

## **Application of Context-Oriented Architecture in Designing Residential and Tourist Complexes (Case Study: Ali-Sadr Cave Located in Hamedan, Iran)**

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**Abstract:** Conceptualism and perception thereof is a necessity in design process of projects that is planned to be implemented in line with sustainable development. Regardless of the physical aspect, various facets are stated in this field. They, in order to be realized, require research studies from the basic architectural planning in order to modify and improve the interaction with the context. The present research mainly focuses on recognizing methods and the way of creating interaction with context to express context orientation position in hospitality industry and recreational and tourist spaces. Iran, despite of enjoying historical, natural and tourist attractions, possesses little share of tourism industry. Tourist's tendency to travel and visit countries with tourist attractions is not only due to historical monuments and beautiful coasts and sceneries but to some extent, it also originates in available types of welfare facilities and tourist attractions. By considering the concepts of context-oriented architecture and with respect to the significance of such topics in designing recreational and tourist spaces in order to encourage tourists and also with regard to lack of concepts in designing the available hotels, the present study seeks to investigate the importance of this issue. Ali-Sadr Cave located in Hamedan as a case study was examined because of having natural unique attraction. Ultimately, a design was proposed.

**Key words:** Tourist, tourism, hotel, contextualism, Hamedan

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### **INTRODUCTION**

Contextualism is defined as the possibility of developing a building in the future and a tendency to create a relationship between the building and surrounding environment. In fact, context-oriented architecture emphasizes on proportion and compatibility and encourages new structures by considering their around buildings (Morteza, 1999). In recent years, hotel and hospitality industry has been changed into a real industry and have had rapid advancement and extension so that it follows market rules and profit-making calculations as every industrial production. Doubtlessly, this in one hand, improves the relative quality of services provided in hotels and on the other hand, it degrades the quality of façade and interior space.

The importance of this issue is beyond the methods called "rapid and logical" by which the requests and expectations are temporarily fulfilled. That is a "cheap perfection" shouldn't be achieved. It should achieve range of spaces that cannot be repeated similarly from a place to other one by architecture consistent and congruous with requirements and suitable organization. This space ought to induce the sense of belonging.

At the time being, negligence to the context is a typical issue in designs particularly hotel spaces. Therefore, the present research is based on the principles that may increase the planning, designing and constructing hotel and recreational and tourist complexes especially by considering context orientation through case studies and proposing alternatives for one of the mentioned natural attractions.

### **MATERIALS AND METHODS**

Generally speaking, the following items can be stated about research method: types are research include fundamental research (expanding knowledge borders), applied research (consist of fundamental-applied research and applied-executive research) and reports and suggestions. This research adopts executive-applied method.

**The procedures of distinguishing research:** They consist of statistical and descriptive methods that both are used in this study. This means that statistical calculations are used wherever it is necessary in the research and other sections of the study apply descriptive method.

**Research process:** Desk research (using books, journals, magazines, etc.) and field studies are applied to examine the data in various backgrounds.

**The relationship between architectural design and context:** Architectural planning is an effort to create solutions before they are implemented. Designing is often an analytical process while it needs analysis, assessment and selection (Vela and Bichril, 2005). The context gives the architect the basic elements of the design for analysis and assessment. Mario Botta describes the relationship between the building and its surrounding area: “every architectural work has its unique and its own environment. In other words, the surrounding area of the building is called the context of that building. It can be acknowledged that the context and its architecture are always interacted and communicated to each other”. This interaction is clearly observed in Islamic architecture while in contemporary architecture it is challenging with its context.

Classifies context to three groups, pattern of form, pattern of activity and pattern of climate. Form here, involves elements like space, shape, scale, proportions, materials details, texture and colors. These elements may be used to connect architecture with its context in two dimensions of geography and time. Geographical dimension can be considered in three following scales: the relationship between the building and adjacent ones in a distance that can be observed and perceived. The example of this type of relationship is seen in urban facades and placement of new buildings in historical sites. The development of Museum of Pennsylvania University by Romario Giurgola is an example of this case.

Next scale is the time when the building communicate not with the surrounding environment but with its around sites. Charles Moore *et al.* decided to make a reasonable relationship between the club of the California University (Santa Barbara) and the Spanish architectural style of the city instead of surrounding building of the university campus.

