Beyond the Façades in Tehran: When Tradition Meets Innovation

From Knowledge to Wisdom

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Beyond the Façades in Tehran: When Tradition Meets Innovation

Simona Canepa

DAD Department of Architecture and Design, Politecnico di Torino, Torino 10125, Italy

Abstract: Over time, the traditional house in central Iran, which Tehran geographically belongs to, has undergone deep physical and morphological changes as a result of technological, social and economic transformations, passing from the characteristics of an introverted house enclosed by walls overlooking an inner courtyard to the multi-storey condominium with an extroverted outlook. Here the façade becomes a key element: it is a threshold between urban and private, outdoor and indoor. The article shows a mosaic of patterns and materials of the new mid-rise residential building façades via photographs and diagrams to emphasize the strict connection between contemporary design and local tradition.

Key words: Façade design, protection, connection, outdoor, indoor.

1. Introduction

Claude Lamure, in his book *Adaptation du logement à la vie familiale* in the late 70s of the last century, argued of a façade space invested with the role of representing users to the outside world, and therefore a space that must be beautiful and representative to the strangers. In detached houses this function is performed by the front garden, which is given greater care than the space at the rear of the house; in multi-storey buildings, on the other hand, the façade space is not very livable, both because of the small size of the available space and because of the protection required for introspection from the outside world [1].

Rem Koolhaas includes the façade in the 15 fundamentals of a building and in his book *Elements of Architecture*, describes it as the "element most invested with aesthetic, political, and cultural expectation …" and argued that it is one of the few elements that has not been forgotten by architects, influenced over the centuries by technological progress, climate change and, not least, the new digital age [2].

Corresponding author: Simona Canepa, Ph.D. candidate, lecturer, research fields: interior architecture and exhibit design.

The façade defines the building architectural identity, makes it stand out or blend with the urban environment: at the same time the external skin acts as a barrier against different weather conditions, regulates light penetration and provides acoustic comfort. So architects' primary consideration when selecting materials is their ability to adapt to different scenarios and requirements, thus allowing the creation of interior unique spaces and acting on the users' experience.

2. From Introverted Traditional *Khaneh* to Extroverted Condominium

Tehran has experienced a very fast demographic development since the end of the nineteenth century, and as a result the house has undergone deep physical and morphological changes: from a traditional introverted house configuration, called *Khaneh*, with an internal courtyard, to terraced houses and small apartment blocks facing outwards and onto a south-facing courtyard, up to the more recent high-rise tower blocks facing only outwards [3].

Iranian vernacular residential architecture was providing privacy for residents with its organization around inner courtyard with all the openings oriented

towards it. Since in contemporary residential buildings the organization provides the vertical disposition of the units and windows are opened to the public street, privacy is often lost. In most existing apartment blocks the connection between indoor and outdoor spaces is limited to openings in a solid skin: to hide their living interior spaces from the view of the outsiders Iranians always cover windows with thick curtains. Balconies can be used with the adjacent interior rooms: so they are at the same time both outside and inside, they belong to the individual owners but others can observe them. Most new buildings in Iran are curtain wall houses: municipal regulations and market laws suggest the architects to use as much as possible the available volume on the building lot, and the result is almost always a simple square shape, like a vertically placed shoebox with a regular arrangement of openings on the façades [4].

Walking through the streets of Tehran in a landscape like the one described above, it is anyway possible to come across residential buildings, whose façades stand out in terms of design, composition and materials. They belong to 5-6 storey apartment typology with the ground floor devoted to the entrance hall and in the richest examples also to a communal living room, 1 or 2 basements for parking and sometimes the wellness centre. Generally building orientation is north-south: if there is only one apartment on each floor, public function is on the south side and private area in the north one; when there are two apartments, they can have the same orientation or opposite (one to the south and the other to the north), it depends on the staircase and elevator position. The views are mainly on the road but, if the plot permits, also on an internal condominium space, a contemporary redesign of the Qajar period traditional inner courtyard. The façade on public street has a fundamental role in the whole design: it becomes the backdrop by which the building connects or detaches itself from the built environment, threshold between public and private, outdoor and indoor, city and apartment.

3. Tradition and Innovation as a Strong Connection

The research has taken into consideration some façade compositions in Tehran belonging to the typology described above, where a generation of young architects, with great skill, recover elements of the Iranian construction tradition by reinterpreting them in a contemporary key. The façade is faced with the public space of the street but at the same time with the internal space of the apartments: it is therefore configured as a physical type of protection because it aims to improve the thermo-hygrometric, acoustic and luminous features of the living spaces behind, and at the same time of a psychological type to guarantee views to the outside and privacy to the inside, a concept which has deep roots in Iranian culture.

