INTERACTION BETWEEN INTERNAL STRUCTURE AND ADAPTIVE USE OF TRADITIONAL BUILDINGS: ANALYZING THE HERITAGE MUSEUM OF ABU-JABER, JORDAN

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Abstract
This paper analyses the three-floor gallery plans of the Abu-Jaber Museum that correspond to the two stages in the evolution of the Abu-Jaber House: 1880, when it was originally constructed to house the families of three affluent brothers; and 2007, when it was rehabilitated into a local heritage museum. Using a multi-method approach of ethnographic observation, space syntax analysis, and interviews, we find that the 2009 spatial and morphological conversion constitutes a certain phenomenological departure from the spatial principles embedded in the original plans. We suggest that this is linked to a predominant approach in the process of adaptive use where the essence of the original spatial configuration is overlooked. We discuss the three-way interaction between spatial structure and its architectural language, interpretations of conservation priorities and curatorial principles.

Keywords: *Space syntax; adaptive use; traditional buildings; phenomenology; heritage museum.*

INTRODUCTION

The Museum of Abu-Jaber, Jordan, originally three attached houses of an affluent family in the end of the 19th century, opened its doors to the public in 2009. It was rehabilitated as part of a project for heritage tourism funded by international agencies (Al-Masri, 2014). In this paper we discuss the relationship between the historical spatial structure of the building, its circulation patterns, and the adaptive use decisions. We investigate the two stages of the building's development: first, the original interior layouts as it stood in 1900; second, the layouts designed as part of the rehabilitation (adaptive use) project.

The process that took place represents major and systematic efforts which rehabilitated the spatial composition with minimal inventions in the actual articulations of the original stone walls and their stylized openings and vaults. The commissioned designers responded to the existing architecture, without having an agreed upon curatorial program and within the framework of preserving the physical integrity of the buildings.

The spatial history of the studied building during the 120 years of its life can be investigated from several points of view. First, as a history of the changing spatial requirements, reflected in a set of formal transformations and choices that were brought into play within the constraints of the architectural shell. Second, as a history of different patterns of user experience in relation to the spatial qualities of the layouts. Within the context of the conservation process, this paper will investigate the balance between the ways in which shells are preserved and the design of their space and the salient patterns of use. The intention is to contribute to the understanding of the interdependencies between the different parameters which were involved in the final product. This inquiry addresses the following fundamental question: do the changes in the preserved layouts involve changes in the original underlying spatial organizational principles? In other words, are we dealing with sensitive permutations on the spatial original and traditional organizational principles, or can we identify a fundamental spatial departure from the preserved themes? More specifically, this paper addresses the issue of the arrangement of spaces in relation to: a. the spatial qualities of the original and new layouts, exploring the impact of each on the rhythm of perception; and b.

the patterns of movement, both global and local and their impacts on the experience of the moving observer.

Museums and Heritage

Museums have recently become the center of interest among scholars in many disciplines in what Sharon Macdonald called “the museum phenomenon” (Macdonald, 2006, p. 4). While some scholars have begun examining the museum and its role (Mason, 2006) others intended to draw attention to the ways in which museums are physically encountered and their role both to their collections and to the public. The museum’s role in the construction of cultural identity has been affirmed, thus, it has been explained as a space for assessing, defining, and displaying “the value of culture” in accordance with the changes in contemporary society (Giebelhausen, 2006, p. 42).

If seen within this context, Crane’s (2006) arguments become of great relevance. She discusses museums from the vantage point of temporality, and argues that the mandate of museums is to preserve and present objects for people to appreciate (Crane, 2006, p98). In regard to the museum as an agent, museums are created to capture “a moment of creativity or cultural significance” thus she warned from “silencing and forgetting” of cultural speech and from loss of collective memory, which takes place when other meanings are generated in their place “using the same objects of reference” (Crane, 2006, p.105). When artifacts are selected to be preserved, it is because “that representation is itself valuable to us ... and essential to secure the reference of the past” (Crane, 2006, p. 108). This becomes of significance when the building itself is an artifact of display, which is the case of house museums.

Fyfe (2006) points out that the museum is a “modality of showing, of telling, and of mediating”, arguing that museums are as cultural as the things they contain” (Fyfe, 2006, p. 35). To Foucault, it is that space which is outside all other places, but in which other places and times are “represented, contested and reserved” (Foucault, 1994). Mason discussed the readability of museums as texts and believed that understanding museums in terms of “texts and narratives” promote the idea that visitors have a crucial role in the process of “meaning-making” and shifts the emphasis towards the visitor as reader (Mason, 2006). Thus, recent scholarship considers the architecture of the museum as a museum itself, since it determines viewing conditions, frames the exhibits, and shapes the visitor experience thus providing meaning to the narrative (Giebelhausen, 2005).

Unlike the designed museum, the historic house museum is adapted from an existing building which simultaneously becomes a container and an artifact. The chief objective in the design of such a building is to ensure the harmony between the building and the collections so that the museum narrative is not disturbed (de Gorgas, 2001; Cabral, 2001).

Hoelsher (2006) touched upon the importance of museums as active vehicles in producing, sharing, and giving understanding of the past. He draws on the unique connection between heritage and place and the ways in which the “sites of memory” give prominent attention to the various ways in which heritage is spatially constituted. He confirms the recognition of the importance of the place and stated that “it is the stabilizing presence of place as a container of experiences that contributes so powerfully to its intrinsic memorability” (Hoelscher, 2006, p. 204-205). He believes when an artifact is removed from its surroundings and is placed in a new taxonomic arrangement, it might acquire a totally different set of meanings, an issue which is very critical in manipulating the spatial experience of the one site itself (the building in our case).

The spatial layout of a museum is of significance for its success. Patterns of accessibility through the space of museum exhibits, their arrangement in groups, or their separation have an impact on how a museum is explored, the extent it engages its visitors, and the level of understanding it shapes. In addition to the curatorial narrative, there is a spatial discourse in the museum, based on the circulation pattern and visibility of spaces (Wineman, Peponis, & Dalton, 2007).

