



Gulf Organisation for Research and Development

International Journal of Sustainable Built Environment

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Review Article

The edge environment in Cairo: An approach to reading the social pattern language of the Middle Eastern built environment

Gamal T. Mohammed^a, Noha Mahmoud^{b,*}

^a *The University of Sheffield, Landscape Department, Sheffield, UK*

^b *Effat University, Achitecture Department, Jeddah, Saudi Arabia*

Received 25 January 2013; accepted 13 April 2013

Abstract

This paper introduces a new concept that might help in reading both social life and urban process, showing how they are interlocked in a way that clarifies ideologies and their implications for the physical form of the city. This reading is capable of envisioning and analysing the relationship between the cohesive social pattern language of traditional built environment and its physical expression, relying on a new reflective and exploratory concept, the edge environment. This illuminates the relationship between the values hidden beneath the physical edges of spatial morphology in Middle Eastern urban contexts like Cairo, and allows those values to be understood in terms of modern ideologies relating to the human community. The concept of edge environment might help in the design education particularly in conservation and up-grading processes, as an analytical tool and as a design method by careful interventions at edges by fine tuning of the edge environment.

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Keywords: Social pattern language; Social sustainability; Urban spatial morphology; Public participation; Edge environments

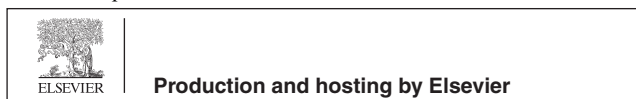
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* Corresponding author.

E-mail address: noha_nga@yahoo.com (N. Mahmoud).

Peer review under responsibility of The Gulf Organisation for Research and Development.



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1. Introduction

Cities in the Mediterranean basin, and in particular Middle Eastern cities, have lost much of the diversity that contributes to street life and vitality. The dense and varied rhythms of traditional buildings, spaces and streets are now being replaced by larger residential and commercial developments. The great longevity of beautifully crafted spaces in traditional Middle Eastern cities which have maintained their multi-functionality and urban characteristics through many historical periods, stands in contrast to many modern cities and new developments that fail to achieve such sustainability. The central assertion of this paper is that this sustainability may be related to historic city layouts and traditional urban fabrics, which appear to be much more ideologically responsive. In many ways these layouts constitute a physical manifestation of ideologies that were created to maintain social interaction. In *A New Path to Urban Rehabilitation in Cairo* Bianca (2004) says:

“The cohesive patterns of their historic urban fabric embody meaningful modes of social interaction and tangible environmental qualities, which transmit the experience of past generations and are still able to shape and support contemporary community life; for the values inherent to their spatial configurations transcend short-lived changes and fashions.”

This paper seeks to explore some of the reasons behind this apparent success, focusing on the relationships between social values and spatial configuration by examining the spatial organisation of Middle Eastern historic city centres. As Akbar has recognised, when city planning and design development separates ideological and physical dimensions, this can adversely affect the social relevance and value of city fabric (Akbar, 1995). Conversely, greater unification of ideology and physicality is associated with participatory design and in particular to the balance between top-down and bottom-up decision making processes within traditional built environments. Identifying the optimum balance between top-down and bottom-up processes in the traditional built environment may make an important contribution to ensuring that the physical configuration of built forms is conducive to delivering a

socially responsive built environment. The paper will demonstrate that managing the interface between built form and public realm, the edges, through this balance of top down and bottom up is the key to social sustainability. The central theme of this paper is that lessons of social distinctiveness can be found in understanding the important role of the physical edges in this environment. So, first we must ask, what is the cohesive social pattern language of these historic urban fabrics, and what lies behind their apparent success?

This paper is in three parts. A unified framework for understanding the cohesive social pattern language of the traditional built environment is applied to explain aspects of social sustainability which are then illustrated in three case studies of sites in old Cairo. The paper concludes with a discussion of the significance of the concepts of edge environment and its fine tuning.

2. The cohesive social pattern language

An appreciation of social pattern language is central to understanding the role of people in building, managing and maintaining their own environment, as these traditional contexts relied on the interaction between dead and live loads of spatial form (Mohammed and Thwaites, 2010). In this context, the dead load is essentially given by architectural interventions such as the fixed and built in features of space, whereas the live load is a term which describes the social conception of urban form, such as displayed goods outside shops, any light and moveable structure that shop occupiers add to their facades, various transactions among people, passersby and vendors. Their interaction created a kind of socially responsive pattern.

Contemporary Middle Eastern writers like Basim Hakim and Jameel Akbar have analysed the mediaeval treatises of master masons, and Western scholars like Christopher Alexander have investigated the edges of traditional built environment. They have argued that the success of this social pattern is based on three factors centred on the role of human agency. Firstly, the building regulations of the traditional built environment were rooted in ideological principles that had evolved into accumulative and interconnected entities (Alexander et al., 1977) in the form

of building patterns which were the end product of a developmental process which started from people's needs and ended with generalised building laws (Akbar, 1995). Secondly, the accumulative and adaptability characteristics of these patterns (Lindley et al., 2007) meant that they were used over and over again without repetition, embodying the flexibility of these building regulations. Finally, these patterns were subjected to a specific order and operated within a hierarchy and sequence which was explicit in the phasing of the building process in a two-stage top-down phase which set out the patterns of the key urban features such as the main thoroughfares, public squares, large plazas around the great mosques and the larger urban grains, and then regulated the pattern of in-fill around them.

The role of human agency is reflected in the spatial morphology through the vibrancy and legibility of cities and in the level of people's participation (Habracken, 1986): traditional cities worked as living entities because they were the products of engagement by their inhabitants through shared lives and common social patterns, and a shared responsibility that influenced their buildings.

2.1. Two components of human agency that maintain the linguistic metaphor of the social pattern as an urban language

The social pattern has rules to unify its grammar and diversify the accents of the spatial urban morphology which acts as an urban language of the built form. The uniqueness at macro-level of spatial form (Hakim, 2007) results from top-down processes and acts as the basis of the urban language all over the Middle Eastern region. There is great diversity at the micro level of spatial form within each region resulting from community-based customary rules or bottom-up processes, providing different accents within the same language. This diversity is generated by the interplay between bottom-up conventions and the shared responsibility of the inhabitants. These two components together give this pattern its ideological dimension since they are a product of the mutual relations

generated between physical form and the values and forces that lie beneath this physicality.

