

Buildings Energy Performance in the Mediterranean Area

The identification of the environment disposal of the traditional Algerian houses

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Abstract

Computing tools are usually used to describe, represent or simulate a field. In the architectural field these tools are also used to represent building elements to quantify any energy consumption.

Conceptual modelling is a way to represent a domain order to explain some actions. In our case, we will use this technic to reach to steps.

The first one concerns the description and the explanation about the spatial organization to better understand the relationship between the house and the outside environment.

The second one concerns the description of the spatial organization of a house to identify the better point to manage the energy consumption to enable designers to be inspired from these houses organization to design their new projects. The tested corpora concerns the traditional Algerian houses.

Nowadays, the question related to the energy consumption is very important specifically in our country. Several researches used computing software to evaluate and compute the energy consumption thanks to some measuring or simulation tools. In our case, we will use a part of computing tools to better understand the spatial organization and the architectural disposal related to the environment. This part of the computing tools calls the conceptual modelling which aims to describe a domain from a conceptual point of view. This comprehension can help designers to better suggest their new projects. These projects should include varied environment disposal inspired from the studied examples.

The following paper present results obtained with post graduated students.

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1. Introduction

Algerian architectural heritage [19] is rich, not only in terms of historical value and identity, but also with the various architectural solutions used to respond to a specific environment problem.

Nowadays even if the energy consumption occupies a very important place in the design process, most of the architectural production requires additional technic elements to increase the comfort inside the constructions. Several studies have shown that the energy question must be thanked in the early steps of the design process and not be at the end of the project.

Today some of these knowledge are used especially for new projects aiming to adapt to local customs. Their social genius shown some urban and architectural solutions which are applied until today. For example one of the core principles include the HQE for harvesting and recycling of water, these two methods were in use throughout the home or Ibadites and Ottoman period [23].

For example in the new ksar Tafilelt Valley M'Zab [22] allow their designers to win prestigious award in international competitions because they suggest nowadays real architectural solutions related to the environment problem inspired by the original architectural principles of the area. However, it is important to precise that this inspiration is not only limited to the architectural aspect but it is more global. It concerns the social, the climates, the structural, the urban, ... Aspects.

It is important to precise that the aim of this paper is not to establish a general or a specific model of the traditional houses or to give the precise values of the energy consumption inside the studied houses, but is to better understand the organisation to suggest a design project related to the protection of the environment. These environment disposals could be inspired from the traditional organisation and construction of the Algerian traditional houses. After understanding the environment disposals of the houses we will create a database including documents of the described houses. This database can be used by designers searching some environment solutions to their projects.

It is also important to precise that this work have been done with post graduate student in architecture. Their objective was to describe and define every architectural element linked to the natural environnement.

2. Conceptual modeling :

To analyse and to describe the traditional houses we choose a conceptual model called E-A [4]. This kind of model aims to describe a domain by identifying its concepts. To identify the concepts of a domain we have to make an abstraction. To apply the principles of the conceptual modelling we propose a method of work. The modelling allow us to define the concepts thanks to a semantic abstraction. The orientation given to this abstraction is oriented through the physical part identified visually of each house.

For this we choose the entity/association model [4]

When we describe a domain to create a database, we have to organize several kind of information. To be reached, these information have to be identified, defined and structured according to a specific point of view [1]. We choose to describe the physical parts of the architectural realisations of our heritage.

This description must respond to some rules to be efficiency. For this, we decided to represent the knowledge of the domain from a conceptual point of view. According to the shared knowledge of the professional belonging to the domain. This modeling or representation in a semantic network we will call it "Conceptual modeling".

This kind of modelling consist in the simplification of a domain in its concepts elements. In this kind of language [10] description we identify 3 elements;

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