Words as *Fakhromadin* (kind of bricklaying method), *Mashrabiya* (half-timbered architectural elements, of medieval origin, to generate semi-transparencies), *Orsi* (latticed window with colorful pieces of glass), *Shobak* (technique to adjust light and to create privacy at home), are taken from historical architecture with the aim to revitalize the lost heritage and to give a modern interpretation of old concepts [5].

Brick, wood and stone are the main architectural materials in Iranian traditional buildings: architects can use them alone or together or with other materials such as metal. The combination of different materials sometimes can be done in order to respect the surrounding buildings as much as possible.

Referring to the world-famous Persian carpets that once covered the floors in the traditional houses but still nowadays, we can say that these façades look like large vertical carpets.

The use of brick appears to be a right choice since it has always been used as a local building material: meeting environmental needs (brick acts as a temperature buffer by filtering natural light) while creating various beautiful textures both outside and inside. The following projects use the brick to rethink

conventional construction methods and techniques across ancient Iran.

Cloaked in Bricks (2015) by Admun Studio is a five-storey building where bricks create a dynamic façade thanks to parametric design software. The bricks are used without mortar and are perforated by metal rods. There are three types of modules comprised of two, four and five bricks: 30 templates are produced according to 30 different types of rotation angles of the bricks. The bricks, covering only the apartment floors and not the ground one, are rotated level by level providing the opportunity to have different degrees of opening along the skin of the building. In this situation the south façade changes its aspect during the day: behind the façade the brick pattern creates a different effect of light and shadow inside the private semi-open spaces of the balconies and through the windows further inside. The light wood floors in living room, dining room and master bedroom adapt to the reflections of light creating warm atmospheres. At the same time the façade design provides different views from inside to outside: the openings are organized in such a way as to show or hide the opposite apartments across the street or specific views of the city. The brick membrane works also as an acoustic filter against the outside noise due to the traffic (Fig. 1).

Woof Shadow (2016) by Tachra Design is a five-storey building with ten apartments, two for each floor. The building occupies the entire plot area, so the architects designed two façades facing the streets, north and south, with almost the same features. Unlike the previous example, here the façades start from the ground floor, so they seem growing from the earth. Their surface is inspired by the technique of origami, through which a folded two-dimensional surface is transformed into a three-dimensional one giving movement to the composition. Thanks to parametric factors the façades appear to be composed of a first bricks level that is interrupted where there are the windows and of rhombus-shaped elements which partly pass in front of the openings at the second, third and fourth floors, where the visual pollution is considered to be the worst. In this way the brick skin creates light and shade and changes the façade into a structure in which overlapp shades form the texture. The architects used dry brick laying and in some cases, they sewed them to the main structure through gaps. The rhombus-shaped frames provide various visual views of the city from interior spaces and at the same time they act as fixed curtains creating privacy. The interior spaces are characterised by light colours and by cuts in the ceiling functional for lighting that echo the design of the façade (Fig. 2).

Niloofar Apartment (2016) by Alidoost and Partners has a south-facing façade in bricks which in some points becomes perforated, and with large windows along the five floors in a pattern that varies from level to level. On this side is the living space for guests with the dining area, separated from it by a partition but communicating with the kitchen. The kitchen, which overlooks the family living room thanks to a snack counter, is set back from the façade line, creating a small loggia with different size of facing balcony. The living room is characterized by a glazed window and a metal sunshade with CNC (computer numerical control) cutting for light controlling inside the apartments: in this way it creates shadows on the ceiling, floor and walls able to generate different situations of spaces and privacy, paying attention to appropriate outside views from inside. Here and there on the façade are transparent niches for potted plants, involving outdoor green spaces with the living ones and recalling how in the traditional house the greenery was an important element (Fig. 3).

Fig. 1 Admun Studio, Cloaked in Bricks, 2015 (©Mostafa Karbasi, Parham Taghioff, courtesy of Admun Studio).