2.1.1. The conventions, unwritten laws

The conventions at play in this process emerged through a generative process which transformed ideological values into aesthetically active bottom-up conventions. This transformation worked through two processes, feedback, positive or negative, and networking (Hakim, 2008), which played a key role in maintaining the dialogue between inhabitants. Positive feedback came from the repetition of good examples that had been initiated by bottom-up processes and were supervised from a distance by top-down processes in the event of disputes between neighbours. This supervision ensured that negative feedback on the basis of undesirable and harmful acts would not recur. These conventions encouraged people to engage in dialogue, created social interaction and were based on proscriptive rules which only defined what must not be done, allowing greater freedom to people in what they did do. The centralised laws of modern times are, by contrast, prescriptive and seek to define and control everything that may be done. This pattern embodied a language that encouraged and corrected mistakes, disseminated good examples and excluded disputed ones.

Analysis of this social pattern shows that the two processes, feedback and networking, operate in three phases, emerging and expressing values, a tactical phase and an aesthetic phase (Fig. 1) (Mohammed and Thwaites, 2011).

The first phase has two steps, recognition of need and proposals for a solution. People discover solutions to meet specific needs, which may embody religious, social, cultural or political values (Akbar, 1995). The tactical phase has two steps: an ideal example and the pattern. The solutions proposed in the previous phase are refined to form ideal examples, that is, optimum valid tested examples which are then widely used and well-known and therefore function as a pattern. This phase maintains spatial social sustainability. In the aesthetic phase a pattern which is proven and achieves success in the tactical phase gains validity and credibility as a law which can be generalised

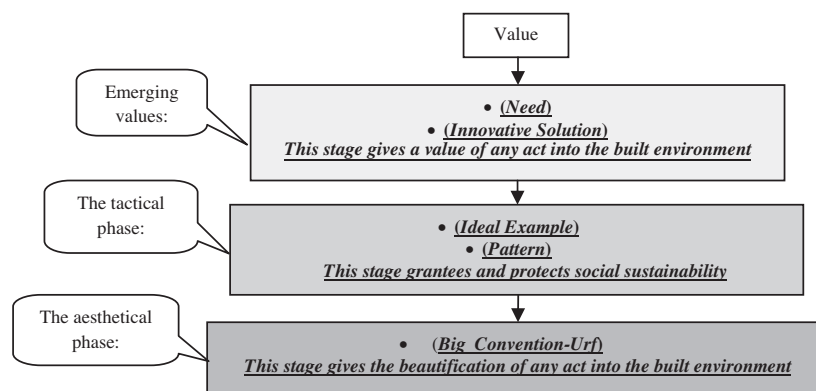


Figure 1. Regenerative process of bottom-up conventions.

and stated as a general principle, a convention (Urf) which is articulated into smaller practical conventions used throughout daily life. This phase produces distinctive character in the built environment.

2.1.2. Shared responsibility

These conventions worked through a mechanism of responsibility distribution as it is understood within responsibility theory (Akbar, 1984). The concept of responsibility contributes to a deeper understanding of the traditional Islamic built environment because it sees that environment as a process, not as a product. Responsibility describes the perfect distribution of claims and rights, ownership, use and control, between different parties in the built environment (Akbar, 1995). Its distribution was always followed by various actions that the different parties were expected to take in respect of the built forms, according to their rules or rights (Habracken, 1998). An understanding of the distribution of responsibility thus helps contemporary professionals and specialists to read the built environment in a way that is rational and predictable. In some cases, a single party might have the rights to all three claims together, a unified responsibility, to use, control and own. In other cases, one party might have one or two rights. For example, vendors in market places only had the right to use and control their own places, without actually owning them. This is possessive responsibility. Sometimes shop occupiers only had the right to use, without owning or controlling, through a rental agreement. This is permissive responsibility. In this case the shop occupiers were not allowed to change the interior or the exterior walls by removing or adding, but they were only allowed to use or to rearrange the interior space to display their goods. Moreover they were not able to add a deck or overhead shade to the shop frontage without pre-consent from the owner. Occasionally the physical form or property was dispersed between three parties, when one party owned, the second used and the third controlled. This is dispersed responsibility, as in the public service buildings owned by central authority, the endowment institutions (Akbar, 1988).

These different forms of responsibility distribution created a balance of control in the traditional built environment, resolving the tension between top-down and bottom-up approaches by filling the gap between them and helping to determine when top-down interventions

should gradually give way to allow processes of bottom-up or self-organisation to take hold (Fig. 2). This helps to identify the indeterminate margin between territorial expression, in which activities dominate the fore-space of buildings, and building expression, in which there is no activity outside the building line.

2.2. The principle of no harm

The role of human agency in the traditional built environment was centred on preventing harm, risk or hazard to others, to the environment or to people themselves which was in different forms based on different environmental, social or topographical priorities. The principle of causing no harm was derived from the teachings of the Prophet Muhammad (PBUH), back to 650 B.C., and involved not causing any harm to any users of space through the prevention of harmful action (Al-Nawaawi introduced by Zarabozo (1999)). This was the most important foundation for all building regulations, and generated conventions that have regulated the built form in cities all over the Muslim world. It delineated the role of community members towards each other and towards their built environment, and had a particular relevance to the way the cohesive social pattern of traditional built environment operated. The limits of the margin between building and territorial expressions were decided according to the level of harm that might occur to any member of the community, so this principle powered sustainable communities, enriching and enhancing a sense of belonging.

This social pattern was built on the idea of the community as a single entity, able to reduce any potential harm or risk to its members, so it has been conceptualised by scholars such as Hakim et al. (2006), Olwig (2005, 2007), as a community-based customary rule system. In the Muslim built environment, the basic foundation of the bottom-up process depends upon the idea of the collective reaction of society against any harmful act by a community member or stranger (Lindley et al., 2007; Roselló et al., 2009). The idea of preventing harm and searching for collective solutions is centred on, and attached to, various concepts such as control and management of the harmful and harmless, social vulnerability, vulnerability of the human environment, adaptability and the sense of community. So, preventing harm in traditional built environment can be seen in two ways.



Figure 2. The balance between the building and territorial expressions achieved by responsibility distribution.

2.2.1. Preventing harm within traditional city centres

Preventing harm can be seen in the control and management of public spaces, to control undesirable acts and instead encourage desirable ones. There was freedom of action in public spaces to encourage ‘responsible freedom’ (Carmona et al., 2010), giving inhabitants of these communities the ability to carry out activities as desired but with the recognition that public space is shared (Carr et al., 1992; Akbar, 1995). There was a broad consensus of what was permissible or tolerable (Lynch and Carr, 2008), so various regulations or conventions evolved as a result of the collective feeling of these communities.

