The Multi Functional Architecture in Curitiba, Brazil: Urban Planning for Sustainability

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Abstract

This paper outlines “multi-functional buildings” in the context of city planning and development which heterogeneous function concerns two or more distinct functions at the same time: housing, work, commerce and others, as instruments of intervention in urban areas. These buildings also reveal the possibilities to increase the performance of the physical occupation by promoting interaction amongst their inhabitants and focusing on urban planning for sustainability. The study shows a wider perspective of an interdisciplinary understanding of the urbanization process in the city of Curitiba. Curitiba is situated in the south of Brazil, and is considered a world-wide reference in urban planning. The example chosen is the “Massa Plan” located in the structural axis of the city.

Diversity is the key for sustainability. A sustainable community promotes multi functional spaces instead of mono-functional, and determines urban compact centers with a diversity of services, quality of life and promotes togetherness. Other functions include businesses, schools, sites for entertainment, relaxation, leisure and lodging. Places to live and work. Such multi functional buildings can be instruments of integration, to intensify or to renew urban space.

Keywords: multi functional buildings, public spaces, Curitiba, multi functional architecture
1 Southern Structural Axis of Curitiba - Urban Planning

The structural axis of Curitiba (Fig.1) is the result of one of the main proposals of the "Preliminary Plan of Urbanism", in 1964. The winning project was prepared by Serete Society of Studies and Projects and Jorge Wilheim Associated Architects. Although this urban spatial configuration has undergone changes concerning the appropriation of its public spaces, the diversity and functions of the buildings, in other words, the multi functionality is still an essential factor for the occupation of structural axis.

According to the structural axis concept, there are tangential sectors to the city center that are divided into Structural North and Structural South (Fig. 2). The guidelines of the Master Plan proposed to the City Council outlined: linear growth, hierarchy of streets, preferential development of the city in the northeast-southwest axis, polycentrism, density, extension and adaptation of green areas, characterization of pedestrian areas and creation of an own urban landscape.
In the 1970s, the Preliminary Plan of Urbanism was developed with some changes made by the Institute for Research and Urban Planning of Curitiba (IPPUC), resulting into a synthesis called the Serete/Wilhelm-IPPUC Plan. One of the changes resulted the “Massa Plan” which consists of a peculiar architectural and urban configuration characterized by multifunctional buildings of which the ground floor and mezzanine levels are used for commerce and services and their architectural configuration is covered galleries; the remaining part of the building is allocated for housing or offices. Thus, the “Massa Plan” corresponds to an architectural typology based on parameters of a specific legislation.

In this urban context there is analysis of the implications of sustainability between the building and the city (Fig. 3 and 4).
The “Massa Plan” is described in the ordinance n. 190/00 and establishes criteria for building constructions located within the structural axis. They should follow these specific guidelines: occupancy; alignment of facades; continuity of commercial use at the front area, use of trade or services on two floors: ground floor and mezzanine; the ground floor is to be constructed 4 meters from the alignment creating a covered shopping arcade, the ground floor must occupy at least 50% of the land area, and may extend to 100% with the distribution of the developed space at the front side of the property.
These criteria influence and lead to the production of sustainable urban spaces as a result of a process that involves public policy, housing demands and socio-cultural realities.

2 Urban Dimension of the Multi-functional Buildings

As part of Jacob’s (2003) speech on the multi-functionality of buildings and their urban dimensions, she raised the diversity of functions within cities. She promotes the necessity of combining different uses at different times of the day, and varied reasons for occupation that brings life to the urban space. The diversity of functions is one of the four conditions that the author considers to improve urban vitality through urban planning.

The organization and connection of the multi functional building to its immediate surrounding depends on the transition areas between public, semi public and semi private space. Its dynamics however are modified physically or socially with a system of human activities inside or outside the building itself. Therefore, these buildings may be instruments of integration, intensifying or renovating an urban space, as well as contributing to its segregation, in case it is isolated from the city.

The spread of urban enclaves has led to discussion of the processes that lead to the reduction of public spaces of postmodern cities. Caldeira (2000) states that fortified enclaves are private spaces, closed and monitored; they promote negative relationships with the city, where public spaces are becoming increasingly marked by suspicion and restrictions.

Buildings that are closed to the urban environment and that transform public spaces into private ones are part of the scene of several Brazilian cities, and among them, Curitiba.

