Saliency Cognition of Urban Monuments Based on Verbal Descriptions of Mental-Spatial Representations (Case Study: Urban Monuments in Qazvin) *

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Abstract

Urban monuments encompass a wide range of architectural works either intentionally or unintentionally. These works are often salient due to their inherently explicit or hidden components and qualities in the urban context. Therefore, they affect the mental-spatial representations of the environment and make the city legible. However, the ambiguity of effective components often complicates their saliency evaluation and measurement. In addition, the literature of architecture and urban planning evidently lacks a systematic method for extracting and determining the architectural components affecting the saliency of urban monuments. After reviewing the research literature, this study aims to analyze the nature of these components by proposing a method of extracting and identifying them through a qualitative approach through case studies of urban monuments in Qazvin. For this purpose, given the importance of verbal descriptions of urban monuments in advancing the objectives of this study as a result of realizing mental-spatial representations of the environment, the "Reading of Verbal Descriptions" was integrated with the "Fuzzy Delphi technique" to extract the components that affect saliency. Based on these strategies, architecture and urbanism experts were surveyed using a questionnaire. In addition to determining the features of urban monuments and their examples, the results explained 16 effective components. Based on the percentages of referral and consensus, the components are then weighed and codified in a saliency model of urban monuments.

***Keywords*:** Urban monument, Saliency, Mental-spatial representation, Verbal descriptions

1. Introduction

The nature and definition of urban monuments have always been so important to researchers and scholars that studies have often been very different in their objectives and methods. Apparently, there is no single better or even agreed-upon method in this field (Barsalou & Baxter, 2007; McCallum, 1993; Antonova et al, 2017). For instance, some researchers attempted to analyze the causes of developing monuments (Kay, 2002; Kumar, 2014). Others sought to perceive urban monuments by studying visitors of the builtsites (Cohn, 2004; Krzyżanowska, 2016; Pavlaković & Bădescu, 2019). Meanwhile, the dominant view to monuments in modern urban landscapes, resulting from their ongoing development and change, is mainly product-oriented. In other words, the monument is seen as a product in this field, whereas understanding it is almost impossible except as an element connected to and involved in social (spatial, physical, cultural and symbolic) and structural systems. What matters is to perceive how the inhabitants of urban environments interact with such architectural works in an active (participating in space) and passive role (observing the space), and how their interaction with monuments helps the realization of mental representations of this space.

In general, the realization of urban monuments has emerged from the intersection of various overlapping public policy-making areas such as urban institutions and protocols, social space and people in urban life, urban design and architectural infrastructure, cultural tourism and economy, heritage, and historical and narrative identity (Vickery, 2012: 5). These five domains constitute the major arenas of urban life. In recent decades, research on monuments has increasingly been conducted on these domains (Landscapes, 2010: 76–169; Stevens, 2019; Jain & Jigyasu, 2019). In a wide range of such studies, monuments have been cited as the most important exemplars of urban signs/landmarks (Al-Hinkawi, 2016: 502; The Oxford dictionary, 2019; Wikipedia, 2019; Pour Ja'fat et al, 2011; Pour Ja'far & Montazerol Hojjah, 2010) which are very effective in the efficiency, examination, and evaluation of realization levels of human mental-spatial representations of urban environments. In other words, there is extensive consensus on the importance of monuments, emphasizing their mediating role in the realization of mental-spatial representations, and consequently, increasing the visualization and legibility capability of any urban environments (Zemla, 2016). However, mental-spatial representation, by definition, is the mental representation of

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an environment that leads to the flexible management of spatial information due to its saliency. It, therefore, facilitates the perception of what they are and how they relate to each other along with other environmental characteristics (Wolbers & Hegarty, 2010: 138- 139). Thus, the saliency of some works such as urban monuments is considered an important and fundamental factor in the realization of mental-spatial representations of the environment. Although its being intentional is still debatable, it seems that addressing saliency can be help understand the realization processes.

From a cognitive perspective, saliency deals with those qualities of urban monuments which attract people (intrinsically and inherently or extrinsically). These qualities make the monuments salient, significant, remarkable, effective, and unique in their surroundings. Saliency rises competition between various works to be selected as urban monuments. In other words, to succeed in obtaining their structural objectives, monuments must be salient in urban environments. These competitions along with essential diversity of these works from one place to another, fundamental and significant changes occurred in various levels (shape, function, meanings, spatial connections etc.) and, most importantly, the absence of a specific framework and procedure in their design are considered serious challenges to architects and designers in the measurement and evaluation of monuments as a research project. For this purpose, identifying the concept of saliency and its qualities (effective components) under the title of 'saliency cognition' can be discussed in various fields of research. This paper tries to explain saliency based on the results from the experimental analysis of a case studies conducted on urban monuments in Qazvin and match them with components extracted from the literature review according to their significance and weights in the form of a saliency model of urban monuments. Developing and explaining such a model can serve as the basis for architects to design and evaluate examples of monuments.

2. Theoretical Foundations and Research Approach

Addressing urban monuments and their saliency in the related literature provides the theoretical foundations for this study through the identification of effective components.

2.1. Urban monuments and their saliency

According to the definitions provided in the related literature, a wide range of architectural works are intentionally or unintentionally considered monuments in cities. These definitions suggest that monuments can be physically adapted to the environment through their direct contact with it. On the other hand, due to their incompatibility or lack of connection with the physical environment, they can be clearly visible and salient. Monuments are defined and expressed in this way, albeit not completely, but at least metaphorically. Saliency with a cognitive approach encompasses architectural components such as size, shape and sense of grandeur, general saliency and superiority. It also contains a main theme (mostly historic and stylistic) as well as abstract qualities such as 'the capacity to instill fear and wonder through the message to promote certain human emotions'; because its design ranges from metaphorical and abstract forms to realistic and formal architecture (Mehrabani Golzar & Khamseh Ashari, 2016). In general, based on the importance and repetition of characteristics of urban monuments in comparative definitions, they are 'landmarks designed and built in the form of architectural works in the urban context with common objective characteristics (the nature of intentional and artificial creation; appearance/visibility; a specific location and position in the environment due to the contrast and distinction with the environment, singleness and movement stability); objective-subjective characteristics (visual, cultural or structural saliency, uniqueness, physico-mental permanence), and subjective characteristics (mental-spatial representation with recognition, differentiation and recognizability, recalling or memorability due to attractiveness based on stimulating emotions resulting from visual, semantic and behavioral interaction with the observer and functioning as an anchor or reference point in urban context) (Table 1). In this definition, properties like saliency, as an objective-subjective property, are affected by objective characteristics and they affect subjective properties such as mental-spatial representations.