This core principle played a significant role in manipulating functional and cognitive cues to increase the possibility of better behaviour in public domains, encouraging community members to participate and behave acceptably (Carmona et al., 2010). The liveliness and vibrancy of this environment was a product of good streets, sidewalks, parks and other public spaces, which brought out the best in human nature by enhancing the feeling of shared responsibility for any damage or harm that might occur in the public domain. This is often translated into a highly risk-averse approach which discourages all harmful activities (Jacobs, 1961).

2.2.2. Preventing any threat from outsiders or insiders

Through the lens of this principle, the traditional city was conceived as a ‘polis’ or a self-governing political community. This was reflected in the main streets and gated communities where there might be a risk of crime or dangerous strangers. The streets had to not only defend the city against risk from strangers, but must also protect the community from risk from within, and this was the role of the traditional gated community (Jacobs, 1961; Grant and Mittelsteadt, 2004). These shared places were a kind of restricting urban environment, more liveable, secure and controlled, not only by police but also by the community sharing a place (Newman, 1973). The residents had the power to control and to manage their environment, the basis of the bottom-up process in such societies expressing this control architecturally through the hierarchy of spaces. This hierarchy was achieved by dividing the quarter into sub-quarters by building gateways all way through the quarter in hierarchical manner. The self-governing cells in traditional communities were ruled through ethnically specialised quarters, each with their own Sheikh, in a similar way to modern municipal government (Marcais, 1928;

Abu-Lughd, 1987). The quarters were governed by bottom-up processes and community-based customary rules.

Generally, the principle of ‘no harm’ encompasses social vulnerability to risk, and public participation (Fedeski and Gwilliam, 2007). Some traditional cities within the Middle Eastern region were less vulnerable socially, as the inhabitants were only concerned with vulnerability when there was a risk of being physically exposed to a hazard (Alexander, 1993). The vast majority took into consideration the social as well as the physical dimension. The complexity of social vulnerability was described as the capacity of the society to address hazard and damage (Susman et al., 1983; Blaikie et al., 1994; Cutter, 1996; Hewitt 1997). This social vulnerability stems from the interaction between population and locations of activities, particularly at the edges of spatial morphology, the structural and spatial characteristics of territories such as size, distance, position, distribution and topologic sequence. Urban design and landscape approaches have been considered the principle of no harm in the traditional built environment as a comprehensive principle because it includes the three domains of the built environment, physical, social and psychological. The architectural measurement or the physical expression of this social vulnerability could be seen in the level of openness or compactness of residential spaces of these traditional communities. So, social vulnerability has been re-conceptualised to include consideration of the ‘vulnerability of the human environment’ (Roselló et al., 2009).

Therefore, it can be argued that the traditional built environment in the Middle East was managed and run through a social pattern language that developed from a combination of three elements, tools, core idea and theme (Fig. 3). These three elements composed the ideological dimension of traditional built environment in the Middle East. The tools comprise the two main components of human agency, conventions and shared responsibility between inhabitants. The core idea is the principle of no harm, which is central to this social pattern. The balance between the two decision-making processes is the mechanism through which the tools operated. Altogether, this pattern language created a built environment which was socially responsive.

3. Reading the pattern language through case studies

The urban culture of mediaeval Cairo was made up of a mixture of cultural layers from different periods (Noweir and Panerai, 1989). This overlapping of historic layers

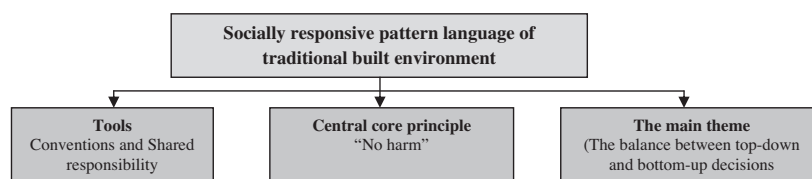


Figure 3. The social pattern language framework.

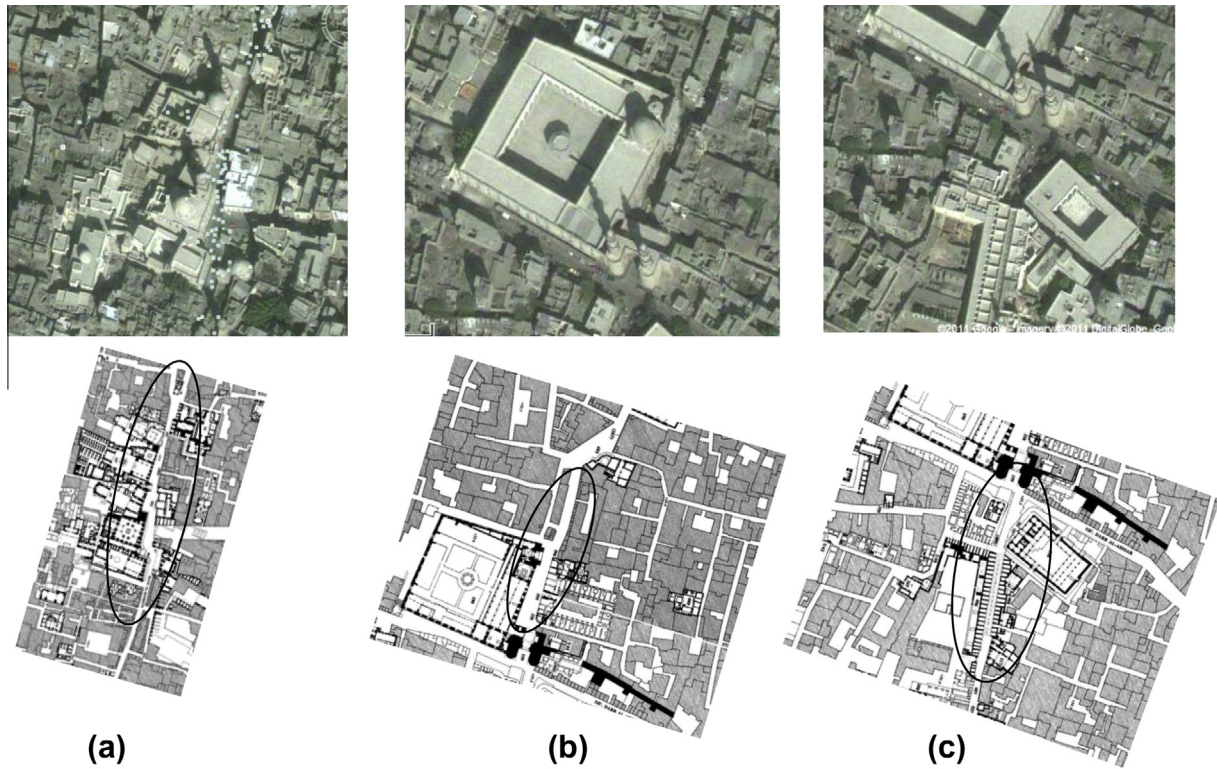


Figure 4. (a), (b) and (c) The location of the three cases in historic Cairo. (a) Space of Been El-Qasreen; (b) space of El-Sokaria; and (c) space of Bab Zewila, source, Google Earth.