The starting point of this analysis is the proposed buildings in the Southern Structural axis of the “Massa Plan”, where social forces are in conflict with planning, which sometimes means spaces are created for humanization, the cities image, as sources of investment, and out of demand by governments.

It must be emphasized that the spread of shopping arcades around the world suggests an increasing of the capitalist society in which a wide range of new products dumped daily from the factories require city spaces for the huge demand. According to Lefebvre (2001), the urban space appears as an expression of social relations and the production of a society. It means that as the relations of a society are changed, the place where such relationships are mediated is also changed. Thus, the architecture is the stage of social relations production of a society and it changes itself and "re-generates" itself.

Moreover, the notion of social space that, by definition, is a space that "is both labor and product - a materialization of social existence" (Lefebvre, 2001), it does not seem to be built into the physical space of the postmodern city. This is presented as a product that can be exchanged, bought and sold, becoming much more an abstract space. The city of Post-Modernity seems to miss places as
spaces for human life. Its spaces are appropriate abstractly through the double character of the centrality of capitalism: the place of consumption and the consumption of the place. (Lefebvre, 2001).

Therefore, studying the transformations of public spaces adjacent to buildings is to understand that there is a dynamic purpose for the presence of commerce function inside the buildings due to the advent of capitalist practices.

From another perspective, one can observe that despite its subversive side, the phenomenon of speculation emerges as a key that enables postmodern urban plans, as they have the ability to attract investment and contribute to the development of urban life.

The importance of public space in post-modern cities is analyzed by Giurgola and Mehta (1994) that observed that the postmodern cities lost their representative value concerning progress, so that the significance of using the street has changed. For the authors, the street - a way for pedestrians - should be a place that is conducive to meetings, with the possibility to compare it to a living room. In this image, the facades of the houses would be the walls. "To give life to the street, it must be animated by the back-and-forth of the residents and improve the exchanges they have with each other. Take your project plans and properly distribute the houses on the edges of the streets, restore them to a human aspect" (1994, p. 95).

Additionally, Gehl (2006) notes that public space for the pedestrian determines the quality of an urban city. And if the city is the meeting place it is the pedestrian public space and its spatial relationship with the architectural objects that contributes to the quality of the city.

Arnheim (2001, p. 210) states that such architectural objects not only reflect the attitudes of the users of the spaces, but also influence human behavior. According to the author, "The buildings have a large part in determining the degree of each citizen as an individual or a member of a group, and the reason we take decisions freely obeying the spatial boundaries". And adds that the physical layout of a given space refers to the grouping of parts of the building, the distance between them and its symbolism. However, the visual expression pointed by Arnheim, it adds to the functional aspects, urban, technical and cultural ones.

Gehl (2006) adds that the buildings should no longer be considered an end in themselves but an instrument to enhance social life in the city by attracting the public space, where one can develop urban activities perceived by the city.

It's worth mentioning Rossi (2001) and his thoughts on the inseparability of architecture and the city, a factor outlined in this study. It appears that the architecture becomes a substantial part of what is identified as a place. It is through it that a memory of places is developed and men make it possible to understand the city as a work. "So the urban fact and its architecture are one, are pieces of art" (Rossi, 2001, p. 117). However, the "works" of postmodernity introduce the idea of relocating a city’s public spaces into buildings.
An overview is observed that during this process the continuous and homogeneous vision, that seemed avant-garde, has been obscured, which has entered into a universe of intellectual pluralism and discontinuity, which has lost one of its most important qualities of urban life, the richness of its complexity and contrast.

Therefore, it is needed to discuss the intervention in spaces (public or not) in the cities and the reflection on it. There are mutability, flexibility and possibility of dialogue in the planning process and the architectural projects.

Despite the efforts of private capital in making public spaces more internal, the city continues to be needed as a place of mediation, social contact, and remains the area of greater, greater diversity of function and a greater potential for producing social contact. Multi functional buildings can contribute to urban sustainability if they can communicate to the city, promoting the permeability of space without being an architectural barrier.

The meaning of multi functional buildings is still vague in literature but they represent the relationships between the different functions of the building and the permeability of public and semi-public space without isolating the building from the city.

3 Sustainable implications for Multi Functional Buildings and the City

Given that "implication" means relationship and result in advance, through facts, actions or behaviors, it can be stated that multi functional architectural interventions can be considered as strategies and opportunities for urban sustainability.

