The Concept of Access and the Mechanisms of the Threshold Space in Arab Traditional Built Environment: The Case of Najd, Saudi Arabia

By Mohammed Mashary Alnaim

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Abstract- Contemporary built environments experience a vast number of factors due to globalization, which effected and influenced how the built form is generated and used. The relationship between the urban and the building levels is a crucial aspect that needs a thorough investigation to understand how these two levels can integrate and complement the built environment's overall identity. This paper examines the concept of access and its location within the urban fabric and how an access influenced the formation of physical and nonphysical threshold spaces to overcome the number of socio-cultural issues. Space Syntax convex map and justified access graphs were used to understand the connectivity, density, and integration of the access and the threshold space in relation to the overall built form.

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I. Introduction

The access (house entrance) in the traditional Najdi built environment influenced and shares some of the urban principles, which brings the argument that the hierarchical order of spaces found at the urban level continued inside the house. The objective here is to focus on understanding how the access to a building (house) is an element that increased the connectivity of and integration between the spatial and physical order and worked as a transitional element/space between the outside and inside spaces. Five settlements were chosen for this study Old Riyadh, Alkhabra, Ad-Diriya, Ushaiqer, and Sudus to examine how the concept of access influenced the generation of physical and nonphysical mechanisms in the inner threshold space of the traditional building [1].

In the traditional Najdi buildings, the access (entrance) has a transitional dual meaning (Alnaim, 2020). The perceived meanings are related and depend on how users approach the access itself either from the outside (external street) or from the inside domains (inside the house). The first meaning relates to how the family of the house perceives the entrance from the

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[1] The five cases gone through variant processes of filtration, such as availability of raw data, existing literature, were the case can be visited for site observation, etc.

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inside. They consider the access here as a semi-private element that provides access to the outside realm. The second meaning of the entrance is related to the access it provides from the outside where the community perceives it as a private element. By identifying these two transitional meanings in the traditional buildings, certain questions of concern to this study arise: to what degree does the entrance of the building form a relationship with its surrounding forces? How does this relationship affect the access' placement and the arrangement of the building's internal spaces? And how do multiple adjacent accesses in the same area relate to each other and influence one another?

Henri Lefebvre elaborates further on this notion when he argues that a group of places and their elements have a center. The center may be approached from any side and reached from any angle, hence, perceiving a place from a particular side or a particular angle means you occupy a place and discover everything that occurs within the place from that chosen vantage point (Lefebvre, 1991). The "center" in Lefebvre's argument is similar to the access element in this study, which means that the transitional dual meanings in the access are related to each other and those dual meanings are generated based on how people perceive the element from the spaces they occupy.

Therefore, the concept of access as a spatial order organizer is analyzed in two phases. The first phase is to identify the different types of entrances in relation to their street types in the traditional Najdi built environment. The second phase is to examine accesses and adjacent entries to understand how the access functions in the public and private domain. The intent of these two phases is to help identify how the access may generate transitional dual meanings and how the entrance as an element/space increases the organization of the spatial and physical order in the public and private domains so later we have the ability to understand how the threshold space is generated.

II. The Operational Aspects of the Access

The three street types (public, semi-public/private, and private) identified in the hierarchal

order of spaces control the formation of access at the building level according to three factors: street width, street location, and the kinds of activities conducted on the street. While these three factors influence the access form and location (in a building). The core concepts found in the hierarchal order of spaces and its street types still govern 'access' as an element. The process identified in the hierarchal order of spaces (Alnaim, 2020), is essential to ensure that *where* and *how* the access occurs is not interfering with the spatial order that the settlement established for itself. To better understand how the entrances of various buildings operate under different circumstances, a further analysis has been conducted to examine the different access types, keeping in mind the different street types and outside forces that affect access (Figure 1).
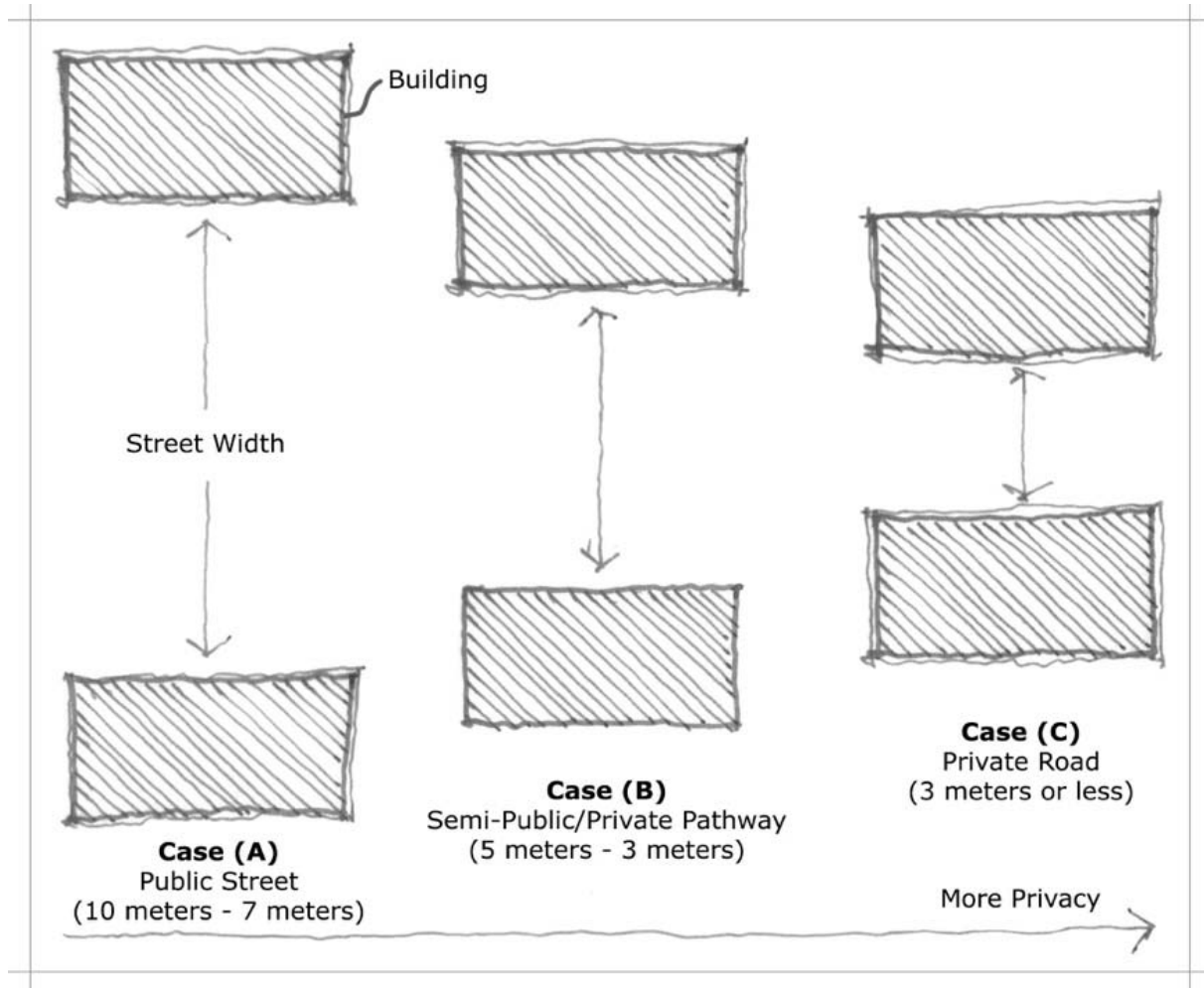
Figure 1: Street types and their classification in the traditional Najdi built environment. Source: Author

We identified three access types while examining how an access operates on different street types. The differences here are only related to how they open and close (related to doors for the family or the public), while their functionality is similar (Figure 2). In street type (A), the street is public and wide, which makes the access appear to have fewer restrictions on its placement and operation. This is because opposite buildings (houses) have enough distance between the buildings to disengage with each other. This makes direct visual access to internal spaces not much of a concern. Also, buildings located on this type of street usually have more than one entrance, a public entrance for a small shop or *majlis* space and another private entrance for the family.