reflected a long urban development process of formation, growth, change and transformation as well as many interactions throughout time and place. The spaces of Been El-Qasreen, El-Sokaria and Bab-Zewila have been chosen as examples of this social pattern language of the built form as they present interesting cases of a traditional urban culture of contradistinctions, diversity and homogeneity (Al-Sayyad, 2011) (Fig. 4). These three sites still maintain aspects of mediaeval social life, drawing clear social boundaries which make them distinct from the surrounding context (Denscombe, 1998), and the balance between the two decision-making processes is clear around the edges of spatial morphology of these sites. These sites witnessed a high level of competition between the elite relating to the possession of land and property. The main role of the case studies is to illustrate the social pattern language of these places, which are good examples of the balance between top-down and bottom-up decision-making processes, and allow a focus on the concept of edge environment and its role in maintaining social interaction in traditional urban forms.

The case studies have been studied through observational graphical analysis, a traditional method that uses freehand sketching (Al-Kodmany, 2001). This method is useful because it can be used to depict and document the evolution of towns or neighbourhoods in the past, present, and in a suggested future, so it can be used to help preserve the desirable characteristics of towns. Henry Sanoff used the method in his book, *Visual Research Methods in*

Design (1991) in which he developed the concept, ‘knowledge of emerging environmental preservation strategies’ (KEEPS). In this paper, this method is used to re-build and re-envision the appearance of the traditional city, and to interpret documented data from the survey. This fosters visual analysis and allows examination of the multiple layers of spatial form. This work proceeds by analysing changes and their physical impact on space configuration, particularly focusing on the edges and walls of space: analysing the transactions and interactions that took place within the space to determine the position of territories, and where its qualities and the most usable areas were; illustrating the evolution of building processes and harm caused by squeezing space or thoroughfares; documenting the fluctuation of building lines and urban grains over time; observing, estimating and analysing graphically the social aspects of open spaces including passive and active engagement with the environment; and documenting graphically whether those changes were initiated by people or by the authorities. This method enables the observational part of research to deepen its knowledge and experience of the case study sites (Tufte, 1997).

3.1. Decision making processes and the sustainable community

Social pattern language can be read and understood in these cases by studying the balance between top-down

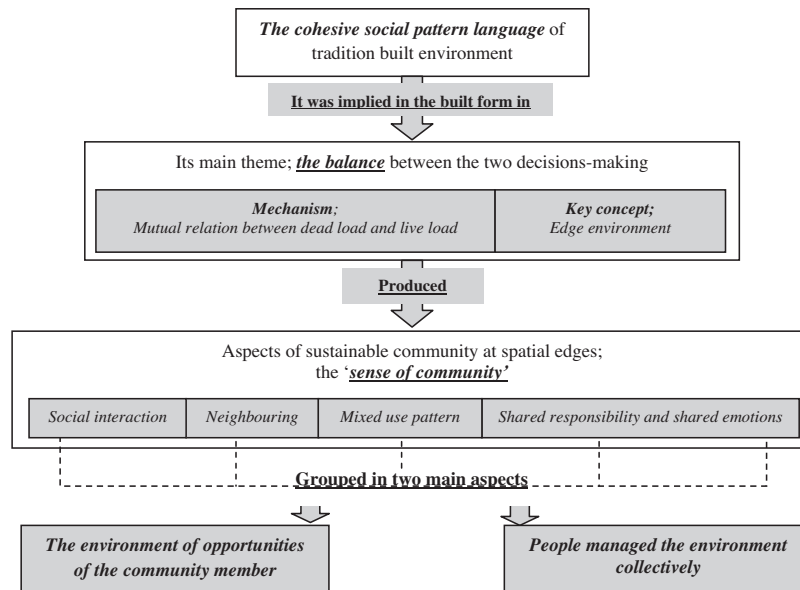


Figure 5. The reading framework of the social pattern language of the traditional built environment.

and bottom-up decision making, which was central to and worked through the mechanism of the mutual relationship between inhabitants and their physical surroundings, the live and dead loads of space. The balance of these reciprocal relations took place through conversations, negotiations, networks and feedback between the inhabitants, which is why this social pattern is described as an urban language. Analysis of this balance has shown that it generates several aspects of social interactions concentrated at the edges (Fig. 5).

From its study, the key concepts of the edge environment and fine tuning of the edge environment have emerged. The concept 'edge environment' helps us understand the mechanisms of social interaction in the traditional built environment, and the distribution of responsibility between the different parties. It has been applied in the three case studies in examination of the relationship between the live and dead loads generated around the edges of space. A common theme in the three sites is that 'spaces became corridors to link, not rooms to live' because priority was given to the private domain over the public in Middle Eastern cities. In these cases the edge environment is mainly seen in the conversion and development of communal land and fore-spaces in the public domain into private spaces, so this concept can be seen as the pivotal or a polar pattern of the traditional built environment (Meyer, 2001).

People of these traditional societies defined and developed their own solutions to meet environmental and development problems, and they worked towards shared power and participation at a local level which constitute the fundamental basis of a sustainable community (Canadian University Students Organization, 1989). A close bond of association between local residents and their physical surroundings was created from shared emotions and interests,

feelings of shared responsibility towards the local environment, respect for the role of individuals and groups as well as the freedom given to people to act with limited intervention from central authority. The most important aspect of a sustainable community was a sense of community, including shared ownership of places, the priority given by people to their environment in terms of social and economic investments, public participation and the significant role people played in decision-making relating to issues in their built environment, the collective feeling of residents that they should protect their environmental resources and social structures against any potential risk.