2.2. Saliency cognition approaches to urban monuments

The word 'saliency' is the noun form of the adjective 'salient', which is defined as the quality of being particularly noticeable or important (salient) from a very dominant surface or linear view (The Free Dictionary, 2019). In psychology, it is used to identify some aspects of sensory stimuli that are dominant or noticeable and attract attention immediately. This property in visual environments refer to those physical or organized structures that are recognizable by people as they leave the place (Khullar, 1985: 19).

Many attempts have been made to identify the salient qualities of urban landmarks and buildings, the most important of which is the 'saliency model of Raubal and Winter' (2002). Based on the typology of urban landmarks by Sorrows and Hirtle (1999), this model calculates and assesses four indicators of visual appeal, i.e. facade area, shape, color and visibility; two indicators of semantic attractiveness, i.e. cultural-historical significance and explicit signs; and two indicators of behavioral attractiveness, nodes and boundaries, the degree of attractiveness and the overall saliency in a combinational and qualitative manner (Richter & Winter, 2014: 140). The saliency model of Raubal and Winter has been frequently referred to and extended by researchers; for example, the emergence of the concept of 'advance visibility by Winter' with an emphasis on structural attractiveness (Winter, 2003); 'saliency of a building developed by Winter, Raubal and Nothegger' with an emphasis on route finding status, type of individual traffic, individual's role, or traffic time (Winter, Raubal & Nothegger, 2005); 'structural saliency developed by Winter, Tomoko, Elias and Sester' with an emphasis on visual saliency of buildings (based on the height of the building) (Winter et al, 2008); 'the concept of saliency of buildings developed by Klippel and Winter, and

Richter and Klippel' with an emphasis on structural saliency of buildings and developing a classification of structural attraction in the model (Klippel and Winter, 2005; Richter & Klippel, 2007). In addition, 'in an experimental study conducted by Nothegger et al.' on facade area, shape, color and visibility and semantic attractiveness calculated for a building, the model proposed procedures on the compatibility of model parameters with a specific field (Nothegger et al, 2004).

In another study based on the saliency model of Raubal and Winter via a different approach, Elias focused on extracting salient objects from space databases using spatial data mining methods (Elias, 2003a, 2003b). His research approach focused on structural and architectural data. In this regard, a number of geometric and topological features, including size, usage, height, distance to the road, orientation to the road and the number of adjacent buildings were identified (Elias, 2003b). Galler also conducted a similar research on identifying salient elements in urban environments with the aim of developing a method to estimate their saliency in a 3D model (Galler, 2002). The most important and interesting feature of the study by Galler is the reference to a set of urban features (such as facades) that are evaluated using descriptive statistics and Shannon's information theory (Shannon, 1948) in order to select more features in the information set. Results of his research showed that this approach is promising in identifying urban spaces and depends on 8 characteristics (accessibility, height, width, curvature, color, signs and marks and relief) (Galler, 2002). In addition, descriptions have been the basis for Elias and Sester's perception of the saliency of urban landmarks based on the study by Elias (Elias & Sester, 2006). Such an approach makes it possible to select the most salient building from a set of potential buildings, using qualitative criteria such as 'permanence, visibility, usefulness of location, uniqueness and brevity' (Burnett, 2000; Burnett, Smith & May 2001).

Table 1
Extracting and classifying the characteristics of monuments from definitions in literature

Features	Type	Researcher & Theorist
Objective Feature		
Realization	Intentional - Unintentional / Natural - Artificial	Riegl, 1982; Tomaselli & Mpofu, 1997; Elliott,1964; Assmann, 2009; Habibi, 2010
Location	The type of placement in the environment	Verschaffel, 1999; Habibi, 2010
Visibility	Scale, size, shape	Verschaffel, 1999; Emanuel, 1997; Tamms, 1993; Rowlands & Tilley ،2006
Objective- Subjective Feature		
Saliency	Visual, cultural, structural	Verschaffel, 1999; Tomaselli & Mpofu, 1997; Assmann, 2009; Habibi, 2010
Permanence	Physical-mental	Emanuel, 1997; Tamms, 1993; Rowlands & Tilley, 2006; Habibi & Maghsoodi; 2014
Style	Sculptural approach	Rogers, 1983; Fowkes, 2002; Clark, 2017; Ziyayi & Ra'nayi, 2010
Subjective Feature		
Representation	Narrative-conceptual Individuals and events and concepts with Special and important historical value / Experience from people's point of view / memories (memorability)	Reynolds, 1996; Tomaselli & Mpofu, 1997; Edensor, 2000; Rowlands & Tilley, 2006; Igwe et al, 2008; Assmann, 2009; Nora, 1984; Habibi, 2010; Fakouhi, 2012
Interaction	Visual, semantic, behavioral / With observer (stimulus observer) - With the environment	MacCannell,1976; Igwe et al, 2008; Mas'oodi Asl, Farzin, & Barati, 2016; Habibi, 2010
Attraction	Absorb Attention and Attract the observer's attention	MacCannell,1976; Young, 1993; Nelson,2005
Remembrance	Memorability	Reynolds, 1996; Emanuel, 1997; Edensor, 2000; Choay, 2001; McIntosh, 2014; Parzadeh, 2014; Yari et al, 2008; Habibi, 2010
Emotional stimulus	The emergence and physical crystallization of emotional responses to events Capacity to induce fear and wonder - Affect emotions	Elliott, 1964; Emanuel, 1997; Rowlands & Tilley ،2006
Use	Expressing personal and social feelings Creating space - Reminding and Representing - Promoting cultural identity An explicit reference to the efficiency of Landmark	Reynolds, 1996; Emanuel, 1997; Verschaffel, 1999; Nelson, 2005; Al-Hinkawi, 2016; Krzyżanowska, 2016; Pour Ja'far & Montazerol Hojjah, 2010; Habibi, 2010; Pour Ja'far et al, 2011; Sa'idi Rezvani & Shesh Pari, 2013

Although, the typology of Sorrows & Hirtle (1999) was the most referred to in the literature, other attempts were made with different approaches by other authors like Lazem & Sheta (2005) to determine five factors affecting the saliency

of buildings (height, color, importance/activity, width and location in street in relation to other buildings). Caduff & Timpf (2008) defined the concept of 'Saliency Vector' in order to assess perceptual, cognitive and contextual saliency based on a set of definite and helping components such as location- and object-oriented attention, scene context, degree of recognition and idiosyncratic relevance, and identification of important aspects of saliency in terms of attention through contrast, size, distance, and the like. Sadeghian & Kantardzic (2008) considered dynamic variables (such as the number of visitors) as the criteria to measure saliency; Duckham et al. (Duckham,Winter & Robinson, 2010) as well as Schroder et al. (Schroder, Mackaness & Gittings, 2011) emphasized on semantic saliency and extracting it based on the length of individuals' descriptions, as well as inclusiveness and familiarity of buildings in an environment given the historical-cultural significance and performance.

