects are not contained within a space, but each generates its own space.

Positive space, which has the quality of being static, corresponds to our bubble and its extension around us. This extension is embodied by a limit beyond which negative space, which is dynamic, begins.

Fig.2.11. personal bubble
Source : thebubblegirl.com

CONCLUSION:

Architectural space is more than just a physical structure; it is a living, dynamic experience that influences people's daily lives. By combining rigorous design principles with a sensitivity to human experience, architects can create spaces that enrich our world, promoting well-being, social interaction and emotional engagement.

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Lesson 3. Architectural analysis parameters

INTRODUCTION

Architectural analysis is a fundamental process in the design and evaluation of buildings and structures. It involves examining and evaluating various aspects of an architectural project to ensure its viability, functionality and aesthetics.

1. Analysis as a project

Analysis goes beyond a simple descriptive reading of the site; it is above all forward-looking, meaning that we analyse with the primary intention of planning ahead. The analysis therefore enables us to verify and confirm certain working hypotheses.

The aim of the analysis is :

- Identify the fundamental characteristics of a given area in terms of landscape, town planning and architecture;
- to highlight the constituent parts of the area (or the content of the area);
- show how the area has changed;
- highlight the strengths to be developed and the problems to be corrected (diagnosis)
- define the challenges of the urban project,
- to conclude with the first steps to be taken,

2. The elements of the Analysis :

Methodology: a three-stage process: read, understand, and translate

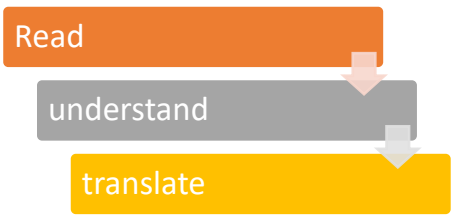

Fig.3.1. Methodology: a three-stage process
Source : Author, 2021

Analysis involves identifying the "materials of the game", i.e. the boundaries, relationships and content of the area, highlighting its strengths and diagnosing its weaknesses. In other words, we break down the area into its key components.

2.1. Reading (analysis)

The first step is to read the territorial, urban and architectural scales through different dimensions, which we will call landscape, historical, morphological and analysed according to boundaries, relationships and content.

These three levels of reading make it possible to explain the causality of the boundaries, relationships and contents involved, and to identify the main characteristics. By looking at the territory in terms of its boundaries, relationships and content, we have already begun to analyse it.

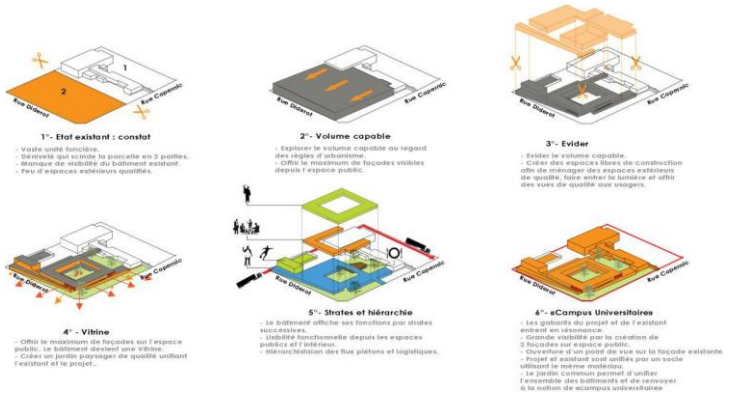

Fig.3.2. architectural analysis
Source : www.issuu.com

2.2 Understanding (issues, strategy)

Secondly, we will need to use the knowledge base, the local culture and the theoretical foundations to take advantage of these readings and to move beyond simple reading towards a forward-looking analysis.

2.3. Translating (urban and architectural project)

The third step is to show that, on the basis of these elements of analysis (reading, understanding and theory), we are capable of drawing out the issues at stake and the conclusions likely to form the basis of a strategy for the future.

3. Scales of interpretation and analysis

- There are three main levels to the territory: territorial, urban and architectural. A reading of the territory through these three scales makes it possible to identify what is territorial, urban or architectural, and above all it makes it possible to understand how these three scales are articulated.

3.1. The territorial scale

The territorial scale correlates the urban scales and is linked above all to the space of the field of vision and locomotion.

3.2. The urban scale

The urban scale correlates the architectural scales and is linked above all to the space of action and locomotion.

3.3. The architectural scale

The architectural scale correlates human scales and is above all linked to the space of experience. At this scale, people are confronted with their space of experience.

Architectural analysis is a multi-dimensional process that requires an in-depth understanding of various parameters to create buildings that are functional, aesthetically pleasing, sustainable and safe. By integrating these aspects, architects can design structures that meet the needs of users while respecting economic and environmental constraints.

4. The method adopted for analysing a building

4.1. Introduction to the analysis

4.1.1 Historical context

Of the chosen building or monument and the artistic movement to which it belongs.

4.1.2 Identify the architectural element chosen:

- Nature of the building: stadium, theatre, museum, opera house. Etc.
- Function of the building: residence, education, exhibition, leisure, government, etc....
- External dimensions (dimensions of the building) and internal dimensions (surface programme of the project)
- Shape of the building: round, rectangular, compound, metaphor, etc....
- Date of completion
- Location: district, town and country.
- Technique, materials and construction methods used.
- Specify whether the building stands alone or forms part of a larger whole.
- Indicate who placed the order (client) and why.

4.1.3. Brief presentation of the designer

Architect and his architectural approach.

4.1.4. An analytical problem

(why did we choose this work?)

4.2. Developing the analysis

4.2.1. Describing the work

- **Subject**: what are the main buildings (who, what, when, how)?
- **Space** :
  - what are the main elements that make up the building (make a sketch with the main lines of the building.
  - Analyse one of the façades, generally the one the public sees most, orientation.

- The components of the facade: roof? structure?
- How many storeys and why?
- How many openings and why? The relationship between full and empty?
- Symmetry or asymmetry?
- The decorative elements and texture of the façade.

- **Taking a step back** :

4. 2.2 Interpreting the work

- **Relationship to the viewer**
  - What feelings is the architect trying to evoke?
  - What sensations does the building evoke and why?
  - The massage transmitted by the building.
- **The relationship with the architect's life and ideas**

Express the political and aesthetic ideas, the artistic movement and the links with other architects and the client.

- Why is this building of political, historical and artistic value?
- How is it innovative? Find out what distinguishes this building from others.
- If several buildings are to be compared, identify the points in common and the differences.

4.2.3 Draw a conclusion if the work(s) is (are) innovative.

- Explain why the work(s) are typical of the chosen theme and issue.
- Explain what you have learnt by working on the works or the architect concerned, whether you liked them or not, what you felt about them.
- Research the architect's posterity.

CONCLUSION

Analysis is a key stage in urban planning. First and foremost, it consists of putting in place a methodology for reading and understanding the area, in order to define a diagnosis and then the issues at stake in the project. More than just a stage, analysis is the first achievement of the project.

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Lesson 4. Programming in architectural projects

INTRODUCTION

Programming in architecture is a crucial stage in the design process, consisting of defining the needs and requirements of a project before moving on to the design phase. It involves an in-depth analysis of the project's objectives, constraints and available resources to establish a clear and structured framework to guide architectural creation.

Programming in architecture is the process of gathering and analysing the information needed to understand and formulate the requirements of an architectural project. It acts as a bridge between the client's aspirations, the constraints of the site and the architect's vision. Well-executed programming ensures that the project optimally meets functional, aesthetic and technical needs.

1. Definition of programming

The purpose of architecture is to organise space in a dynamic way so as to allow the various social functions to play their part, in almost all cases, a building is constructed according to a programme drawn up by the project manager,

A building is almost always built according to a programme drawn up by the project manager. The programming can be carried out according to a plan adapted to the one mentioned above in order to take into account the importance of clarifying the needs to be met. Broadly speaking, it consists of five phases:

- Defining the objectives ;
- Gathering and analysing data
- Uncover and test concepts;
- Determining needs;
- Defining the problem.

Programming is therefore an analysis phase. The order of the stages in this analysis is not necessarily as rigid as it would be for an algorithm, but the statement of the problem is necessarily the last stage.

This analysis, in the case of an architectural problem, must take the following four distinct areas into consideration in each phase: functions, forms, economy and duration.

2. Programming objectives

Programming is a working method, a systemic way of :

Tackle the various problems and analyse them, then present them in a comprehensible form to the various parties involved,

Controlling the design and implementation to speed up commissioning,

The objectives are intended to enable the architect to know what the client wants to achieve and why. The objectives must be consistent with the concepts; in fact, the objectives are the ends and the concepts are the means to achieve them. Concepts are not just ideas, of course, but in programming terms, they are ideas for solutions in functional or organisational terms that meet the customer's concerns.

Analysis of the data relating to the economic and physical context and the environment of the project is a basic necessity, but care must be taken not to let it be invaded by useless data, and to use only the information that is directly useful for comparing objectives and concepts and checking their accuracy or plausibility.

Twelve programming concepts seem likely to arise in a large number of projects:

- Grouping services or splitting them up;
- Grouping or dispersing people;
- Spatial interaction or segregation of activities;
- Priority ;
- The network of relationships between spaces;
- Security controls;
- The flexibility of buildings in terms of their capacity for expansion, internal transformation and multi-functionality;
- The paths followed by sequential flows;
- Segregation of flows;
- The meeting of different flows;
- Orientation;
- Energy savings.

How should this programming phase be conducted? William Pena sees it as a phase of clarifying the request, designed to enable the architect to help the client explain his request by getting him to go into more detail about its reasons (needs and objectives) and its implications in terms of programming concepts. It is therefore necessary for the client to be involved as much as possible in the successive choices that appear on the decision tree.

3. The programming stages.

The programming stages can be defined as follows: Site and building studies,

Pre-programming enables the needs of a structure to be dimensioned with its general operation

The drafting of a detailed technical programme (PTD) comprising quantitative (functionality)

quantitative (functionality), qualitative (surface area), technical, environmental, etc.

4. The role of programming

Functional plan	**Environmental plan**	**Behaviour plan**	**Quantitative and qualitative plan**
The programme must define the objectives The appropriate functions The requirements associated with each activity	The programme determines the urban context and the site It determines the role of the future building in the site and its immediate environment, It determines the links between the building's activities and those of its surroundings,	The programme must be based on a logic of observation of the public concerned before, during and after the performance of certain activities: Descriptive sections Diagrams Functional functional diagrams Architectural and technical recommendations Architectural and technical performance,	* Potential and constraints * Expression of space requirements: detailed tables of usable space for each project area,

Fig.4.1. The role of programming
Source : Author, 2021

5. The role of the various parties involved :

5.1. Project owner:

the driving force and manages the different phases of the project.