3.1.1. Reading the balance and key concepts of the social pattern

At the scale of the space as a whole, the motivations behind the feeling of the sense of community were central to the roles and attitudes of individuals and groups, as well as to the behaviour of central authorities towards the community, and their ability to communicate with each other in the top-down and bottom-up processes of decision-making. This is best exemplified in the space of Been El Qasreen, where the top-down process was limited to delivering architecture and elements of the urban infrastructure like official buildings and big institutions. The bottom-up process needed less design, but more work to do with issues related to how spaces were managed, used and controlled. The balance in this space shows the development of monumental buildings concentrated on the Western edges of the space (Fig. 6): the urban grains on the western edges became larger than those on the Eastern edges, making the area more coherent and its built form easier to read creating a kind of environmental preference (Kaplan and Kaplan, 1982).

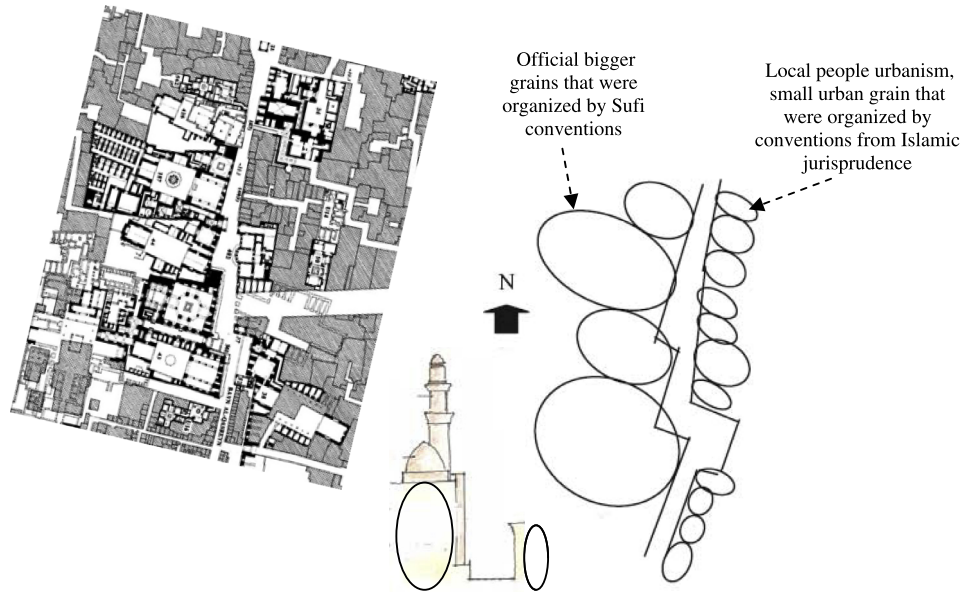


Figure 6. The balance of the first case study. Top-down process delivered bigger urban grains in the Western edges, whereas the bottom-up produced the smaller urban grains in the Eastern edges of space.

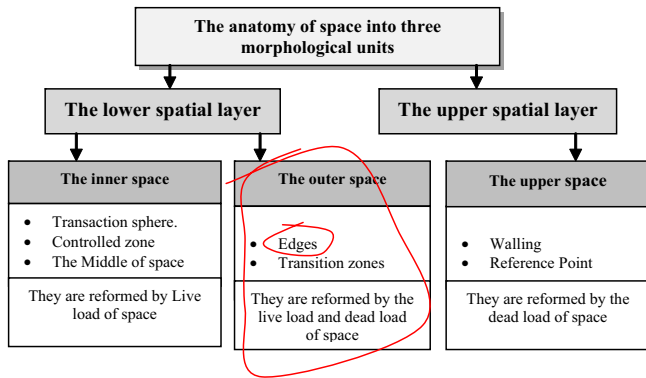


Figure 7. The anatomical analysis of spatial urban morphology.

At the level of the detail of urban spatial morphology, this social pattern or urban language cannot be seen while the traditional built form is perceived as a single entity: its elements need to be analysed separately, one part at a time. So there was a need to develop an anatomising tool that was fit for purpose. The anatomical tool is capable of revealing aspects of the relationship between the social life of places and their spatial and physical expression in a way that conventional analysis does not. Its components comprise two working models, the physical and ideological, its tools are the conventions and responsibility models, and its key roles are anatomical, analytical roles and in supporting design. The main task of this anatomical method was therefore, to dissect the urban form into spatial layers (Mohammed and Thwaites, 2010). The lower layer is composed of inner and outer spaces, whereas the upper layer is composed of outer space only, each with

its own people, activities and spatial relations distinguishing it from the others (Fig. 7).

Through such anatomical analysis, it has been found that this social pattern generated a balance which governed each spatial layer independently, each functioning as an environment in itself. The mutual relations between people and their physical surroundings, through which this balance was operated, characterises their spatial layer and the relationship between the dead and live loads of spatial form. The most influential mutual relation forms were concentrated and generated around the outer space of the lower spatial layer, at the edges. Examples of the way in which these reciprocal relationships contributed to a sense of community include socio-cultural mutual relations, religious mutual relations, economic mutual relations and cultural mutual relations. Each case study contained examples of these forms.

It has been observed that all social processes in market places and thoroughfares, such as transactions, agreements, disagreement, disputes, co-operation between vendors, users and shop occupiers, interactions between passersby and processions, took place around the edges. In addition, all built-in decks, overhead shades, and vendors' places were built along or within edges, based on an interactive dynamic mutual relationship. These mutual relations were particularly attached to monumental and public buildings. In residential quarters and gated communities they could be seen in the collective role of the community in managing, maintaining, using, controlling and utilising the fore-spaces (fina') of abutting houses. These relations have also been observed in the development of dead land into marketplaces, beside the old walls where they brought new life to these dead edges. This can be seen in the third case study, of the space of Bab Zewila (Fig. 8).