The geometric relationships of spaces and the topology of the parts of the building impact way-finding. Space provides a structure for orientation in museums; as visitors understand their location within the floor plan they will also understand where they are in the narrative that the curator is presenting to them (Wineman, Peponis, & Dalton, 2007). A building's design is successful if it is legible (Werner & Schindler, 2004; Weisman, 1981). Within this framework, Hillier (1996) introduced the concept of "space configuration" to notate the arrangement of spaces inside the building and how they interconnect and interrelate, creating an overall structure that has an impact on the user's behavior. The configuration of museum layouts provides a structure for the exploration of the collections and buildings by visitors (Choi, 1999).

Adaptive Use

Literature on adaptive use (rehabilitation) is part of a rich discourse on heritage conservation, addressing the safeguarding of heritage places through a variety of strategies. Adaptive use is among the more liberal interventions, compared to restoration and preservation, as it provides allowances for changing the use of the building, which requires deep interventions (Fitch, 1998; Murtagh, 1997).

Adaptive use is defined as "a process by which structurally sound older buildings are developed for economically viable new uses" (Austin, 1988, p. 49). The challenge originates from changing the building's typology, as churches may become libraries, and houses turn into museums (Powell, 1999). As a profound change, it has been labeled "re-architecture" (Cantacuzino, 1989). This kind of change warrants care in the general approach to allow the needed change without impacting the integrity of the historic fabric of the building. Thus, many scholars of architectural heritage have been critical of this approach due to its impact on the historic integrity and character of the building (Nelson, 2005; Murtagh, 1997; Weeks, 2005).

Literature contends that at a minimum, this approach requires two main steps: 1. The preparation of an architectural design program based on a careful study of the possibilities and constraitns of the building, and 2. The identification of necessary alterations needed to achieve that project, taking into account maintaining its architectural features, which may require different levels of interventions (Eyuce & Eyuce, 2010). This raises the questions: What does the careful study of necessary alterations entail? And what are the limits of constraints of intervention? is it merely the form or are there other spatial constraints? RehabMED (2008) identified several steps for the adaptive use for traditional buildings, focusing on local participation and values, place-meaning-making, and sustainable heritage principles. Different principles are provided in this regard so as to maintain the value of the place without damaging its significance by maintaining its value, integrity, and historic character (The National Register of Historic Places, 2002; ICOMOS Australia, 1999). As shown below, we argue for the understanding of the juxtaposition of the formal and spatial structure, and the spatial experience offered by the original design as one of the starting points for rehabilitating such buildings.

METHODS

This paper uses a case study approach, utilizing multi-methods in order to analyze and understand the interrelationships of adaptive use with spatial experience of a heritage museum. The study proceeded in a qualitative manner, as questions were raised at each stage based on analysis and observations, and new investigations developed to answer the questions.

The architectural qualities of the layout of the Abu-Jaber building were examined by looking at their compositional principles in terms of their: configurational properties, vertical and horizontal agglomerations, circulation systems, scales of organization, spatial interventions and patterns of exploration.

"Participant observation" was used to document how visitors behave in the museum. Sixty university students and professionals were observed on a floor-by- floor basis. It was carried out during the period of April through July 2013, and September- October 2013. Each visitor was given a disposable camera in order to record his/her own route and the duration of their visit.

Five semi-structured interviews were used to triangulate the analysis and observations. The interviews were supported by data obtained from documents, such as exhibit panels, project reports, and heritage studies of the city of Salt.

Several site visits were conducted in the period (April 2009- February 2014), which allowed for better understanding of the current and past museum spaces. The site visits allowed for detailed assessment of the plans, sequence of the narrative, spatial characteristics, and possible circulation patterns. The researchers took notes of their observations and discussed them in-situ, sometimes casually asking local staff for clarifications.

THE HERITAGE MUSEUM OF ABU-JABER

The Abu-Jaber house is a significant residential compound in the city of Salt, the former capital of Jordan. It has significance as the location where Prince Abdullah resided upon the founding of Jordan as a state 1923 (figure 1). Further, it is one of the finest examples of a merchant house in the 19th century, incorporating architectural detailing from the greater Syria region in addition to Europe. Its architecture represents the golden age of Salt, when the city was the hub of commercial, political, social, and artistic activity. It was built in stages incorporating the courtyard house and the three bay houses in its floors (Abu-Jaber, 2009; Al-Masri, 2014).

The Architectural Qualities of the 1890 Layouts

In 1892, the construction of a 700m2 plot for the Abu-Jaber family's three attached multi-story houses began. Inspired by the architectural traditions of the greater Syria area, the layouts are mostly composed of bounded rooms defined by traditional double-leaf stone masonry walls (60-100 cm), cross vaulted ceilings, elaborate arched openings and fresco-painted ceilings. Special attention was made to the details of stone work whether at the main facade, projected balconies, stairways, or cornices. Italian roof tiles were used to stylize the external pitched roofs and their three open-court pathways. Large, elaborate, and stained-glass windows occupied the northern main facade and introduced subtle amounts of daylight. Squared, arched, and diminishing-in-size openings are located at the southern elevation which faces the natural slope (Abu-Jaber, 2009).

The key spatial property of each of the layouts is the centrality and the revolving tendency of the user's movement. The spatial structure of each house is created by one concentric vertically-revolving axis which is a continuation of a vertical deflected shaft that terminates at the upper level, forming a warmly lit open court (Figure 1). This vertical axial shift allowed the creation of the central enfilade of the rooms at the lower floors (Figure 2). Open courtyards added to the lighting intensity and quality in each of the three houses, creating light wells of the internal central zones. Three consecutive vertical axes run through the east, intermediate, and west houses (Figures 1,2) and structure their spaces.

The layout also brings together a number of compositional principles: houses are organized to suggest a clear experiential movement; the overall rotational direction of movement is perceived through wall openings and internal windows. In the west house the composition even allows multiple internal and external views from the varying distances which draw the viewer into different patterns of exploration. At some locations the space is exposed to diverse scales of organization, ranging from the double volume spaces to the intimate and private spaces. All these principles embody the formal ideas cultivated in the vernacular traditional architecture of the region which includes: co-presence, the filtering of light, hierarchical spaces, and momentary intersection of gazes.