In addition to the above references, recent research has mainly focused on saliency cognition and evaluating it. For example, Kumar et al. used Graphic-Based Visual Saliency (GBVS) to recognize and classify urban monuments in India, which performed 8% better than the previous approaches in this regard (Kumar et al, 2018). With a similar objective, but a different approach, Saini et al. classified 100 Indian monuments based on the evaluation of properties found in their images (Saini et al, 2018). In her study, Davoudian explored the visual saliency of urban elements at night, highlighting the contrast and density of light with respect to the context (Davoudian, 2011). In another experimental study, she found components such as view angle important, in addition to photometric variables such as brightness and contrast in the visual saliency of urban elements (Davoudian, 2017). Quesnot and Roche investigated semantic saliency of urban landmarks by tracking geographical and spatial information shared by people (Quesnot & Roche, 2015). In another study, visual saliency of urban elements was investigated by examining and tracking eye movements and Deep Learning Model (Ghariba, Shehata & McGuire, 2019) which are proposed as novel approaches in the field. However, it appears that in the relevant literature, especially in Persian references, the lack of a comprehensive and systematic view on saliency to identify their components regarding architectural works such as urban monuments is quite evident. Given the available approaches to saliency cognition of urban landmarks, its examples and buildings, components of recognizing the saliency of monuments can be traced with a combination of the above-mentioned approaches. These components are provided in Tables 2 and 3 based on the relevant literature.

Table 2
Saliency cognition approaches to landmarks and their examples

Author	Saliency Cognition Approaches	Saliency component
Raubal & Winter(2002)	Total qualitative weight balance of attraction	Size saliency (façade area) Age saliency Color saliency Shape saliency Decoration and signage saliency (explicit marks) Cultural and Historical saliency
Galler (2002)	Having 8 features and evaluating them (access, height, width, curvature, color, signage and comfort)	Size saliency (height, width, curvature) Location saliency (accessibility) Color saliency Emotional saliency (relief) Decoration and signage saliency (signs and marks)
Winter (2003)	The ratio of initial appearance of buildings in comparison	Size saliency (features of facade and orientation of the feature)
Elias (2003a, 2003b)	Examining the hierarchical system of potential capacities of buildings	Name saliency (building label) Functional saliency (building use) Size saliency (size of building) Location saliency Shape saliency
Winter et al. (2004)	Investigating individual-related contextual factors interacting with landmark	Location saliency
Nothegger et al. (2004)	Total qualitative weight balance of attractions based on Raubal and Winter's model	Size saliency- Shape saliency Color saliency Cultural-historical saliency Decoration and signage saliency
Klippel & Winter (2005)	Measuring faster and easier cognitive perception of the situation in a set of routes	Location saliency
Lazem & Sheta (2005)	Evaluation and analysis of five potentials of buildings	Color saliency- shape saliency Size saliency Location saliency
Elias & Sester (2006)	Evaluating Burnett's quality criteria by focusing on the number of words used to refer to an object	Temporality saliency (Durability of a feature) Shape saliency Use saliency and usefulness (efficiency) Size saliency

Richter & Klippel (2007)	Determining and evaluating the location of landmarks relative to each other	Location saliency
Winter et al. (2008)	Examining the height of buildings in measuring saliency	Size saliency
Caduff & Timpf (2008)	Analysis and evaluation of the level of attracting observer's attention via the potentials of contrast, size, distance, etc.	Size saliency Location saliency Emotional saliency Shape saliency
Sadeghian & Kantardzic (2008)	Identification and valuation of dynamic context-related variables	Functional saliency Use saliency (efficiency)
Duckham et al. (2010)	Measuring the familiarity and pervasiveness of landmark based on the length (extent) of people's descriptions	Emotional saliency
Schroder et al. (2011)	Assessing the importance of each one of cultural-historical components	Cultural-historical saliency Functional saliency
Davoudian (2011, 2017)	Assessing the importance of light contrast and density relative to the background as photometric variables such as brightness and contrast- the significance of the observer's view angle	Shape saliency Decoration and signage saliency Temporal Saliency Location saliency
Quesnot & Roche (2015)	Based on the amount of shared data among people	Location saliency Emotional saliency Cultural-Historical saliency
Kumar et al. (2018)	Recognition and classification of urban monuments in India	Size saliency- Shape saliency Color saliency Location saliency
Saini et al. (2018)	Assessment of 100 monuments in India Feature-Based Assessment	Size saliency Shape saliency Color saliency
Ghariba, Shehata & McGuire (2019)	Quantitative assessment and evaluation of results using eye tracking methods	Size saliency- Shape saliency Emotional saliency- Color saliency Decoration and signage saliency