In type (B), the street is semi-private, which makes the access appear more restricted in its placement and operation due to the proximity and compactness of buildings facing each other. In this street type, most of the buildings have only one access entrance and rarely is another access for a building found. The study discovered that the building access here has two regulatory mechanisms. The first mechanism is that two or more entrances should not face each other as this action interferes with the privacy of internal spaces of the different buildings. The second mechanism is the allowance that if the spatial order does not support the first mechanism, two entrances may face each other. However, in the second mechanism, setbacks and internal thresholds (*dehreez*)

were generated to overcome the privacy issue and these setbacks and internal thresholds were meant to decrease the direct visual access of the external domain to the internal private spaces. This action always depended on the agreement of the buildings' owners and most of the time the owners developed architectural solutions on site to overcome these circumstances(Akbar, 1981).

In type (C), the street is private, which makes the access appear highly restricted and have a similar regulatory process mechanism found in street type (B). However, the difference here is that the entrances in private pathways never face each other in any way. This is because the path in this street type is very narrow (less than 3 meters, around 9 ft) and buildings form one cluster of houses accessed by this street. This type of street is a private zone, and in many cases occupied by close families. Social agreement among neighbors is more present in this street type. Although most residents in this street type act as one big family, they still maintain a high level of privacy.

According to several interviews conducted between 2016 and 2018, access as an element seems to not only be used to separate public and private domains, but it is also used as a social gathering element and as a wayfinding [2]. Local people use the outside space in front of the house to meet and have a quick chat about their daily life. One conclusion that arose from interview discussions: this outdoor space is partially controlled by the house owner and is used as a social gathering space that does not require him to use the *majlis* (guest space) located inside the house [3]. Also, the setback of the entrances supported this social activity where several building owners in the same area can use their outside spaces near their access without worrying about affecting the privacy of their neighbors.

As a result of this key insight, the study found that the regulation of the locations of the dwelling entrances by inhabitants is significant for the spatial order as it established the relationship between the spatial aspect and the physical form. This core principle, in fact, developed to support the social structure of the community and serves mainly to support the middle social class(family related at the private neighborhood). Inhabitants developed these simple solutions to control the visual corridors between neighbors and was a result of the people's participation in the decision-making process to achieve social agreement.

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[2] The way finding tool here is used an implicate meaning that changes depending on how inhabitants use the door and to whom it serves (men/guest door or private family door).
[3] Interviews with the local people of Alkhabra, Ushaiqer, and Sudus between 2016 and 2018.
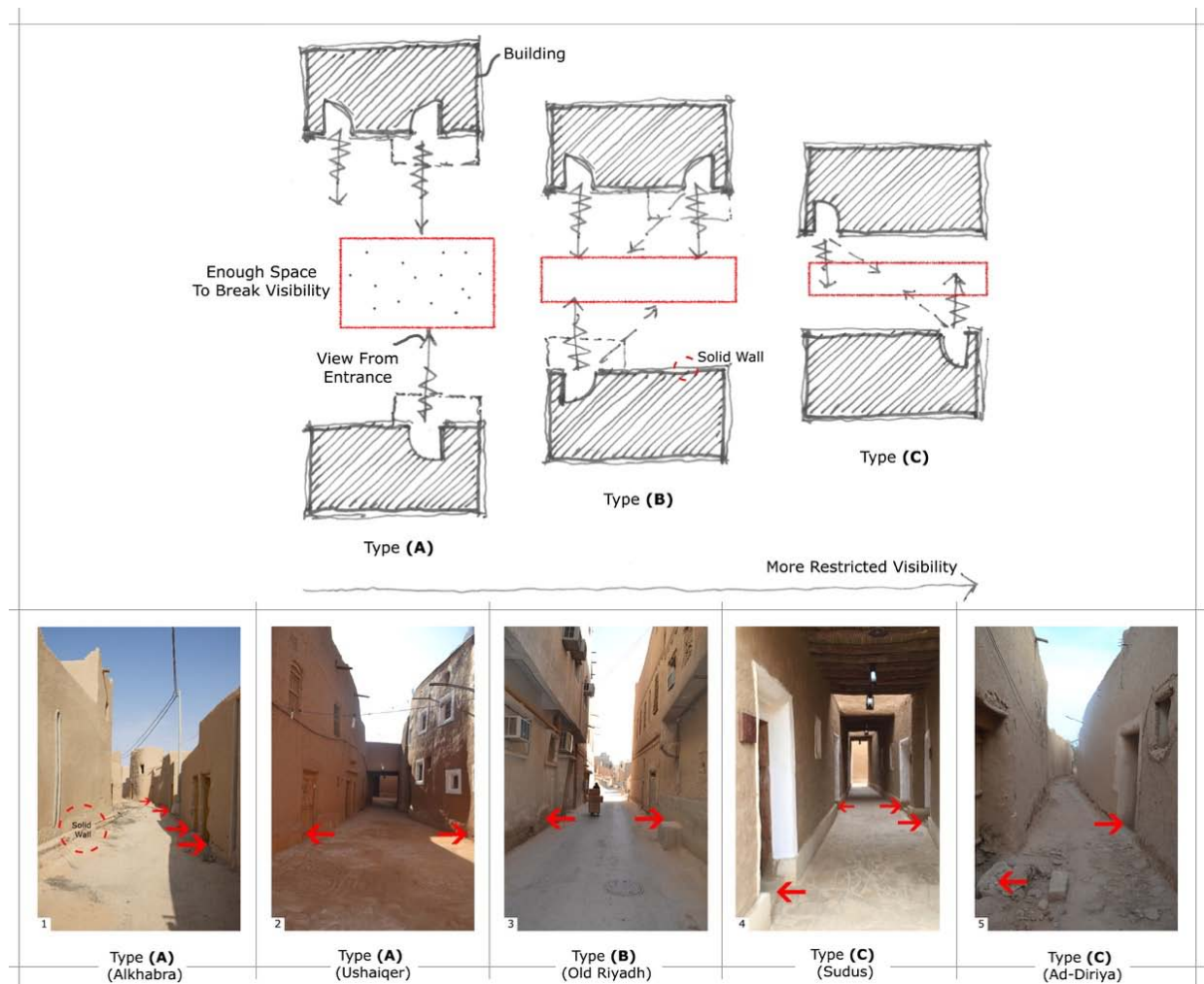
Figure 2: Different street spacing and how width controls openings in each street type. Source: Author

III. Phase One: The Location of the Access

To examine how inhabitants placed their entrances to control outside spaces, the possible locations of access in the five cases must be identified (Figure 3). The organization of the analysis is based on the type of street and at which settlement the street is located. The objective here is to identify the access' placement in the building, so later it is possible to understand how the entrance as a space/element increased the linkage and organization of the spatial and physical order in the public and private domains(Alnaim, 2020).

Referring to (Figure 3) the access placement in the traditional Najdi buildings supports the study's earlier analysis: that most entrances do not face each other unless they are on a street that has the appropriate width. In Sudus, for instance, one extended clan occupied the entire settlement. However, the access placements still seem not to face one another, even though the surrounding residents might be related family members (Figure 3(E)). The argument here is that

the regulatory process mechanism of defining the access location does not consider the close relationship between neighbors. This is because the process itself limits the ability of individuals to interfere with it, which makes related social groups or individuals have the same process. This is important as it makes the operational aspect of access maintain the required privacy regardless of any familial relationship among the affected parties, which led to a shared and similar access generative process across the five cases.