The Architectural Qualities of the 2007 Adaptive Use Layouts

An examination of the plans of the new museum (figure 1) shows that the new layout accomplished three things. First, by stopping the vertical movement axis which used to connect the two floors of each house, it practically (yet not physically) eliminated the multi story circulation loops. Second, by introducing a new door opening at the backside rooms of the three houses, a new axial-deflected

disjunction was created and made the transition between the original houses awkward. This transformation created a more determinate circulation system and aimed at imposing a more rigid viewing sequence upon visitors on the one hand, and maintaining the physical integrity of the other rooms on the other. Third, by introducing a main entrance at the ground floor level (originally used as stores and services), it incorporated the west spaces of this floor to the spatial composition of the museum. Fourth, by adding an elevator shaft at the southern end of the intermediate house, the circulation system across the floors and starting point of the first and second floors was reinvented. The new layout restricted the impact of the older stairways as the new circulation system integrated only the west house's second stairway as an option to connect the second with the first floors. It also reintroduced the original shared entrance of the "intermediate and west" houses as an alternative entrance and as an option to the use of a stairway to access the first level. This entrance cannot be interpreted as a mere return to the 1900 original entrances (figure 1).

The emphasis on the horizontal movement allowed the creation of a central enfilade of rooms. The new orbit axis of the museum follows the linear arrangement of the rooms along the north facade. Although the themes of the vertical transition were almost eliminated, the secondary original and vertical older residential axes, originally at perpendicular angles to the new major one, are still phenomenologically active and make the transition confusingly felt.

Each floor's axis now crosses through the three older houses; spatially it is composed of a series of varied-in-size rooms and corridors. It narrows and widens across the east-west direction and runs through, varied-in-scale, across vaults and ceiling compositions. Architecturally, a new visual play with the perspective construction is created. The new doors introduced at the walls originally separating the older houses at the back side, (formerly a small bed room leading into another room through the central aisle -originally saloon with multiple cross vaults), the arched single or sequenced varied-in-size openings along the northern and southern internal walls, along with the impact of the shorter vertical axes with their penetration of light, offer fragments of visual information and spatially guiding sequence. The changes in the visitor's views are monotonous; the visitor does not change views of partially exhibited examples of Jordanian history, but entire works become visible or disappear within the museum's rooms. Only in the main axis are the wide and tall arched openings of the central aisle viewed in perspective. The visual play is enhanced by the fact that the preserved forms and stonework are of high architectural value. It could be said that the powerful impact of the architectural forms counteract the lack of clear spatial variety and differentiation that would engage the visitor.

Given this, the questions to be pursued in subsequent sections are whether the forces that had united and composed the older phenomenological impression of the different and hierarchal sizes of spaces are still in order? Did the new building succeed in creating an enjoyable ambiance and a combination of hierarchical controlled spaces? Have the new functions and their interrelationships been translated into an aesthetically satisfying balance of preserved setting and clear interior spaces which effectively serve the needs of both the visitor and the preservation?

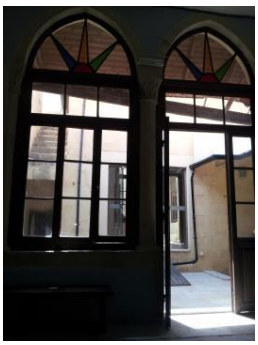
Figure 1. Drawings of the original houses and adaptive use
(Source: Tiba Consultants,2007; Redrawn by authors)


1.First floor middle house


2.First floor west House


3.Ground Floor


4.Second floor middle house


5.Second floor west house


6.Second floor east house

Figure 2. Central Spaces (Source: authors)

How is the Abu-Jaber museum working now: the pattern of exploration and the configurational clarity?

Visitor observation showed that all visitors used the main entrance, and started their visit from the ground level where all turned right attracted by the visual distinction of the perspective and the penetration of light at the end of the double volume and multi-arched vista of the ground floor (figure 1, figure2/3). Furthermore, observations have shown that all visitors went back to the entry point and ascended to the first floor to initiate, as proposed by the museum staff, their first floor's tours. Once in the first floor 45% of the visitors observed turned right and started their visit through the east side (figure 1, tour1). About sixteen percent (16.7%) moved along the west axis (figure 1, tour 2).However, a count of the pictured images showed that visitors did not reach all exhibits (dubbed function spaces, Table 1).

Two observations are noticed: First, visitors start moving normally and then express confusion: They move randomly, returning to the same spaces or missing parts of the museum. Second, the spaces that seem to lie outside the search track of visitors are those connected to the central space of the older houses at either of the extreme east or west ends which they did not reach.

Number of function spaces reached	% of people
11-12	20%
8-10	58.3%
Less than eight	21.7%

Table 1: number of people who reached function spaces (Source: Authors)

To elucidate, people enter the first floor from the midpoint (figure 1). Upon entering the first room (middle-point space; figure 2/1) visitors grasp the immediate convex space, build up a picture of the visible museum space, and its spatial structure. They have then the choice between the east perspective axis (tour 1), and the slightly shorter axis that stops around (tour 2). Encouraged by the flat level at their east, compared to the multiple steps to their west, most visitors move through the rooms of the east side, following the confronted openings (tour1).

Moving along any space seems to take them either back home to the original starting point too quickly (tour 1), or if they like to take the risk, they venture towards the stepped pathways, which they confronted when they entered the main space of the first floor, reaching point A.

Up to that point people follow the lines suggested by the interesting architectural compositions. The difficulty lies in deciding the continuation of their route when they find themselves at the middle of extremely similar architectural compositions (figure 1, point A; figure 2/2) since they find themselves in spaces very similar to the ones they had experienced (i.e. the central space of the third house similar to the central space of the first and second house). At that point (point A), visitors get puzzled and lose their sense of orientation and move inconsistently. Some backtrack, returning to the same spaces, or they move in a non-systematic way missing some parts of the floor. However, if they take the risk and decide to continue the journey due to the light rays penetrating through the grand balcony and the integrated view of the city at the west end, they move and enjoy again the double-volume space (tour 3). A large percentage of observed visitors end their journey at this floor thus missing the second floor.