Table 3
Saliency components of Landmark and buildings in the realated literature

Saliency Component	**References In The Literature Of Architecture & Urban Planning**
Size Of Monument	Raubal & Winter, 2002; Galler, 2002; Winter, 2003; Elias,2003a, 2003b; Nothegger, et al, 2004; Lazem & Sheta, 2005; Elias & Sester, 2006; Winter et al, 2008; Caduff & Timpf, 2008; Saini et al, 2018; Kumar et al, 2018; Ghariba et al, 2019
Age Of Monument	Raubal & Winter, 2002
Color	Raubal &Winter, 2002; Galler, 2002; Nothegger et al, 2004; Lazem & Sheta, 2005; Saini et al, 2018; Kumar et al, 2018; Ghariba et al, 2019
Decoration & Signage	Raubal & Winter, 2002; Galler, 2002; Nothegger et al, 2004; Davoudian, 2011, 2017; Ghariba et al, 2019
Form or Shape	Raubal & Winter, 2002; Elias, 2003a, 2003b; Nothegger et al, 2004; Lazem & Sheta, 2005; Elias & Sester, 2006; Caduff & Timpf, 2008; Davoudian, 2011, 2017; Quesnot & Roche, 2015; Saini et al, 2018; Kumar et al, 2018; Ghariba et al, 2019
Cultural & Historical Importance	Raubal & Winter, 2002; Nothegger et al, 2004; Schroder et al, 2011; Quesnot & Roche,2015
Location	Galler, 2002; Elias, 2003a, 2003b; Winter et al, 2004; Klippel & Winter, 2005; Lazem & Sheta, 2005; Richter & Klippel, 2007; Caduff & Timpf, 2008; Davoudian, 2011, 2017; Kumar et al, 2018
Emotions towards...	Galler, 2002; Caduff & Timpf, 2008; Duckham et al, 2010; Quesnot & Roche, 2015; Ghariba et al, 2019
Name Of Monument	Elias, 2003a, 2003b
Function	Elias,2003a, 2003b; Sadeghian & Kantardzic, 2008; Schroder et al, 2011
Temporality	Elias & Sester, 2006; Davoudian, 2011, 2017
Use	Elias & Sester, 2006; Sadeghian & Kantardzic, 2008

2.3. Saliency Cognition of Urban Monuments through the Reading of Mental-Spatial Representations

One of the strategies used in the saliency cognition of urban monuments is the reading of mental-spatial representations (Richter & Winter, 2014: 72). Mental-spatial representations are formed by experiencing the environment by individuals and acquiring spatial information from it (Wolbers & Hegarty, 2010; Muffato & Meneghetti, 2020). In this process, anyone can have salient experiences in the environment which could be extracted through the reading of mental-spatial representations. The reading process is very similar to the first-hand experience of the environment and any salient subject in the environment is also

highlighted in the achievable mediators of these representations, such as external mediators (like plans and maps) or verbal descriptions (location descriptions, route descriptions) (Hegarty et al, 2006; Pazzaglia & Meneghetti, 2012). Thus, it can be argued that the reading of mental-spatial representations through mediators such as verbal descriptions can be one of the important approaches to saliency cognition. This approach was used in studies with indirect reference to the perception of urban landmarks (Klippel & Montello, 2007; Lee, et al, 2002). Since urban monuments are the best and most important reference options to be referred to in the expression of mental-spatial representations as well as spatial relations (Sadalla, Burroughs & Staplin, 1980; Couclelis et al, 1987) they can be tracked through strategies such as measuring saliency by reading verbal descriptions resulted from mental-spatial representations in urban environments.

3. Research Methodology

This qualitative study tries to identify salient elements affecting the design and assessment of examples of urban monuments. In the first section, theoretical discussions and a review of literature was provided which employed strategies such as logical reasoning with a descriptive-analytical approach and documentary and desk study, as well as comparing the collected information from references. Then, through induction, 12 effective components in the saliency of urban landmarks and buildings were extracted; in the next step, these components were solidified by experimental testing in cases of several urban monuments.

The test used a combination of qualitative and qualitative strategies, such as 'reading verbal descriptions resulted from individuals' mental-spatial representations' and 'the fuzzy Delphi (ranking/fuzzy) method. The first phase of the test was fully based on the content of verbal descriptions extracted directly from natural language (NL) based on text content classification (Manning et al, 2008) which considered cognitive preferences based on the principle of the hierarchy to interpret acceptable descriptions of individuals. This was conducted by 'labeling the clustered and classified data' (Hauthal & Burghardt, 2013) and to interpret the descriptions, an exploratory approach was used by researcher based on the proven hypothesis of "cognitive adequacy" (Knauff, Rauh, & Renz, 1997; Renz, Rauh, & Knauff, 2000). In this regard, survey-descriptive data were extracted according to the experts (in the first round of Delphi) using a survey and an/a (open-ended) questionnaire. Then, factors affecting the saliency of urban monuments were labeled and using a questionnaire in the second round of Delphi (a combination of close-ended and open-ended questions), they were assessed and surveyed.

The analysis of the results in this round of Delphi was determined on the basis of both mean responses and fuzzy logic. Triangular fuzzy numbers were used in accordance with the opinions of experts in recording them in order to analyze them using the Fuzzy Delphi Method. for this purpose, minimum and maximum values of experts' opinions were considered as the boundary points of triangular fuzzy numbers and their geometric mean was used as the degree of membership of triangular fuzzy numbers to remove the boundary points (Murray, Pipino & Van Gigch, 1922). This method provides a more accurate representation of traditional Delphi method in the component extraction process (Ja'fari & Montazer, 2008: 69) and after two rounds, results could be summed up and analyzed. Finally, weighing of the components was evaluated based on the results of the consensus (average, average rating, relative weight and relative weight rating) as well as the referral of experts (percentage of references in the descriptions); then, it was presented in the summary, by applying the results of the relevant literature based on the modeling strategy in the form of a conceptual model as a saliency model of urban monuments. To analyze data during the course of the study, Excel 2013 and SPSS 22 were employed.

3.1. Statistical population and context

Since there was no sample size (Kobus & Westner, 2016) and statistical and probabilistic approach to determine sample in Delphi method and Fuzzy Delphi Method (Okoli & Pawlowski, 2004; Paré et al, 2013), 40 experts of architecture, urban development, urban design, landscape architecture and restoration of monuments from Faculty of Architecture and Urbanism at Imam Khomeini International University (all professors) and Islamic Azad University (some professors) in Qazvin and some experts in the practice domain (for homogeneous sampling) were selected for the experimental study. These individuals as general experts in these fields were selected purposefully (Windle, 2004) due to their familiarity with the researcher (in order to better participate in the study). Qazvin was selected as the setting of the study, because it enjoys abundant monuments with assorted applications (Pour Ahmad et al, 2018; Eshraghi, 2011) and it is shared in the embodied experience of the people under study in terms of presence or residence (from 5 to 60 years).

After contacting the participants by calling them or sending email, only 26 individuals were willing to participate in the study and finally, 24 questionnaires were filled in the first round of Delphi (with 92.31% response rate). This participation decreased to 21 people (87.5%) in the second round.

