

Building Facade Study in Lahijan City, Iran: The Impact of Facade's Visual Elements on Historical Image

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Abstract—Buildings are considered as significant part in the cities, which plays main role in organization and arrangement of city appearance, which affects image of that building facades, as a connective between inner and outer space, have a main role in city image and they are classified as rich image and poor image by people evaluation which related to visual architectural and urban elements in building facades. the buildings in Karimi street, in Lahijan city where, lies in north of Iran, contain the variety of building's facade types which, have made a city image in Historical part of Lahijan city, while reflected the Iranian cities identity. The study attempt to identify the architectural and urban elements that impression the image of building facades in historical area, based on public evaluation. Quantitative method were used and the data was collected through questionnaire survey, the result presented architectural style, color, shape, and design evaluated by people as most important factor which should be understate in future development. in fact, the rich architectural style with strong design make strong city image as weak design make poor city image.

Keywords—Building's facade, historical area.

I. INTRODUCTION

It has been revealed that the quality of image extracts from combination of different factors such as shapes, forms, and colors of the building [1]. In fact, image of the place reflects different meanings and values of the components, factors, and characters that formed out the particular venue. Facades do play an important role in design of urban and environmental design. Façade should not be reminded as skin and face of the building but may carry out other meaning as well. A conducted investigation defined two functions for façade namely; use and value of structure [2]. It reveals that beside common role in buildings façades also represent the value of building structure as well. Moreover, facades are considered as a linkage between inside and outside environment [3]. Hayashi [3] notes that façade may determine the scale of the space and building. Askari [4] mentioned that people evaluation of building facades is based on visual elements such as shape, color and architectural style which indicates that the architectural visual elements influence the image of building facades. Therefore, the study attempt to imply the visual elements of building facade which influence the public evaluation.

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II. CITY IMAGE AND BUILDING FACADE

This part begins with description about the image of the city and its components. The image of the city is mostly related to the visual quality of the city which is named mental quality of the city. Facades do play an important role in design of urban and environmental design. A conducted investigation defined two functions for façade namely; use and value of structure [5].

It reveals that beside common role in buildings façades also represent the value of building structure as well. Moreover, facades are considered as a linkage between inside and outside environment [3][4], delineate facades are representative of the face of the city (city image). Building facade is known as feature of environment image of city therefore it is very critical and challenging to use a certain and specific ornamentation to establish a rich context [6].

Hui [13], through conducting a survey of public evaluation toward the city image in China, revealed that building façade do play an important role in urban landscape and image of the city. He also argued that regarding to enhance the images in districts, style, color, volume, material of the building structure, and perceived value about building are challenging and crucial visual elements. So it is expressed that façade as important parcel of building is considered as representative device for inner and outer. It produces the image of a historical district in city [4]. As Abu- Ghazzeah [7] has portrayed façade, influence the quality of city image.

Since this research is kind of public evaluation for city image particularly façade building in historical district, therefore, façade components are determined from the literature such as form, shape, color, material, and structure as well. Understanding of public evaluations and preferences for the quality and condition of the aforementioned details will lead to understand the best pattern of façade in public evaluation. Know what and how much importance are their roles to provide clear and attractive facades in historical district areas.

III. EVALUATION OF BUILDING FACADE

The previous studies have explained that the quality of the built-environment is evaluated according to its physical features [8], however, the mental presentation public toward buildings is mostly achieved by façade evaluating [9]. In other words, buildings' appearances do play main role in evaluation of built-environment. Nevertheless, some other researchers have described that the emotional positions of the observers in order to evaluate architectural quality of built-environment are also important apart of from physical features solely [10].

Regarding to the exterior features, some factors and elements such as cleanliness and ornamentation [11], curved lines and decorated figures [12], and details and context [11] may influence quality evaluation. Moreover, several studies also indicated other effective elements regarding to the evaluation of façade building.