An Analytical Profile of the Spatial Structure of the Abu-Jaber: 1890s, 2007 layouts

The analysis will now move from the general description into more particular spatial properties of the museum, addressing circulation as a key element of the layout's morphology.

The ordering of spaces into sequences and justified graphs

With reference to the results of the observation, the question addressed at this point is, what are the museum's spatial reference points and what is the role of the original gathering spaces (central spaces) of the older houses? Do they still have meaningful functional value? Are there any differences that arise from the way these older spaces are embedded in the new global system? What is the impact of the new cores if any, on the user's movement in the whole system and how do they correspond to the original shell? The goal behind these inquires is to understand and communicate the hierarchy of relationships in preserved buildings, and the nature of the new developed perception of the space. To make these strategic differences of movement and its underlying spatial structure visually clear, we suggest representing the houses' and museum's layouts as schematic justified graphs (Figure 3 and Figure 4), where nodes are used to represent a space. Lines are used to capture the logical relationships between spaces (i.e nodes), so that a node is selected outside the entrance to denote the starting point, and then all other nodes are aligned in layers above it.

If we examine the plans and their justified graphs, we find several interesting features. There are always gathering spaces which serve as spaces for setting out from or returning to. Linked to these locations are several spaces which are not necessarily hierarchal in terms of their built up size or in their shape of boundary space. In the houses' layouts, these spaces can be walked through without getting lost. In their justified graphs, this manifests itself as a limited amount of rings or bushy spaces which interconnect to each other and eventually lead back to the gathering space (Figure 3).

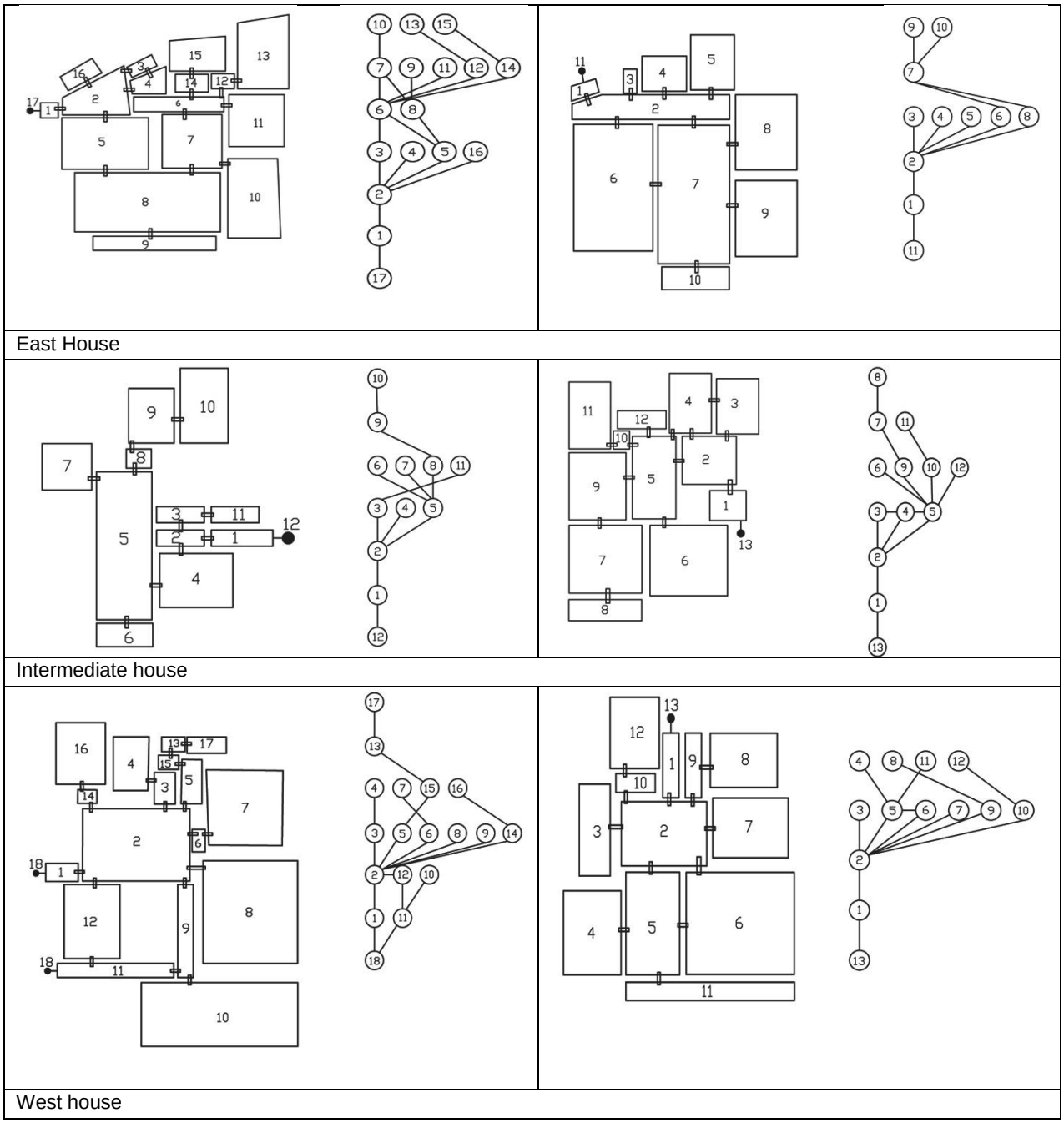


Figure 3. (Left) spaces and justified graphs of the original first floor of each house (Source: Authors); (Right) spaces and and justified graphs of the original second floor of each house (Source: Authors)

Conversely, in the museum, these spaces are weakly sequenced; the size and shape of their built boundary space is not hierarchal. They cannot be walked through without back-tracking or getting lost. In the justified graphs (figure 4), this shows itself as a large number of rings or bushy spaces. This incongruity between sequences, sizes and back-tracking could be seen in the following nodes and routes; the ground floor's Reception (node 2 in figure 4-a) and its adjacent elevator's lobby small space (node 5) originally the corridor to a utility, ("The Geography, Agriculture

& Cultural Landscape" in the first floor) (node 26 in figure 4-b) and "Museum Staff" (node 7 in figure 4-b), originally, the morphological central spaces of the original houses are now exhibition spaces and part of the whole layout. The route of the distinguished architectural experience of (nodes 26, 27, 28, and 29 in figure 4-b), originally the central event in the west house, was in fact missed by many visitors (as the observation study showed).