5.2. The users:

future occupants "requirements and needs

5.3 The programmer :

1st stage	**2nd stage**	**3rd stage**	**4th stage**
Define the project owner's general objectives Collect data on the site and its environment Specify user requirements	Explain the programme to the designer	Matching the programme to the project, and following it through to completion	The project

Fig.4.2.stages of programming
Source : Author, 2021

6. Ergonomic studies for space's surface:

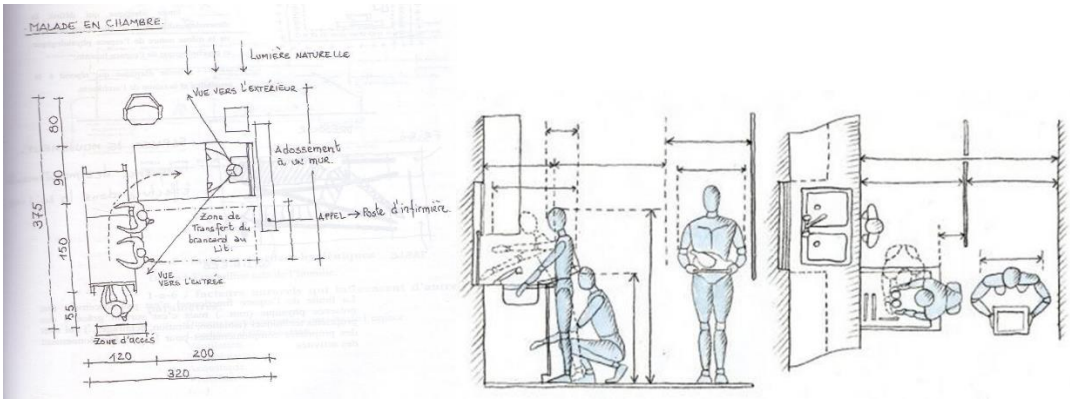

Fig.4.3. ergonomic studies of different spaces
Source : www.slideshare.net.fr (antropometria)

Ergonomic factors: dimension and dynamics of the human body surprised in work attitudes.

Ergonomics is a term coined in 1949 to describe the study of specific behaviour.

Ergonomic studies will give minimum spaces for an activity to be carried out normally.

to be carried out normally.

7. A model of programming don by student:

To explain for aothers haw

Programme des exemples analysées

	Exemple 01 : centre de TchuggenBergoase	Exemple 02 : Centre de sidi Fredj	Exemple 03 : Complexe de Hammam el challala	Programme retenu
Accueil	Hall d'accueil Sanitaire	Hall d'accueil Réception Sanitaire	Hall d'accueil Réception	Hall d'accueil Réception
Administration	Administration	Administration Salle de conférence Sanitaire	Bureau directeur Salle de conférence Sanitaire B secrétaire B de gestion Bureau de comptable B de facturation B chef réception B d'informatique Salle de prière	Bureau directeur Salle de conférence Sanitaire B secrétaire B de gestion B de comptable B de facturation B chef réception B d'informatique Salle de prière
service médicale	Cabinet pour médecin	Planning médical	b médecin chef b médecin assistant cabinet examen M radio laboratoire	Cabinet pour médecin radio laboratoire
Soins humide (hydrothérapie)	Sauna/hammam Zone de douche Sauna/hammam Soin humide collectif Sanitaire	Boxes des individuel Boxes d'hydrothérapie individuel Piscine hydrothérapie Sanitaire	Douches individuels Bassins Douche filiforme Douche au jet Salle de repos Vestiaire	Sauna /hammam Douche individuels Boxes d'hydrothérapie Individuels Piscine collectif Bassins Douche filiforme Douche au jet Sanitaire Salle de repos Vestiaire

Soins sec (kinésithérapie)	Salle de firness Soin sec individuel Sanitaire	la kinésithérapie soins extérieur soins intérieur sanitaire	Sanitaire Salle de rééducation Salle de paraffine Salle de gymnastique	Salle de firness Soins sec individuel Soins extérieur Soins intérieur Sanitaire Salle de rééducation Salle de paraffine Salle de gymnastique
Soins sec (physiothérapie)	Soins sec individuels		Salle d'électrothérapie Salle de massage Salle d'inhalation Salle de nébulisation	Soin sec individuel Salle d'électrothérapie Salle de massage Salle d'inhalation Salle de nébulisation
Hébergement	Suites privés Sanitaire	Sanitaire Chambres	Suites privés Sanitaire Chambres Bungalows	Suites privés Sanitaire Chambres Bungalows
Soin de beauté	Coiffeur			Coiffeur
Autres espaces	Cafétéria	Cafétéria Restaurant Salle des fêtes Vide sur l'hydrothérapie Vide sur le hall	Cafétéria Restaurant Salle à manger	Cafétéria Restaurant Salles des fêtes Salle à manger
Locaux techniques	Des locaux techniques	Des locaux techniques Stockage	Stockage Buanderie Linge sale chaufferie groupe électrogène transformateur locaux de menuiserie	Des locaux techniques

Fig.4.4. model of programming
Source; 3rd year student work, 2023

CONCLUSION

Programming in architecture is a fundamental step in ensuring the success of a project by establishing a solid basis for design. By combining an in-depth understanding of users' needs with a rigorous analysis of constraints and opportunities, programming makes it possible to create architectural projects that are functional, aesthetically pleasing and adapted to their context. It plays a key role in creating spaces that meet users' expectations and requirements, while respecting technical and environmental constraints.

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Lesson 5 Creativity in architecture

INTRODUCTION

Creativity in architecture is an essential dimension that transcends technical and functional aspects to produce works that inspire and enrich human life. It involves innovation, imagination and artistic expression, enabling architects to design spaces that are not only practical, but also aesthetically pleasing and culturally meaningful.

Creativity in architecture can be defined as the ability to devise innovative and original solutions to construction challenges, while taking into account the aesthetic and emotional needs of users.

1. Creativity in architecture :

Creativity: Creativity is one of the most ill-defined and, at the same time, one of the most fascinating concepts in existence. It sometimes requires an exceptional personality who breaks with the spirit of the age.

The creative process is often marked by intense concentration, leading the artist to become fully involved in his or her work and to imagine unusual solutions. However, creativity requires real expertise beforehand, which is acquired by gathering information.

2. The history of creativity in architecture :

According to Mihaly's historical theory, creativity was born when man was able to devote a little more time to "something else" than survival.

2.1. Greek antiquity

Aristotle considered creativity to be an imitation of nature in the form of regeneration. It enables the creation of a new entity, different from what exists in reality, and requires considerable effort. Plato describes it more as an unconscious mental activity, due to an external force that illuminates the idea to the creator. This is what is commonly known as the "Eureka" effect, that moment of sudden revelation that springs to mind as if it were obvious.

2.2. The Roman era

The Roman philosopher Seneca considered creativity to be an ingenuity intimately linked to madness: "Demencia". A madness that comes close to the sense of inspiration.

2.3. Currents of the 18th century

The rationalist movement of the Enlightenment led to the development of concepts linked to genius and creativity. During this period, the concept of "aesthetics" emerged, a philosophical

discipline devoted to the study of beauty, sensory perceptions, emotions and judgements linked to art in general.

2.4. The contemporary era

The scientific study of creativity only really began towards the end of the 19th century with the contribution of psychology and later neuropsychology.

3. The process of creativity :

Today creativity is defined as a set of mental activities that encourage the process of imagining and creating new ideas. Several models attempt to define the creative process. Among the most important are Graham Wallas's model, developed in his book "The Art of Thinking" in 1926, and Guilford's model, developed in 1967.

3.1. The creativity process according to Wallas

It comprises 4 successive stages:

Preparation phase: gathering information and studying the subject in depth, involving an alternation between the imaginary and the logical, the irrational and the rational.

Incubation phase: production of considerable effort in order to link this information together in an unpredictable way and produce (discover) a new and unexpected arrangement. This phase is generally interrupted by the creator when resolution proves impossible. This allows them to move away from their subject.

Illumination phase: this is when the creative flash occurs.

Verification phase: this validates the creator's idea.

Some believe that the difference between creative people and ordinary people lies in the amount of time invested in moving from the preparation phase to the verification phase.

3.2. Guilford's creativity process

Wallas's classic four-stage model was widely challenged by the American psychologist Guilford. In 1967, he developed a much more complex creative process than the previous one. In his model, creativity is based on different intellectual operations. He lists five of them: divergent thinking, convergent thinking, knowledge, memory and evaluation.

Guilfordes believes that creativity is linked to several mental attitudes:

1) **Sensitivity to the world**: developed by stimulating curiosity.

2) **Fluidity of thought**: this is a way of accepting changes in society. To become aware of the diversity of cultures and accept the differences of others.

3) **Personal originality**: the ability to stand out from the crowd.

4) **The ability to transform things**: this ability to see everything that can be exploited and modified.

5) **The ability to analyse and synthesise :** this is the ability to investigate, study and produce.

6) **Organisational skills**: the ability to think logically.

4. The channels of creativity

Can be divided into two categories: tangible and intangible; concrete and abstract.

4.1. Channels of creativity as tangible concepts:

4.1.1. The use of precedent the historical precedent" :

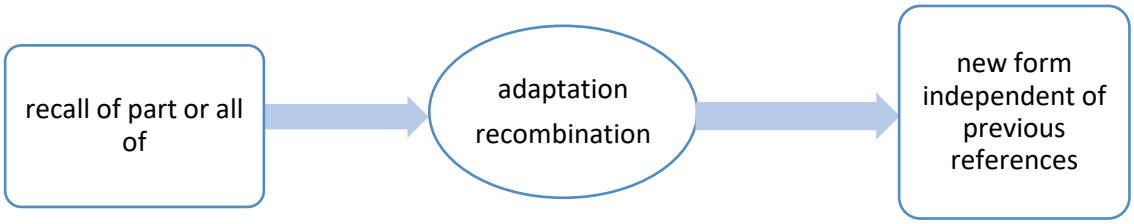

Fig.5.1. Channels of creativity
Source: Mazzouz.S, 2004 p 40

To design, architects relied, at least until the beginning of the 20th century, on the imitation of examples of works of architecture.

Learning from architectural references is one of the most widely used teaching methods. This method consists of reusing the forms of previous buildings (concrete projects from the past) in the design of new buildings.

