THE NATIONAL CONGRESS PALACE:
Niemeyer's masterpiece facing a functional conflict

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Abstract

This paper discusses configurational issues at the Brazilian Chamber of Deputies, in Brasília, rising how configurational issues are collaborating with planning strategies and workplace design. Space syntax tools (visibility and axial analysis) are used to explore form and space patterns, simulating future scenarios and illustrating its usefulness for complex building design.

The National Congress, Brazilian legislative headquarters, hosts two houses: Chamber of Deputies and Federal Senate. It constitutes one of the corners of the Three Powers Square (to the West), and is the main landmark of the Monumental Axis, to the East. It represents the monumental scale proposed by Lucio Costa, congregating a strong symbolic and civic appeal.

Preliminary configurational simulations point to a clear movement conflict, highlighting a fragmentary impression. Passageways and rooms have been changed, subdivided or interrupted, creating a more labyrinthine pattern.

By the absence of intervention guidelines, the building tends to disfiguration, for there is no legislation considering it as a whole and it faces a dilemma: maintenance of its modern features, including the form-space layout, without resulting in an "iron cast". Efforts towards a solution, such as studies for a Master Plan, are including configurational issues and, based on the first findings, it seems to be a positive track to be followed.

Eyes on the Chamber of Deputies

This paper is associated to actions focused on built space at the Brazilian Chamber of Deputies (Figure 1), aiming at helping architects, engineers and managers in planning routines. The core of the argument refers to flows, accesses and movements, discussing methodological possibilities, through space syntax theory.

Intended results are strategic for a Parliament master plan under development, by means of five axes: flow; population/densities; occupation; urbanism and recently acquired areas.

The Brazilian Chamber of Deputies presents some peculiarities. The complex (5 interconnected buildings) receives everyday around 20,000/30,000 people and accesses among buildings are not clear, so wayfinding indoors is quite difficult. This results in a general labyrinthine impression.

Therefore, how to evaluate questions such as flows, movement and access in the buildings? How is it possible to advance beyond plan/project and reach the simulation target aiming at promoting or restraining movement?

Figure 1:

123-02

The Brazilian National Congress Building: The Chamber of Deputies is on the right

Usually as architects, engineers and planners, during the planning process, we hypothesise what the results of a specific project may be. Only when built space is inaugurated and experienced, we are able to evaluate its success or failure, and this may imply high costs. If we succeed in previously simulating the results of a project, we will have a wider control over the proposal impact, whether positive or not. Space syntax is a powerful tool in simulating movement, as it is related to configurational issues, which can strongly interfere with promoting or restraining movement (Read, 1997, Holanda, 2001, Greene e Mora, 2005, Chiaradia et al., 2005).

Beyond Configurational Analysis: Other Tools

Simulation and modelling were conducted considering space syntax approach, which ascribes movement potentials to built spaces. These values indicate the investigated spaces capability in concentrating or moving away people.

Besides configuration techniques, based on axial maps and isovists, geoprocessing tools were used, as well as some statistical procedures (mean, median, correlation and regression). For decision-making, geoprocessing presents many advantages: (a) easiness to use, read and publish available data, such as maps or tables; (b) speed in correlating information; and (c) ability to provide control and managing tools, with a wide use in urban and complex buildings studies.

Validity

Procedures

Literature (Hillier et al., 1993; Barros, 2006, Cybis et al., 1996) suggests there is a strong correlation between real flow (counting people or vehicles) and integration values obtained from an axial map. However it is recommended to test the assumption in order to guarantee its validity for specific cases, such as in a complex building as the Deputies House.

Therefore, two procedures were applied to verify simulated flows: (1) drawing the axial map for the whole complex (five buildings), and (2) counting people trough corridors, by means of selected cameras from the CCTV

7 cameras were chosen according to location and clarity, resulting in 13 observed points (some cameras allowed more than one corridor visualization). Recordings were simultaneous for the same day and period: November 8th, 2006, from 9 AM to 10 AM).

Findings

Firstly, when integration values and counting are associated, R2 found was only 14%, meaning a moderate variability (Figure 2, top). Nevertheless, looking at chart point's distribution, one can observe two distinct behaviors: there is a group of points in a clear linear distribution (group A, top chart, left), while some others oscillate significantly (group B: top chart, bottom right).