In the case when the house has only one entrance, the entrance functions as a private family entrance and to accommodate guests (men). This type of use mostly appears in buildings that are small to medium in size and located in private areas (*hellas*) (Figure 3(A1, D1 & E1)). In an interview with the Ushaiqer local people in 2017, interview participants described how they accommodated guests[4]. They described that they mostly perceived the house entrance as a private element. However, to indicate when guests can use the private entrance, the owner

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[4] Focus group interview with Ushaiqer local people on 1/7/2017

leaves the door open, signifying that guest are welcome. By keeping the doorway open, the owner nonverbally communicated with the community and granted them permission to access the house and directly enter the *majlis* (guest space) through the staggered entrance hallway. This act was essential and was understood by the local community to limit irrational behavior among neighbors to achieve the required privacy for the house (Figure 4). In this way, access is limited not only by the access' placement, but the access is also controlled by the socio-cultural needs that influenced its formation and its different usage.
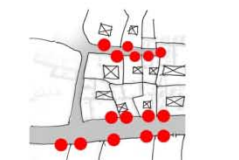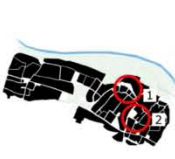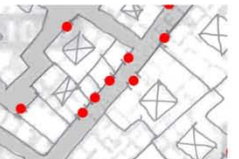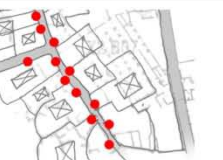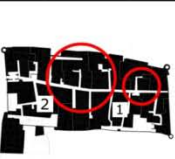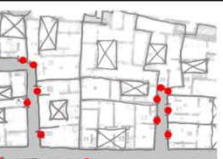
Cell	Study Location	(1) Semi-Private / Cul-de-sac	(2) Semi-Private/Public Streets	(3) Zoomed in Access Pattern
Old Riyadh (A)				
Alkhabra (B)				
Ad-Diriya (C)				
Ushaiqer (D)				
Sudus (E)				

Figure 3: Examining the entrance location in the traditional Najdi buildings. Source: Author

In the case when the house has two entrances, one of them is for the family (private) and functions as a service entrance, while the other entrance is for men (majlis or shop). The difference here is that the building location can form a secondary entrance dedicated for guest use. This is because houses of this type are usually located near local mosques, semi-public spaces, or may even be located near the center of the settlement (settlement core) (Figure 3 (A3, B2)). This house type, for the most part, is related to people with high social status or someone who is the eldest in an extended clan that has their *majlis* open all day for visitors[5]. This is why the secondary entrance is generated to support the high volume of social activity while also guarding the family's privacy.

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[5] Interview with Ushaiqer local people on 1/7/2017 and Alkhabraon 1/1/2018
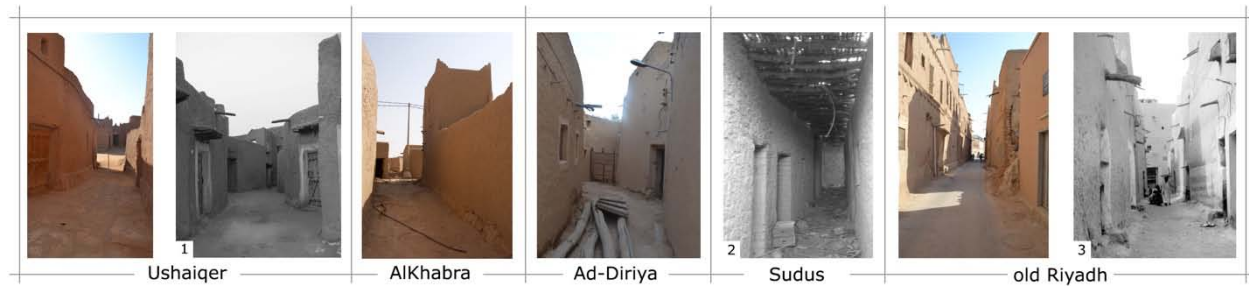
Figure 4: The entrance location within the traditional Najdi built environment. Source: (1,2 & 3) by ADA, Author

Al-Nowassair states that people that have more than one access usually leave the guest door open after prayer or when they are accepting visitors. He asserts that this type of behavior "Suggest[s] a spontaneous and informal action, where it signifies welcoming and generosity from the owner" (Al-Nowaiser, 1999). This kind of behavior also occurs in the Gulf regions and other regions of Saudi Arabia (see Abu-Ghazzeh, 1994; Al-Zubaidi, 2007; Alajmi, 2009; Jomah, 1992)[6]. This is similar to the Ushaiqer locals' interviews in 2017, were they described the same social behavior.

By leaving the door open, the owner of the house is using the door as an element to communicate "non-verbally/implicitly" with the community to invite them to visit. This social behavior usually occurs on a daily basis before and after the daily five prayers, family meetings, etc. Usually the visitor states the name of the owner loudly and then enters the guest space because they know from the open door that the family has taken steps to maintain its privacy. The owner usually answers *Hayak* (please come inside, you are welcome)[7].

This study argues that there are limits to this behavioral action when the family and guests share the same access. It is for this reason that settlement inhabitants perceive the second entrance as having a higher social status, enabling people with a second entrance to accommodate certain social obligations. That is not to say that buildings with one entry could not have this kind of behavioral action, but as discussed, it developed to accommodate normal daily social activities within the neighborhood, which already has other outdoor alternatives for social gatherings. This is why it is important that entrances not face each other in private zones in order to facilitate this limited behavior.

The difference between the two types of access is controlled by the location and the particular socio-cultural needs of different social groups. The fact that the second access is generated to accommodate the high volume of guests explains why the one entrance

access type is the most repetitive pattern seen in the traditional Najdi built environment as the majority of local people do not accommodate guests on a daily basis. Instead, they gather in the outdoor spaces (e.g., *Al-Meshraq*) located in their neighborhoods [8]. This also encouraged people of high social status to live in houses near public streets to satisfy their economic and social activities while also maintaining the privacy of their families and adjacent neighbors.

IV. Phase Two: The Influence of the Access Location on the Spatial Order

The above-mentioned analysis highlights how socio-cultural needs might control certain access formations. By using the Space Syntax justified access graph technique, two graphs are developed to represent two different patterns generated by using the two types of access (Figure 5)[9]. This analysis aims to observe access placement, how the outside personal space formed, and the influence of adjacent access to understand the level of control that the access imposes on the street.

Pattern One, relies on building size and location which affect how the access operates. While this type of access is located within private zones, any secondary entrance intended to segregate public and private usage is more restricted. This is because the private pathway is already controlled by the surrounding residents who can identify any stranger in the area (Figure 5(A1)). Also, the people using the pathway are almost always the inhabitants of the neighborhood. The process of generating entrance setbacks is essential to preventing doors from facing each other under certain circumstances. This ensures that the outside personal space is not shared as it affects how each building access is used (Figure 5(A2))[10].

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[6] Similar conclusion reached when the researcher interviewed local peoplethat experienced the traditional era across the five cases between 2016 and 2018.
[7] Interview with Ali Alshuabion 1/1/2018, Saleh Al-Hathloul 1/2/2018 and with local people from Ushaiqer on 2017.

[8] The *Al-Meshraq* is an outside bench, and inhabitants developed it to accommodate their socio-cultural needs within the traditional Najdi built environment.
[9] Usingjustified access graphing analysis enables the study to employ an analytical comparative approach to not only identify the similarities and differences of architectural elements, but also to understand the social behavior and meanings behind these different layouts.
[10] A conclusion reached by conducting a number of focus group interviews from the five cases between 2016 and 2018.