The third connection with the site is achieved in the scale of the area. A fine example of this case is the houses designed by Rober Venturi in Nantoker. He could successfully create a vernacular architecture with simple forms, material details and colors inspired by New England fishing cottages (Roodman *et al.*, 1995).

In addition to visual and distance dimensions, a building can be communicated with its surrounding area in the time dimension (past, present and future). In Greater Columbus Convention Center designed by Peter Eisenman, he links the geometry of the complex with a historical layer of the site to the history of the city.

However, in this case, perception of such relationship is not as clear as of the prior ones. In terms of activities, circulation in the site, people's behavior and groups are factors that are able to connect the building with its own context. The role of yards as the connector which facilitates the people's movement and circulation in both side of the museum in Stuttgart Museum designed by James Stirling or the way by which mosques or Caravanserais are placed along with the squares and markets can be considered as the connection between the building and the context by users' circulations in the city (Ross, 1999).

The climate that results in materials, colors, openings, volume compression and forms, ceilings, etc. Does contextualism in architecture always mean creating coordination and harmony to surrounding background (geography, time, activities, climate, etc.). The architect's art and sensitivity and his perception of physical, mental specifications of the site or sense of the place that can be achieved only by attending and living in a place help him for better understanding creation of this relationship. This specification can be interpreted as a hidden nature that should be found by the architect. This is a nature which changes the site from what it is into what it can be. Nevertheless, it can be controversial due to being subjective because there is always the danger that potentials of a site are determined and defined by the architect's mental philosophy (Kamran, 2007).

**Hotel:** The word “Hotel” was used to name the places which had enough facilities for temporary residence of the travelers since 256 AD “Hotel” is a French word that means a place where provides necessary facilities for short and temporary residence of the travellers in the destination or on the way of the travel. The Persian equivalent for hotel is Caravanserai, Mehmankhane, Mehmanpazir, Zaersara and Mosaferkhane. They have thousands years history regardless of their quality and their provided services (Spiegel and Meadows, 1999). The history of the hotel dates back to ancient civilizations. There were places in Iran, Mesopotamia and ancient Rome that can be called the ancestors of the current hotels. Hospitality and reception of travellers has long history even before the word “hotel” was used. In ancient civilizations, travel and transportation was an exceptional issue. By considering the dangers of the trips, only nomads used to carry their entire belongings to everywhere (Spiegel and Meadows, 1999). At the present time, constructing rest areas and complexes on the ways of travelling is a program for tourism infrastructure. Hotel as a service complex, aiming to make

profit is a phenomenon that its history goes back to Industrial Revolution in the Europe. At least, four events have helped to develop the tourism industry and hospitality since industrial revolution. First, the change of manufacturing pattern and energy consuming from herbal and animal fuel to coal and then to Hydrocarbons energy from the early of 20th century (it gave human rapid and massive transportation). Second, it is industrial mass production and trade expansion. The third one is the invention of automobile, train and airplane and that led to fast and easier transportation. The last factor is increase in people's income together with working hour's reduction and increase of leisure time hours (Algapotolo, 2005).

**Comparative studies:** What distinguishes Kanada Lama hotel among others is intelligently integrating the simplicity and luxury. This cause a viewer sees this hotel as a unique and exceptional hotel. The hotel is placed in front of a cliff and a bit higher than an ancient artificial lake with >20000 years history. This is man-made lake which irrigates the wide area around itself. In distant, there is Sigiriya castle and palace where is known as the most dramatic element of the Sri Lanka. On the other side, there are Dimbukka and ancient caves. In the middle, there is a disperse jungle that is expanded in a dry area (Froeschle, 1999).

As it is observed in the Fig. 1-3, the appearance and facade of the hotel is faded due to the dark color of the concrete structure and the plants growth around it. Therefore, the hotel cannot be seen from the opposite side of the lake and it is combined and concealed with the rock and the mountain. Because of minimizing the impact of a building on the environment, the building separates and cuts itself from the ground in some cases so that the ground and context which has surrounded the hotel building is filtered by a structure that provides the path to access rooms (Roodman *et al.*, 1995).