3.2. Questionnaire content

Based on the selected method, two rounds of Delphi method were conducted in this study. In the first round, an open-ended questionnaire was used which included the statement of topic, problems and objectives of the study, as well as details of experts (name, gender, expertise, and education). Questions were divided into two sections of three questions. One question dealt with the definition of urban monuments according to the experts and the remaining two questions were about choosing examples of urban monuments and describing the selected ones. Analysis of the results of the first round based on exploratory approach and logical reasoning of authors made it easier to prepare the second round questionnaire in which factors affecting the saliency

of urban monuments were evaluated using close-ended questions based on the five-point Likert scale (very much, much, neutral, little and very little). Then, the level of consensus and agreement on each component was measured using fuzzy logic. In the second round, in addition to the assessment questions, one open-ended question was included to add experts' views on other components.
Results from the questionnaire in the second round selected, weighed and completed the components based on experts' views.

3.3. Data Analysis

The research data were analyzed in the following sequential steps:
Regarding the component extraction from verbal descriptions, the components extracted from the relevant literature were used. Therefore, these components were labeled as default in the form of classified descriptors to extract the components of saliency from verbal descriptions of experts on urban monuments and the rest of descriptions were labeled as classified descriptors. Finally, factors affecting the saliency of urban monuments (16 components) were explained.
At this stage, although the identification of effective components can never be conducted in a completely definite way, the relative weight of criteria could be well assessed in this process. In other words, due to the ambiguity and uncertainty in experts' views, it is inappropriate to express data with certainty (Keshavarz Ghorabaee & Salehi Sadaghiani, 2014). Therefore, verbal phrases were used instead of specific numbers to determine the weight of components and their rankings, and definite opinions were used only in the initial evaluation to obtain a general insight into the opinion.
Since the Likert scale was employed to describe components, it helps prevent ambiguities in all stages by adding the fuzzy numbers (Chang, Hsu and Chang, 2011) and obtain the triangular fuzzy number (Table 4).

Table 4
Triangular Fuzzy Numbers For Five-Point Scale; (Chang, Hsu and Chang, 2011)

Likert Scale	Linguistic Expressions	l	m	u	Fuzzy Numbers
1	Very Unimportant (Very Low Affecting)	0	0	0.25	(0, 0, 0.25)
2	Unimportant (Low Affecting)	0	0.25	0.5	(0, 0.25, 0.5)
3	Moderately Important (Medium Affecting)	0.25	0.5	0.75	(0.25, 0.5, 0.75)
4	Important (High Affecting)	0.5	0.75	1	(0.5, 0.75, 1)
5	Very Important (Very High Affecting)	0.75	1	1	(0.75, 1, 1)

For this purpose, given the verbal descriptions and components defined in the questionnaire, and determining fuzzy numbers for each view, the triangular fuzzy averaging for experts' views on each component was calculated using the geometric mean of fuzzy numbers.
Since the interpretation of definite values is easier than the fuzzy state, the final outputs of this stage were expressed as definite numbers via defuzzification of values (Thomaidis et al, 2006). For this purpose, the simple Center of Gravity (COG) defuzzification method was used.
The obtained definite numbers indicate the evaluation of agreement on the components in question. Here, key components could be screened and selected with regard to the threshold ($\propto$) and could be weighed based on definite numbers. This is usually determined by mental inference of the decision-maker and there is no simple or general rule to determine it (Pour Ezzat, Bigdeli & Sa'd Abadi, 2013). Given the objective of this study which was to extract and identify components and weigh them, components with definite numbers lower than the threshold were also important; since they are extracted based on individuals' unconscious verbal descriptions; although they might be less important than other components in this regard.

4. Determining Validity and Reliability

It seems that due to the nature of this study based on Delphi method, it is more appropriate to use the Guba and Lincoln's conventional approach while considering the concepts of "trustworthiness" as a criterion to replace validity and reliability with "credibility", "transferability", "dependability" and "confirmability" (Lincoln & Guba, 1985) to assess the reliability and validity of the results instead of using positivist qualitative approaches (Hasson and Keeney, 2011); however, obtaining validity in Delphi method is also associated with reliability.
In this study, validity was obtained by using 'triangulation' and reading verbal descriptions of experts in various fields (Kimchi, et al, 1991), using the related literature; 'accuracy of the information' technique by the amount of time spent to conduct the study and the questioner's proximity to the experts; 'techniques for controlling members' responses' using Delphi and determining validity by repeating the feedback given to experts (Engels & Kennedy, 2007); and 'researcher's self-review' in two different rounds. Transferability was obtained as external validity of the study through development and rich description of the set of data in the first round of Delphi method, using an open-ended questionnaire and explanatory technique in coding and analyzing the obtained data in data analysis phase, especially by fuzzy logic, and by comparing the results of referrals by consensus in the second round. In addition, reliability was obtained by a group of experts in various fields related to the topic; confirmability was obtained by investigating raw (descriptive) data, coding and converting them into research data, evaluating them in the second round by experts along with matching the results with the results from the relevant literature.

5. Findings

According to the respondents, 24 experts of various fields were questioned in the first round. Among them, 12 respondents were male, and 12 others were female (with normal gender distribution). Participation decreased to 21 people in the second round. Table 5 shows the details on experts.

Table 5
Distribution of experts in the first round Delphi test

Field Of Expertise	Masters	Ph.D	Number	Percentage In Expertise
Architecture	4	8	12	50 %
Urban planning	2	3	5	20.83 %
Landscape Architecture	0	4	4	16.66 %
Architecture- Urban Designing	1	1	2	8.33 %
Conservation Of Architectural Heritage	0	1	1	4.17 %
Total	7	17	24	100 %
Percentage In Level of Education	29.17 %	70.83 %	100 %	

For the first question 'What is urban monument?' 226 terms were extracted as 178 characteristics in 22 classes for urban monuments as represented in Table 6 based on the rate of referring to each characteristic (frequency of definitions by experts). It seems that each of these features either affects the saliency of urban monuments itself or results from them. In the responses, 18 experts directly pointed to the quality and nature of saliency of urban monuments, provided in Table 7 based on their frequency in definitions of urban monuments.