While this pattern mostly appears in narrow semi-private and private pathways and buildings are very compacted, increasing the number of access points for each building can affect the privacy and arrangement of the entrances in those buildings. This means sharing occurs between the outside personal space that each access creates for itself with other building accesses, which, in turn, affects the spatial order of the pathway. It could also affect the organization of internal spaces. Not that this action is unseen while examining this pattern, but it is not common, and if it did occur, there must have been an agreement among neighbors to find solutions to prevent any visual corridors. This is because the access in this pattern does not affect the building itself, but it does affect adjacent buildings which makes the arrangement of the entrances and how those entrances are used by the inhabitants critical to ensure that the spatial order of their shared pathway is preserved. We observed a level of flexibility in this pattern which gives a group of people the ability to interpret the regulatory process mechanism of access to fit and adjust to their specific conditions.

Pattern Two, relies on the street type and surrounding activities which affect how the access operates. The size of buildings in this type of street are usually medium to large in size, which makes secondary access a viable option, supported by the width of the street (Figure 5(B1))[11]. The study typically observed the generation of this pattern in public streets and semi-public passageways that may contain public buildings (e.g., mosque and market). This means that there is a possibility of travelers and strangers, along with local people from different areas passing through this type of street daily. The importance of implementing a secondary access here is that it is oriented for the family, and has a main access for guests (Figure 5 (B2)). This is because the building's owner here cannot control the street activity, which makes the generation of a secondary entrance a way to overcome the public activities that occur in the street. This is different from the other pattern, where people in their private areas control who accesses their space. In that sense, the importance of the secondary access in this street type is to increase the privacy level of the building that is located on a public street by dedicating one access for family use.

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[11] Worth mentioning here is that wealthy people usually liveon public streets,so it makes sense to see medium to large sized buildings in these spaces. This social class generally wants to be near commercial spaces in the settlement. That is not to say that wealthy people do not live in private zones, but more individual wealthy figures are located near public zones to sustain their economic activities(see Al-Hussayen, 1996; Al-Nowaiser, 1999; Alajmi, 2009). Also, an interview conducted with the local community of Alkhabra, Ushaiqer in Saudi Arabia between 2016 and 2018 described the same phenomenon

(A) Pattern One Semi-Private & Cul-de-sac

(1) Sudus

(2) Ushaiqer

(3) old Riyadh

(B) Pattern Two Public Street

(1) old Riyadh

(2) Alkharba
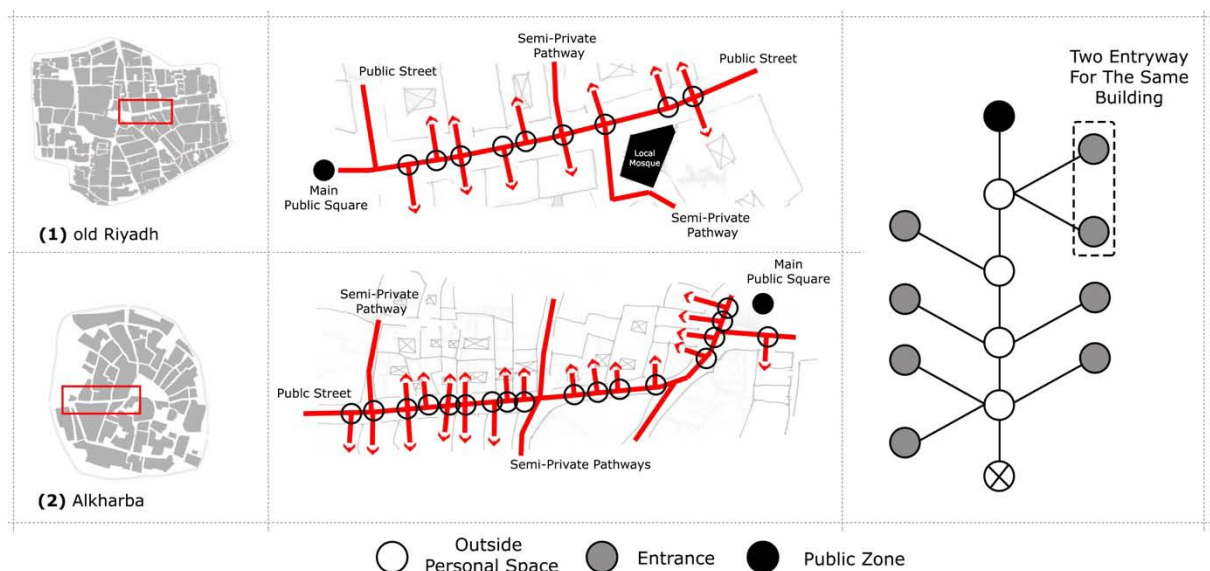
Figure 5: The justified access graph identifies two patterns for two access types in the traditional Najdi buildings.
Source: Author

This study identified three core concepts related to the regulatory process mechanism of access. First, the physical element (the main doorway) serves as a medium to implicitly communicate with the community about the owner's social status and how much privacy the door signifies to outsiders. Second, the access functions as an element to maintain an optimum distance between neighbors by developing the concept

of the door's setback. Third, the access controls the level of privacy and activity of the street. Therefore, it is not surprising to use gender segregation as a fundamental organizing device for the access. Although it is evident in the traditional settlements that the concept of access produces different patterns for different socio-economic classes and areas, the regulatory process mechanism of the access itself remained constant across the five cases (Figure 6). The hidden mechanism of the process that controls access maintains privacy for its owner and ensures that his outside space is preserved to practice quick social activities, as well as extending the hierarchical order of spaces seen at the urban level to the inner parts of the house.
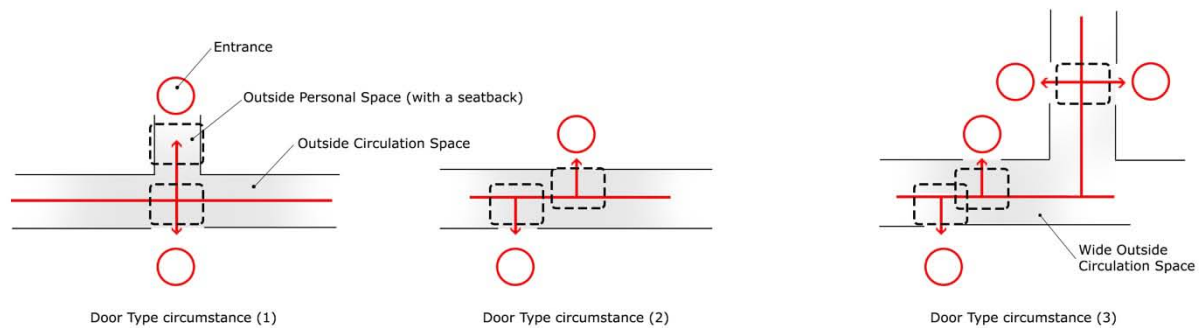

Figure 6: Different types of access formation found in traditional Najdi buildings. Source: Author

V. The Physical and Nonphysical Mechanisms of the Threshold

In Saudi Arabia and, specifically, in the traditional Najdi environment there is a complex relationship between the generosity and hospitality of families and each family's need for privacy. The need to balance between those two social necessities is a natural consideration seen already in previous studies relatedto the traditional Najdi built form(Al-Nowaiser, 1978; Hakim, 1986a, 1986b, 1990, 1997a; Al-Turabi, 1991; Al-Mohannadi, 2019). In this sense, this study sees the door access (the door as an element) as one of the most important architectural elements that strikes a balance between the owner's privacy, guests visiting, and outside surrounding activities. The entrance, as noted, can have different placements, can have different sizes, and can even have different quantities (typically one or two) to assure the privacy for its users while also supporting their social needs and obligations(Al-But'hie, 1996; Alnaim, 1998, 2015)

Observing the placement of the access (doorway), this study discovered two internal elements that appeared constantly near the building access. These elements are "staggered inner access," and "partitioning walls." Briefly, both elements are coexisting elements and depend on each other (Figure 7). This is because privacy is an important religious and social need in such a cultural context (Hakim, 1997b). The distinction between the desirable action and the actual level of privacy have influenced settlement inhabitants to develop and generate internal architectural elements that accommodate the different social engagements inside the house. This, in fact, goes along with an earlier study'sargument that the spatial organization of the house accommodates two domains simultaneously (Alnaim, 2020).