**Ice hotel:** Ice is a great achievement to construct a wonderful hotel in Quebec (Canada) although it does not have many supporters in the winter. This building in addition to be a hotel is a major place for tourism attraction in Canada. More than half a million visit the hotel during winter. This hotel is placed in a site with about 3000 m<sup>2</sup> area and was constructed by using 15000 ton snow and >5000000 ton ice. Regarding that the materials of the hotel consist of ice and snow, the design and plan of the hotel is changed at the beginning of every year that takes a month. This hotel has 40 suits designed by ice decoration. From walls, sculptures, columns, ceilings arch and stunning lusters to furniture and beds, all is made of ice.



Fig. 1: A hotel designed based on the climate condition (<http://khadmi.persianblog.ir/rag>)



Fig. 2: The observance of contextualism architecture in planning of Kanada Lama hotel



Fig. 3: Contextual architecture in plan and design of the ice hotel in Canada ([www.hoteldari.com](http://www.hoteldari.com))

**Ali Sadr cave situation:** Ali Sadr cave, one of the most beautiful pheromone of Iran, is located adjacent to Ali Sadr village and near to Sari Ghieh Mountain. The mountain which has surrounded the wonderful cave is located to the Southern side of the village and above mean sea level is 2180 m and the level from the hillside is 230 m. In this area, there are two other caves named Soobashi and Sarab which are kilometers away from Ali Sader Cave. The interior space of the cave is filled with water because there are many well around the cave. Ali Sadr cave is considered as the most visited place of Hamedan province. Despite of being 84 km away from Hamedan City, it attracts many visitors and tourists

across the country and all over the world. The ceiling of the cave is made by carbonates which form cauliflower. Stalagmite and stalactite columns are other decoration natural elements of the ceiling which attracts any visitor (Ross, 1999).

The inside space of the cave is very spacious and is about thousands cubic meters. The width of the cave is 50-60 m in some parts and it is 1.5-2 m in other ones. The height of the ceiling is about 15 m from the water surface. The interior of the cave consists of many small, spacious and complex halls which are connected together by corridors which some of them are  $>100 \text{ m}^2$ .

**Spaces specification list:** To achieve a standard plan, first the capacity that can be exploited should be determined. The capacity is specified by the number of visitors. In fact the suitable physical program should be in accordance with the visitor's requirements. Visitors to Ali Sadr cave are divided into three groups: public visitors, scientific and cultural visitors, foreign tourists. 1st group: most of the visitors are public. They come to visit the cave for recreation by their automobile. This group of visitors is temporarily accommodated in one of the cities nearby the cave. Some others are passing the main road to the adjacent locations. They take the chance and make a plan to visit the cave (Brenda and Robert, 1992).

Regarding that most of visitors of the group come to see the cave in the summer, creating a permanent space for them to reside would spend and waste large amounts of money followed by repair and maintenance. The needs of this group of visitors are limited to using public spaces such as park, market, recreational spaces, restaurants and W.C with respect to the time duration they spend here (it is about 7-8 h).

This should not be taken to imply that we are not going to make any plan for their permanent stay. Regarding that Ali Sadr village is near to the cave complex, the village can host the visitors in case that there is any demand for sojourn. This may reduce the force of the complex and at the same time it can make a profit for the village residents.

**Scientific and culture visitors:** Ali Sadr cave has unique characteristics and is globally renowned due to being the biggest water cave in the world. The cave is a suitable place for attracting scientific groups. Many people of this group tend to perform research in this place. To this end the required planning is more complicated than the first group and more facilities should be designed in the complex. Spaces for staying, holding seminars and exhibitions for artists interested in presenting their works

beside to this natural phenomenon can be designed. The planning for this group is made by considering 100 individuals in every day.

**Tourists as the third group:** Due to being globally renowned, every year, the cave is visited by many foreign tourists and passengers. Considering and meeting the tourist's requirements is important because our country may make huge profits because of the existence of numerous historical monuments and locations. Therefore, 50 tourists in every day are considered for the initial planning. Their required spaces is first spaces providing services like restaurant, recreational facilities, markets and a place for spending leisure time. Then, it is spaces for their stay like hotels and suits.