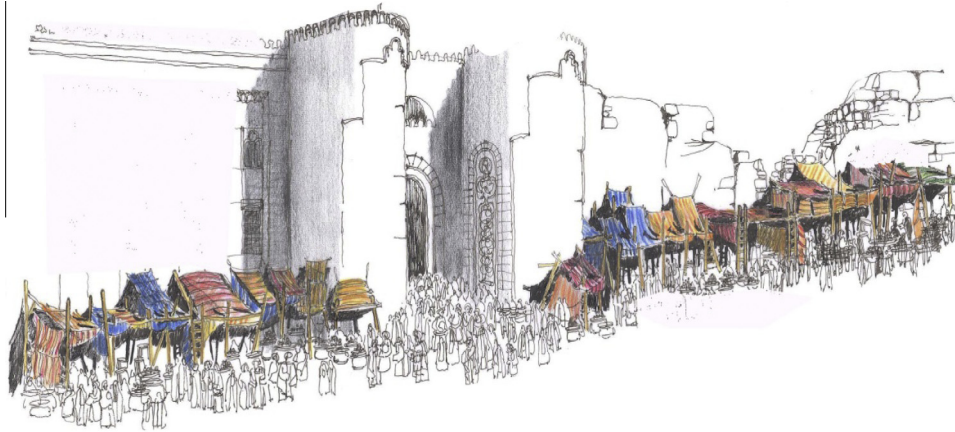


Figure 8. The mutual relations developed dead land abutting Bab Zewila into marketplace, where they brought new life to these dead edges.

So it appears that aspects of sustainable community and its built environment are particularly visible at the lower corners of any open space, ‘spatial edges’, because all the transactions there are pushed towards the edges by spatial movement or dynamic transaction spheres.

The edges of spaces reflect the life of a place, its identity and attachment (Kim and Kaplan, 2004), its character and most importantly its ideology. Where they occurred, top-down interventions were concerned with a removing or adding acts, off or onto the edges. The second case study, of the space of El-Sokaria, illustrates this as its edges reflect all aspects of the environment and are the key morphological factor responsible for transforming the lower space socially, economically and environmentally (Fig. 9).

Interactive edges have various forms, religious, socio-cultural and commercial, each related to the mutual relation by which it is controlled. Each form emphasises the central idea: the edges are the place of social interaction and the playing field of bottom-up decision-making. Two general bottom-up rules driven by the core principle of ‘no harm’ have regulated all these forms of edges (Al-Nawaawi introduced by Zarabozo (1999): the middle of space belongs to passersby, not to buildings or activities; and passersby have a right of objection against any obstacle or harmful act in the passageway (Akbar, 1995). These two rules generated conventions that regulated these edges physically like the conventions which include right of way, rights over fore-space, easement rights, the rights of neighbours (Hakim, 1986). Besides these general conventions, each of these edges was controlled by its specific combination of Sufi and Islamic jurisprudence conventions (Mohammed and Thwaites, 2010, 2011).

The religious and socio-cultural relation edges can be seen in the first case study, the space of Been El-Qasreen. These types of edge were controlled by conventions concerned with creating mutual relations between spatial walling and passersby, so between the dead and live loads of space. This mutual relation is mostly clearly seen in the dispersed model of responsibility, in which rights and claims are distributed between three parties. This model was the

key organiser of the system by which the elite endowed buildings for religious and social charitable purposes in order to gain public acceptance and enhance their political and religious power. These mutual relations created edges that might be perceived as something alive. The religious-cultural mutual relation edge between the mausoleum and passersby formed one of the most important social patterns of daily life through the application of the Sufi convention of a window sitting reciter (Mohammed and Thwaites, 2011). A tomb was attached to the back of the complex later, as an expression of the continuing power of the royal family. The design requirement for such a building was that it should be exposed to the space and articulated from the building line. The aim was to create a reciprocal relation around the mausoleum’s windows, between passersby and the deceased person in the tomb, in this case the king El-Saleh Ayyub. The mechanism of this mutual relation relied on the reciter, a man whom was employed by the royal family, who sat in the tomb’s window reciting verses from holy Qur’an, attracting passersby near the tomb to benefit from hearing holy Qur’an. This might lead passersby to pray for the venerated tomb occupant, so the tomb had to be located in an imposing position along the passageway (Fig. 10) (Mohammed and Thwaites, 2010).

The socio-cultural relation edge can be seen in this space at the edges of various Sabil buildings (water house), another kind of endowment distributed between three parties. This relation was based on religious, charitable and social mutual relations. Its function was the use of water inside space: it is religiously desirable to provide water for the poor who cannot afford cisterns in their own homes, so it was a pious act for the elite to endow places which offered free drinking water (Antoniou, 1998). The large, round, corner and elaborated windows on the ground floor of these buildings generated this socio-cultural mutual relation around its edges, as many people gathered to obtain water, as people drank from taps which came out of the windows. They would wish good health and pray for the establisher of the endowment. The windows are projected