When the association points/corridors is checked for group B, it is found that they corresponded to those corridors which, despite near some very crowded areas, present a low flow of people, as in the situation for the Leadership and Presidency Passages.

Findings indicate the low use of some passageways that have a high potential as movement axes. And it is extremely important in a situation like this, where movement flow is highly dependent on a sole corridor connecting most of the buildings. Practically there is no alternative route and the great majority of movements converge to the passage underneath the Monumental Axis.

If when we exclude these corridors where such situation was identified and correlate again variables only for group A (middle chart), R2 reaches 76%, meaning a very strong figure.

When we associate integration values with corridor width (bottom chart), it is found a R2 equal to 15%, classified as moderate. It would be expected that, the higher is a flow, the wider is a corridor, but this is not so. Point distribution is dispersed, illustrating clearly one of the items to be developed in the planning goal: the labyrinthine pattern found at the Chamber.

Findings legitimize space syntax use, allowing for, specially, future plans and project simulations and its consequences over the flow movements among buildings – is a crucial factor for built space planning at the Parliament.

Snapshots: Localized Situations

Once identified the validity and usefulness of an axial map as a tool to predict movement for the Chamber of Deputies, some simulations were conducted in order to evaluate built or planned interventions, as detailed below.

Case 1 – Annex II Building (First Floor)

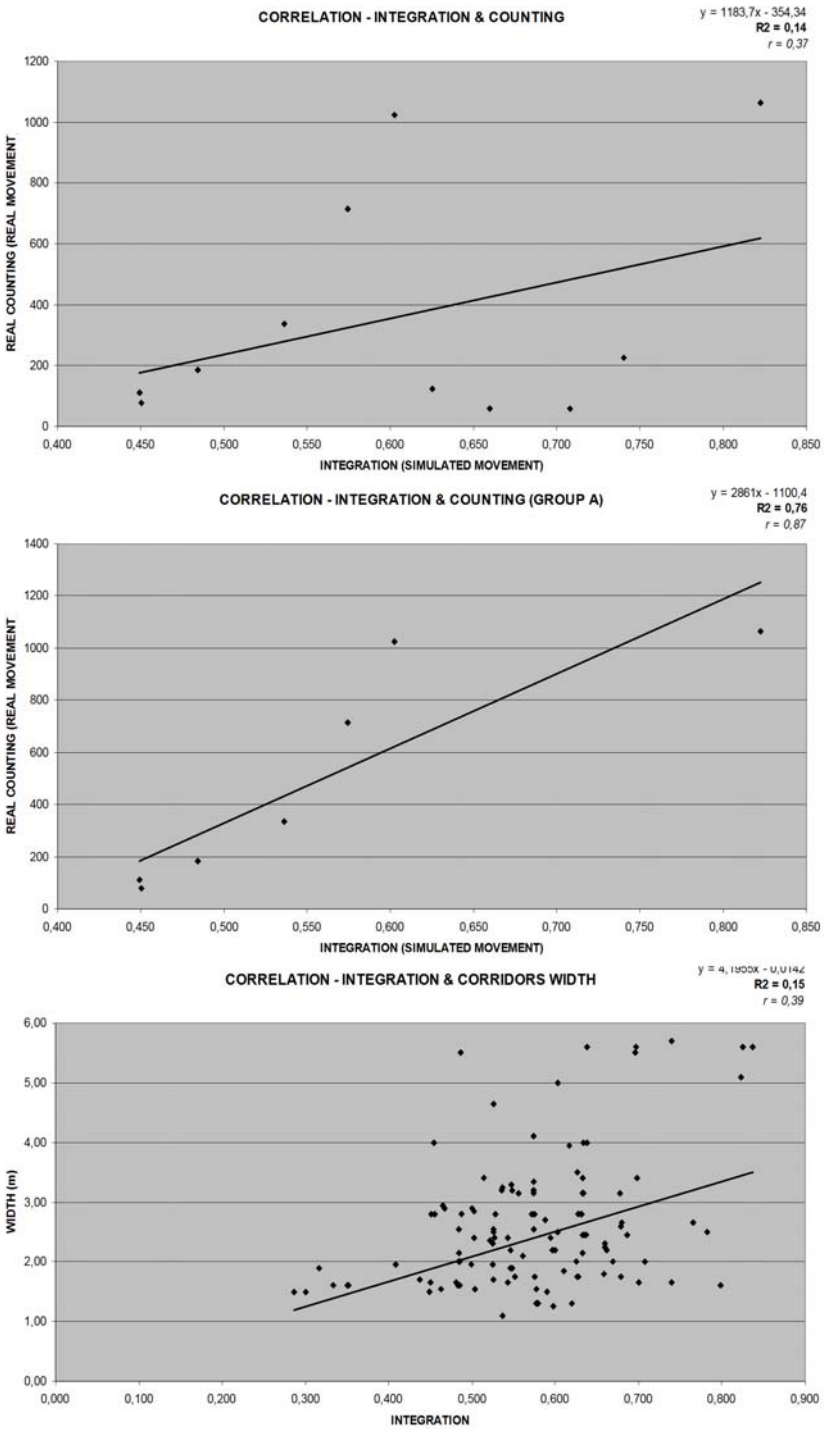
Problem: A corridor was interrupted to be used as a new room. Despite the interruption of flows and security risk issues, the change which was argued as ephemeral, remains.