For example architectural style [13], age of the building, size of shape, value of the building [13] forms, lights [15], color and used materials [13] can affect building façade evaluation. According to the previous investigations [14], some criteria such as color and material for beauty of façade of a historical building was determined. It is also necessary to mention that a historical building dominates beauty and artistic quality if it exposures an expression of idea [16]. However, the other researches [8] were highlighted clarity, complexity, friendliness, originality, ruggedness, and meaningfulness as cognitive factors that can predict quality of building facades. Some other researches explained evaluation as an image of observer's reason and emotional answers which are been resulted by cognitive and effective evaluation, respectively [17]. Cognitive evaluation is a complicated brain evaluation supported by knowledge and belief, while affective is more related to the feelings and emotions toward certain object [18]. With consideration of cognitive structure, building facades can be considered moderately complex. Elvin and Nasar [19] explained building façade orderly and coherent. However, it was argued that visual quality evaluation is in relation with the degree to the consistency between buildings' facades and their contexts [4]. As mentioned earlier the answers of the observers and respondents to architectural evaluation are related to their evaluation of building facades. Mehrabian and Russell [10] claimed that evaluation is extraction of pleasure and arousal inspiration by building facades. Pleasure can be ranged from ugly (displeasing) to beautiful (pleasing), meanwhile arousal is considered from arousing (intense) to un-arousing (numbing) as mentioned by Alkalin et al [11]. In addition, other researchers [20] declared that the evaluation of building facade could be achieved by measuring of preferences (like-dislike), arousal (arousing-sleepy), naturalness (natural-artificial), and relaxation (relaxing-distressing). From the literature, it can be concluded that there are two basic components for affective (emotional) appraisal, evaluation component of building façade and arousal components. Evaluation contains pleasant- unpleasant and arousal consists of active-inactive. There are other common factors in both evaluative and arousal components. These factors can be grouped as relaxing-distressing, interesting-uninteresting, and fearful-safe [21]. According to Berlyne's [22] findings, arousing quality has a direct linear relation with complexity.

IV. PUBLIC PREFERENCE FOR BUILDING FAÇADE

Following the previous researchers such as Kaplan, Suhardi, M, Lekagul [23], who conducted research on preference which based on the psychological approach, had been selected as the basis of this study. Some previous studies on environmental preferences have proven that preferences are practical, valid, reliable and systematic approach used to measure people's preferences so as to gather data, with the aim to categorize the degree of human influences, as well as the elements and features in buildings' facades as preferred or disliked by people [24]. The preference approach has been extensively used to evaluate the perception of a particular setting because it is a simple judgment made by people on a daily basis [25][26]. According to Kaplan, preference is a product of perception [25].

Kaplan [27] revealed two basic approaches from perception, "First, it is assumed that perception is oriented to getting along in the world, to making sense out of the environment"; second, perception is a highly inferential process whereby it requires a vast of knowledge, experience and interpretation. More accurately, perception is one of the physical-psychological process through which human acquire information of the environment [28]. Perception involves a highly cognitive process which is rather difficult for the general public to make. Thus, the selection of preference was the most appropriate in this study. Commonly, through previous studies on the preferences on buildings and facades, it is a simple perceptual response which involves a judgment made by the people regarding something which they prefer more than others. However, in order to obtain the people's preferences towards a particular town environment, various information (presents in the environment and the information which is stored in human brain until it emerges as a measurable and observable response) is therefore required [24].

V. METHODOLOGY

Quantitative method was selected as research methodology and data was collected through a questionnaire survey. Oppenheim [29] explains that the questionnaire is a Fast and simple track to collect the truth for us, while the complexity Len has hidden inside. Askari [4] delineated that Finkmentioned questionnaire is self - questionnaire includes questions which answered by respondents. Also Askari [4] stated that the questionnaire - based survey for similar studies have proven suitability by e.g.Hanyu;Imamuglu,;Galidano and Hidaglo ;Akalin et al [4]. The questionnaire was designed as primary data while designed question base on literature review as secondary data. Wording, efficiency and time were checked by pilot study and some questions and word which were recognized difficult changed by easy words and questions.

During the questions asked participants to answer them evaluate about architectural and urban elements which influence historical area of Lahijan city. Likert scale was used to rank their answer in five scaled questions.

VI. PARTICIPANT

The study were established base on Lahijan old area population, whom were calculated 4025 people in year 2010 as Lahijan consulting engineer predicted in Lahijan Historical area study. in other hand , base on Lahijan age pyramid [30]which, presented in that report, 48% of people are between age 20-60 years, which means 1932 people. Base on 10% of it about 200 people were selected as survey participants. Questionnaire presented that 57.7% were male and 42.3 % female. In addition, the participant's education level falls under three categories, which most are university graduated. 48.2% (n=96) of participants are graduated in university which is the most part of participants. It followed by 30.7% (n=61) of participants in high school graduated and in finally 21.1% (n=42) of participants are in guidance school and below. In the discourse of participant's occupations, most of the participants worked in the governmental sector in 27.9 % (n=42) which followed by self-employee peoples in 26.9 % (n = 54).

The students in 19.4 % (n=39) are third group of participants. Householders are almost equaled to students in 18.9% (n=38) and the last group are workless people in 6 % (n=12).

VII. STUDY AREA

Historical area are lied on most Iran cities as well as other cities in other countries, building's facades at Karimi street in Lahijan city, located at historical area, was studied as place, where have various architectural samples as modern and traditional style (Fig. 1 and Fig. 2).