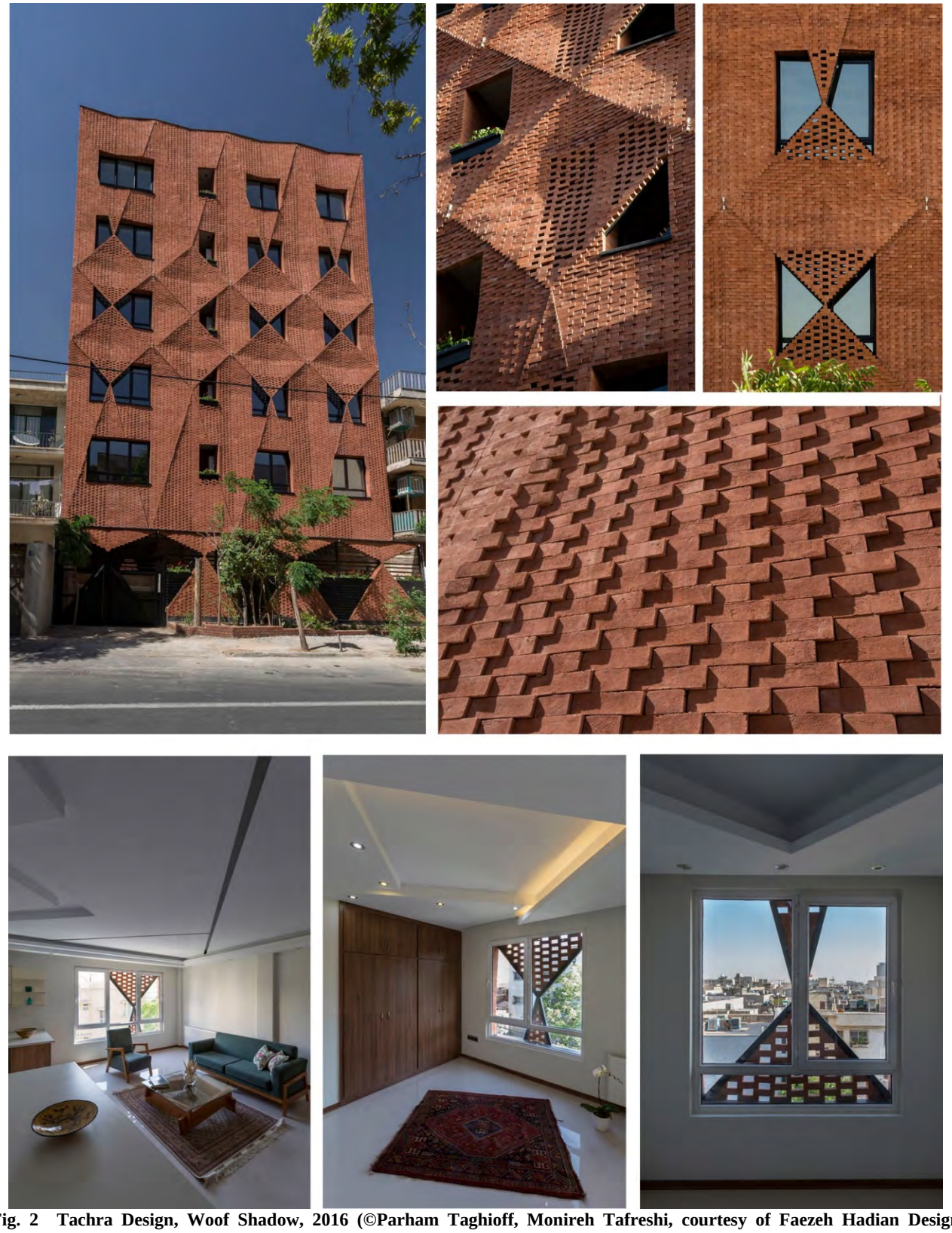

Fig. 2 Tachra Design, Woof Shadow, 2016 (©Parham Taghioff, Monireh Tafreshi, courtesy of Faezeh Hadian Design Studio).

Fig. 3 Alidoost & Partners, Niloofar Apartment, 2016 (©Parham Taghioff, courtesy of Alidoost & Partners).

Like brick, stone and wood are very common materials in Persian tradition: the following examples create therefore compositions strictly linked to the Iranian spirit of "Genius loci" which respects both users' mental and biological needs. At the same time light and plants have been highlighted both in the façade and the interiors.