To begin with, the architect must undertake an in-depth historical investigation that will enable him to enrich his memory with new images, and thus help to solve design problems. Historical precedent often encapsulates knowledge about previous solutions in the form of architectural elements. However, several architectural elements can be modified and recombined.

Fig.5.2. the postmodernism
Source: https://www.pinterest.com/

Fig.5.3. brutalism, modernism ,deconstructivism
Source: https://www.pinterest.com/

4.2. Creativity channels as an intangible concept:

4.2.1. ANALOGICAL reasoning:

analogy , feminine noun

Meaning 1 A relationship of partial and non-essential resemblance between two things.

Example: A verbal analogy, an analogy of faith, reasoning by analogy. Synonym: similarity

Meaning 2: A figure of speech that establishes a certain similarity between two elements.

It involves imitating non-architectural references in the design process. However, analogy is not a copy that is modified locally, but a process of generation and experimentation that draws on several references. One of the most famous examples is Le Corbusier's Citrohande mass-produced house. Although its volumetry is fairly uncluttered, the house is designed like a car of the time, a real living machine.

Analogical reasoning is an inexhaustible source of creativity, different from the metaphor that we solve problems by unearthing them from the world around us,

<u>solving a structural problem by analogical reasoning:</u>

bearing capacity, crossing, articulation, entablature

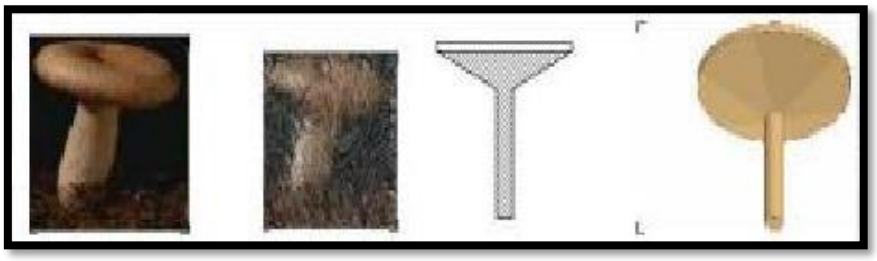

Fig.5.4. solving a structural problem by analogical reasoning
Source: : Mazzouz.S, 2004 p61

<u>solving an environmental problem by analogical reasoning</u>

introduction of natural light, various forms of protection, sun, wind and rain.

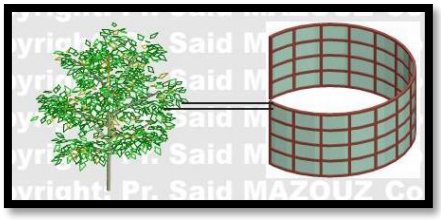

Fig.5.5. solving environmental problem by analogical reasoning
Source: : Mazzouz.S, 2004 p61

solving a functional problem by analogical reasoning

circulation and movement, patterns rationality, continuity, evolution.

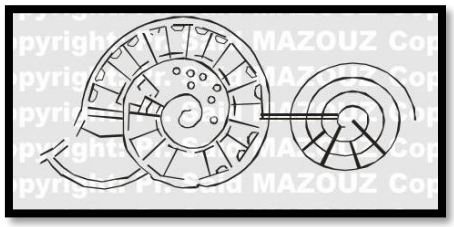

Fig.5.6. solving functional problem by analogical reasoning
Source : : Mazzouz.S, 2004 p61

4.2.2. The "PARADOX" vice versa technique

The technique of vice-versa, also known as paradox, is one of the most widely used sources of creativity in architectural design. Paradox is a kind of attitude that runs counter to situations that are accepted by everyone. Paradox can be expressed in the following way: to build is to deconstruct, hence the emergence of the deconstructivism of Gehry and Zaha Hadid.

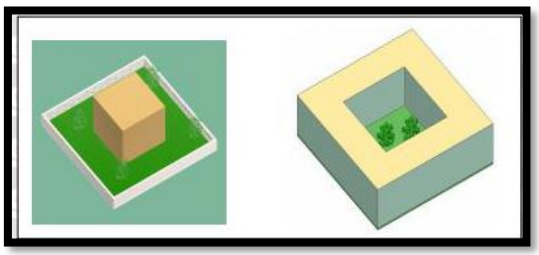

Fig.5.7. The garden around the house and the house around the garden
Source: : Mazzouz.S, 2004 p59

CONCLUSION

Creativity is at the heart of architecture, offering the possibility of transforming built spaces into works of art that inspire and elevate the human experience. By combining innovation, aesthetics and functionality, creativity enables architects to respond to contemporary needs while anticipating future challenges, creating built environments that are both useful and deeply meaningful.

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Lesson 6 Genesis of the architectural project

INTRODUCTION :

Architecture unfolds within a field of concern that we can attempt to circumscribe. It is the result of several components that interact and combine within a space. The project as a means of knowledge and production must be based on an idea that is capable of bringing together the site of intervention, the programme and the theoretical references.

The project must also be conceived in a context organised in relation to the requirements and form part of a conceptual process.

1. The genesis of the project.

Designing in architecture means building a representation of something that does not yet exist. To arrive at this representation, to "project" ourselves into time, we go through a complex process of creation.

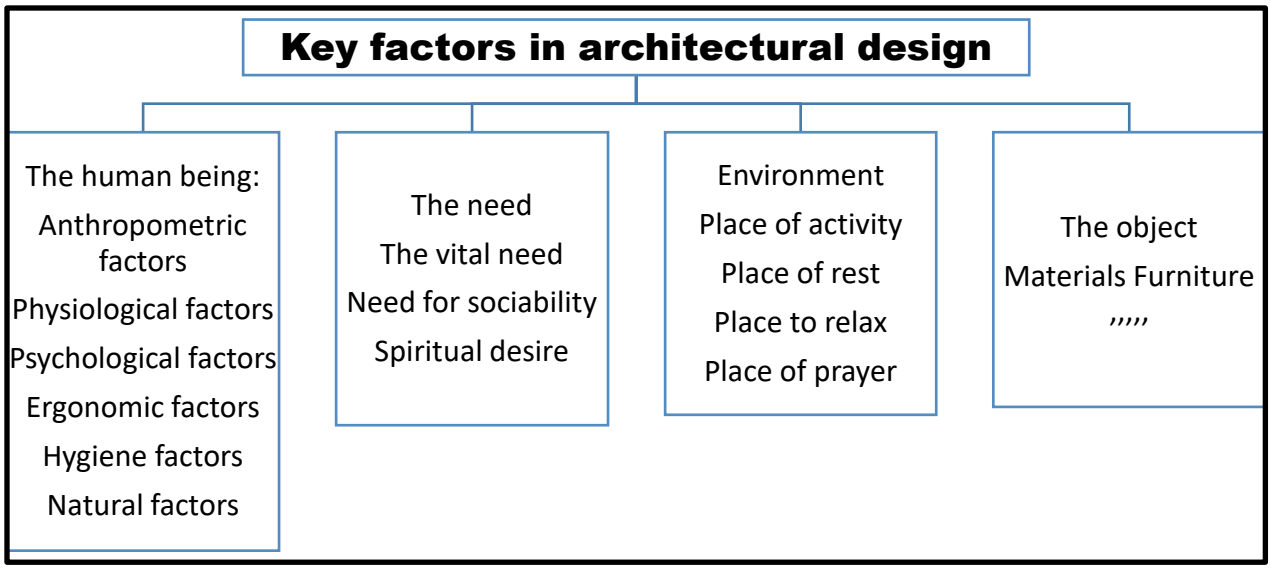

Fig.6.1.key factors in architectural design
Source: Handout, Pr.Mazouz.S

2. Principles and concepts :

2.1. The site :

the choice of site must be justified

in relation to the chosen activity

2.2. The programme and its requirements:

Apart from the role it plays as a text describing the objectives and role of the facility, it prioritises the activities and ensures that they are grouped according to their characteristics: the programme is seen as a technique for controlling and preparing the formalisation of the project Programme and form maintain such an intimate relationship that it is difficult to think separately.

3. Architectural references:

3.1. Concepts related to the programme:

- **Functionality :**

In order to function properly, the different disciplines will be arranged according to their relationships and characteristics, to achieve continuity and complementarity.

- **Hierarchy:**

The project presents a rich programme and a diversity of functions which
requires a hierarchy in the layout of the latter so that we can distinguish between
primary and secondary functions, quiet and noisy.

- **Flexibility:**

This should ensure that the city can adapt to new changes in the space and to new requirements, in order to anticipate the various modifications. It is reflected in the structure, which would reduce the constraints on the layout of the space as much as possible, and the modularity of all the constructive components.

3.2-Concepts related to architecture:

- **Centrality :**

The aspect of centrality can be defined as an articulating and organising element,
which ensures the various functional and spatial links. The purpose of the central space is to :

- ✓ freedom of movement.
- ✓ visual clearance.
- ✓ identification of spaces.
- ✓ rapid reading of space.

- **Permeability:**

This ensures the facility's relationship with its environment through its various access points (pedestrian and mechanical) and the functional relationships between the various parts of the facility. access (pedestrian and mechanical) and the functional relationships between the different internal entities. It can also be expressed in terms of internal and external visual relationships.

- **The itineraries :**

Paths influence the individual and reveal the geometric, spatial and formal characteristics of the environment in which we move.
geometric, spatial and formal characteristics of the environment in which we live.

images can be distinguished by the quality of their structure, the way their parts are arranged and linked. parts are arranged and linked, so an unfamiliar space requires reference points and and anchors for easy orientation.

- **Fluidity and clarity:**

Visual quality, apparent clarity or legibility combine to create an overall structure for the project that allows it to be readable from the inside and can be discovered with the help of fluidity and legibility of circulation.

- **Unicity:**

This consists of uniting the different parts of the project to create a coherent image.
image of the project

- **Notion appeal :**

The project must be an eye-catching element that invites people to visit it through
incorporating large volumes, exceptional treatment or unusual shapes.

- **Notion of reference**

The project must be a landmark, so that people can find their way around it
its shape, morphology, size or position in the town.
in the city.

- **visual field:**

Qualities that increase the range and penetration of vision, in a real or symbolic way.
or symbolic, include transparencies such as glazing

- **Concept singularity:**

This is the presence of a unique form or element that cannot be repeated.
objective is to mark an important moment through its meaning, its formal aspect, its structural aspect and its function, structural aspect and its function.