**Types of hotels:** Hotels can be classified as per the following factors:

**In terms of location:**

- Down town hotels
- Suburban hotels
- Airport hotels
- Motels

**In terms of guest type:**

- Family and relative guest hotel
- Commercial guest hotels
- Group guest hotels
- Clinical guest hotel
- In terms of number of rooms
- Small hotels (up to 25 rooms)
- Medium hotels (consist of 25-100 rooms)
- Large hotels (consist of 10-300 rooms)
- Very large hotels (over 300 rooms)

**In terms of servicing plan:**

- American plan hotels
- European plan hotels
- Continental plan hotels
- American modified plan hotels

**In terms of guest type:**

- Family and relative guest hotel
- Commercial guest hotels
- Group guest hotels
- Clinical guest hotel

**In terms of stay duration:**

- Transit hotel
- Residential hotels
- Semi residential hotels

Table 1: Characteristics of hotel guests

Characteristics of hotel guests	The goal of the travel	Design factors of bedrooms
<b>Business guests</b>		
Team: Single room or double room, staying for 2-4 days, 75% male and 25% female (this value is increasing), little sensitivity to room charges	Congress, conference, commercial and training sessions, specialized relations	King size bed, double size bed with bath tub and locker room
Individual: Single room, staying for 1-2 days, 85% male and 15% female, They are extremely non-sensitive to room charge	Company and commercial tasks, congress, conference room with a suitable workplace	King size bed, two tubs with shower and a living
Family: Double room or multi rooms (which consists kids), staying for 1-4 days (it is increased in resort and recreational hotels), chip and medium room charges	Holidays, sightsee, sport and physical activity	Double size bed, a couch convertible to king size bed, rooms connected together, along with a living room, T.V, W.C, balcony and access to outside
Couples: Double room, staying for 1-7 days, medium to high room charge	Tour, club, communication, visiting cultural and artistic places, theater, shopping	King size bed, a table for dining and working, closet, and a large bath
Single	Tour, club, communication, visiting cultural and artistic places, theater, shopping	Queen size bed, a dining and working table, a standard tub

#### In terms of available facilities:

- Limited services hotels
- Semi limited hotels
- First class hotels
- Luxury hotels

The best designers are those who are informed of market and customer's needs and are able to identify the welfare facilities which they need more than any other things. One of the effective factors in hotel designing beside other drivers is bed room design. The bedroom form and design should illustrate the personal needs of the guest and user. For instance, commercial hotels have high earnings in renting single rooms. Therefore, there is not much need to double rooms. Thus, it is necessary to have bigger workspace, high quality design and full services for the one who uses this type of hotels. Table 1 indicates the market of the major customers of the hotel and their characteristics and effects on the bedroom designs.

## RESULTS AND DISCUSSION

Every complex has its own needs which are created by the location condition, market needs and the application of the hotel application that needs to be investigated thoroughly at the beginning of this planning. When the design principles are determined by these needs and requirements, we examine the details. Principal issues needed to be examined in the planning include type of location and needs of the area, the number of rooms, main facilities, type of use, architectural concept, building site and its form, site specifications and built-up area, the connections among guests, VIP entrances, etc.

## CONCLUSION

Context-oriented architecture is an effort to reveal the potential of visual environment in a larger scale than the

architecture. The message of this type of architecture is the necessity of paying attention to environment around the architecture work.

Contextualism architecture in hospitality industry can create tourist attractions, energy saving and in the end creating sustainable architecture. With respect to cold climate of Ali Sadr Cave district and unique specifications of the site, this cave as the case study can be investigated from the following standpoints:

- Climate considerations
- Form patterns

**Climate considerations:** Energy consumption can be notably reduced in the building by paying little attention to climate principle design and applying renewable energy. Direct and indirect absorption of solar energy, appropriate orientation of the building, designing guest's room around an atrium to enjoy daylight to mitigate energy consumed for lighting and heating in cold seasons, building orientation and direction toward a side with the minimum confrontation to unfavorable western winds, proper ventilation, utilizing standard natural and artificial insulations, using materials appropriate to climate, etc. In case of applying passive solar systems, the building should be designed in a way so that heating, cooling and lighting needs are met naturally and compatible with the climate.

**Form patterns:** Form patterns adapted from the context and background of the design can be considered in designing the complex. They are as follow:

- The harmony between the building form and grade of the land and designing the stepped building. This type of design would attract more visitors
- Designing some parts of the building under the ground

- Adapting the cave ceiling formally and structurally to shape the initial concept of the building
- Utilizing curved shapes and curved lines of the around hills and mountains in order for more harmony between the building form and the context

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