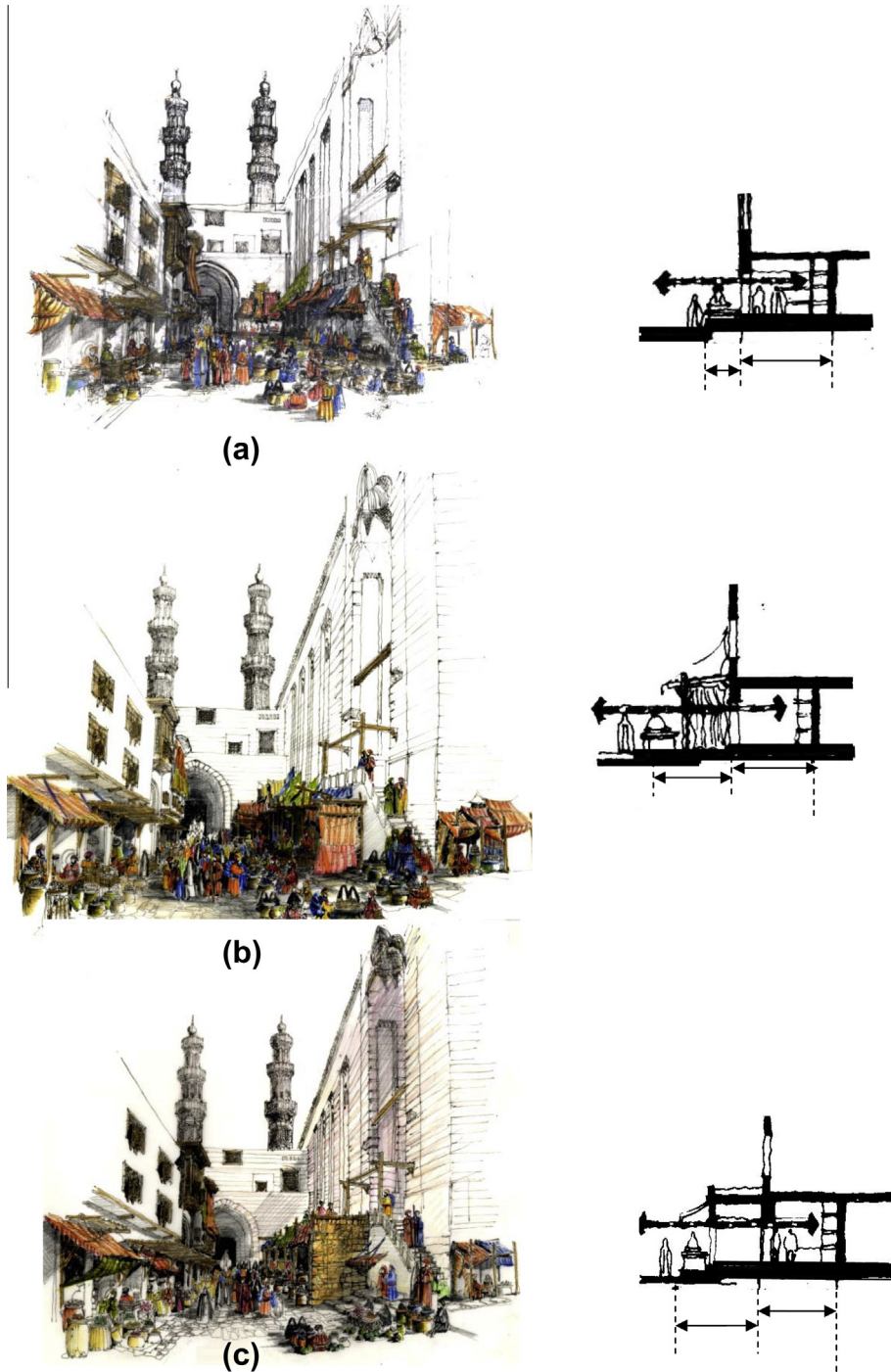


Figure 9. (a) During 1412-1422, the complex was in the permissive model, under the control of the erector, the king. (b) After 1422 the shop occupiers started to increase the level of control they had, transforming their temporary structure to a permanent one. (c) The shop occupiers gained power, eventually owning their shops. The tenants became shop owners, and the extensions became built in shops with fixed structures.

into the space of Been El-Qasreen in order to expose them to the largest number of passersby without straddling the passageway. The dynamic shape of the building line arose because these buildings were always attached to the walls of space according to the convention that ‘the middle of space belongs to passersby, not to the buildings’ (Fig. 11a). The mutual relation was further emphasised by elaborated and heavily decorated friezes conveying

spiritual messages. As people drink, they contemplate the decoration and these written friezes, so that the spatial experience changes from walking to stopping completely. There are also public services provided on the upper floor, where there was a Kuttab, a school where children and the orphans of the districts learnt how to recite and memorise the holy Qur’an (Fig. 11b) (Mohammed and Thwaites, 2011).

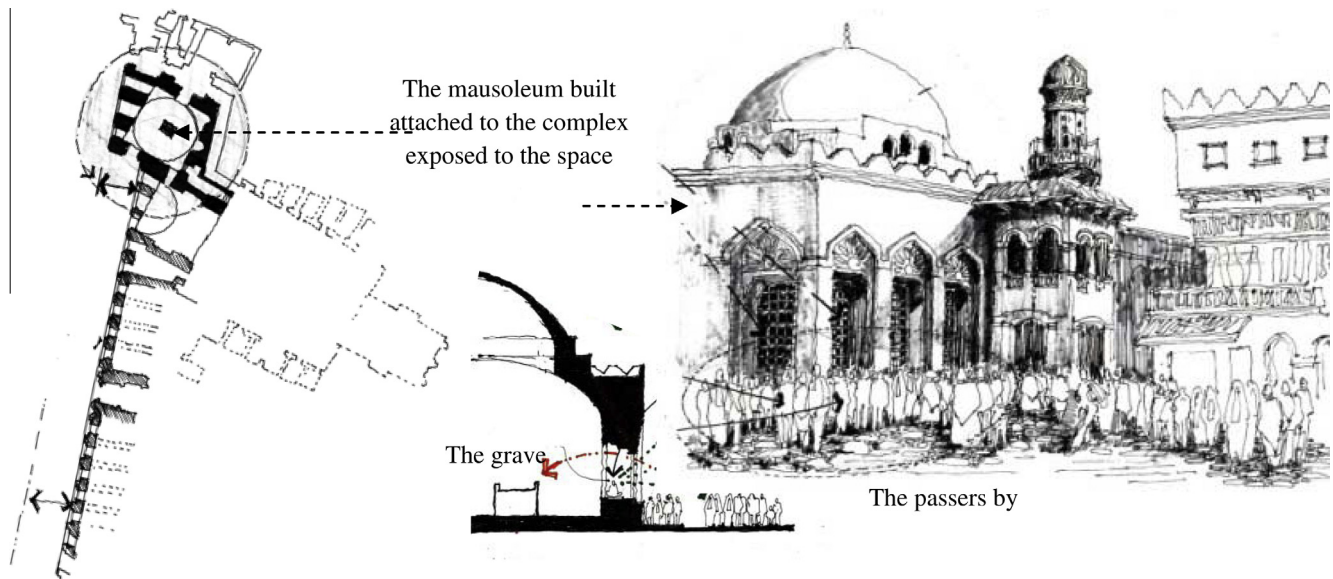


Figure 10. The religious mutual relation edges of mausoleum of the king El-Saleh Ayyub, controlled by the Sufi's convention of window sitting reciter.

The multiple layers or endless edges form a cultural mutual relation. People used to gather together in public meeting regularly after each prayer, five times a day. At these meetings people used to discuss issues related to their daily life, as seen in the arcaded facades of the mosque of El-Saleh Tala'i in the third case study, Bab Zewila, which give a feeling of edges through phenomenal transparency (Rowe and Slutzky, 1964; Képes, 1995). This space on this side has no edge, so there is continuity between the architectural and urban spaces. The flow of people moving across the edge's line between indoor and outdoor creates an invisible edge, best illustrated by the arcades which mark the porch of the mosque, El-Saleh Tala'i (Fig. 12).

The edges on this side of the space are non-visible, phenomenal transparent edges, because people can see the different vertical layers simultaneously, through the arcade, the inner wall to the inner court of the mosque. This type of edge acts as a transition more than an edge and it is only found in front of official or elite buildings, so it is the product of a top-down decision process (Mohammed, 2012).