- **contrast:**

According to Pierre Von Mies <<contrast serves to give an immediate identity ..., contrast
contrast is a principle for ordering our environment, the meaning of a form is enhanced by its contrast.....>>

- **openness:**

Because it will be used by people from all over the world, the project must be a modern facility that is open to the outside world. This openness will give visitors more freedom so that they do not feel confined.

- **Symbolism :**

Through its morphology and form, the project must be a symbolic element
expressing a philosophical idea and a message that the architect must convey to the public.

- **Dynamism:**

Our project must have a dynamic, futuristic form that is in tune with the times.
time. This form must express the constant evolution of the economic world that surrounds us and the economic development that is increasing.

- **Identity:**

The project must reflect society and the city of which it is a part.
of which it is a part. Each person must identify with it, which means that it must
context and social groups so as not to upset them.
to avoid upsetting them.

- **Plasticity:**

The project must be plastic in its shape and volume and must express the
modernity.

4. Stage of genesis for an architectural project:

Our aim is to develop a project that will leave its mark and the architectural richness of the city of Oran. There are 6 stages to the project. Moving on to Let's move on to the formalisation of the project's schematic diagram.

4.1. Stage 1: the axes

A strong axis of visibility: this is a major axis from which we will have an overall view of the facility (Project).

Fig.6.2. Stage 1: the axes
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

1.1. Stage 2: accessibility

The setback: to materialise our project, reduce noise propagation and ensure safety.

The main pedestrian access will be located on the main road so that it is visible.

The mechanical access and car park are located on the south-east and west lanes, which will be characterised by low mechanical traffic.

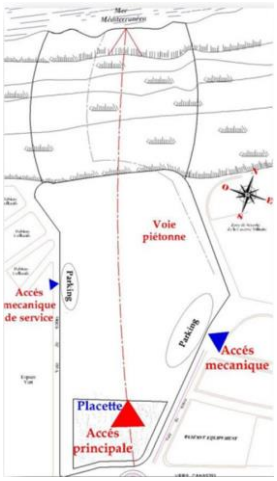

Fig.6.3.Stage 2: accessibility.
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

1.2. Stage 3: siting alternatives.

The built mass of the project: is located in the middle of the plot on the major axis of composition.

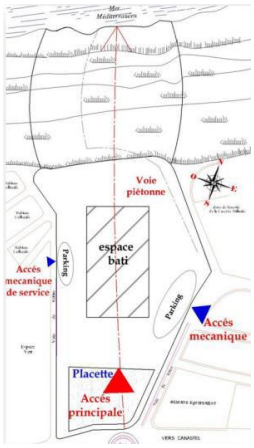

Fig.6.4. Stage 3: siting alternatives
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

1.3. Stage 4: Spatial organisation (zoning)

The spatial organisation of the functions is based on priority and the functional relationship between them.

Entity -A-: this is the main part that houses the student reception area

(training)

Unit -B-: this is the outreach and awareness block.

Entity -C-: is the accommodation block for girls and boys, which can also be a relaxation area.

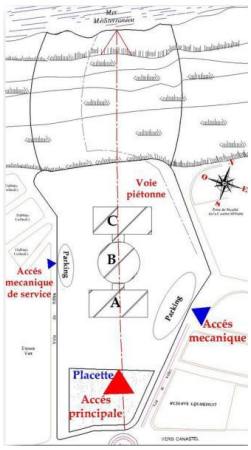

Fig.6.5. Spatial organisation
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

1.4. Stage 5: shape and massing

The project site is located by the sea, directly overlooking the sea, and the project necessarily uses seawater to research and feed its aquariums.

So they opted for a shape that dictates and symbolises the link between the project and the sea, and that allows the project to communicate with and harmonise with its natural environment - the shape of the anchor with the boat's helm:

-The integration and harmonisation of the project with its environment.

-The flexibility and movement expressed by its curved shape.

-The conformity of its volume with the organisation of our project into a compact monoblock.

-Treatment of the volume of the entrance to ensure that it is visible from the road.

from the road.

Fig.6.6. shape and massing
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

1.5. Stage 6: the schematic diagram.

Within the institute, an interior layout was recommended, with the aim of creating a link between all the areas.

The development guidelines are presented in terms of the layout of the entertainment, leisure and walking areas around the establishment.

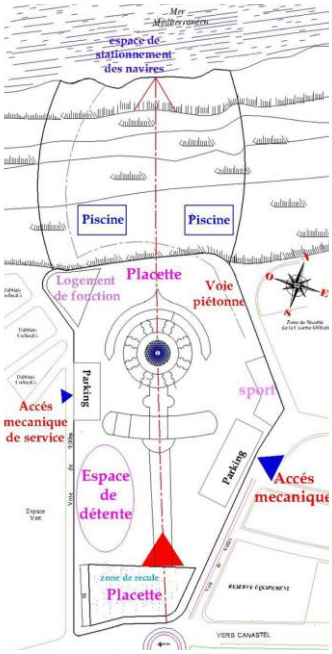

Fig.6.7. the schematic diagram
Source: http://dspace.univ-tlemcen.dz/bitstream/112/1226/16/la-genese-du-projet.pdf

CONCLUSION

The genesis of an architectural project is a structured process that extends from the initial idea through numerous stages of planning, design and construction to its actual realisation. Each phase is essential to ensure that the project meets the needs of the users, respects the constraints of the site and achieves the objectives set. Through close collaboration between architects, clients and other stakeholders, an architectural project can become a successful and lasting work that enriches the built environment.

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Lesson 7: Architectural design method: Functional method

INTRODUCTION

Functionalism is an architectural principle according to which the form of buildings and furniture should be an expression of their wisdom, and is accompanied by a gradual rejection of purely decorative elements. In the 20th century, most architects of the modern movement adopted this principle (functional design method). Functionalism was opposed to neoclassicism, which emphasised the symbolic value of decorative forms inspired by Antiquity.

1. **Functionalism:**

The doctrine of functionalism cannot be detached from a wider framework of thought that aims to reform the whole of man's relationship with buildings.

- The construction of buildings governed by their function is as old as the practice of architecture itself. The construction of a fortress, an ancient aqueduct or a skyscraper meant that the choice of form and materials had to be tailored to the specific purpose of the building.

- On a theoretical level, the principle of functionalism already appeared in the first known treatise on architecture, by the Roman military engineer Vitruvius. The principle was celebrated in the rationalist writings of eighteenth-century French and Italian architects.

- Viollet-le-Duc and Henri Labrouste, in the mid-nineteenth century, advocated adapting form to human needs without rejecting the various decorative styles.

- At the end of the 19th century, the American Louis H. Sullivan, leader of the Chicago School, was the first to say: "Form follows function". (Form follows function)

- The liberation of volumes made possible by the advent of modern building materials such as steel, industrial glass and reinforced concrete allowed architects to subordinate form to function to a very large extent.

- Functionalism was a slogan for the various branches of the architectural avant-garde in the first half of the twentieth century. But each architect applied it in a different way.

The saying "form follows function" comes from the American architect Louis Sullivan, who argued that the form and external appearance of a building should flow from its function and internal articulation:

"It is the pervading law of all things organic and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, ***that form ever follows function. This is the law****."* *Louis H. Sullivan*

The corollary of 'form follows function', which was adopted and popularised by modern architects in the early 20th century and then adopted by designers in many disciplines, can be interpreted in two different ways as a description of beauty or a prescription for beauty.

- The descriptive interpretation is that beauty results from a purity of function and an absence of ornamentation.

- The prescriptive interpretation is that aesthetic considerations in a design should be secondary to functional considerations.

This is also referred to in a more general sense as functionalism. The functional aspects of a design have the advantage of being less subjective than the aesthetic aspects.

In the functional method of architectural design, the designer selects the activities to be taken into account in the design and tries to give them concrete form in the projected drawing.

2. The Functional Order :

Functional order gives primacy to function. It is this function that coordinates the whole and generates the final configuration of the plan. Walter Gropius's Bauhaus school in Dessau, Germany, through the unity of creative thought in art, industry and craftsmanship, was able to lead architectural thought to what is known as a pure, rigorous and technological international style, through a highly elaborate constructive purism.

Today, although this trend is clearly in decline, other factors can still lead to the emergence of such configurations. We are thinking in particular of two factors: the programme and the specifications. The programme, by reducing the surface area or the attributes of certain spaces, can contribute to establishing a functional order, for example by reducing circulation to a simple route. The specifications, by requiring the designer to adopt certain configurations or solutions, can achieve the same results. For example, requiring certain spaces in a school to be centralised while others are set apart, or requiring classrooms to be arranged in a linear fashion in single rows instead of double rows, can contribute to making circulation a mere appendage of the functional organisation in question.

3. Spatial arrangement method :

The various approaches to the organisation of spaces can be broadly summarised as follows can be summarised as follows:

- Identification of space requirements

- Study of needs in terms of movement and distance

- Production of an arrangement that satisfies and minimises distances, it is the movement-distance binomial that is considered to be the main organisational factor.

The techniques used include

- Bubble diagrams
- Interaction matrices or grids
- Graphs

By using the functional design method, we can develop a method for the functional layout of spaces. The fact is that a concept of form can easily be identified even with a minimum of functional mastery.