The two type of access that this study identified in the previous discussion play an important role in *how* and *when* the entrance elements generate. As each access type has different functionalities under different circumstances, the elements here function in different ways to support those needs. The importance, however, is to assure the family that no visual contact from the outside to the inside exists and to create a layer of depth between internal private spaces and the actual access of the building. In this sense, the two elements influence the generation of an internal threshold (*dehreez*). This threshold is located between the building access and the internal private spaces, which makes these two elements only appear near the building access.
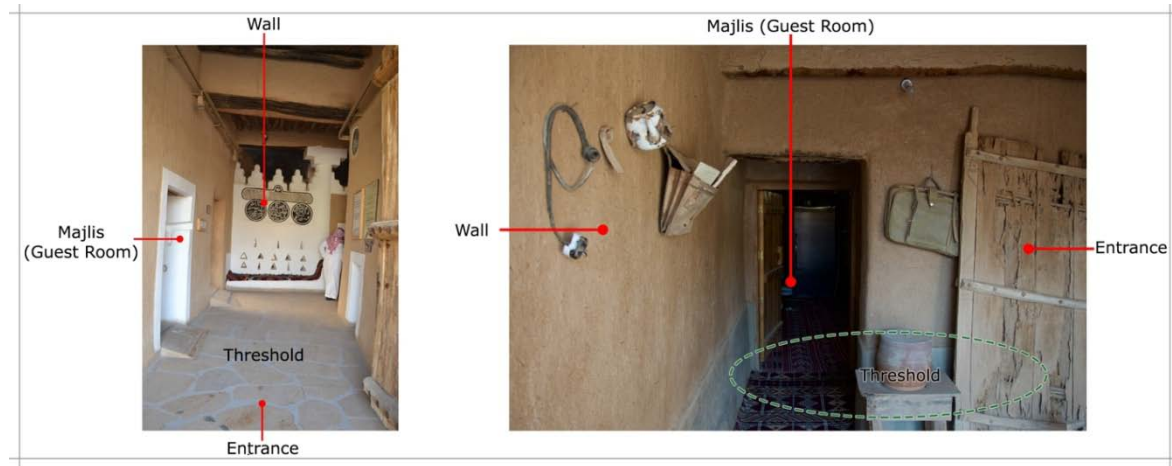
Figure 7: How physical barriers appear near the threshold space, (left) old Riyadh, (right) Alkhabra. Source: Author

The thresholds inside a building are agued and considered a continuous principle that maintains the hierarchical order of internal spaces and defines the level of privacy between the family and guest parts and among internal family spaces. The cultural settings that generated internal relationships among the spatial and physical forms supports this continuous process. A link to this idea is related to Habraken's view when he argues that the process of making of spatial and physical forms expresses two meanings that are understood through practice and collective forces (social production), and its material expression (construction know-how) (Habraken, 2000). In this sense, Najdi people understood their needs at the urban level and as a result formed the urban threshold. They then logically continued to apply the same principle to organize the internal spatial order of their buildings. This led inhabitants to adopt some of the same core concepts seen at the urban level within their buildings, albeit duly modified and reproduced to fit the settings of their buildings.

VI. THE FORMATION OF THE THRESHOLD SPACE

A threshold at the building level takes the shape of a transitional space located near the building's access to separate the semi-private space inside the house (*majlis*) and the most private spaces (family courtyard and rooms) (Figure 8). This space is mostly used as a buffer zone, essentially restricted from any uses other than facilitating a transition between two domains inside the house[12]. In this way, this transitional zone (threshold) is a space generated by the Najdi local people to separate their private internal spaces from their semi-private spaces (*majlis* space).

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[12] In rare cases, it is found that the threshold space may have *"Dakka,"* which is an element similar to the function of *Al-Meshraq* in external spaces. *Dakka* in this situation is used as a bench near the door and inside the house to have a quick meeting that does not necessarily require the use of the *majlis*.
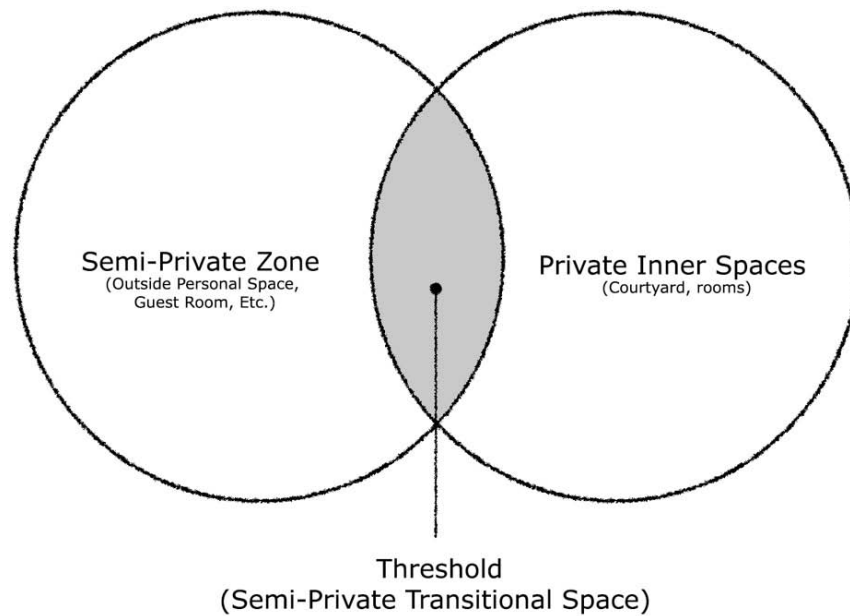
Figure 8: The nature of the threshold space in the traditional Najdi buildings. Developed from(Lawrence 1990: 89)

In fact, one may observe several cultures making use of some type of transitional device to maintain privacy. Ying-Keung Chan describes privacy in the Chinese culture as not an issue in Chinese society. In China, people prefer recognition from their follow clansmen and neighbors for their achievement, which makes them more exposed to the outside. However, he notes that privacy is still a concept that exists, but it is different from how other cultures view privacy. Chan argues that privacy within the context of his study is related to the regulation of personal information among individuals, which creates a number of private zones within a closed boundary (e.g., the house). He describes this behavior as performed "to regulate the permeability of interpersonal boundaries," or to regulate "the nature of the relationship between oneself and the other party in interaction" (Chan, 2000).

In a different context, Rodrick Lawrence examines the public collective and private spaces in the traditional urban housing of Switzerland. He notes that there is a connection between gender and an emphasis on privacy needs, which touches upon the physical boundaries of the concept. Lawrence argues that one may observe this phenomenon when a collective space is formed as a physical barrier for use as a transitional circulation space to "realign" and "redefine" the private realm from the public realm (Lawrence, 1990).