Table 6
Identifying the characteristics of urban monuments based on the amount of references in the descriptions of experts from the results of the first round Delphi test

Features Of Urban Monuments Derived From The Definitions Of Experts Group	Percentage of agreement
Settling in urban context	83.33 %
Standing Out, Distinctive or Unique	75 %
Memorable	66.67 %
Recount and celebrate values and concepts	66.67 %
Recognizable	45.83 %
Describable	45.83 %
Sign, symbol and indicator of the city's identity	37.5 %
Functional requirements	37.5 %
Landmark	33.33 %
Used to navigate and orientate around	29.17 %
Effect on the mind	29.17 %
Prominent within field of view (Prominent in landscape)	25 %
Famous or Well Known	25 %
Noticeable	20.83 %
Permanent	20.83 %
Improve visual quality in landscape and city	16.66 %
Important Location	16.66 %
Assist in urban legibility	16.66 %
Has personal and collective meaning	16.66 %
Historically and Culturally Important	12.5 %
Interactivity	12.5 %
Create a sense of belonging	8.33 %
Total	Up to 100 % for each one

In response to the second question based on selecting examples of urban monuments in Qazvin, 23 monuments were mentioned 153 times, including 'Minoudar Monument of Qazvin' with 20 (83.33%) mentions; 'Jama' Mosque of Qazvin' with 16 (66.67%) mentions; and 'Fadak Mausoleum of Anonymous Martyrs' and 'Chehelsotoon Mansion' with 13 (54.17%) mentions. Urban squares with a mention rate of 30.72% contributed to the highest usage in urban monuments in the results.

Finally, extracting saliency components from verbal descriptions of examples mentioned by experts was based on the answer to the third question of the first round. They were asked to describe examples of monuments for a person who has not seen them before (like a tourist). Based on their descriptions, 1012 descriptors were extracted, and they were then classified and labeled as 16 saliency components of urban monuments. These components are shown in Table 8 based on the frequency of referring to them in descriptions.

According to the results, the 'name' component with 139 descriptors and 13.47% mentions and descriptors such as Aliqapo, Chehelsotoon, Minoudar, and Hamdallah Mustawfi, etc; the component of 'feeling toward the monument' with 116 descriptors and 11.46% mentions and descriptors such as feeling good, enchanting, enjoyable, relaxing, beautiful etc; the 'situation' component (location of urban element) with 102 descriptors and 10.08% mentions with descriptors such as in the historical texture, Rah Rey Neighborhood in the city center etc. were determined as components with priority in this section of the test.

Table 7
Abundance and distribution of urban monuments saliency methods by experts based on the results of the first round Delphi test

Methods of saliency in urban monuments	Number of expert's agreement (Of 18)	Percentage of agreement
Abstract and special shape and form	11	61.11 %
Visually Visible	7	38.89 %
Different dimensions and scales	5	27.78 %
Well Known and/or famous	5	27.78 %
Outstanding location	5	27.78 %
Striking- Notable - Grab attention	5	27.78 %
Different performance	4	22.22 %
Permanent	4	22.22 %
Old	3	16.67 %
Different meaning	2	11.11 %
Different materials	1	5.55 %
Total	18	Up to 100 % for each one

Table 8
The effective saliency components of urban monuments based on verbal descriptions

Questions / The Saliency's Component Of Urban Monument	Number of Answers	Number of Descriptors in Total Descriptions	Percentage of References in Descriptions	Description Referral Rank	Percentage of Referrals by Experts	Reference Rank by Experts
Q1	24	139	13.74 %	1	95.83 %	5
Name Of Monument	Descriptive sample: Aliqapo, 'Chehelsotoon, 'Minoudar, Hamdallah Mustawfi					
Q2	24	116	11.46 %	2	100 %	1
Emotions towards	Descriptive sample: Sense of well-being, Enchantment, Pleasure, Relaxation, Beauty					
Q3	24	102	10.08 %	3	100 %	2
Location	Descriptive sample: Among the historical context, In Rah-e Rey neighborhood, In the city center					
Q4	24	64	6.32 %	7	91.67 %	6
Decoration	Descriptive sample: Tiling, Mirror work, Plastering, Moarragh, Stained glass					
Q5	24	37	3.66 %	14	66.67 %	15
Architectural Component	Descriptive sample: Having special arches, Dome, High porch, Sloping roof					
Q6	24	91	8.99 %	4	100 %	3
Function & Use	Descriptive sample: Recreational koshk (pavilion), Religious uses like mosque, Urban square					
Q7	24	77	7.61 %	5	100 %	4
Size Of Monument	Descriptive sample: Dimensions, Scale, Size, Small, Height					
Q8	24	68	6.72 %	6	91.67 %	7
Age Of Monument	Descriptive sample: Old, New, Under construction					
Q9	24	52	5.14 %	8	91.67 %	8
Shape-Form	Descriptive sample: Like something, Like the tip of a pen, Oblong					
Q10	24	51	5.04 %	9	87.5 %	9
Color	Descriptive sample: Color and Non-color, White, Blue, Dark color, Being monochromatic					
Q11	24	48	4.74 %	10	70.83 %	13
Historical Value	Descriptive sample: One of the important buildings of the Safavie era, The only remaining gate, The largest mosque of the special historical period					
Q12	24	47	4.64 %	11	83.33 %	10

Architecture Value	Descriptive sample: Having its own style, Koshki pattern, Chahar eivani (Four porches) pattern					
Q13	24	40	3.95%	12	83.33 %	11
Cultural Value	Descriptive sample: Special cultural features such as being on the Silk Road, Having many social interactions, Being a symbol of the city					
Q14	24	38	3.75%	13	70.83 %	14
Condition	Descriptive sample: Confused, Alive, Full of scaffolding, Unfinished					
Q15	24	29	2.87%	15	75 %	12
Construction	Descriptive sample: Construction materials such as Brick, Stone, Concrete, Cement, Metal					
Q16	24	13	1.28%	16	45.83 %	16
Temporality	Descriptive sample: A special ceremony, Change of use to the Museum of Anthropology and Museum of Stone					
Total	**24**	**1012**	**100 %**	**1 to 16**	up to 100%	**1 to 16**

Based on the results from the second-round questionnaire on evaluation of experts' consensus on the selection of the extracted components effective in saliency of urban monuments, first, results were analyzed in SPSS 22 and Kendall's coefficient of 0.706 provided a relatively acceptable level of consensus on the components. In the next stage, the data obtained from the questionnaire in this round were assessed and weighed more precisely based on fuzzification method. Table 9 shows the results of weighing components based on mean and defuzzified definite numbers, and Figure 1 shows the amount of consensus between experts based on the obtained results.