3.1. Bubble diagrams

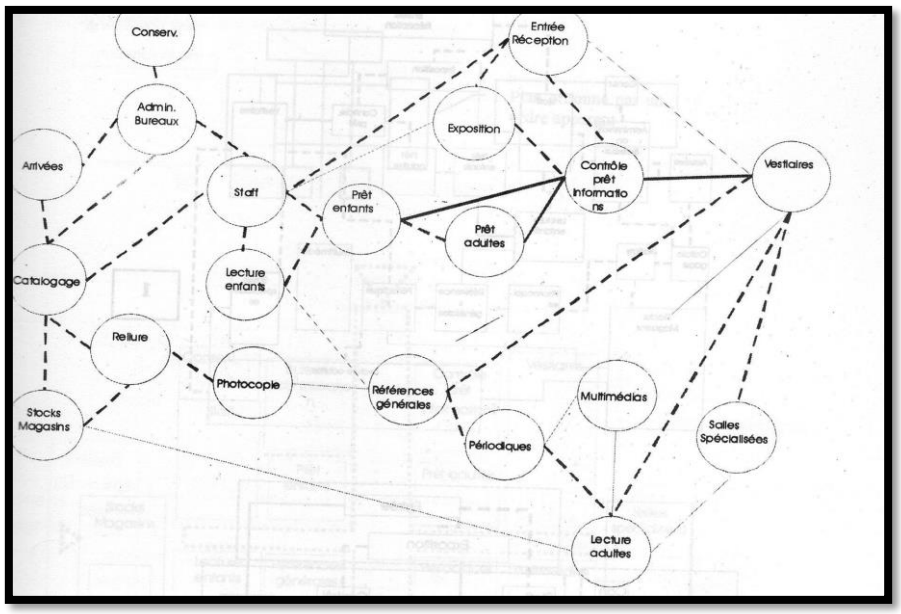


Fig.7.1. bull function diagram
Source Mazzouz.S, 2004 p91

Transforming the diagram into a spatial organisation diagram

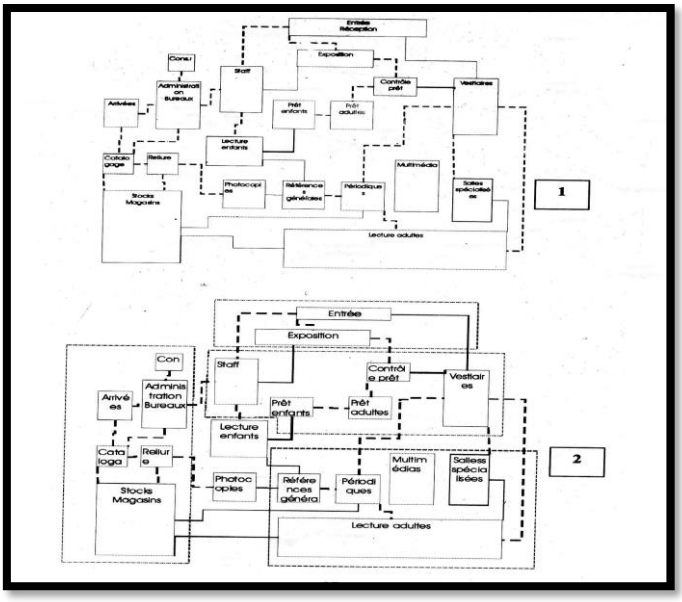


Fig.7.2. Transforming the diagram into a spatial organisation diagram
Source Mazzouz.S, 2004 p92

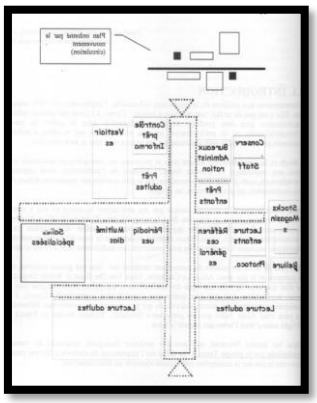


Fig.7.3. The arrangement ordered by movement
Source Mazzouz.S, 2004 p95

3.2. Interaction matrixes or grids:

Construct a space interaction matrix, focusing on function. A semantic scale can be used to assess the weight of interactions, ranging from the intolerable (1) to the important (5).

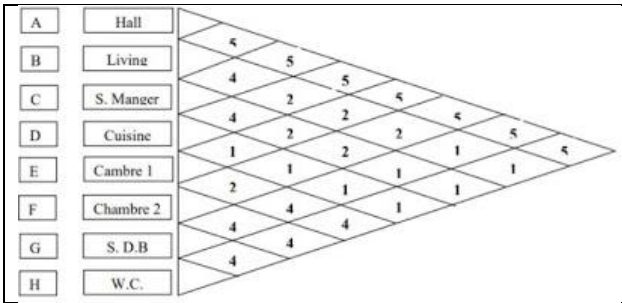


Fig.7.4. Interaction matrixes
Source Mazzouz.S, 2004 p87

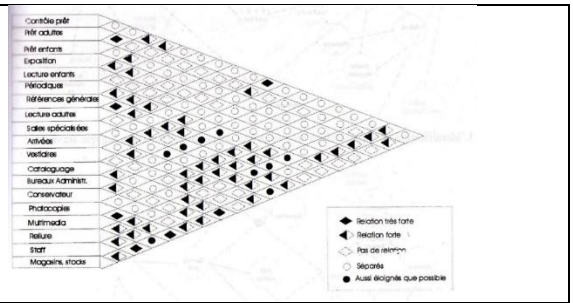


Fig.7.4. Interaction matrixes
Source Mazzouz.S, 2004 p89

3.3. Graphs

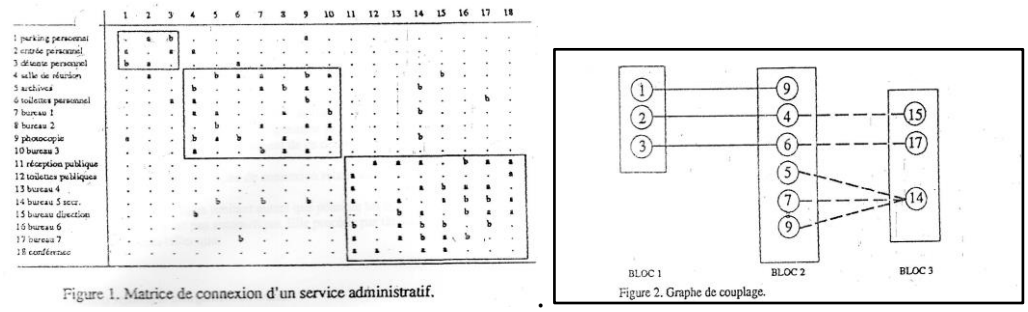


Figure 1. Matrice de connexion d'un service administratif.

Figure 2. Graphe de couplage.

Fig.7.5.graphe of connecrion

Source

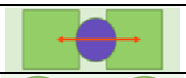
type of spatial and functional relations		diagram
separation	proximity: two spaces linked by a space	
	separation	
closeness	proximity required: adjacent space	
	overlap: intersecting spaces	
	integration : inclusion of one space into another	

Fig.7.6. spatial and functional relationships

Source: https://www.djamiatic.net/hadjeres/Fonct_Relations.html

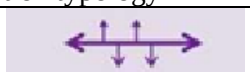
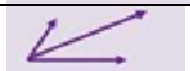
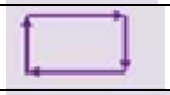
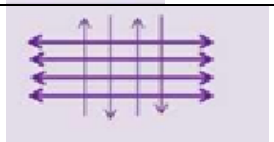
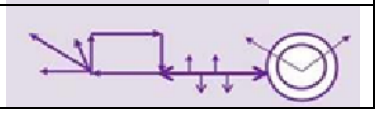
circulation typology	
linear	
radial	
centralised and radioconcentric	
in loop	
grid	
combining different organisations	

Fig.7.7. circulation typology

Source :https://www.djamiatic.net/hadjeres/Fonct_Typologie.html

CONCLUSION

The functional method in architectural design is a systematic approach that ensures buildings are designed to respond effectively to the needs of users. By focusing on functionality, this method creates spaces that are practical, usable and well adapted to their intended use. It requires a thorough understanding of users' activities and needs, detailed space planning, and attention to technical and design details.

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Lesson 8 Architectural design method: the formalist approach (1. metaphors, 2.geometric compositions, 3.bio-mimicry)

INTRODUCTION :

The formalist approach in architectural design emphasizes the importance of form and aesthetics, focusing on how buildings look and their visual impact. This method often prioritizes the artistic and sculptural qualities of architecture, treating buildings as works of art. Below, we explore three key elements of the formalist approach: metaphors, geometric compositions, and biomimicry.

I. Metaphors :

1. definition

The metaphor is a trope because the effect of this figure is to divert a word from its usual meaning. In fact, the word trope means a change of meaning. To say the abstract with a concrete word,

But the metaphor is only a false image, since it does not have the direct virtue of the image that produces the meaning. of the image that produces expression. Its ambiguity has no direct equivalent in either in the language of prototypes, or in the formal language of computer graphics.

Fig.8.1. The central nave of Barcelona's Sagrada Familia1883_ 2026 : the cathedral's pillars tower like a forest of oak trees
Source: https://www.pinterest.com/

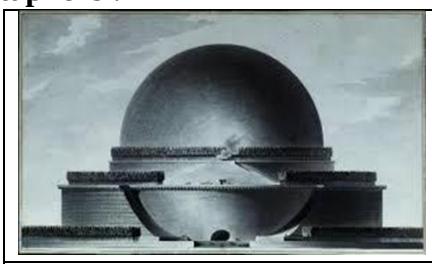
2. Objectives

The use of metaphor can be an inexhaustible source of creativity. It can be used at different stages of the architectural design process. Whether in plan or in volume, metaphor can always lead to original concepts.

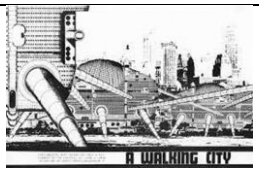
Uncontrolled, abusive or naïve use, however, can lead to the opposite of the desired objective. To avoid this, it is important to ensure that the use of metaphor moves from the tangible to the intangible, following the well-known principle that the less easily a metaphor can be detected,

the greater its artistic and aesthetic value, and the further away it is from "quotation" and literal interpretation.

3. **Examples of metaphors :**




étienne-Louis Boullée, 1784. cénotaphe à newton
Metaphor of the celestial vault

Ron HerronWalking City on the Ocean, project 1966:
(Archigrame)

The Einstein Tower, **Erich Mendelsohn** is an astrophysical observatory.

Fig.8.2. Examples of metaphors in history
Source: https://www.pinterest.com/

Example 1:

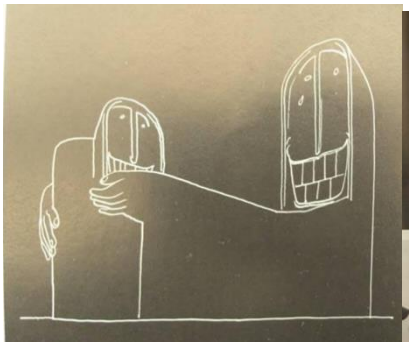
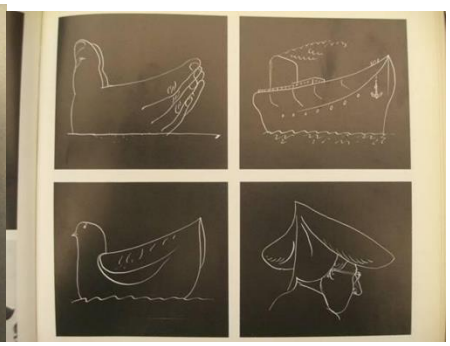
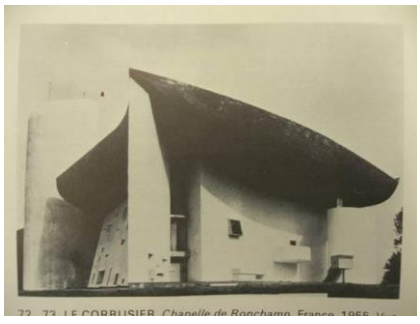




Fig.8.3. metaphor of notre dame du haut Ronchamp
Source https://fr.slideshare.net/slideshow/lecture-10-postmodernism/32693936

Jenk's 1977, interpreted as Swiss cheese,

Less joined in the shape of a prayer Nun wearing a cornette

But the aim of the openings is to take up the milky way "the galaxy".