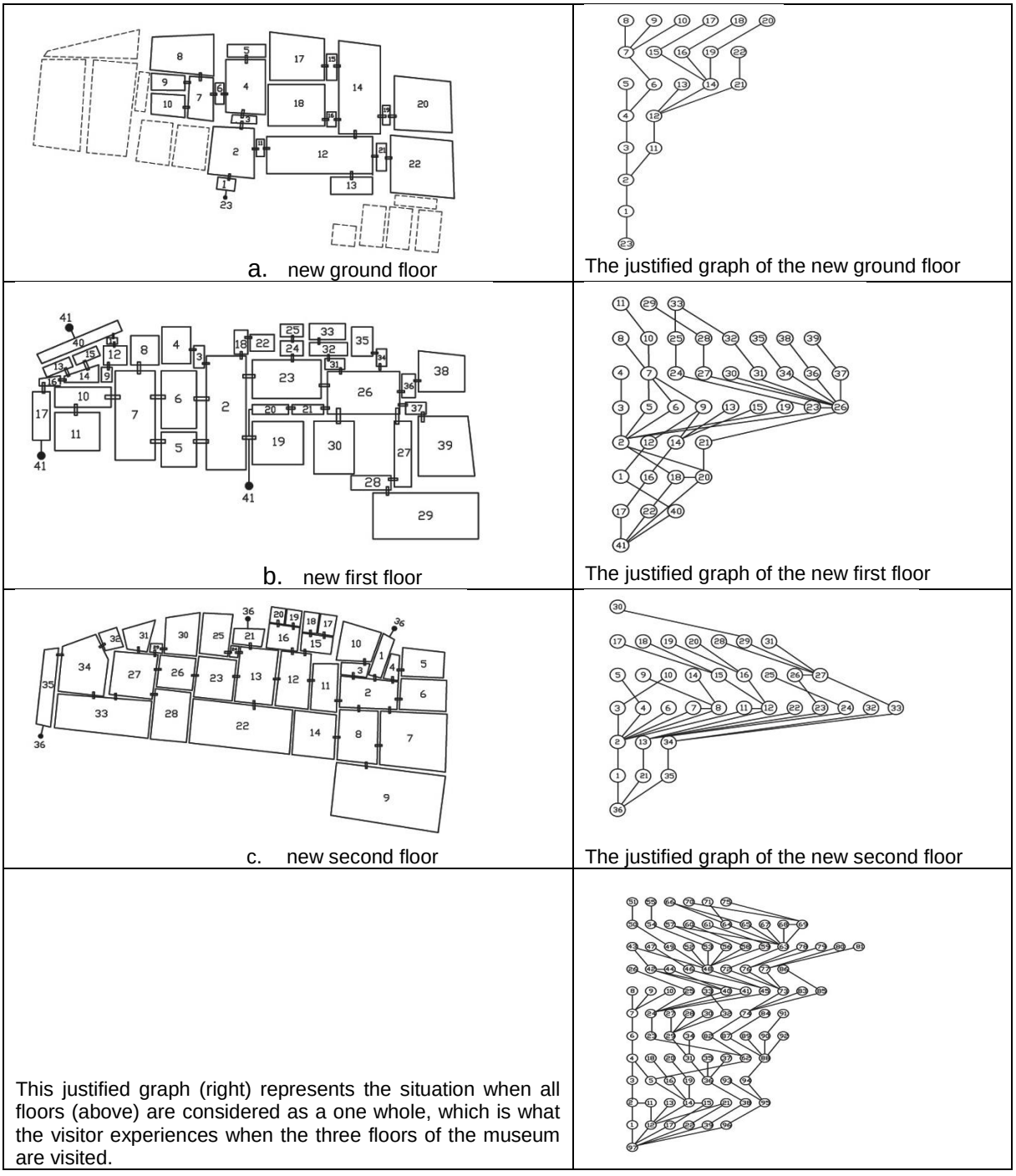


Figure 4. (Left) spaces of the different floors of the museum (Source: authors); (right) justified graphs of the floors of the museum (Source: authors)

Analysis has shown that the pattern of the different space types/forms in the layouts had affected the building's degree of integration and consequently its global perception. Analysis of the older houses clarified that there has always been a gathering space: a central space that guides and distributes the user along the different spaces (figure 1 and 2). Due to the limited numbers of choices that this central gathering space controls, the criticality of the size and hierarchy of these spaces was not of influential value and did not affect the global comprehension of the one house.

However, in the museum as a whole, analysis showed that the existence of several nodes (spaces) within each floor- spaces of large and/or small built up areas that might be of a distributive character or not- made the connotations of size and shape and how these were embodied in each case of crucial importance. The hierarchy that was marginally controlled by the central space of each house is now missed. Its relational proportion was comprehendible due to the limited degree of existing variability. On the other hand, the hierarchy of those gathering spaces at the museum spread across the whole length of the building. This does not encourage the explorative aspect of the visitor's movement. On the contrary, it has reduced people's ability to grasp the overall structure of the museum.

The pattern of space

The research will use now the ideas of syntax theorem to investigate if the new layout creates positive configurational interrelations between the old spaces and the new functions, or on the other hand, is it a layout of a series of connected central spaces that creates a friction to the user's visual and spatial experience? How was the Abu-Jaber building "re-architectured" towards its new use? Is it a static preserved shell that controls the visitor's processional journey, or a dynamic new arrangement of spaces which enhances the exploratory aspect of the visit both spatially and intellectually?