The “Massa Plan”, composed that multifunctional building is characterized in certain sectors as a sustainable community, and this promotes space with several integrated functions, determining urban areas that have a diversity of services, quality, proximity and accessibility. There are also included are other functions such as businesses, schools and places for health, leisure, to live and to work. This variety of functions reduces the "desert" city after business hours making possible the continuity of the activities on the streets. This increased activity on the streets raises security.

The proximity of the functions reduces the need for mobility and might reduce the flow of private vehicles. The “Massa Plan” is strategically located where public transportation infrastructure is accessible. There is also the major task of sustaining what the structural axis promotes in Curitiba: the integration of land use, transportation and road system that enables the reduction of energy resources, contributing to the mitigation of pollution and stimulation of physical permeability for pedestrians.

Buildings in the “Massa Plan” must take into account their immediate surroundings. There is a transition element that contributes to increase the
permeability of space: the covered galleries throughout the buildings (Fig. 5) on the ground floor. It extends the width of sidewalks, increasing the space for public use. As pointed out by Alcock, Bentley and Mcglynn (1999, p. 12): "only places that are accessible to the public can provide alternatives. The vitality of a place can be measured by its ability to be penetrated or passed through it or within it can be moved from one place to another. "It is understood here that the urban vitality is related to sustainability so, the city and the buildings ought to be planned to guarantee that there will be life in the city, with economical viability of the activities with social and cultural diversity.

Multi functional buildings contribute to urban sustainability as they provide:

a) minimization of physical, visual and socio-psychological barriers, paying attention to their forms that allow the visualization of the gradient of the internal spaces, and the reduction of architectures;

b) presence of various functions - including housing - and uses that are required at different time of the day and night;

c) connection between external and internal spaces, favoring the passage of the pedestrians persons in the urban fabric; (Fig. 6);

d) entries dimensions must invite pedestrians to access the building without causing extreme monumentality or being reduced to the point where access is not perceived. The resulting architecture within the Structural Axis of Curitiba addresses specific legislation for the development and planning of buildings, called "Massa Plan". In addition to this, there is the street configuration composed by the transportation and road systems.

e) consideration to the relative density of the environment, which should be high enough to promote greater flow of pedestrians and more permeability between the public and semi-public spaces;

f) presence of common areas, to attract and encourage the interaction of people, as a possibility to find see or feel, respecting the categories of use and ownership for public, semi-public, semi-private and private spaces;

g) presence of leisure areas, which may or may not be located in public spaces.
Fig. 5 – Covered galleries of the Southern Structural Axis in Curitiba, 2008 (DZIURA, 2009)

Fig. 6 – Reduced spatial permeability and contribution to the spatial permeability of Southern Structural Axis in Curitiba, 2008 (DZIURA, 2009)
The contemporary city, in relation to Brazil, has changed from a space for human relations and social demands to an area of economical relations. The multi functional buildings created in the structural axis of Curitiba try to create architecture within the urban context, with spaces that seek interpersonal contact, and attempting to address the local residents.

The multi functional buildings of the “Massa Plan” work as a sustainable urban tool as the structural axis extends throughout the city from north to south and also form east to west, ensuring multi functionality in each urban sector of the city, providing different neighborhoods easy access to private services, and even creating a unique architectural language for different neighborhoods throughout the city. Prioritizing decentralization of community services to areas of demand. It is worth mentioning that urban sustainability in Curitiba through the installation of the “Massa Plan” in structural axis are complemented by political and administrative decentralization of the city, as they are distributed and located in various buildings throughout these structural axis, ensuring not only the decentralization of business and services but also the decentralization of public services.

The contribution of this paper is a mere seed for further studies and sustainable interventions on the scale of buildings and the city simultaneously. The multi functionality elements of the “Massa Plan” in Curitiba have been one of the city’s experiences in sustainability. It is a practical example of how regulatory practices, measurements and priorities combined can promote sustainability from individual buildings to the public city scale level.

The increasing urbanization throughout the world, added to environmental issues, climate changes, pollution, are some of the ingredients enforcing major changes concerning the building and city planning. The study shown reinforces the importance of multi functional buildings to achieve that. They are simple and basic instruments to guarantee varied and necessary functions of a city, as well as the connection of public spaces, public transportation and the integration of the citizens themselves.

References