Table 9
Weighing the components affecting the saliency of urban monuments based on the Mean Rank and Definite value of Defuzzification

The Saliency's Component Of Urban Monument	N Of A	Mean of 5	Std. Deviation	Mean Rank & Rank		Triangular Fuzzy Numbers Evaluation by Experts			Definite value (S_A) & Rank	
Name Of Monument	21	4.29	0.644	10.33	**7**	0.5505	0.8074	0.9733	0.7923	**7**
Emotions towards	21	4.43	0.507	11.12	**6**	0.5989	0.8502	1	0.8333	**5**
Location	21	4.81	0.512	12.88	**3**	0.6882	0.9421	0.9866	0.9072	**3**
Decoration	21	3.67	0.483	7.26	**10**	0.4017	0.6588	0.9097	0.6578	**9**
Architectural Component	21	4.48	0.680	11.33	**5**	0.5942	0.8523	0.9733	0.8295	**6**
Function & Use	21	2.86	0.573	3.67	**15**	0	0.4453	0.7032	0.4141	**15**
Size Of Monument	21	4.95	0.218	13.69	**2**	0.7386	0.9866	1	0.9475	**2**
Age Of Monument	21	3.05	0.590	4.38	**14**	0	0.4938	0.7505	0.4543	**13**
Shape-Form	21	5	0.000	13.88	**1**	0.7528	1	1	0.9588	**1**
Color	21	3.24	0.539	5.17	**12**	0	0.5475	0.801	0.4985	**12**
Historical Value	21	4.62	0.590	12.05	**4**	0.6377	0.8925	0.9866	0.8657	**4**
Architecture Value	21	4.05	0.384	9.19	**8**	0.5073	0.7589	0.9866	0.7549	**8**
Cultural Value	21	3.48	0.873	6.36	**11**	0.3295	0.5938	0.8055	0.585	**10**
Condition	21	2.57	0.507	2.79	**16**	0	0.3763	0.6342	0.3566	**16**
Construction	21	3.05	0.669	4.55	**13**	0	0.4911	0.7404	0.4508	**14**
Temporality	21	3.67	0.577	7.36	**9**	0	0.6499	0.9047	0.5841	**11**

In this section, the results indicated that experts had an over 50% consensus based on reference rate in 15 components and the only component outside the agreement scope was 'temporality'. Results of evaluating the average of views indicated an over 50% consensus for 16 components. Based on evaluations of defuzzified views, consensus was evident only over 11 components and other components such as 'function/use', 'age of monument', 'color', 'situation (conditions)', and 'construction' failed to obtain acceptable consensus.

According to Figure 2, in terms of components' weighing and ranking, results of different methods seem relatively different. The distribution of rankings in the Figures indicates the extent to which experts agree on the components. However, there were ranking interferences in most components. Interferences in two or more methods indicate a greater degree of consensus over ranking and weighting of components based on the importance of the component from the experts' perspective. Interference was observed for 11 components of saliency including 'name of monument', 'location (place)', 'function/use', 'size', 'shape/form', 'color', 'historical value', 'architectural value', 'cultural value', 'situation-conditions', and 'temporality '.

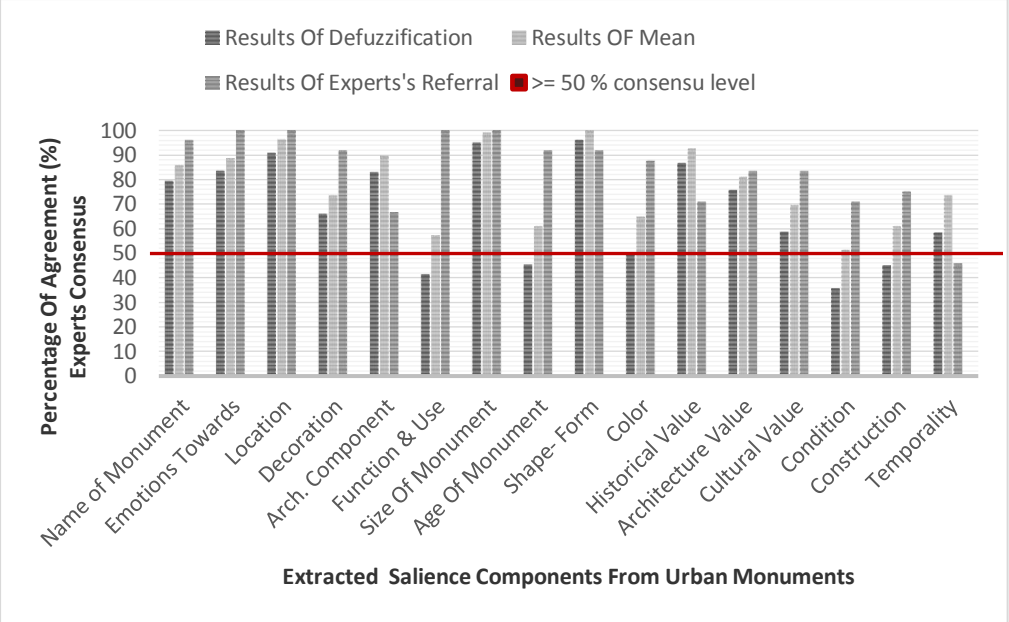
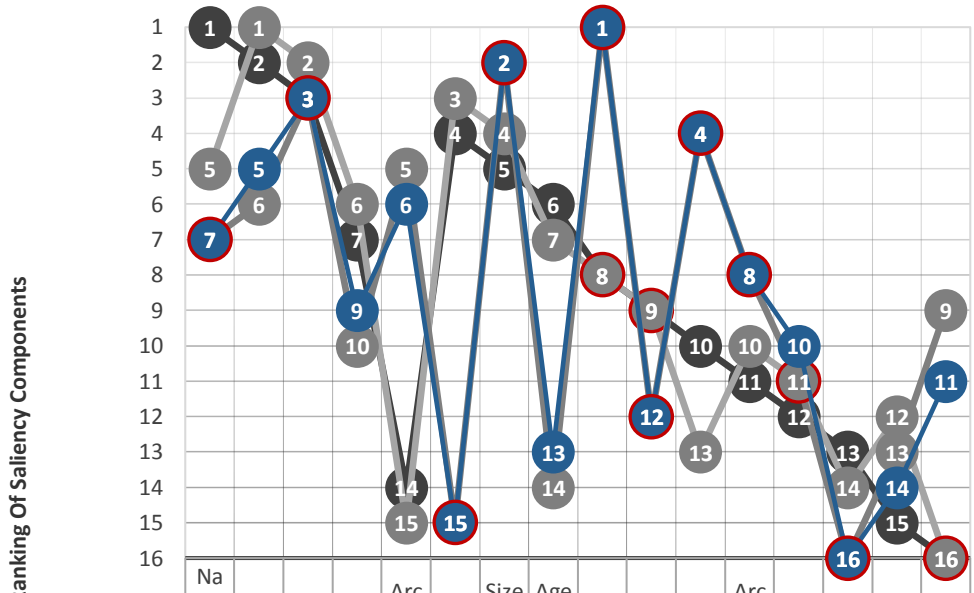