Accordingly, the generation of an internal threshold (transitional zone) within the cultural context of the traditional Najdi built environment creates a privacy balance between different internal spaces. Therefore, this threshold space occurred in two different ways: (1) by the establishment of physical barriers that explicitly limit public access to private spaces by using partitioning walls, and (2) by introducing staggered access to effectively create a threshold space to stop any visual contact to inner spaces of the house (Figure 9).
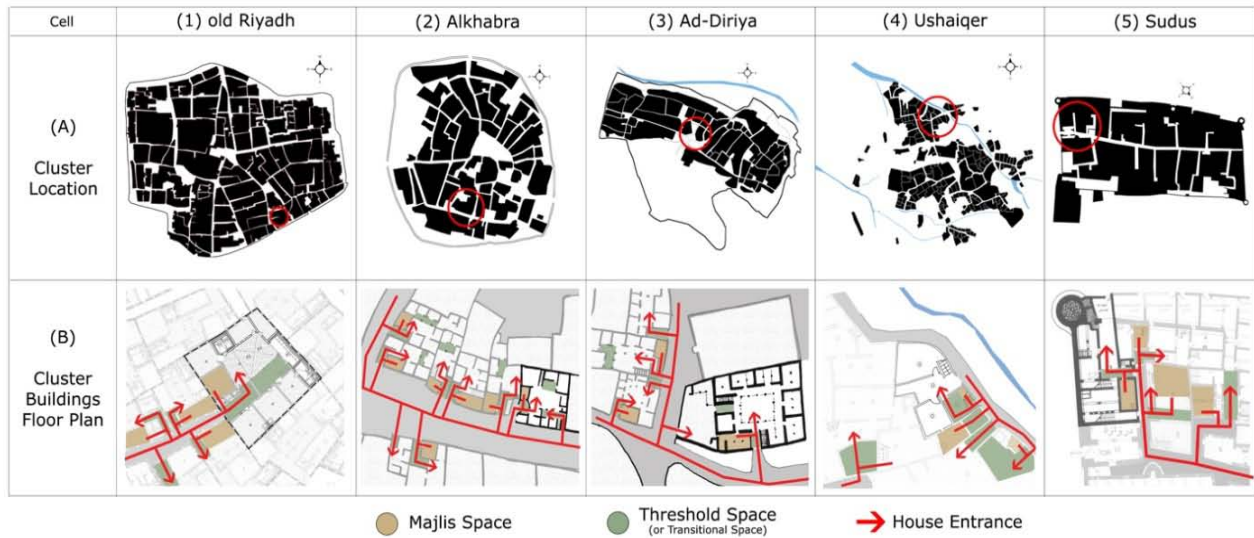
Figure 9: Threshold as a spatial organizer for house entry. Source: Author

There are more physical and non-physical internal thresholds found in the traditional Najdi houses that control the transition between different parts of the house. In some cases, there is a separation of the back of the house from the courtyard by another internal transitional space. It is less important than the main threshold (the *dehreez* near the access). Sometimes these spaces disappear, especially if the house is small and the back of the house shrinks to a small space underneath the staircase. In general, the existence of these thresholds is important in identifying the boundaries between the family and service spaces and it distinguishes between what inhabitants considered "clean" spaces from "dirty" spaces. In many cases the threshold is represented by a door or by an arch or beam to say to the user (usually a family member) "you are entering a different space" (Figure 10).

In fact, the deepest spaces in the spatial order of internal spaces are the family rooms, the main living space of the family. Doors directly connect the family rooms to the courtyard. Inhabitants considered the courtyard a transitional zone for family members and this transitional zone (courtyard) is protected from outside visual contact by the main entrance hallway (threshold). The relationship between the family rooms and the courtyard differ by day and night because family rooms served as multipurpose spaces. In the daytime the family opened the doors of the rooms, and they functioned as spatial defining zones, while in the nighttime the family closed the doors and the rooms functioned as restricted spaces because the rooms were used as private sleeping spaces by family members. Inhabitants achieved this dynamic use of space by developing hidden meanings for different thresholds, which enabled the local inhabitants to maximize the use of their domestic spaces.
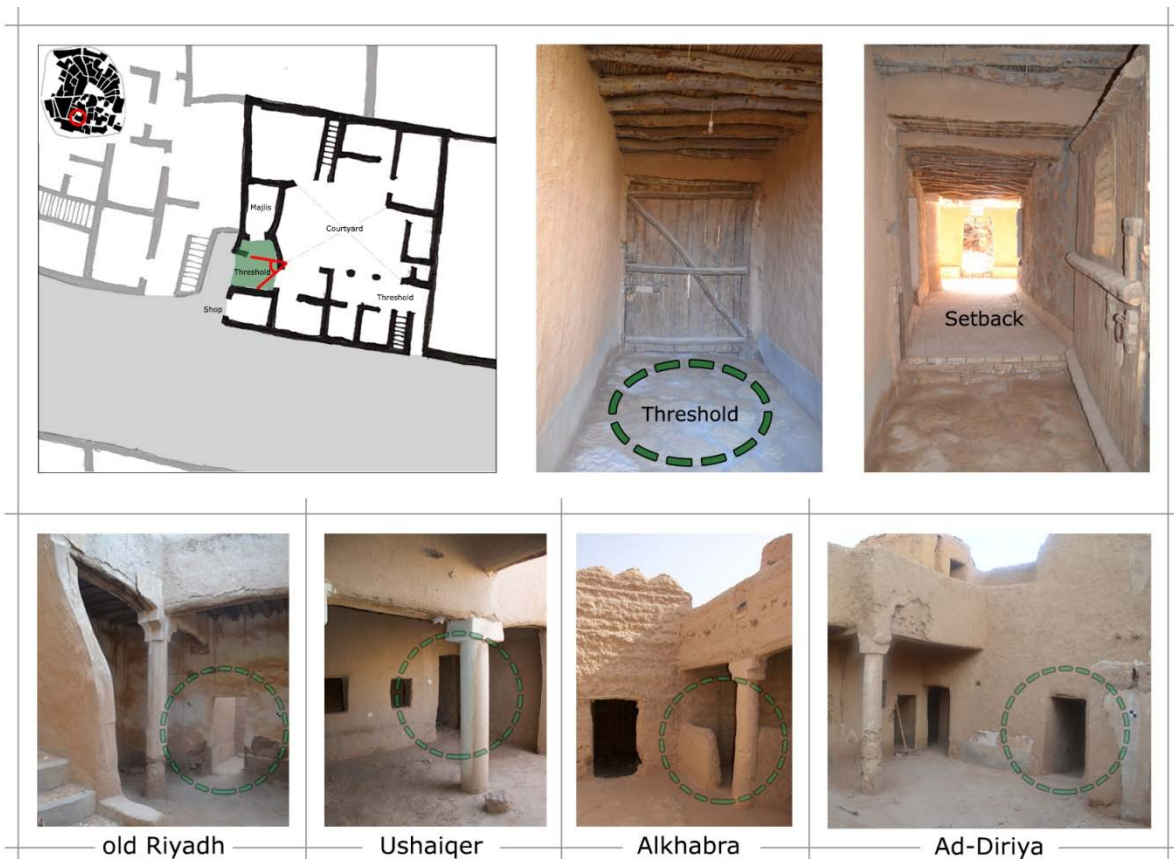
Figure 10: Threshold location inside the traditional Najdi buildings. Floor Plan from Alkhabra. Source: Author

The concept of the internal threshold stemmed from the holistic process of the integrative spatial and physical order which guided the local people to implement the same process at all levels in the built environment. We should view the concept of the threshold as a continuous process used by local inhabitants to create a homogenous built environment. In that sense, the integrative order evolves at each level (urban, building, and architectural element) to protect the main cultural principles in the Najdi built environment, helping the local people find ways to integrate the urban, building, and architectural element in the right places.

VII. THE LOCATION OF THE INTERNAL THRESHOLD SPACES

The researcher examined several buildings across the five cases to identify the location of the threshold spaces. In (Figure 11) the Space Syntax Convex map and justified Access Graph techniques are used to understand the following: the location of the two elements (staggered inner access and partitioning walls) in the house (Figure 11 (2)); the type of spaces in the threshold space as represented by a Convex map (Figure 11 (3)), and how the hierarchical order of internal spaces is organized by having the threshold space

inside the house as shown by the Justified Access Graph (Figure 11 (4))[13].

By examining the threshold locations, the researcher discovered that the space appears in different shapes and forms. However, the difference is limited to the physical appearance as all the various formation aspects of the space are associated with how the access functioned, where it was placed and how it was accessed[14]. It is also possible to say that a threshold's formation is associated with how the internal spaces that are located near the threshold are placed and arranged.

