

Aplicação do Requisito Variedade no Planejamento Urbano

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Resumo: Métodos inadequados são correntemente usados para avaliar o quanto é eficaz o sistema de organização urbano (planejamento, projeto e implementação) em providenciar soluções adequadas aos usuários do ambiente construído. Retroalimentação adequada é raramente coletada, pobremente processada e equivocadamente interpretada por causa das crescentes diferenças entre os profissionais do ambiente construído (projetistas, planejadores, engenheiros) e como eles vem tal sistema e avaliam seus resultados. Este trabalho incorpora a lei de Ashby da variedade requerida para ilustrar um método simples que pode ser usado para ver, analisar e avaliar como as decisões impactam a eficácia do sistema de organização urbano. A lei identifica o grau de variedade total num sistema como uma medida do grau de sua complexidade e advoga que equilibrando as vaiedades regulatórias e ambientais definidas para o sistema se chegaria um estado de estabilidade dinâmica ou eficácia. Breve discussão de um exemplo de uma organização urbana é apresentado para enfatizar a utilidade em se adotar tal metodologia.

Abstract: Inadequate methods are currently used to assess how effective the urban organization system (planning, design, and implementation) is in providing suitable solutions to the users of the built environment. Appropriate feedback knowledge is hardly collected, poorly processed, and mistakenly interpreted because of growing differences among professionals of the built environment (designers, planners, engineers) and how they view such system and assess its outputs. This paper incorporates Ashby's law of requisite variety to illustrate a simple method that can be used to view, analyze, and assess how decisions impact the effectiveness of urban organization system. The law identifies the degree of total variety in a system as a measure for the degree of its complexity and advocates that balancing regulatory and environmental variety as defined in the system would achieve a state of dynamic stability or effectiveness. A brief discussion of an example in urban organization is presented to emphasize the usefulness of adopting such a methodology.

Keywords: Variety, Effectiveness, Complexity.

Introduction

Users' demands expressed by their growing needs and preferences are constantly changing and becoming increasingly more complex. This combined with the increasing complexities generated by modern technology, is leading to the adoption of new ways of thinking the built environment organization system and its effectiveness in providing proper solutions to its users. The variety that exist in the urban environment and expressed by the wide range of users' types is more complex than ever and the current offerings of urban outputs are showing signs of unbalanced performance or ineffectiveness.

Higher degree of environmental complexities should not lead to strict rules societies that are characterized by systematization and rationalization that may deprive life. The fulfillment of a balanced life among many human activities is the main objective of the outputs of the urban organization system. Therefore the prime aim of the urban organization is to continuously maintain and improve the quality of the output of the urban process through continuous monitoring, evaluation, proposing new solutions, and enacting. In order to achieve success in its endeavor, the urban organization system must attempt to address all variety that exist in the urban environment.

Managing Variety: Application of Ashby's Law

Two types of variety must be distinguished according to Ashby's law. First, environmental variety or (V_e) and is defined as the level of variety that exist in the environment. As its levels becomes higher there is a possibility that conflicts among built environment functions will also increase. The second type is called regulatory variety (V_r) and is defined as the level of variety generated by the system internal and external components in response to the variety in the environment. Environmental variety (V_e) is the measure of complexity in a system defined as the number of its possible states. Ashby's law of requisite variety states that in order for a system to achieve stability or effectiveness, its regulatory variety (V_r) has to absorb all the environmental variety (V_e), If regulatory variety (V_r) i.e. urban codes, urban solutions, etc. is in state of imbalance with environmental variety (V_e) i.e. problems in the urban environment, the system cannot attain its dynamic stability or effectiveness.

In some systems, the level of regulatory variety is smaller than the variety in the environment ($V_r < V_e$). In order to satisfy Ashby's law

by equalizing and matching regulatory variety (V_r) and environmental variety (V_e), there are two possible ways. One is to attenuate environmental variety (minimize V_e) by provoking less conflicts in the urban environment functions; the other is to amplify regulatory variety (maximize V_r) by providing flexible solutions that can address more than one problem. These two strategies can be mixed to form a variety loop that has regulatory variety (V_r) amplifiers on one side and environmental variety (V_e) attenuators on the other side. Conflict resolution and problem solving in a system is only possible when both attenuators and amplifiers are correctly installed on the loop.