Orsi House (2015) by Keivani Architects is a five-storey building which takes inspiration from Iranian traditional windows made by wooden lattice and stained glasses, called *orsi*. The street-facing façade consists of a double layer of heat-treated timber added to the wall. Four big white and silver travertine frames, inspired by those in Borujerdis house in Kashan, give the façades a dynamic effect and at the same time their funnel-like shape helps to further reduce heat buildup. According to the tradition greenery has been highlighted: plants not only serve as a decorative element but also help to control temperature. The wooden slats are at variable distance: where the slats are more spaced, in correspondence of the windows and balconies, the architects inserted panes of stained glass. There are also sunshades that easily can open upwards, control the natural light, and moreover increase the dynamism of the façades. As in the tradition the "modern orsi window" reduces the intensity of sunlight and heat especially in summer; the daylight that filters through gives the interior spaces particularly decorative effects emphasized by yellow LED (light emitting diode) strips into the ceiling of the living and dining rooms. The architects designed the residential unit entrance inspired by the pigeon dovecote, another vernacular element which is used to improve the sense of space in a filter area between public and private functions (Fig. 4).

Two years later (2017) Keivani Architects designed Pardis House a five-storey building where stone and wood again are the main materials used in the façade composition both on street and in the inner yard. The main surface is a lattice made of wood carving which is cut in some points to reveal a diagonal turquoise Iranian stone volume. The stone is associated to Persian gardens where it was used for tiles in water mirrors while the wooden surface pattern is inspired by the growth of cedar's leaves, while. The individual pieces of shuttering can be arranged by hand depending on the owners' need for light, privacy or view. Moreover, the play of sunlight during sunrise and also sunset creates a soothing atmosphere in the interior spaces typical of Iranian traditional architecture made even more evident by the choice of light-coloured wooden floors, white walls and fixed furniture (Fig. 5).

Andazgoo Building (2015) by Ayeneh Office is characterized by a movable wooden shell whose shape is in harmony with the grey granite stone-made surface of the façade. As we have seen in the previous example, the shell can be opened or closed at different times to control the sunlight and the privacy according to occupants' wishes. In each apartment a custom created balcony extends into the living area: this is reflected in the design of the main façades with openings in different positions. These transparent elements with wooden ceiling can separate kitchen from the living room, can create the background for the dining table or the sofa, making in all situations a proper place for keeping plants. The idea of the central courtyard overlooking a green area in the traditional *Khaneh* is therefore redesigned in a contemporary design: it is not open from above, but on one side, to the street; as in Qajar era it invites sunlight to the inside of the rooms. Interior spaces are characterized by the use of wooden floors recalling the wooden slats on the façades, white walls and stone-made surfaces when the glass box is placed along the perimeter wall on second and fourth floors (Fig. 6).

Fig. 4 Keivani Architects, Orsi House, 2015 (©Parham Taghioff, Hannaneh Fadayi courtesy of Keivani Architects).

Fig. 5 Keivani Architects, Pardis House, 2017 (©Deed Studio, courtesy of Keivani Architects).