Example2 The Library of Alexandria (Architectes: Snøhetta, Craig Dykers, Christoph Kapeller, KjetilThorsen) achieves the same objective by lending itself to different interpretations while retaining a fairly strong link with the generative elements of its form which are the sun (RA), the moon and the concepts of time and eternity dear to the orient.

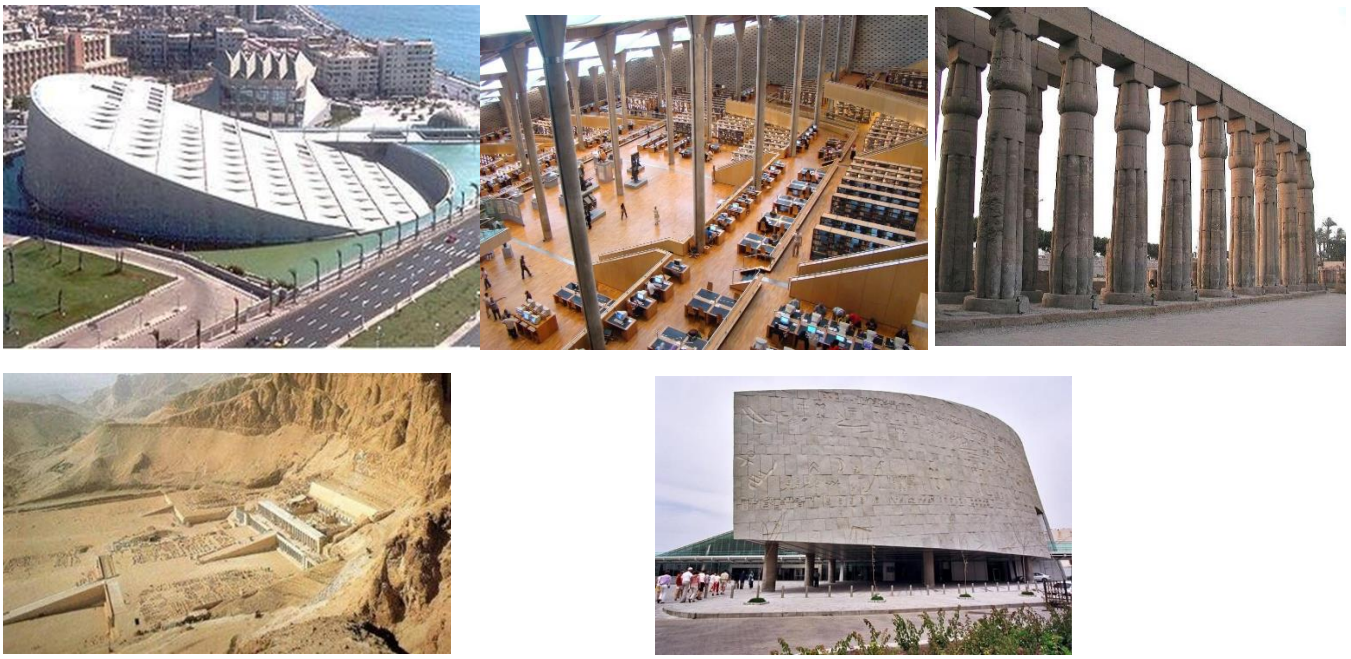


Fig.8.4. The Library of Alexandria
Source: https://www.pinterest.com/

Example 2: Bibliothèque de France (four towers in the form of open books).

In 1996, Dominique Perraulta's project won the prestigious Mies van der Rohe Prize, awarded every two years by the European Union to the building recognised as being of the highest architectural quality in Europe. four large angular towers, each 79 m high, symbolically representing four open books. Each tower has a name:

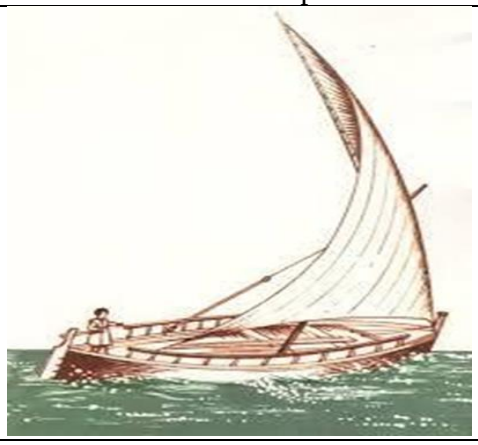
Tower of Time

Tower of Laws

tower of Numbers

tower of Letters.

Fig.8.5. Bibliothèque de France
Source: https://www.pinterest.com/

The source of inspiration	The project
	
Borj El Arab (Dubai)	
	
Jumayrah beach (Dubai)	
	
Paul KLEE museum, Bern, Switzerland	
	
Exhibition and Conference Centre of Scotland	
	
Tjibaou cultural centre	



Stadium Pekin

Constantine University

Fig.8.6 Examples of metaphors
Source: https://www.pinterest.com/

4. Metamorphosis and metaphor.

Metaphor derives architectural form directly from an object that has been erected as a symbol: a cube, a tree, a book, an open shell. The success of the project and the success of future construction depend on the ability of the architect and his team to transform these symbols into architecture. Starting with an object taken as a symbol probably leads to the re-design of an object, and although architecture may be considered an object from a certain point of view, it is only partly so. It is not just that. This is why it cannot tolerate mimicry, even if it means becoming an object of amusement or derision. The architect must therefore find the right distance between the object used as a symbol and the future construction and also, of course, choose a referent that is relevant to the building's purpose.

5. Use of metaphor

5.1. Geometric abstraction :

Geometric abstraction, as in the case of these flats derived from the metaphor of the flower, can be used to create interesting configurations, either by working geometrically on the contours, or by seeking out the underlying structure and transforming it geometrically.

The use of metaphor Metaphor is defined as a special meaning attached to an object or an idea. idea and can be tangible ("visual") or intangible ("concept").

The most difficult stage is the transition from the tangible to the intangible nature of the metaphor, following the well-known principle that the less easily a metaphor can be detected, the greater its artistic and aesthetic value.

The architect must convert the original representation-source into a representation-goal that satisfies all the architectural requirements (functional, economic, technical,,,,,,,).

5.2.Metaphor

- Geometric abstraction: Geometric abstraction, as in the case of these apartments derived

These flats are derived from the metaphor of the flower:

- either by working geometrically on the contours,

- the underlying structure and transforming it geometrically to

the underlying structure and transforming it geometrically.

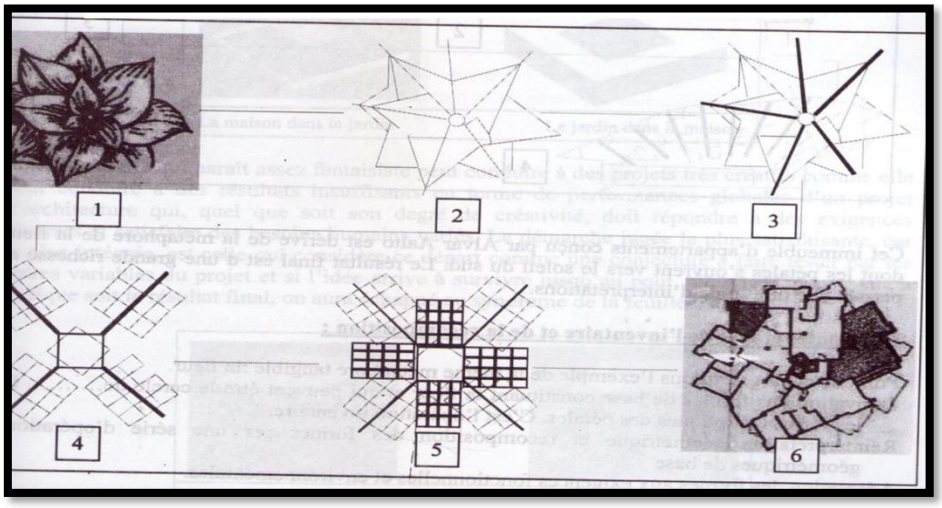


Fig.8.7 Geometric abstraction
source: Mazzouz.S, 2004 p 57

Making an inventory and recomposing: making an inventory involves making an inventory of the basic shapes that make up the drawing and then recomposing them in a different way. This procedure makes it possible to achieve high levels of abstraction.

The architect in the process of designing selects the "significant" semantic features that seem relevant to the project.

Some features appear to be more fundamental than others and resist transformation of the source presentation . If we want to explain the stability of an architectural model, the problem that arises is to distinguish between the semantic features that resist and those that disappear.

II. Geometric compositions:

Note: this method was studied in detail in the first year of training, so tackling geomeric composition will be a simple reminder of the lesson.

1. The different compositions:

1. linear.

