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Bioclimatic design strategies in Shopping Centres
a study in Lisbon

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Extended Abstract of the Master Dissertation in Architecture

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Abstract

The purpose of this research work is to analyze the environmental performance of shopping center buildings, in order to contribute to the development of bioclimatic design strategies, which could adapt to the behavior of this type of building.

The study approaches the Portuguese reality, focusing in Lisbon city. Therefore, the two main shopping centers (Vasco da Gama and Colombo) will be presented as case studies.

Firstly, the historical background is considered, together with the evolution of marketplaces. Reference is made to the theory of architectural sustainability criteria and environmental comfort, with a presentation of passive design strategies. The case studies are then analyzed, diagnosing the current situation and considering alternative scenarios. In the sequence of this analysis, the strategies with the most significant impact in thermal and visual comfort are identified.

The aim of this work is to produce design recommendations that can be applied to shopping centers.

Keywords:

Sustainable architecture, shopping center, energetic-environmental performance, comfort, passive design

Index

- Introduction 3

- 1. Historical analysis of trade places 3

- 2. Shopping Centers 4

- 3. Sustainable Architecture and Bioclimatic Design 4

- 4. Case Studies 4

- 5. Project Recommendations 5

- Conclusions 5

Introduction

The contemporary world lives at a rapid pace of technological change, consumption and abundance. Social relations are based, not only in the loop with our neighbors, but also in the handling of goods and messages. The shopping malls are true cultural icons, meeting point and focus of the new citizens. To survive and preserve the status of modern *Ágora* these spaces have to adapt to the demands of society and meet the desires and beliefs of consumers.

It is essential to meet the needs and objectives of social, political and cultural at the sametime it creates conditions that will enable future generations to ensure their own needs. The recent awareness of the environmental problematic has focused the people attentions in the building's use of energy and its interior environmental quality. This concern has been a guideline for many companies, wishing to gain green consumers, this way is also essential that the commercial spaces follow the trends dictated by the public.

Considering the shopping centers as spaces planned and managed to receive a large number of users, where the activities carried out well beyond trading and where the entire environment is controlled, which is important to understand the impact of these areas from the standpoint of sustainability. The dissertation focuses on the question of Bioclimatic Design applied to the particular reality of Shopping Centers. As a central objective, we intend to analyze and develop strategies to optimize comfort and energy through Bioclimatic Design.

1. Historical analysis of trade places

The first chapters are about the historical background and evolution of the concept of shopping centers.

First approach is a retrospective of trade in the city of Lisbon, since the Middle Ages to the twenty-first century. From street markets to the shopping centers, places of trade have changed a lot, and are increasingly sophisticated. In Lisbon, the center of trade which for centuries was the Baixa and Chiado is nowadays out of this area, inside of shopping centers.

To finish this chapter, it is an overview of four decades of existence of the Commercial Centre in Portugal, the onset and development.

2. Shopping Centers

Chapter 2 expands the concept of shopping center, since its origin in the world and their presence in the Portuguese economy over the past four decades, through the spatial and social characteristics, analyzing the duality between public and private space present in these spaces and classifying them according to areas and commercial format. This chapter attempts to identify the programmatic needs of shopping centers and the functional level of comfort with space as a backdrop to the context and social interaction.

3. Sustainable Architecture and Bioclimatic Design

Chapter 3 is related to issues of sustainability, bioclimatic architecture and design. It is intended at this point to identify strategies and solutions Bioclimatic architecture, from the perspective of Shopping Centers. So the first point concerns the issue of sustainability in architecture, introducing the concept in urban scale, to the architectural scale of the building as part of a whole.

Then, with the backdrop of the shopping centers, we analyze the potential of architectural sustainability and business strategy in order to understand extensively the contribution of this study.

Finally explores the concept of bioclimatic design in the context of sustainable architecture showing, finally, a general review of passive bioclimatic design strategies applied to commercial buildings.

4. Case Studies

Chapter 4 presents and explores case studies Vasco da Gama Shopping Center and Colombo Shopping Center, both located in Lisbon and managed, both by Sonae Sierra.

The analysis of these buildings as case studies can explore some of the points mentioned above and, above all, to understand the behavior of two existing buildings by comparing them with their problems and identifying their potential for improvement and adaptation to environmental issues.

To this end, this analysis is divided into several facets, such as on-site observation, contact with those responsible for administering the Center, the collection and analysis of data on the behavior of the energy centers, and for simulations using the Ecotect software.

5. Project Recommendations

In chapter 5 it is reflection and critical analysis of results and environmental feasibility of introducing architectural and design techniques bioclimatic Shopping Centre, including some recommendations for the project.

Conclusions

The historical analysis of the commercial spaces, demonstrates that only those who adapt survive over the years, the fashions and generations. In a time of financial crisis like the one we are experiencing, investment in sustainable solutions, making the built environment more energy efficient and less dependent on external solutions, is undoubtedly the way to achieving the future.

The implementation of architecture based on sustainable environmental design, should be heavily studied and introduced, preferably right from the design phase in order to create efficient solutions effectively. For this it is necessary to sensitize developers and architects for there to be the opening needed to change some paradigms often imposed on architecture, on behalf of a highly controlled indoor environment.

The application of such measures in the architecture of shopping centers is beyond an environmental asset, an economic asset, first of all by allowing lower energy costs and then to be able to use the buildings as a differentiating factor for sustainable competition.

This dissertation sought, through the study of various hypotheses, contribute to the knowledge of bioclimatic design strategies that can be applied successfully and benefit in the context of shopping center buildings, with the aim of optimizing user comfort and minimize energy consumption.