Fig. 1 Study area and location in North of Iran
(source: Bo'ed Technique consultant engineering, Lahijan Comprehensive master plan, 2004)



Fig. 2 Karimi street Located in Lahijan historical area
(source: Bo'ed Technique consultant engineering, Lahijan Comprehensive master plan, 2004)

VIII. DATA ANALYSIS

The questionnaire classified in 4 parts, which in 3part of it's, were asked participants questions while their answer followed by Likert's scale. In this method a qualitative answer has

coded to as comparable quantitative variables. One of organization communication content in a manner is coding process, which allows for easy indexing, retrieval and identification of content relevant to research questions. [31]. Therefore, the analysis of data carried out by the means of contents analysis and Kendall's tau, a measure of correlation analysis (to explore relationship between the evaluation of historical facades and architectural and urban elements through people evaluation to know which elements impressing people evaluation). [32] Delineated Content analysis is a technique, which allows a quantitative analysis of seemingly qualitative data. Lekagul & Maulan [25] Mentioned content analysis was used to identify the characteristic affecting the public's evaluation of build environment. [4] in this research, the content analysis was used to understand the historical buildings facade characteristic. Thus, the image of building facades ranked base on their mean. To classified strong and weak images in viewpoint of city image by participants, first five images with highest mean ranked as strong image as well five images with lowest score as weak images.

TABLE I
DESCRIPTIVE STATISTICS FOR BUILDING ELEMENTS IN LAHIJAN
(1= STRONGLY DISAGREE, 2= DISAGREE, 3= I DON'T KNOW, 4= AGREE, 5= STRONGLY AGREE)

Variables	N	Mean	Std. Deviation
Importance of architectural style, shape and design	195	4.50	.71
Importance of Coordination between Old design and modern design	198	4.02	.87
Decoration of building facade such as curving, engraving sculpture	199	3.61	1.11
The bright color of building facade is more suit than dark colors	197	3.54	1.04
Modern design is more favorable than traditional design	197	3.44	1.06
Preference of mono color as main color of building facade rather than multi color	198	3.44	.97
Preference of traditional materials (wood, clay, sand...) as the main material of building facade	200	3.33	1.07

IX. RESULT

Mean score, which obtain by participants opinion about building facade images, presented importance of architectural visual elements .it indicate which facade obtained higher mean score as strong image of historical city image and ranked to facade with lower mean score as poor image of city image. The ranking revealed which architectural and urban elements is more important in city image by public evaluation. According to the table, 'shape and design of the building (mean= 4.50, sd= 0.71)' is received the highest preference among the other factors, it followed by 'coordination between old design and modern design (mean= 4.02, sd= 0.87)'. The participants responded that that they find modern designs are more favorable than traditional design (mean=3.61, sd=1.11). Meanwhile behalf the participants received that they preferring of bright buildings than dark color buildings is the next elements (mean=3.54, sd=1.04). Decoration of building facade is the next preference (mean=3.44, SD=1.06) which

selected by participants .participants preferred mono color buildings more than multi color (mean=3.44, SD=.97) in lower score and the table present that the participants preferred traditional materials rather than the moderns (mean=3.33, sd=1.07).

A. The historical facades with the highest mean

Base on the participant's opinion about the historical facade, the facade were arranged in a descending manner as their mean shows from higher to lower mean (Fig. 3 and Fig. 4). Facades with highest score were assumed as strongly representative of historical city image. Therefore, the study tried to find how the facade affected the participant's opinion. To achieve this, the facade characteristics and architectural elements have been analyze and detailed.

B. Correlation between the building facade with the highest mean and the architectural elements

As indicated in Table I, the design and shape of building facade are the most important factors as participants mentioned. The second elements are coordination between old buildings and modern buildings, which got second mean. As mentioned ready, the analysis of data carried out by the means of contents analysis and Kendall's tau, a measure of correlation analysis (to explore relationship between the evaluation of historical facades and facade's architectural and urban elements through people evaluation to know which elements impressing people evaluation). Refer to Table II. Smith M, Hardy RB, delineated Content analysis is a technique, which allows a quantitative analysis of seemingly qualitative data. In next step, the correlation between architectural elements such as color, material, shape and design, and architectural style with historical building facade with highest mean has studied.