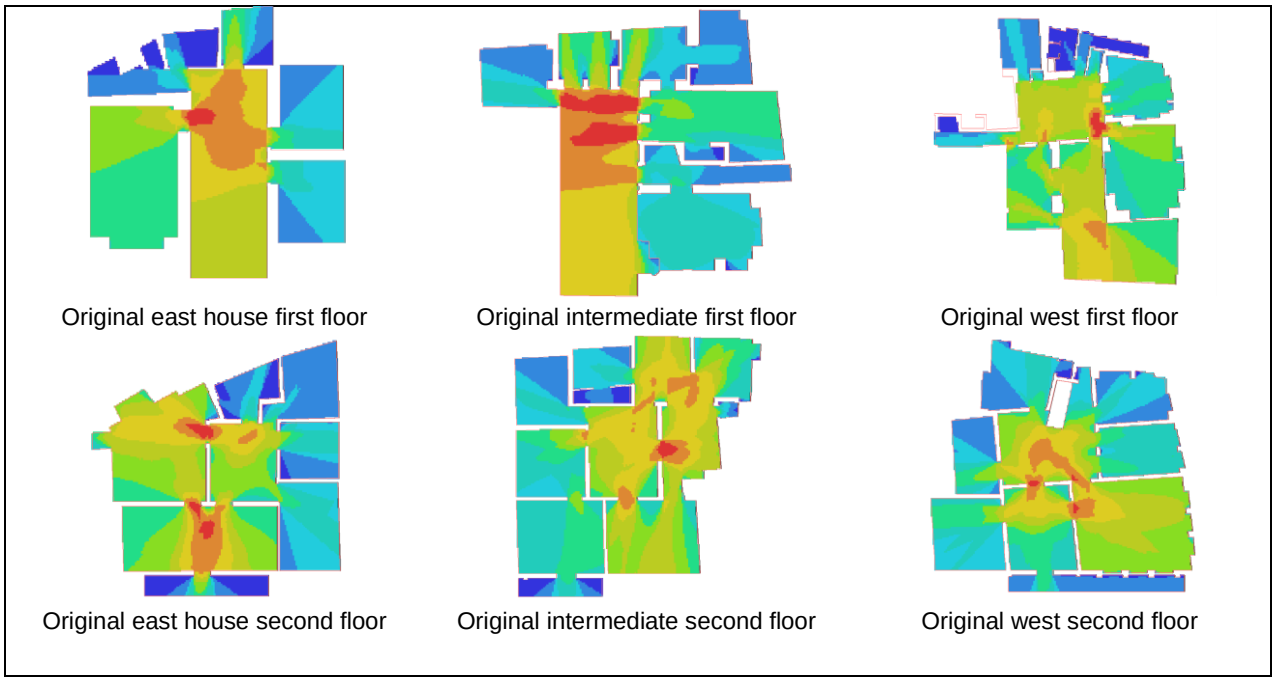


Figure 5. Visual integration of each house at its different floors (red as the most visible points and blue the least visible points) (Source: authors)

The results of our analysis are graphically presented in (Figure 5). The syntactic centrality refers to areas from which the plan becomes more readily accessible, visible and intelligible, (as distinct from shape-geometric centrality, the region which is simply "in the middle" of a plan-shape). In the

1900s plans, the points associated with greater visible and accessible area, as well as with greater visual integration and integration of access, include, most prominently, those near the circulation areas and the multi-cross vault receiving spaces. In the west (third) house, this syntactic centrality occupies a larger area and extends to the balcony which is architecturally a pivotal and distinctive region within the layout as a whole. Each of these centers provides both views and access into the peripheral spaces. Within each of the individual houses these spaces act as orientation points within the floor, and help in concentrating the movement and guiding it up into the second floor. What these results suggest is that, the 1900 architectural compositional principles juxtapose with the spatial syntactic qualities, thus making the spaces interesting and easy to grasp.

In adaptive use plans the same areas maintained their syntactic importance. However, the museum's architectural plan represents an attempt to orient visitors with respect to the linear extension of the building as a whole. The results show (Figure 6) that each syntactic central hub has maintained its role as a space of reference for those moving in the local (not global) peripheral spaces. What is unusual in these results is the fact that each of these syntactic centers is visually isolated from the other syntactic centers within the floor and that there is no access or integration core that connects those centers. In contrast, those integration centers are surrounded by extremely weak accessible, visible and weak intelligible areas all of which counteract the movement within the museum and negate the expected linear accessibility of the museum's floors.

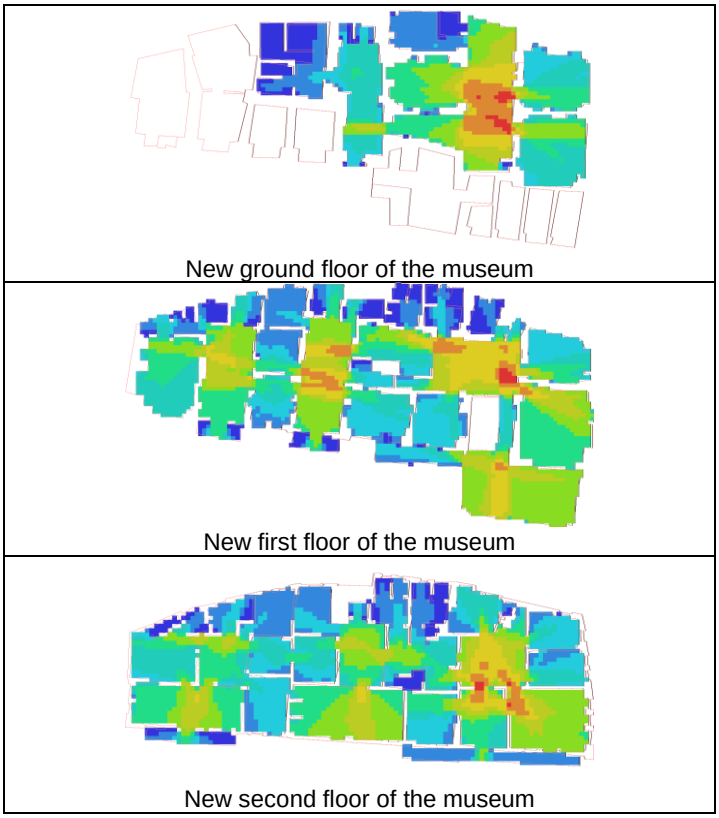


Figure 6. Visual integration of museum's floors (red as the most visible points and blue the least visible points) (Source: authors)