The Location of the Guest Space and the Formation of the Threshold Space

Staggered access and partitioning walls are physical elements associated with building access and this study argues that they influence the organization of the spatial order of internal spaces and vice versa. They significantly influence the formation of the threshold

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[13] A convex mapcontains a number of convex spaces, each space abstracted to a shape (node).The shapes are connected in order to abstractly represent the permeability of a convex map (Hillier et al., 1993). In a graph, a convex map is represented by a node and lines linking the different nodes represent permeability (Klarqvist, 1993).

[14] Double thresholds can be foundin Alkhabra in rare situations; this is related to how inner adjacent spaces are positioned and to what extent they have visibility to the private domain spaces which requiredan alternative approach.

space and what shape it takes. This is because internal spaces that are located near the threshold, as well as how people access these spaces, such as the *majlis* space, influence the location and formation of the threshold space inside the house.

Susan Kent identified three factors – gender, age, and function – which influence how social needs interact spatially in domestic spaces. These factors influence the formation of portioning spaces that take place differently in various cultures. She argues that each of these factors may play a role in shaping the organization of domestic space (Kent, 1991). To elaborate on Kent's argument, the discussion turns to an example from the Ushaiqer settlement. Referring to (Figure 11 (D)), while entering the house we are in the threshold space, and the *majlis* in this example is on the first floor. The guest space placement on the first floor led to placing the staircase near the door to prevent guests from going deep inside the house. Knowing that the semi-private space *majlis* (guest space) is in an isolated area on the first floor did not affect the placement of the threshold space. It also did not affect the existence of its associated two elements (staggered access and partitioning walls).

Guests, in this case, will not go deep inside the house; rather, they will go directly to the first floor. Even so, the two elements still appeared to ensure the preservation of a layer of depth between the semi-private spaces and the private spaces. This is similar to what Kent argues. In the Ushaiqer example, gender and functional factors played significant roles in the placement of the threshold space to accommodate the *majlis* space, which in turn, influenced the organization of the spatial order of internal spaces (e.g., staircase being next to the access).

If the *majlis* is placed on the ground floor (usually it is in most cases) and near the door access (Figure 11 (E)), the two physical elements constantly appeared in similar manners. The only difference found in those elements is the way they formed inside the house to prevent visibility and maintain the desired level of privacy while accommodating guests. This means that whichever interpretation process led to generate the threshold space's formation, the two physical elements are always present in the threshold space to separate the semi-private spaces from the private spaces.

The location of the *majlis* is usually on the ground floor. It is for this reason that the devices of the threshold space developed to protect the inner family spaces from any visual contact. However, when the settlements became crowded and the houses divided into smaller ones, inhabitants sometimes moved the *majlis* spaces to the upper floor while keeping the threshold devices as mentioned above. This study observed in the traditional settlements that guest spaces are more flexible and inhabitants sometimes modified and moved guest spaces to upper floors, but the

devices (threshold spaces and their elements) govern and organize internal spaces, therefore their existence is constant. This is because they work as the main tools for the integrative spatial and physical order to generate a similar and understandable built environment.

The Type of Spaces Near the Threshold Space

The types of internal spaces located within or near the threshold space are examined using the Space Syntax Convex map technique. The goal here is to understand why specific spaces are located only in the threshold space and not in any other internal spaces inside the house. The Convex map helps to explain and identify how the threshold space and its associated physical elements function to link or segregate different internal spaces.

Referring to (Figure 11), the Convex maps have shown that internal spaces that are associated with the threshold are mostly semi-private spaces, while private spaces are deeper and separated from the threshold space by the courtyard element (Figure 11 (3)). This supports earlier arguments that the threshold space was mostly empty and functioned as a transitional space between the main access of the house and the most active private spaces. The threshold space, then, is meant to generate another layer of depth to reach the most private spaces. Justified access graphs in which the *majlis* is always located in the threshold space support this argument. In order to go deeper inside the house the threshold is the first space that must be accessed, then the courtyard is accessed, and only then, a private room may be reached (Figure 11 (4)). In this way, the importance of the threshold space is not limited to being a space that serves semi-private spaces inside the house and to accommodate two domains, but it also serves as a space that creates a layer of depth in the spatial order inside the building's internal spaces.

For example, hospitality in Saudi Arabia is essentially a religious and social norm which is also based on deeply shared social values[15]. The main door and entrance in the traditional house is highly important and is used as a communication tool, communicating ideas such as: how welcome the guests are, how private the home is, and the wealth of the home owner (Al-Hathloul, 2016). Therefore, how local people of Najd had their doors open during the daytime is mentioned earlier as a way to communicate that guests are welcome (Al-Soliman, 1991; Alnaim, 1998, 2006).The implicit mechanism that links how welcome the guests are with the privacy of the home is important to understand as it helps to better understand the

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[15] Guest hospitality in Islam is a worthy practice for the sincere Muslim, and clear evidence of the strength of his faith, and these ideas have been pointed out by the teachings of the Prophet Mohammed (peace be upon him), who urges us to honor the guest(Al- Bukhari and Muslim, Book 1, Hadith 308).

organizational aspect of the spatial order of the internal spaces in the traditional Najdi house.

Having the main door open requires creative solutions by local people to control the privacy of the internal family spaces from external exposure. The staggered access and the partitioning walls are generative elements mainly developed to enable people to connect with the outside domain without exposing their private internal spaces. Therefore, inhabitants developed the threshold space (transitional zone) to accommodate different needs (e.g., the two domains inside the house), while at the same time isolate private spaces from outside visual contact. The researcher noticed a pattern across the settlements in how local inhabitants generated solutions to serve their main socio-cultural needs by utilizing similar devices and principles (threshold) at different levels (urban and building) to control different spaces' connectivity.
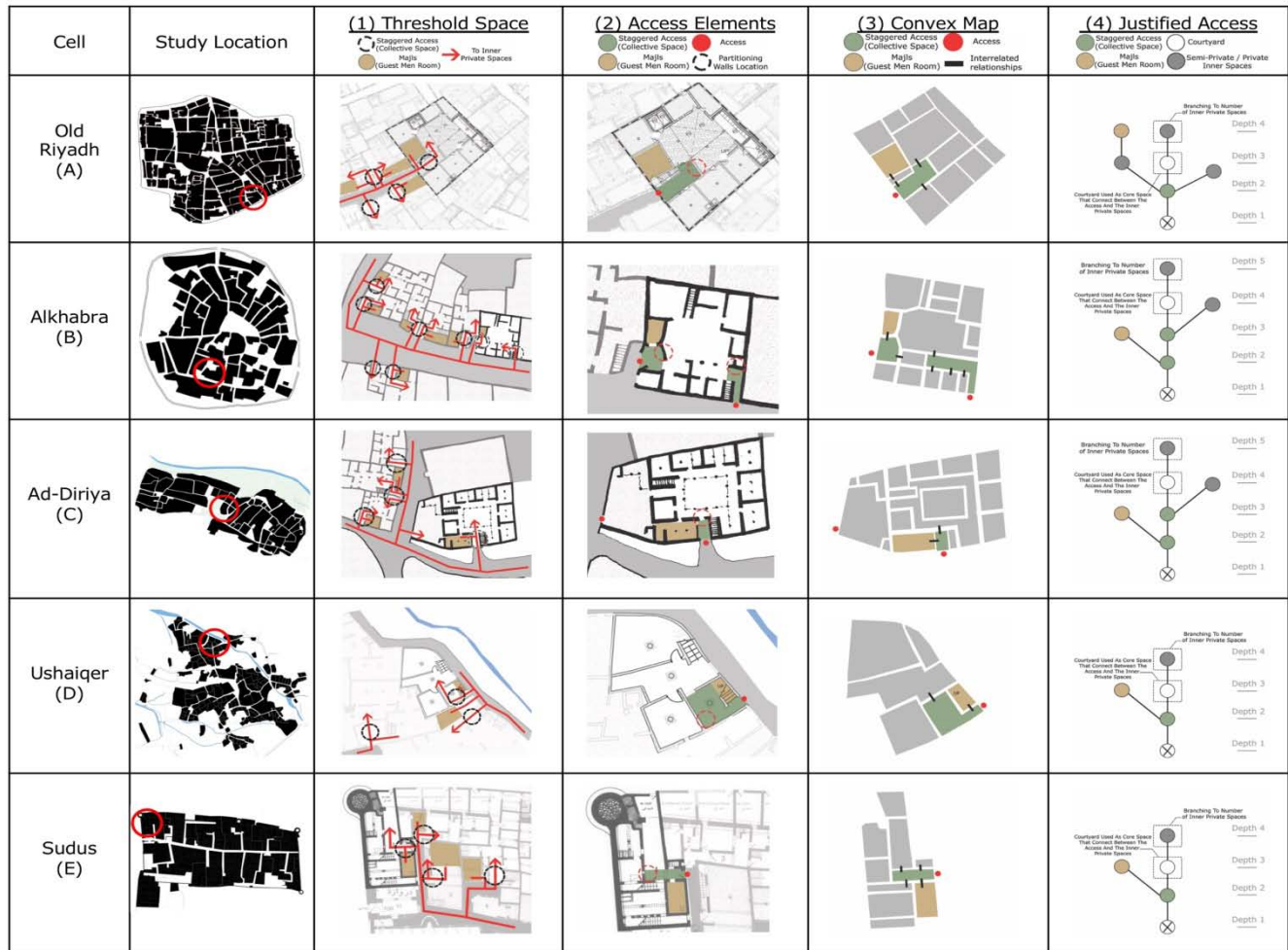