Examination of many decisions made by most urban organizations often reveal that attenuators and amplifiers have been installed in the wrong side of the variety loop, so instead of minimizing (V_e), (V_r) is minimized, and instead of maximizing (V_r), (V_e) is maximized. An example of urban organization practices that originally intended to attenuate environmental variety but rather increase it by creating more complexity follows.

Example: Analysis of urban zoning practices according to Ashby's law

The North American suburban sprawl illustrates the attempt of attenuating the variety by homogenizing urban zoning that resulted into imbalance among city functions and decreased performances of the built environment. The zoning laws in the United States prescribe single use and low-density in urban spaces and there are basically three distinct uses for land that cannot (and/or must be avoided) be mixed: residential, commercial, and industrial. The role of the regulator becomes easier with this urban organization but the effects of this homogeneity is over emphasizing the need of mobility; persons inside this ambience are required to have more mobility within these three different city functions to attain their needs than inside a heterogeneous urban set. On the other hand, there are examples of increasing system variety in the built environment that resulted in satisfactory and affordable outputs in North America. The main result for this variety reduction is the failure of planning organizations to manage the process; additionally these organizations also fail to learn with previous experience. In general, the feedback knowledge generated in the process and the experience gained from the previous outputs are not considered. There is insufficient assessment for the effects of overemphasizing the need for access.

Issues in Planning and Housing: Density and Diversity

The achievement of city functions requires some degree of public interactions, the social part of the environmental variety. Christopher Alexander says that "people come to cities for contact" and that cities are meeting places. Moreover, a new concept of space utilization must be sought to reestablish the city as a diversified place of heterogeneous functions where people gather, work and trade.

One way to quantify the possibility of people's interaction is the number of persons related to some land area, such as persons per hectare (persons per 0.4047 acres), namely demographic density or simply, density. As denser settlements propitiate more contacts among citizens, higher density could lead to a successful urban design to better accommodate environmental variety on their physical feature. However, many arguments have been raised against high-density approach in urban settlements. Despite that, researches and inferences from available and actual data inform that density is not a factor of success in urban sets. Kevin Lynch gives examples of density ranges and their meaning. He says that 3.86 persons per hectare margins rural land and is the density of a single-family houses' on lots about a half hectare (one acre). From 12 to 15 persons per hectare is the current value of a typical US suburb. He quotes that 40 persons per hectare represents a density for cities like Baltimore and Washington. Lynch has a special admiration of Florence (Italy) where he says that the feeling of urbanity is strong and confirms the assertion of Christopher Alexander. The density of this city (135 persons per hectare) promotes "better social intercourse" and short journeys to work or to the open country besides allowing efficient mass transportation. Although Lynch quoted that high densities could lead to bad effects on persons but advises that no density (by itself) is perfect, regrettably he did not provide the critical success factors in urban settlements; no recipe has been provided so far to achieve the dynamic equilibrium for the built environment as described above for Florence.

Lewis Mumford also quotes that "the city is essentially a place for diversified and mixed activities" and provides other numbers for density in a study ranging from old settlements to today's cities. In Mohenjo-Daro (about 3,500 BC), Ur (2,000 BC), Greek Piren (200 BC), the East End of London (1800's), and the "model housing state" that he (himself) once occupied in Sunnyside Gardens, Long Island (New York), the range of density value (120 to 200 persons per hectare) comprises the same as Florence's. Designed by Frank Lloyd Wright and Clarence Stein, this successful approach although deliberately promoting social integration by mixing persons of different social status, heterogeneity was never pursued again by these two renowned professionals of the building environment. Social integration has the meaning of coexistence among different social classes and--when achieved-- represents a balanced social diversity. Reputed as the first

Quality of life when related to infant mortality, general criminality, happiness, and ecological characteristics has no positive correlation either with high- or low-densities. Hong-Kong, the highest-density city in the world (403 person per hectare), has few murders per capita than 88 of the 100 largest cities in the world, and its infant mortality is lower than 94 of the 100 largest cities. A sociologist promoted a comparative research about aspects leading to happiness of life in suburban sprawl and in urbanized area of Detroit. This research has found that there is no significant differences between these two types of neighborhoods. Satisfaction or psychological health in these two types of urban settlements is the same. Besides this finding, this research reveals that the ecological characteristic (physical aspect) has no influence of personal happiness in these two types of urban settings.