While the adaptive use architectural layout adopts a new circulation system and represents an attempt to move away from the emphasis on centrality and centripetal forces of the original plan to a continuous reference point for overall navigation and experience, the syntactic properties seem to contradict this intention. The main axis ceased to act like the spatial center of the museum as a whole. Although the new curatorial suggestion seeks to create a linear procession; the older

narrative of the house scenario and vertical penetration seems to still dominate. Maintaining the older hubs of syntactic centrality in fact encourages the older vertical movement to the upper floors but it is not supported by the adaptive use plans. This eschewing of the older centrality is further complicated due to the penetration of light, and the hieratical un-clarity of the sizes of spaces.

These characteristics are clearly demonstrated from a point location in both the single house as a detached entity and the museum as an aggregated space (figure 7). Results also show that despite the three zones of syntactic centrality (central spaces; figure 2) there has been neither an architectural nor a compositional connection with the beginning of the route. In fact the new spatial composition of the museum did not benefit from the vistas of distinctive locations, nor did it continue the older phenomenological spatial thesis (figure 7). Thus, the Abu-Jaber museum lacks clarity of spatial structure. Visitors did not grasp the spatial morphology of the museum and did not manage to track their journeys back.

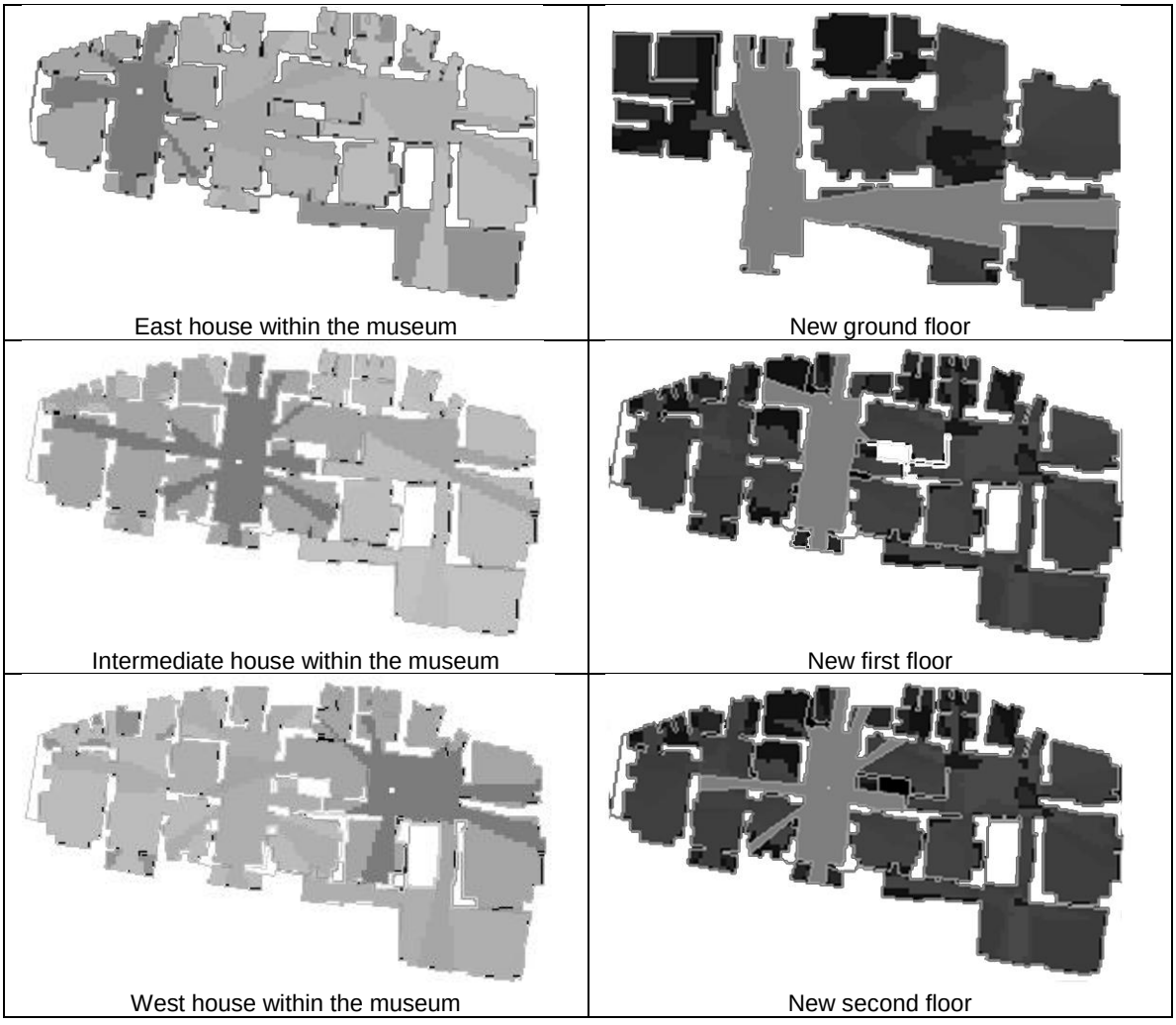


Figure 7. (Left) Isovist from a point location in a single house compared to the aggregated museum space (source: authors); (Right) visual field of the museum at main circulation spaces (source: authors)

The Spatial Strategies of Display

To better understand the design intention, the spatial strategy of display was reviewed. The museum has many stories to tell. The galleries include: the golden age of Salt, Salt in its regional context, education history, medical history, municipal history, archaeology, geography, agriculture and culture, architecture in the 1900s, significant houses, and the Salti house (which includes: the kitchen and food exhibits, dining room, bedroom, courtyard, living-area and related style of social life).The exhibits constitute a mediating force between the experience of the current city and the museum.