TABLE II

CORRELATION BETWEEN THE BUILDING FACADE WITH THE HIGHEST MEAN AND THE ARCHITECTURAL ELEMENTS

Image	1	2	3	4	5
Design	0.012** 0.008	0.170* 0.012			
Harmony & Modernity				0.102 0.098	
Color		0.116 0.7			
Brightness				-0.111 0.08	
Decoration					0.138* 0.02

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed)



Fig. 3 Historical building facades with highest mean

TABLE III

CORRELATION BETWEEN THE BUILDING FACADE WITH THE LOWEST MEAN AND THE ARCHITECTURAL ELEMENTS

Image	1	2	3
Coordination	-0.168* 0.014		-0.140* 0.043
Brightness	0.142* 0.029	0.132* 0.054	

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed)

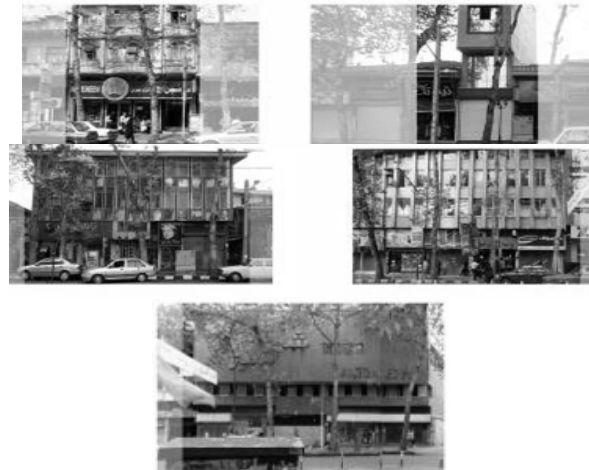


Fig. 4 Historical building facades with lowest mean

The result showed that the correlation between scenes were almost positive with architectural elements except with brightness for scene no 11. Accurately, there is correlation between the evaluation of scene no 6($r=0.12$, $p<0.01$), scene no 7($r=0.170$, $p=0.012$) and facade architectural style, design and shape, scene no 15($r=0.138$, $p<0.05$) and facade decoration. In addition, the table showed there is about 90% significant correlation between scene no.7($r=0.116$, $p=0.07$) and facade color, scene no.11 ($r=0.102$, $p=0.09$) and harmony of modernity's design, scene no.11($r=-0.111$, $p=0.08$) and brightness. The result indicated the facade design having strongest and modernity have weakest correlation with facade with highest mean. In fact, there are architectural elements, which influence the evaluation of the historical facades.

Future more, the impression of architectural style is agree with some previous result as Askari [4] mentioned it, Nasar, stamps III, Karaman, Hui [13] and It showed that, the design, and facade decoration [12] and details and context [11] may influence quality evaluation. Architectural style [13], age of the building and shape, color [13] are other factors, which accepted as important factors in evaluation of facades by research.

C. The historical facades with the lowest mean

Base on the participant's opinion about the historical facade, the facade were arranged in a descending manner as their mean shows from higher to lower mean. Facades with lowest score were assumed as weakly representative of historical city image. Therefore, the study tried to find how the facade affected the participant's opinion. To achieve this, the facade characteristics and architectural elements have been analyze and detailed.

D. Correlation between the building facade with the lowest mean and the architectural elements

In Table III it is presented there is correlation between the facade with the lowest mean and the architectural elements. The result showed that the correlations between scenes were found negative with coordination between modern and traditional design. Accurately, there is correlation between the evaluation of scene no 5($r = -0.168$, $p < 0.05$), scene no 18($r = -0.140$, $p < 0.05$) and facade coordination between modern and traditional design. Also were found correlation in scene no 5($r = -0.142$, $p < 0.05$), and brightness as well scene no. 13($r = 0.132$, $p = 0.05$). The result indicated the coordination between the modern and traditional style has negative correlation with facade image. also, facade brightness having strong correlation with facade with lowest mean which confirmed that brightness of facade color has negatively impose on the quality of city image in building facades and it paralleled with the finding of Swirnoff [15], who explained lighted facade as influential factor of facade evaluation.

X. CONCLUSION

The quality of the built-environment is evaluated according to its physical features [8], however, the mental presentation public toward buildings is mostly achieved by façade evaluating [9]. In other words, buildings' appearances do play main role in evaluation of built-environment. Nevertheless, some other researchers have described that the emotional positions of the observers in order to evaluate architectural quality of built-environment are also important apart of from physical features solely [10]. base on public evaluation, the study revealed that the architectural and urban features influence the historical city image while some are most important than others. Architectural style, color, shape, and design evaluated by people as most important factor which should be understate in future development. in fact, the rich architectural style with strong design make strong city image as weak design make poor city image. Also, the coordination between modern and traditional design is second important factor in historical city. in other word lake of a policy which, considered coordination of designs is second issue which, impact the city image. As result presented, building façade's

decoration and ornaments is the next elements in historical area image. Strong facades enjoyed more architectural decoration and ornaments and poor facades are simpler with less decoration. Finally, this study emphasized to make a bridge between people and architects regarding to urban design for future development. in other word, architectural style, design, shape, coordination between modern and traditional design and color should be considered by urban makers in future development as main elements which, influence city image. This issue revealed the city development should participate people whom, directly will judge the city image.

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