Fig. 1. Percentage of agreement and consensus of experts on the extracted saliency components based on test results



	Name Of Monument	Emotions Towards	Location	Decoration	Arch. Component	Function & Use	Size Of Monument	Age Of Monument	Shape-Form	Color	Historical Value	Architectural Value	Cultural Value	Condition	Construction	Temporality
References To Descriptions Ranking	1	2	3	7	14	4	5	6	8	9	10	11	12	13	15	16
Referral OF Experts Ranking	5	1	2	6	15	3	4	7	8	9	13	10	11	14	12	16
Mean Ranking	7	6	3	10	5	15	2	14	1	12	4	8	11	16	13	9
Defuzziation Ranking	7	5	3	9	6	15	2	13	1	12	4	8	10	16	14	11

Fig. 2. Distribution and ranking of saliency components of urban monuments based on the reference to descriptions, referral of experts, means and defuzziation of experts assessment.

6. Discussion on Results of Modeling Saliency of Urban Monuments

According to the results of the experimental study, 16 saliency components of urban monuments were extracted in the form of Figure 3 Components such as 'the size of monument', 'age of monument', 'shape/form of monument', 'decorations', 'situation/conditions', 'construction', 'color', 'function/use', and 'architectural components' which are visually perceived by individuals were considered visual-perceptual components leading to the perceptual or objective saliency of urban monuments. 'Name of monument', 'feelings toward monument', 'historical value', 'cultural value' and 'temporality' are other components of urban monuments leading to subjective saliency due to the individuals' background knowledge. Other components such as 'location/place of urban monument' affect saliency by attracting people both subjectively and objectively. Some of these components were consistent with the components extracted by previous researchers (Table 3). However, some components such as 'current situation/condition of the monument', 'its construction (type of materials used)', 'architectural components', and 'architecture value of the monument' were not mentioned in the saliency cognition, and components were classified as visual, structural and semantic cases of saliency. Compliance of the extracted components in the form of the proposed model with the components existing in the relevant literature and their inclusion could confirm the present model based on the experimental test (Figure 3).

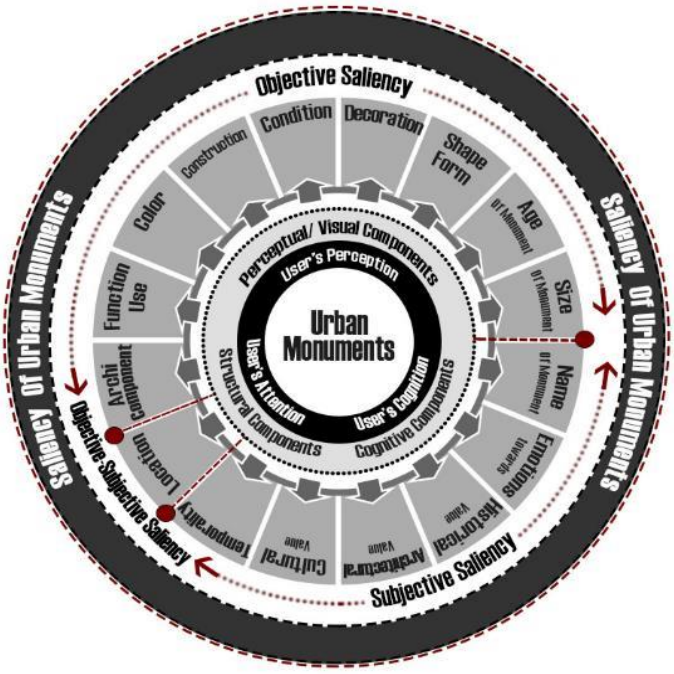


Fig. 3. Saliency model of urban monuments; Components affecting on saliency of urban monuments.

In addition, results of questioning experts indicated that in examining the saliency of examples of urban monuments, some components were more significant, including 'shape/form of monument', 'size of monument', 'location/place of monument', 'historical value', and 'having feelings for it'. Other components such as 'architectural components', 'name of the monument', 'architectural value', and 'decorations' were less significant. Although this ratio differs from the results of unconscious reading of mental-spatial representations of experts' descriptions, it seems more logical to prioritize the results of questioning them. The relationship between components or the combination of results can be utilized to evaluate the examples of urban monuments as well as architectural design.

7. Conclusion

This study aimed to determine factors affecting the saliency of urban monuments in order to promote urban visibility and legibility. According to the results, numerous components of varying importance at the perceptual/visual, cognitive, and structural levels play key roles in this process. Saliency of urban monuments results from the interaction between individuals' perception, cognition, and attention. Therefore, the most effective components in this process include the perceptual/visual components such as 'size of monument', 'age of monument', 'shape/form of monument', 'decorations', 'situation-conditions', 'construction', 'color', 'function/use', 'architectural components'; cognitive components such as 'name of the monument', 'having feelings towards it', 'historical value', 'architectural value', 'cultural value', and their 'temporality' as well as the structural component of 'location/place'. The results of ranking and weighing the components that affect the saliency of urban monuments indicate that the components are not of equal importance. Here, components of 'shape and form', 'size of monument', 'location/place of monument', 'historical value', and 'having emotion towards that' were of significant priority in the survey, and 'architectural components', 'name of monument', 'architectural value', 'decorations', and their 'cultural value' were ranked next. However, it is possible to create, strengthen, and develop legible urban spaces through the realization of urban monuments only when all components affecting the saliency are considered by architects, designers, and planners at various levels beyond their importance and ranking. This study sought to lay the foundations for this objective in architecture and urbanism research.

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