The use of ICT – Information and Communication Technologies to support decisions in the area of heritage and landscape preservation

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This work presents an experience of Information and Communication Technologies – ICTS used in heritage and landscape preservation activities. The focus is a special enterprise in the city of São Paulo. The proposal is to build a new building on the backyard of an historical mansion as a way of getting financial resources to the revival and maintenance of this building. We describe, step by step, the entire path, using computing tools, to get the necessary documentation to demonstrate the interferences range of the new building on the existing one.

Keywords: *Architecture; town planning; heritage and landscape preservation; digital modeling*

Introduction

One of the most dramatic urban challenges in taking-off countries is the rapid and unbalanced cities growth as a result of the enormous immigration stream from the country to the most important urban centers. This question causes several problems as the chaotical territorial expansion without the necessary infra-structure and criterion to avoid the destruction of the main urban references which compose the cities identities.

In order to face this issue, Brazilian government developed several policies to the heritage and landscape preservation which are managed by different governmental institutions, in different levels of the state hierarchy, to whom the urban actors, as builders and architects, must send theirs projects to be analyzed and approved.

By the other hand, to get financial resources to support those preservation policies, since the last decade some strategies have been adopted and one of them is to associate the preservation of some historical buildings to new enterprises, where the ancient building revival and maintenance are exchanged by the authorization to a new building at the same site with the minimum possible interference in the original building and landscape.

Thus, to get this approval, the entrepreneurs must elaborate and submit their proposes to governmental institutions responsible for the heritage and landscape preservation, and in this case, the Information and Communication Technologies are a very important support, helping the virtual reconstruction of the original site in order to evaluate the interferences which the new enterprise eventually will produce in those historical buildings.

So, the goal of this paper is to relate an enterprise under this condition showing, step by step, the

entire path, using computing tools, to get the necessary documentation to demonstrate the interferences range of the new building, since the scanning of the original documents till a walkthrough presenting different times of the site.

The enterprise

The subject of this enterprise is a mansion designed by Victor Dubugras, one of the most important Brazilian architects of the 20th century beginnings, which was built on 1912 in a special site derived from a big property pertaining to a traditional family of the State of São Paulo, located not far from the historic center of the city.

Being originally a small farm, this site has been urbanized giving place to an elegant district where have been built several mansions of the elite linked to the Coffee Plantation, the most important economic activity of São Paulo at that time, between the 19th and 20th centuries.

But, according to the chaotical territorial expansion trends in São Paulo at the middle of the 20th century, this district has been absolutely deprived of its original characteristics with the substitution of those traditional mansions by residential skyscrapers. So, in order to stop this debasing process, the government institutions responsible for the heritage and landscape preservation have frozen all the new enterprises in this area and made mandatory the revival and maintenance of the few original buildings which got to resist, like this one. But, the only possibility for the owners to keep it preserved was through a new enterprise under the conditions that we have related before.

Thus they proposed a new multifamily building to be built in the big backyard of the mansion according to others successful enterprises already built in São Paulo and to get it, the challenge was to analyze and show how this new building would interfere in the traditional one.

Methodology

The work we had implies three different steps: to study the original characteristic of the mansion and of the site where it has been built, to determine the interferences already done in it after its construction and finally to design the new proposal, showing the interferences.

So, in order to get it we define a methodology using different digital tools according to the specific needs of each step: scanning to recuperate the original technical documentation, geometric modeling

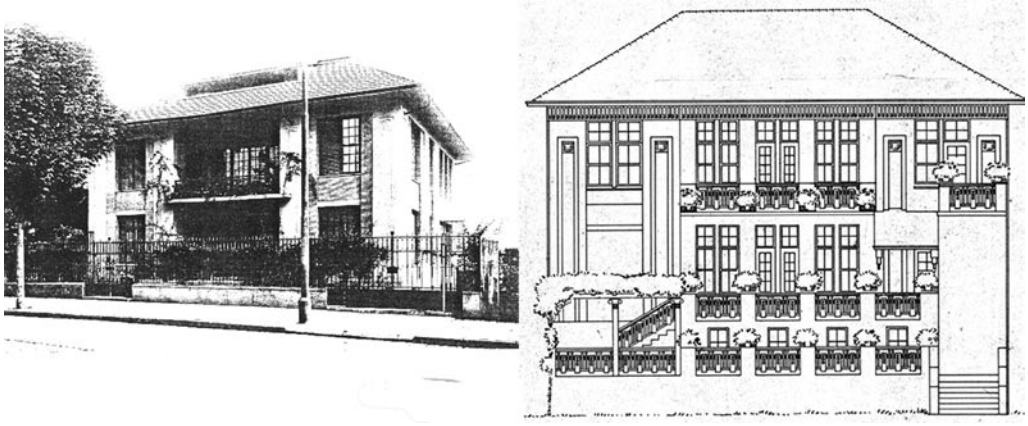

Figure 1
The original building at its time and the original drawing from Dubugras' studio

to update the technical documentation according to nowadays status of the ancient building and to design the new proposal and then rendering and animating techniques to the visualization of different sceneries.

Scanning original documentation

We start looking for the original technical documentation designed by Dubugras which was found at the Documentation Center of the Library of Faculdade de Arquitetura e Urbanismo of Universidade de São Paulo, in very poor conditions of preservation.
So we scanned it and afterwards we rebuilt it in a CAD system by which time we realized that even the original Dubugras' proposal hasn't been built exactly as it was presented on the technical documentation.

Thus, we had a huge work to produce new drawings since the updating of the original ones by comparing them with nowadays status of the original building and determining which item hasn't been originally built according to Dubugras' design and which could be considered as a post interference.

Geometric Modeling

After having the technical documentation updated we finally could start the regular design process considering the environmental and urban characteristics of the site and the legal requirements to this kind of enterprise.

So we found that a tower could be built in the backyard of the mansion with 21 floors with a four bedrooms apartment in each floor, having, each apartment, around 75 m high and a very large common area.

In that program the ancient building has been considered part of this common area and the main entrance of the new building.

Figure 2
Rendering of the 3D model of the mansion in nowadays context with the new building at the backyard

Once we had the final proposal to the area we start modeling the scenery including the tower, the mansion and the buildings around on the neighborhood to analyze the possible interferences.

Rendering and animating

Since the 3D model of the site and the new proposal we could render some views and create a walkthrough to better understand the interference of the new tower on the landscape.

Actually we`ve created two walkthroughs: one with the new tower and the other without it. This way we could see and demonstrate that the interference of the new tower wouldn't be so hard and then get the approval of the governmental institutions responsible for the heritage and landscape preservation.

Conclusions

"A picture paints a thousand words" – this is the much known Chinese saying which sum up the image potential of communication and so on the potential of the digital resources to simulate the reality representing different sceneries according to our proposals.

Once created the digital model, it can be seen by many ways, since a printed picture till an immersive virtual reality, where we can walkthrough. And even it can be materialized by rapid prototyping techniques, acting as a powerful tool to take decisions.

In spite of that and the easy access to lots of simple and not expensive digital resources we have nowadays, the decisions in the field of heritage and landscape preservation in Brazil are still focused on bureaucratic issues and personal points of view.

Therefore, this work intends to demonstrate how useful those simple and already known techniques can be used in that field, since the preservation and the recovery of old documents till the analyses of historic sites and possible enterprises on them.

Indeed we hope that this case might stimulate other similar initiatives in the heritage and landscape preservation field in our country.

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