Evaluation: Axial maps analysis shows how the interruption has damaged movement, overloading the central corridor and isolating corridor A. When the original situation is simulated, it is possible to realize a balanced scenario among corridors and a refined correspondence between real movement and integration value.

Figure 2:

Correlations: integration, counting and corridors width

123-04



Case 2 – Principal Building (Ground floor)

Problem: Similar to the previous situation, a corridor was occupied in order to create a new workplace.

Evaluation: Visual analysis indicates that there is an overload in the main corridor, while the secondary one is extremely isolated (low flow and movement). When the original situation is simulated, there is more balance in the distribution of flows: the back corridor also reaches suitable levels of movement.

Cases 1 and 2 are useful to be presented as a guiding/reference tool to the House managers. Its ability to show easily the result allows a quick problem comprehension, displaying the need for establishing

the original layout for both corridors. For future situations under planning, the tool may supply technical support in order to avoid implementation of certain specific demands, which are requested but are not recommended.

Case 3 – First Secretary Office (Principal Building)

Problem: The head of the secretary room office complains that many people stand alongside her work station, disturbing her job, allowing no concentration. The request was transmitted to the Projects Department and an architect was asked to propose alternative solutions to this case.

Case 4 – General Secretary (Principal Building)

Problem: Employees who work in the protocol office complain that people asking for information constantly interrupt them. Their workstations are located in a passage way that contributes to the situation. The request is a more isolated place. The demand was transmitted to the Projects Department and Mr. Coelho, architect, was asked to design a solution.

Evaluation: A configurational analysis demonstrated the protocol office was in a very integrated place, and the high correlation between integration and real movement answers why a lot of people are always there.

Solution: a new layout was proposed for the whole secretary, changing positions and creating a more reserved place for the protocol office, which needed to keep a direct link to this main passage. The protocol, even remaining in a shallow position, was more isolated, avoiding the previous problem. Once the change was completed, the employees said they were very happy with the result.

Conclusions

This paper comments on part of a first configurational survey aiming at exploring possible procedures for spatial planning at the Brazilian Chamber of Deputies, relating issues like flow, movement, population and use of space. Findings so far are subsidizing a report containing highlighted features for strategic planning at the Parliament, based on a wide range of data collected from different sources (departments and coordination) and empirical observations.

Tasks developed here are related to the purpose of obtaining a spatial diagnosis and evaluating space syntax usefulness in such a case. Besides that, it intends to establish future work routines, improving planning issues. It is believed that first results (including the positive evaluation of space syntax, as a tool for planning) will clarify for managers, department heads and deputies potential new products.

Configurational tools use here have illustrated how relevant they are for a better understanding of movement related questions, allowing for simulations of future scenarios and helping robust layout proposals or refurbishment. Findings are particularly meaningful for they have been validated by means of the coherence found between potential use, indicated by integration measure, and real use gathered though data counting.

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123-06

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