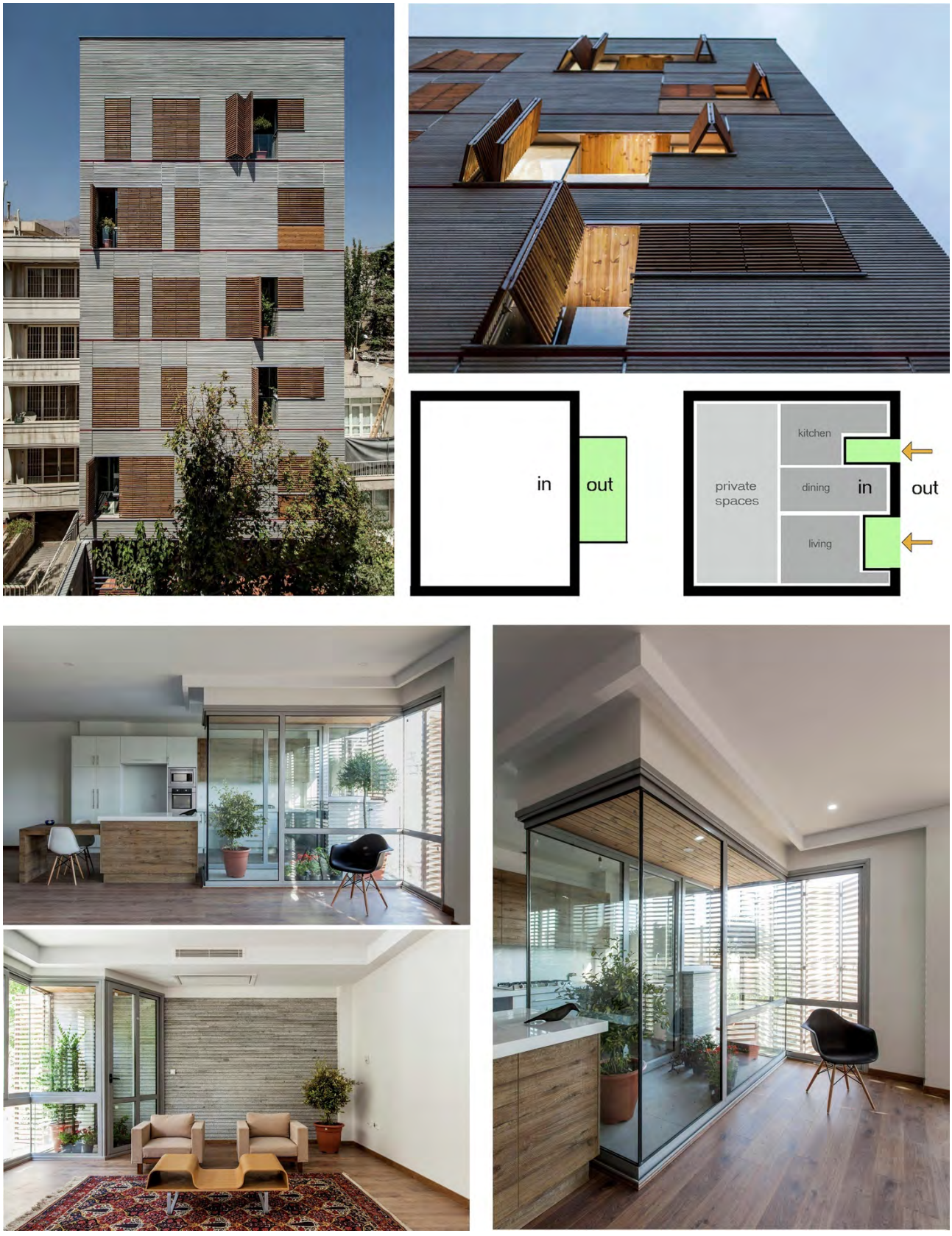

Fig. 6 Ayeneh Office, Andarzgoo Building, 2015 (©Farshid Nasrabadi, courtesy of Ayeneh Office).

Fig. 7 TDC Office, Danial Building, 2012 (©Alireza Behpour, courtesy of TDC Office).

However other architects decided to use contemporary materials but with an eye to tradition.

Danial Building (2012) by TDC Office looks like a stylised tree, reminding that the neighbourhood was once rich in trees and gardens. Inspired by an isolated pine tree left on the site, the façade represents metaphorically the three parts of a tree: trunk, roots and leaves, which have different textures and transparencies. The façade is defined by two layers: the exterior level consists of 20 tree-like panels, four for each level, installed on two rails; the interior layer is covered by large windows. The dynamic panels can slide horizontally, generating infinite positions according to the residents' desires of daylight or shadow and privacy, and therefore architectural scenarios both day and night in the interior spaces and also in the in-between space of the balconies. The variety in shapes of the first level has a unique effect on the interiors and this effect is emphasized in the living room by the use of glossy marble floor and by its ceiling and wall design which makes shadows more evident remembering the faceted mirror decorations in many reception halls of traditional houses (Fig. 7).

4. Conclusions

These case studies investigated in the thesis showed that the façade, as a diaphragm between two worlds, private and public, domestic and urban, seems to be something in motion, alive, participating in the lives of its residents in the complex reality of Tehran. Therefore, not only a two-dimensional vertical surface that envelops the interiors, but an inhabited threshold able to act on the interior spaces improving the quality of sun and air, the sense of privacy and the perception of the urban landscape: a "permeable border" between outdoor and indoor, where there are walls but at the same time they are dissolved in the composition.

History and tradition are involved in the building design not as a nostalgic element, but as a starting point for elaborating solutions able to improve the users' quality of life through contemporary architectural techniques and design.

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When I was in Tehran three years ago, I had the opportunity to visit and meet some architects: this was the starting point to investigate Iranian architecture, especially the residential sector. I would like to acknowledge the seven architectural firms which answered my call and sent me photos and diagrams of the case studies chosen: Admun Studio, Faezeh Hadian Design Studio, Alidoost & Partners, Keivani Architects, Ayeneh Office, TDC Office. Thanks also go to Parham Rashidi for his valuable support in contacting the architects.

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