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A study of the relation between the spatial structure of the city and the quality of urban development using Space Syntax A case study of Mashhad

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Extended abstract

1-Introduction

The primary spatial patterns and the main structures of cities are now changing, due to the present sprawl development patterns. These factors have deconstructed the unified structure of cities and have caused spatial segregation of different parts of these settlements, especially central and old fabrics and finally resulted in their socio-economic segregation. On the other hand, external urban expansion led to a complicated physical and spatial structure, which is impossible to perceive its morphology in its totality.

One of the theories and methods for exploring urban spatial structure is space syntax. Space syntax theory and technique is able to analyze urban spatial structure in relation to all spatial characteristic of the city. Also, the main purpose of this research is to answer this question that is there a meaningful relation between changes in value of spatial integration (resulting from space syntax analysis) and changes in value of development quality (socio-economical, physical and environmental development) of neighborhoods?

2- Theoretical bases

According to David Harvey's theories, there is a meaningful relation between socio-economic processes and the spatial form of a city; therefore, in order to comprehend socio-economic processes, understanding the spatial form of the city is essential.

This theory also, believes that urban spaces are productions of social relationship and the connection between urban spaces

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follow social goals. Therefore, understanding the relation between urban spaces can help to perceive behavioral patterns and also quality and quantity analysis.

Integration is the main concept of space syntax theory. This indicator is defined based on the

connections and depth, not based on metric distance. Indeed, the integration degree of an urban area shows the integrity of that area with the entire city.

Integration map of a city is an important tool in understanding the behavior of components, because numerous studies have shown that there is a strong correlation between changes in integration value and pedestrian movement in the city.

3- Discussion

According to the main question and the basic theory of this research, the development quality of 136 neighborhoods in Mashhad has been analysed based on 20 indicators such as economical, social, and physical and welfare groups. The method used for analyzing data and determining the quality of development, is the integration of factor analysis with numerical taxonomy analysis.

Space syntax is the analyzing method of Mashhad neighborhoods' spatial structure. Accordingly, the axial map of Mashhad was prepared and it was analyzed by space syntax theory. In this study, the integration value was investigated at three radiuses including R_n , R_3 , and $R-R$ for 136 neighborhoods in Mashhad. By finding the results for quality of development and integration value in each neighborhood, the hypothesis of this research has been examined using the statistical methods such as correlation.

4- Conclusion

There is indeed, a direct meaningful relation between the integration value resulted from space syntax analysis and their quality of development in all mentioned radius in Mashhad neighborhoods. So, neighborhoods with high Radius- radius integration value which also have a significant relation with city spatial structure are more developed and in other words, their development is more sustainable.

Among the development criteria, the social and economic factors had a more meaningful relation with integration values than welfare and environmental factors. Thus, with changes in household economical condition (e.g. increasing household income per capita) and social condition (e.g. job promotion and increscent of household education level), people mostly tend to move and reside in neighborhoods with high integration value, so this displacement leads to physical and welfare development increase in those neighborhoods.

5- Suggestions

Recognizing spatial structure weaknesses by space syntax theory is necessary in neighbourhoods with low level of development quality and damaged areas, before intervention (renovation, reconstruction, improvement) in the fabric.

Evaluating renovation and improvement plans by space syntax theory for less developed and undeveloped neighborhoods

Using space syntax tools to evaluate new development plans before implementation.

Keywords: Spatial Structure, Space Syntax, Spatial Integration, Development

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