Figure 11: Examining the threshold space location in the traditional Najdi buildings. Source: Author

VIII. The Dynamic Mechanism of the Threshold Space

By combining the three phases of analysis – access elements, convex map space relationships, and the justified access graph analysis – now it is possible to say that the threshold space and its physical elements mostly control the semi-private spaces that are located inside the house and near the building access. This is because having the semi-private spaces near the door access is a religious and social obligation to accommodate guests. This obligation is honored by having the threshold's physical elements decrease the level of interference with private internal spaces while inhabitants make use of the semi-private spaces. Therefore, the local people of Najd found a way to support these two needs by generating the internal threshold space and supporting it with physical elements that control the territorial structure of different spaces inside the house, as well as using the threshold space's placement to create a layer of depth for the house's spatial order.

Although the physical rendering of the threshold may change from one house to another, the principle remained the same across the five cases. Also, the fact that there is a continuous pattern that links the urban fabric with buildings, suggests that the spatial and physical order work in parallel to increase the territorial

control between two different types of spaces: internal (building) and external (urban fabric) (Figure 12). This is achieved in two ways: first, the threshold space's existence influences to what degree the building is connected with outside spaces; second, the threshold's existence decreases the level of direct visual contact with the inside of the house which made the integration between the spatial areas (urban fabric) and the physical form possible. Having these two applications, the threshold space then has the necessary requirements to support a semi-private space *majlis* (guest space) inside the building and connect it with outside spaces by having the main door of the house open in the daytime.
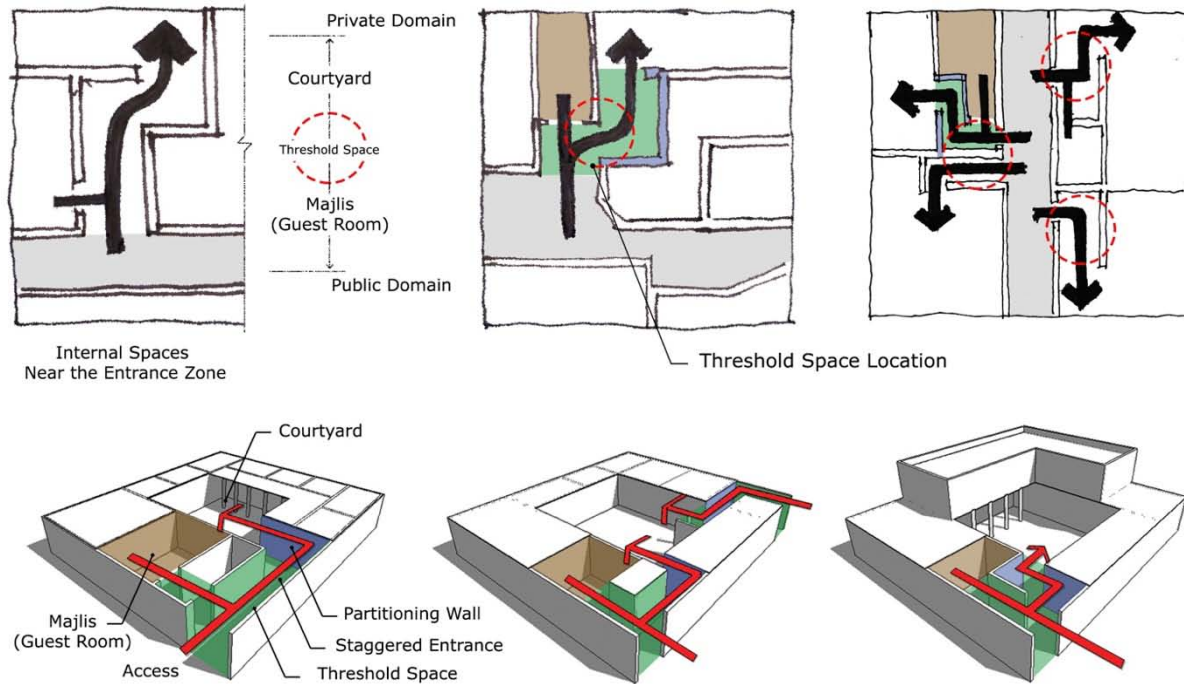

Figure 12: Different formations of the threshold space in the traditional Najdi building. Prototype house from old Riyad, Alkhabra, and Ushaiqer. Source: Author

IX. Conclusion and Recommendation

After understanding the regulatory process mechanism of access, and how two types of entrances were generated to support the social, political, and economic life of its inhabitants, several elements appeared in the internal spaces and near the building access. This study argues that the generation of these elements effectively increases the level of privacy among adjacent entrances. This enabled a deeper understanding of the access regulatory process mechanism, as well as the access' internal elements (e.g., threshold space) to understand how they influenced the organization of internal spaces in buildings in the Najd settlements to support the two domains inside the building.

The function of the access and its location within the settlement played a major role in *when* and *how* to apply the threshold space and its physical elements. The threshold space, however, is persistent in its existence even though some of the elements might not appear in some cases. No matter how big or small a house, a threshold space exists with different formations based on the placement of the elements and the access

provided to other nearby internal spaces. The significance of such a space is to ensure the satisfaction of the socio-cultural needs of a household while also giving local people the ability to transit from one space to another without interfering with the privacy of others.

Examining the influence of the threshold space on the spatial order of internal spaces was critical to understanding the basic logic behind how inhabitants structured the circulation flow inside the traditional Najdi house. This helped to further examine the spatial order of internal spaces and how they relate to one another. In the following section, the focus is on how the traditional courtyard functioned as a space that connects different parts of the house and enhances the spatial order of internal spaces. The objective is to investigate the courtyard's explicit functional role as well as its implicit social roles and meanings.

Future studies can use this paper's findings and extend the concept of access and its relationship to the threshold space in the urban structure and the internal spaces of the building structure. We argue that the threshold is used as a controlling point to differentiate between the variety of spaces founded in the built environment and used to create a kind of hierarchy to

how users might experience those variable spaces in the public or private domain. This perspective, we believe, account expanding upon to truly discover the hidden meanings and the operational processes that the built environments established for themselves at the urban and building structure.

ACKNOWLEDGEMENTS

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