When looked at in conjunction with the galleries, these displays do not impose any clear sequence. The ways in which the stories are narrated do not appear to have been in the design brief nor do they suggest a notion of a single coherent story, or the possibility of multiple narratives. According to the curator the current sequence of the narration was determined after the visitor path was designed (Al-Masri, 2014). The path suffers from having several intersecting loops, thus is not followed by the visitors. When discussed with the curator, it was clear that the final arrangements for the exhibits had yet to be reached. This hesitation resulted due to the lack of a defined narration strategy at the early design phases.

The investigation revealed that there is no close integration between the spatial structures of the galleries, the spatial structures of the entire buildings, or the spatial strategies of display. The design does not use space to serve any clear narrative, an issue which hampered the creation of a rich spatial and aesthetic experience. The lack of visual relationships with the courtyards and the way they integrate with the room galleries does not advance the idea of the museum as a dynamic field of interesting routes. It becomes very clear that the chaos in spatial organization of the new museum was not dictated by an imposed narrative- curation.

DISCUSSION AND CONCLUSION

The analysis showed that the spatial morphology of the original building prompted an activity of positive visual experience in the observer. The flow of the spaces kept the observer anchored perceptually throughout his journey. It analytically showed how, the original experience of each of the houses examined had created visual engagement and encouraged the observer to explore the building. This positive experience, the analysis shows, does not fully hold in the new design. Gathering spaces, which were key elements in the relatively shallow core of each house floor, became part of the museum's deeper sections as the new design abruptly sequenced them to the rest of the spaces of the houses. Contrary to the original houses' functional concentric integration and visual visible cores, the museum's integration and visual visible core do not organize the whole layout or spread out, nor do they link the smaller courts on the east, intermediate and west sides of the one floor. The original embedding of several clear and powerful central spaces has critically affected the whole itinerary and confused choice at the global level, making way-finding difficult.

In fact, people move locally and cannot grasp the global structure from the entrance; the local conditions have a bigger affect than the global layout. Further, the vertical axis which used to link the two floors within each house now creates a false perspective and a misleading visual play that negatively affects the visitor's route. Observations showed that people are hesitant and confused at each sub cycle and always question where to return to continue their journey. From the syntactic point of view, the gathering spaces of the new museum did not develop an efficient clear integration center. By implication, these centers did not fully succeed in maximizing the opportunities for co-presence and encounter. The original embedding of several clear and powerful central spaces has critically affected the whole itinerary and confused choice at the global level. It may be argued that the designers' concentration on preserving the original shell limited them from viewing the whole picture of the livable museum of shell and space. Thus, clear tension arises between the global and the local properties of the museum's space. The fact that visitors are unable to orient themselves with respect to the layout as a whole underscores the way in which the design mediated the building shell and the spatial qualities of the building, an issue which the "re-

architecture" missed. By detaching the conservation interventions from the uniqueness of the original configuration of space, a loss of meaning occurred.

This is in contrast to the original houses where cores are interconnected, and circulation choices are restricted on the local scale. This reinforces their role as ordering devices and contributes to their presence regardless of their actual built-up size. This older experience regains its strength at the entry level of the museum where the designers located the entrance at the heart of the new layout allowing by such allocation the experience of the original double-volume space to be short-looped. Despite the designers' attention to providing spaces for experiencing architecture at several locations (i.e. coffee shop and adjacent balcony), the late introduction of such spaces within the long-looped experience of the museum diluted the quality of that experience.

The purpose of this comparative study goes beyond examining the successful creation of a functional or clear sense of perceived space into appreciating the qualities of the original spaces that were initially available through experience. By focusing on the factors that had a role in shaping the user's experience, it tried to unravel what Bafna and her colleagues focused on when they stated that "It is not in abstract properties of visual artifacts that their imaginative power lies, but rather in the choice and manipulation of the specific set of cues that are brought into play ... the manipulation of visual cues can be obtained not just by articulating the building structure, but also by articulating the spatial organization and controlling vantage points."(Bafna et al., 2009, p. 11). In that sense these ideas could provide designers with a better understanding of the consequences of the strategic decisions they make when dealing with historic locations and encourage new ways of handling internal environments.

Our findings suggest that the preserved museum cannot be used in a clear way. Movement through the spaces requires an understanding of the way in which local parts are interrelated into a whole pattern, a concern that was neglected. Furthermore, no efforts were made to respond to the new spatial morphology or to the perception of the new space. Neither architectural gestures nor major internal interventions were made to guide the visitor's path or to suggest guided transitional clues, an issue that might be related to the conservation strategy.

Adaptive use remains challenging as it changes the functional system in an existing building designed for a different use. Conversely, this paper argues for a change in the way of thinking when approaching the rehabilitation of existing buildings. It encourages refinements in the way some strategic design decisions are made and encourages a new way for handling space. Although the architectural conservation interventions enhanced and used the architectural compositional potentials of the shell, the power of space itself and the potentials of its spatial and ambient morphology seem to have been neglected as attention was awarded to the preservation of the integrity of fabric, leading the designer to minimize physical change. As such, the designer opted to take the visitor in a circulation pattern that ignored the original space syntax. The analysis shows that the phenomenological issues might be unseen agents at work. Space characteristics, overall geometry, private vs. public, and front space vs. back space all provided a holistic experience. Neglecting such unseen aspects in the re-architecture of heritage buildings results in a schism in the connotations of the spatial experience. Thus, there might be a gap, an arbitrary relationship, between architectural and spatial languages.

This paper bridged areas of adaptive use and museums using space-syntax analysis methods. Its combined methods offer a unique approach to investigate museums in general and heritage buildings in particular, offering as such new possibilities for improving design. It is of relevance to architectural historians, designers, and museum curators.

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