2. Planimetric.

3. Volumetric

4. Figurative: represents the real and the imaginary.

5. Abstract: there is no image on them.

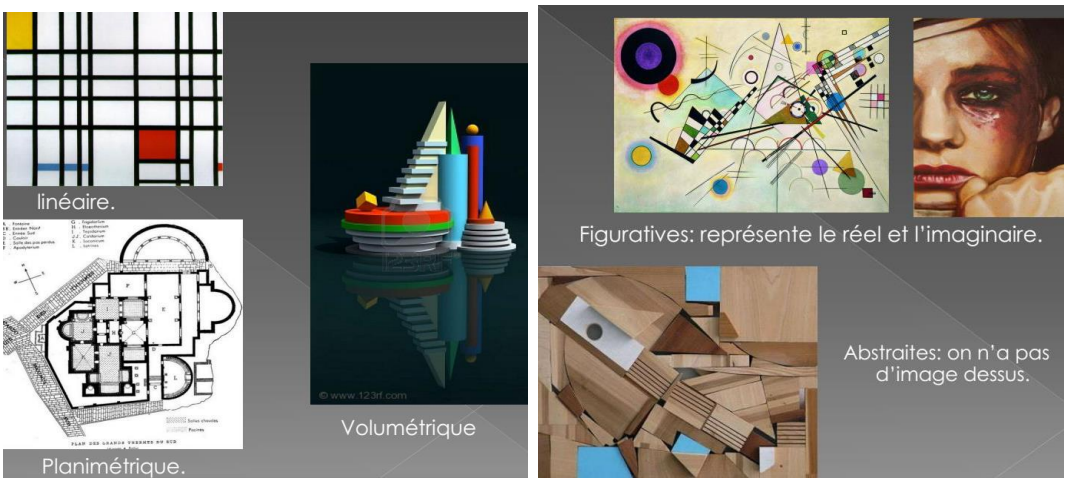


Fig.8.8. The different compositions
Source : https://www.shutterstock.com/fr/image-illustration/primitive-form-architectural-abstract-composition-34199395

2. Assembly of shapes or principles of composition:

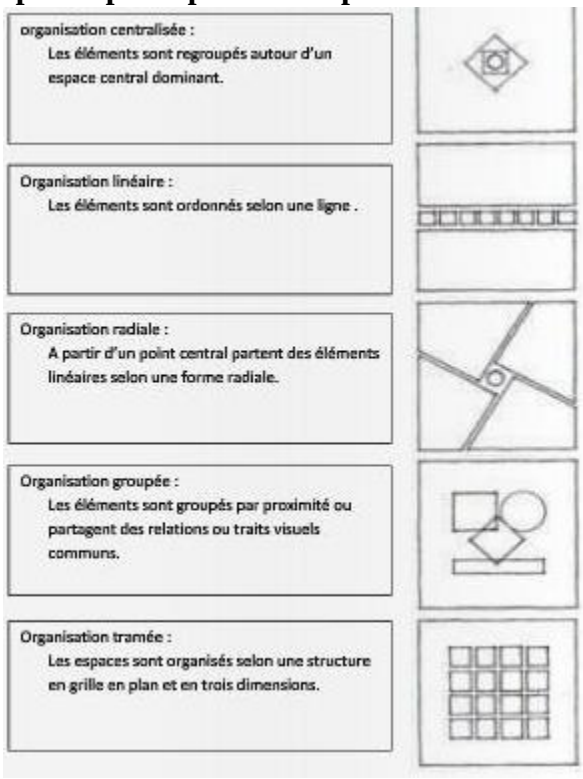


Fig.8.9. type of composition
Source HAMMOU A ; 2016

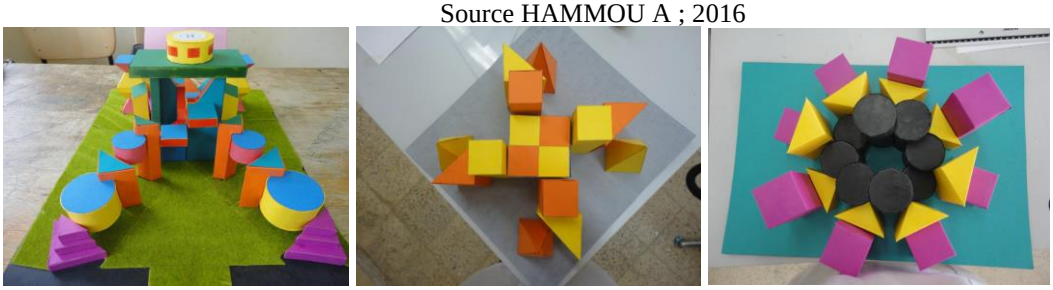


Fig.8.10. student's work
Source Author, 2015

III. Bio-mimicry architecture

3.1.Biomimetic architecture:

a sustainable innovation that seeks to make the most of nature.

3.1.1. Etymology and definition of biomimicry :

The term biomimicry comes from the combination of two Greek words: βίος bíos, meaning life, and μίμησις mímêsis, meaning imitated.

Bio-mimicry is a discipline that studies the best ideas in nature and then imitates them to apply their concepts and processes to human problems. The process of imitation is the basis of all learning, and imitating other species is a phenomenon found in most cultures in close contact with the living world.

"Biomimicry = X+ biology (X=architecture, engineering, design, chemistry, management...).

According to the American biologist Janine Benyus in her book (Biomimcry inspired by

Nature): "Biomimicry is an approach to innovation that involves transferring and adapting the principles and strategies developed by living organisms and ecosystems, in order to produce goods and services in a way that is so inspiring that we now speak of sustainable bio-inspiration, and to make human societies compatible with the biosphere".35

3.1.2. The principles of biomimicry :

A number of guiding principles for biomimetics and architectural bio-mimicry can be identified. These principles converge towards what characterises sustainable architecture, even if the definition and contours of the latter are not really stabilised.

In biomimicry, architects work with biologists and chemists through creative experiments, trying to extract techniques and ideas from nature that could be used in architecture and they have succeeded in six main disciplines:

- Efficient structures.
- Materials manufacturing.
- Waste management systems.
- Water management.
- Thermal environmental control.
- Energy production.

Through biomimetics, buildings should function like human skin, interacting naturally and automatically without human interference. This could be achieved by using intelligent

materials in architecture combined with biomimetic design; this could make a major contribution to the energy-efficient design of architecture.

3.1.3. The levels of biomimetic architecture (the dimensions) :

The biomimetic design process in architecture is based on 4 possible levels of imitation:

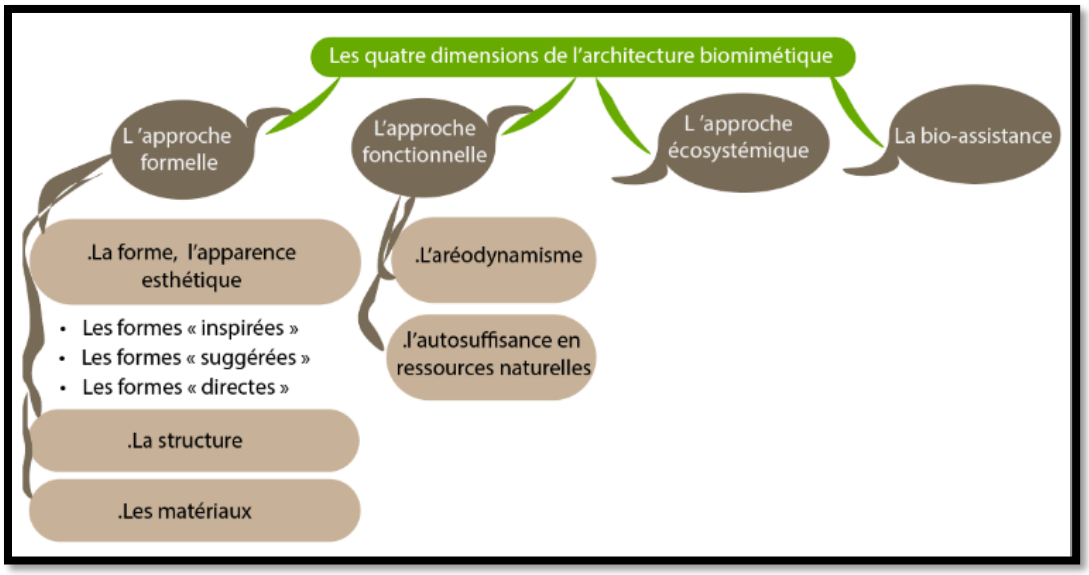


Fig.8.11. The levels of biomimetic architecture
Source : http://dspace.univ-jijel.dz:8080/xmlui/handle/123456789/10100

CONCLUSION

The formalist approach in architectural design offers a rich palette of methods for creating visually compelling and meaningful buildings. By employing metaphors, geometric compositions, and biomimicry, architects can craft spaces that are not only aesthetically pleasing but also culturally resonant, functionally effective, and environmentally sustainable. This approach allows architecture to transcend mere functionality and become a form of artistic expression that enhances human experience and interaction with the built environment.

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Lesson 9 non-standard architecture

INTRODUCTION

Non-standard architecture, also known as non-conventional or experimental architecture, refers to an architectural movement distinguished by its desire to break away from established norms and conventions. It is characterised by innovative forms, unusual materials and daring concepts.

1. The origins of non-standard architecture

1.1. The blob architecture

One of the first to give a theoretical formalisation to these explorations of animation and fluidity was Greg Lynn, who introduced the concepts of animation, inflection, folding and curvature into architectural theory in a series of articles in the early 1990s.

Greg Lynn reports that the elementary architectural form must be like "a blob that, undergoing mutation, can maintain its basic identity". Blob meaning ' drop' or ' a spot '.

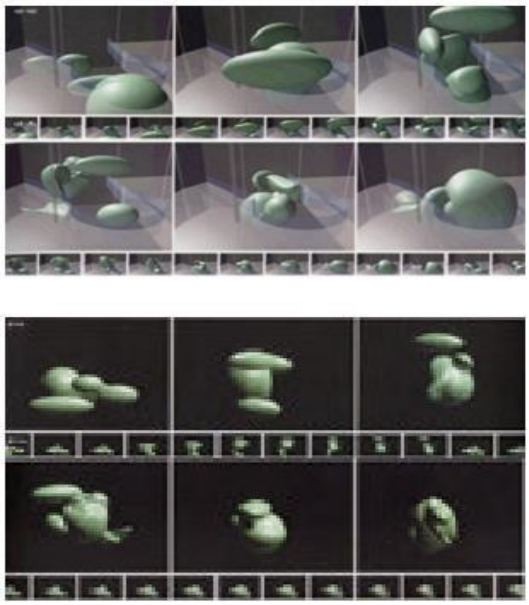


Fig.9.1.The blob architecture G.Lyn, Henie onstad, oslo (1995)
Source https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

In his 1996 article "Blobs, or why tectonics is square and topology is groovy", Greg Lynn proposes a definition of architecture based on these principles: he speaks of a blob, in the sense of something soft, flexible, reactive to the conditions of the environment and the actions and forces that surround it. The reference comes from the 1956 film Blob, where the blob is, in fact, a soft substance that takes on the shape of whatever contains it.

Architecture is interpreted as a "system of dynamic organisation" rather than as a process of formal composition or functional organisation.

Conceptual operations on forms are of the order of inflection and deformation, breaking with traditional 'composition' and the more recent deconstruction.