Boston's North End has a density of 680 dwelling units per net hectare (274 per acre) and has the lowest delinquency, disease, and infant mortality rate in Boston area. Despite this excellent overall performance, in the 19th century, it had the highest rate in tuberculosis. In 1940, Jane Jacobs was there and reported this neighborhood still in a blight situation, badly overcrowded buildings and spread poverty. She returned in 1959 and was amazed at the change. She has found a mixture of buildings for living with food stores, and enterprises (upholstery making, metal working, carpentry, food processing) that characterizes an unusual diversity in the US's urban approach. She also found children playing, people shopping, people strolling, people talking on streets, characterizing what she wrote as "the atmosphere of buoyancy, friendliness, and good health..." Staying in Boston, she was able to rank that neighborhood as the healthiest place in that city. However, no public money was used to renew, and no professional of the built environment was employed to re-design such a place. This part of Boston has been considered by its municipality as a problem because there is no park land and children have to play in the streets besides the high density. Paradoxically, this apparent economic self-sustainability and user satisfaction have not been carefully examined by Boston's municipality.

Other example of increasing system variety to accommodate more options of housing by attenuating by-laws and regulations is also provided by M.D.Lowe and offers a result in housing affordability. In Portland, Oregon, this procedure promoted a diverse neighborhood that attracted essential businesses, including grocery stores and banks. The minimum percentage of apartment, duplexes, and other affordable housing was increased from 30 to 54. These non-homogeneous communities provide ease access to blue-collar jobs because these workers live and work (likewise in Boston North's End) in the same neighborhood, and need not to commute. The influence of this diversity on housing affordability is quite significant compared with other west cost cities such as

Seattle, San Jose, San Francisco, and Los Angeles; housing in Portland is two to three times more affordable than housing in these other cities demonstrating excellent economic performance.

Examples such as Boston's North End and Portland, Oregon, support the adoption of variety as an incontestable idea in urban space that leads to positive financial influence. In the former place, no public money was used to recover the neighborhood from the blight condition to the "atmosphere of buoyancy, friendliness, and good health..."; the community has generated by itself the necessary variety to accommodate its needs without an outside help from the municipality. In the latter, a simple regulatory measure has promoted housing affordability; by allowing a greater percentage of affordable housing in the community, the regulator has propitiated more diversity to the local urban space turning it more attractive to businesses.

Conclusions & Recommendations

Everyday life demonstrates that common sense prevails against logic despite the rationalizations provided by technology. Although specialists are necessary, their strict rules may deprive life in the built environment. The aim of the urban planning is to provide a built environment output wherein persons can fulfill their needs while accommodating some conflicts among city functions such as mixing residential and commercial areas. These needs are of complex and dynamic nature so that only through their continuous assessment and evaluation that it is possible to furnish suitable feedback knowledge. By processing this information, planners can provide to the specialists (commissioned professionals of the building environment) means to re-arrange the specific urban set to fulfill those complex interests of the built environment's consumers. However, proper evaluations of the built environment are not currently being achieved. This is mainly due to the various inadequate approaches currently taken by built environment professionals in viewing effectiveness of the outputs of the urban organization system.

Lack of consensus among professionals on how to view effectiveness of the urban organization has led to attenuators and regulators of environmental variety to be installed on the wrong side of the variety loop in many cases. This leads to unbalance between the regulatory variety in the urban organization and its environmental variety. Thus, the maintenance and the improvement of the quality of the urban process achievements cannot be performed in the most important levels, i.e., dimensions, and attributes, because their importance (success factors) are neither properly weighted nor even suitably established. Improper measures are implemented to attenuate complexities and to amplify the rules, however this leads to unbalanced results as outputs in many cases. An example is when one dimension of an urban solution is stressed while others may be ignored which is the case of the suburban sprawl in North America stressing the dimension of access. The other essential outputs are not looked upon sufficiently while the sides may be overemphasized such as the extreme need of mobility in that example.

Improvement in quality of outputs of the urban organization system can only be achieved by developing a common base on which effectiveness of the outputs can be viewed and related to all dimensions, attributes, and critical success factors of the built environment. Ashby's law as presented in this paper can be used to develop such a view. In turn this will enable the professionals of the built environment to assess the impact of their decisions in a manner that will be acceptable to most and that which will also lead to implementation of suitable solutions in the built environment.

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