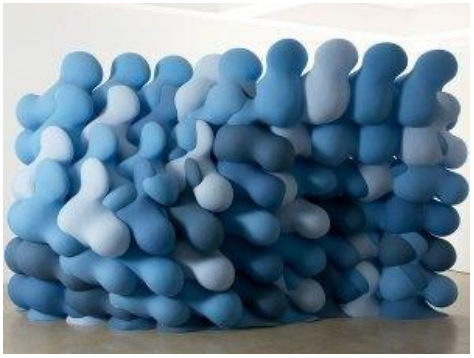
	
Nicholas Grimshaw – Eden Project (2001)	Norman Foster, who designed London's City Hall
	
Greg Lynn – Ravioli Chair (2005)	Greg Lynn – The Evening Line (2008)

Fig.9.2. examples of blob architecture
Source: https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

1.2. Liquid architecture

In the 1990s, the Dutch architects NOX and ONL were working on the idea of the fluid in architecture: they called fluid an architecture that could "incorporate the movements of the human body" and activate the body and its perceptive system. They proposed the term "Liquid" to define an architecture that "continuously connects the real and the virtual, matter and information".

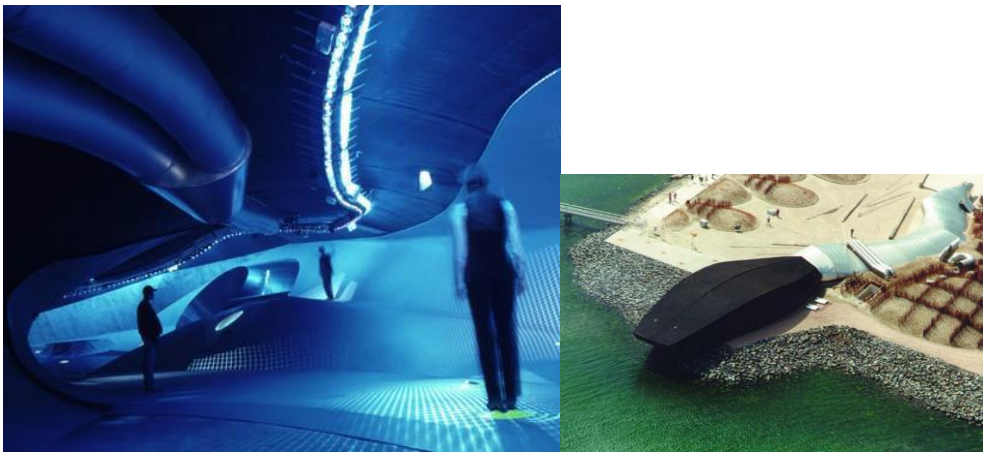


Fig.9.3. the Freshwater Saltwater Pavilion [designed by NOX and ONL Rotterdam
Source https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

1.3. Free Form Architecture

In 1997 the construction of the Guggenheim Museum in Bilbao (Spain)

The visual power of the fluid, curved and brilliant forms of this work transformed it into a veritable visual icon, a symbolic image capable of catalysing around it the economic development of the city of Bilbao as a whole.

In terms of design, the geometric modelling of the complex shapes is carried out using

CATIA software, until now used exclusively used exclusively by the aerospace industry and now widely used in the in the field of complex architecture

Fig.9.4. Guggenheim Museum in Bilbao (Spain)
Source https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

Architecture is conceived as a response to the actions and flows of people and information over time. The logic of formal elaboration stems from concepts such as morphing, hybridisation and topology.

R. Oxman sums up this point of view well when he defines Free Form as "free of formal a priori": there is no formal a priori.

There are no predetermined formal rules (norms, typologies, standards, grids, elementary forms, etc.) in the spatial development of the architectural object.

Form is a result, there are no forms that can be defined in the abstract (like a circle or a square): form is always the result of a process, which depends on a number of specific factors, so in each particular situation it will be different.

1.4. Digital architecture

The use of digital modelling tools in design began in the began in the 70s of the 20th century in the aerospace and automotive industries, and then spread to the field of industrial design. In architecture, it was not until the 80s or 90s that their use became widespread.

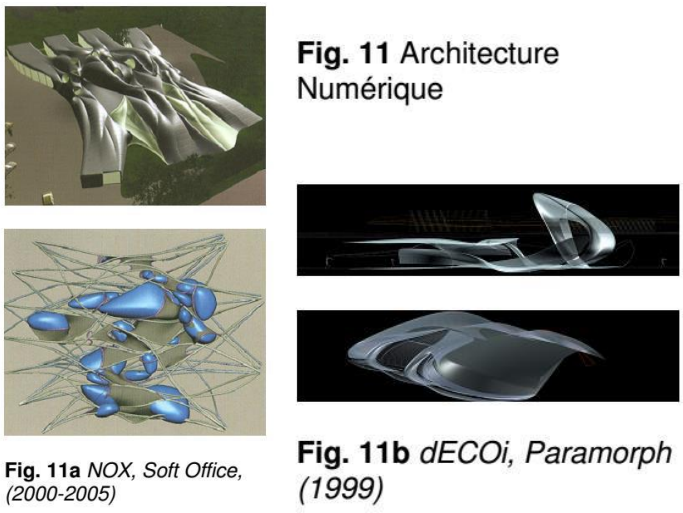


Fig.9.5. Digital architecture
Source https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

1.5. Parametric architecture

The Free Form is therefore the result of a process of "morphogenesis" process, in which a complex set of coupled coupled parameters interact in a non-predetermined way to generate a shape that is the 'best' possible in relation to the chosen parameters and the laws of coupling. For this reason, another definition often used is that of
"Parametric Architecture", or "Performative Architecture", because the shape which is generated through the coupling of parameters is the best "performing'.

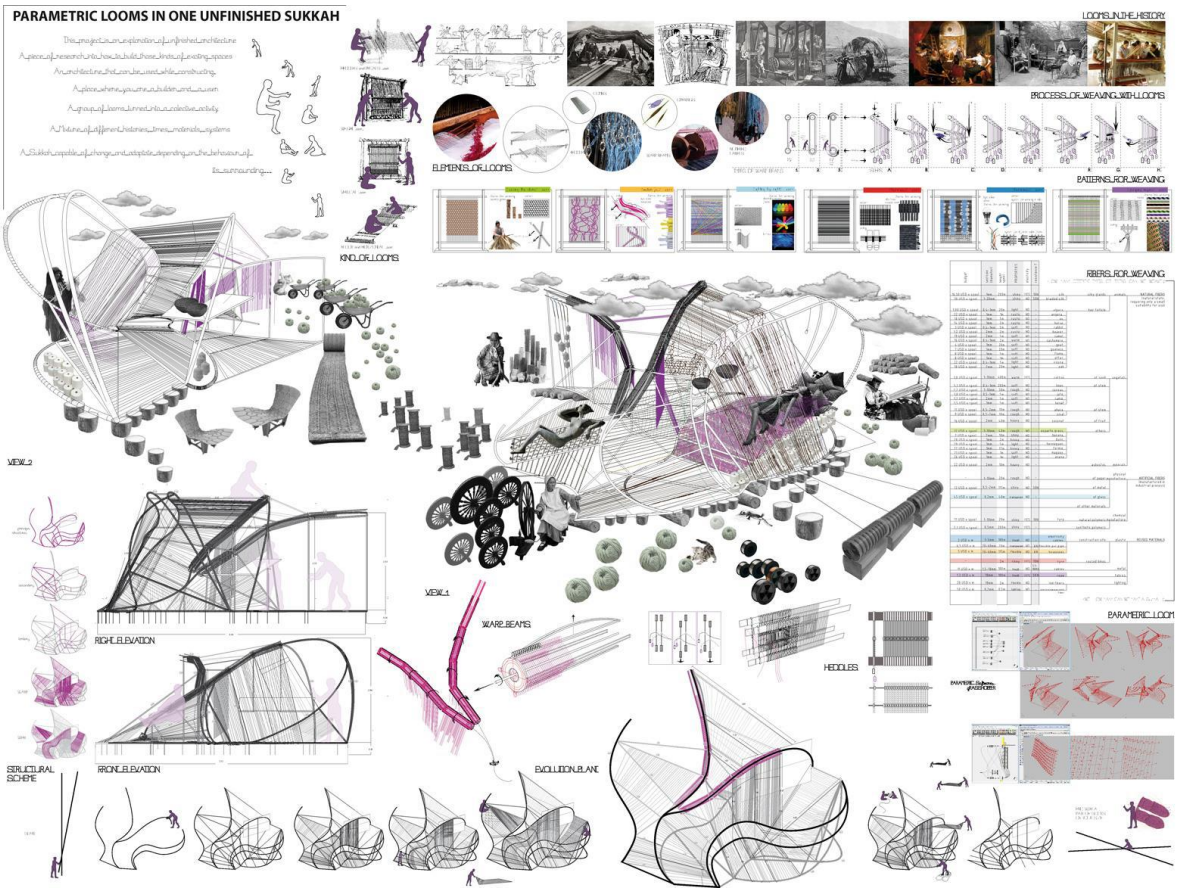


Fig.9.6. project done by parametric architecture
Source: https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

2. Non-Standard Architecture

The origin of this term is mathematics, and in particular non-standard analysis. This mathematical discipline (rigorously defined by A. Robinson in 1966) is based on the theory of infinitesimals, infinitesimally small entities (so small that there is always one smaller than the one under consideration).

there is always one smaller than the one under consideration), through which it is possible to manage the concept of continuity mathematically. The architecture of digital free forms is therefore a Non-Standard architecture, because the concept of continuity is present and decisive both in the theoretical approach (formal generation, functional organisation, etc.) and in the practice of the discipline (continuity, or unity, in the field of language and information exchange).

Fig.9.7. Zaha hadid, funiculaire, INNSBRUK 2008
Source; https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

Fig.9.8. Coop HimmelblauBMW Welt, Munich (2007)
Source: ; https://archiguelma.blogspot.com/2018/03/architecture-non-standart.html

3. Morphogenesis

In this context, the designer's focus inevitably shifts from the object to the information: the "form" object does not count, because form is simply the result of the materialisation of a field of forces.

Compared with the 'traditional' process, the most specific characteristics specific characteristics we have identified are the extensive use of digital tools and the fact that these are collaborative and multidisciplinary processes.

This implies that there is a medium between the designer and the final form.

final form, because the designer does not act directly on the form but on a structural logic which is transformed into form by a system, managed using IT tools.

Non-Standard Design is therefore a collective and collaborative process, in which the final result is the result of the participation of different players.

CONCLUSION

Non-standard architecture is often controversial. While some see it as a necessary break with rigid traditions, others criticise it for its high cost and lack of practicality. However, there is no doubt that these designs stimulate debate and push architecture towards new horizons.

Non-standard architecture reflects a quest for limitless creativity, seeking to reinvent the spaces we inhabit and push back the boundaries of what is possible in architecture.

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