There are moveable interactive edges, the most common form, in front of the commercial buildings in the third case study, attached to the Zawai and Sabil Frag Ibn Brquque. These demonstrate a commercial mutual relation. In these traditional shops there is no glass barrier; instead they have a wide opening to the space which has no depth or thickness. There is a deck in front of the shop on which the occupier sits, carrying out his transactions, so there is no visual relation or passive involvement like that generated by the glass windows of a modern shop. In these open shops, it is possible to exchange everything with whoever or whatever is inside without losing your presence in the space. There is an active involvement with the edges of the space which is transformed into a mutual relation. The way the products of these shops press out into space

increases this feeling of interactive relation, because people found themselves walking by and stopping amongst quantities of goods which would encroach out of the shop towards the other side of the thoroughfare (Fig. 13) (Mohammed, 2012). The conventions that control and organise these interactive moveable edges include those of no-harm, particularly the right of passersby to object, the right of access and the right of way (Hakim, 2007).

3.1.2. Reading 'sense of community' as an outcome of the edge environment

The different types of mutual relation-based edges that can be seen in these three cases successfully generated a 'sense of community.' All the community's members were involved in relationships, with each other and with their physical surroundings. This was reflected in their behaviour and in their attitudes towards their built environment, since their environment gave them a choice and opportunity to act and invest freely its edges (Lang, 1987). This generated a degree of dynamicity in society, and was a key component of its sense of community and belonging (Talen, 2006). It was responsible for creating a unique physical character in two ways: diversity at the micro level, and unity at the macro level.

This dynamicity was particularly evident in conversations and sometimes in community members' debates regarding any harmful act or risk. This could be seen in the dynamic relation between the territorial and building expressions in front of El-Saleh Ayyub complex in the space of been El-Qasereen, as the vacant land was transformed into a market place and then into built-in shops (Fig. 14).

The collective feeling of belonging was particularly evident in shared places like the self-governing communities in the space of El-Skaria in the second case study. In this

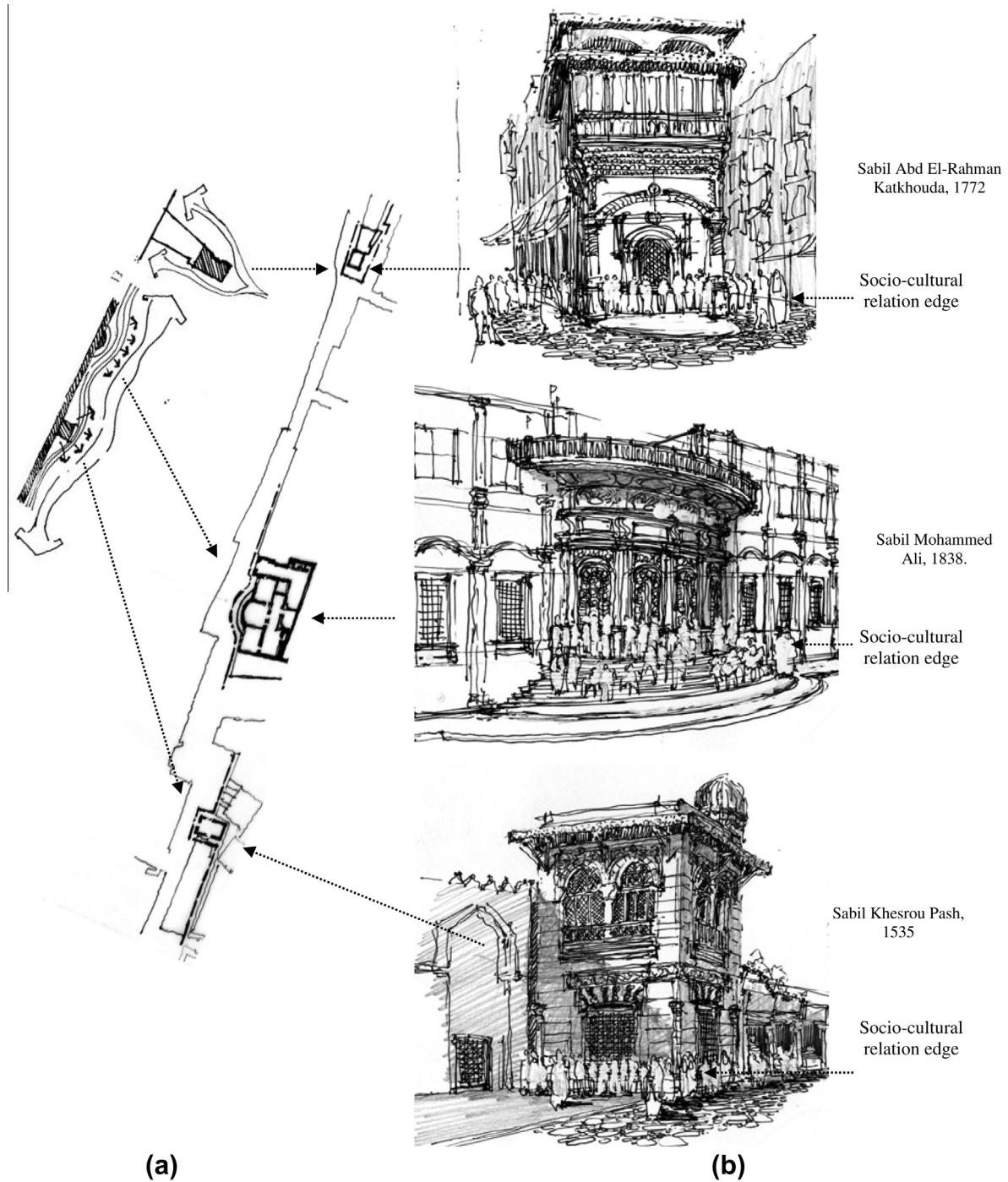


Figure 11. (a) and (b): The Sabil, buildings attached to the wall, as an example of the dispersed responsibility, the endowment buildings that created socio-cultural mutual relation edge.

gated community, the social pattern language and the growth of a community feeling can be seen in the network responsible for refining and reviewing decisions relating to the built environment (Sarason, 1974). These decisions, which might be negative or positive; produced conventions. Such positive decisions relate to the use of the fore-space (fina') in commercial activities, the immediate edges attached to houses (Fig. 15).

Also, the cleaning and the maintenance of shared places and (fina') were the responsibility of all the inhabitants as shown in (Fig. 16) from traditional contexts similar to old Cairo.

The dissemination of these kinds of networks and conventions in traditional communities increased social interaction and created public awareness that any harmful act or behaviour that might occur should be prevented. These

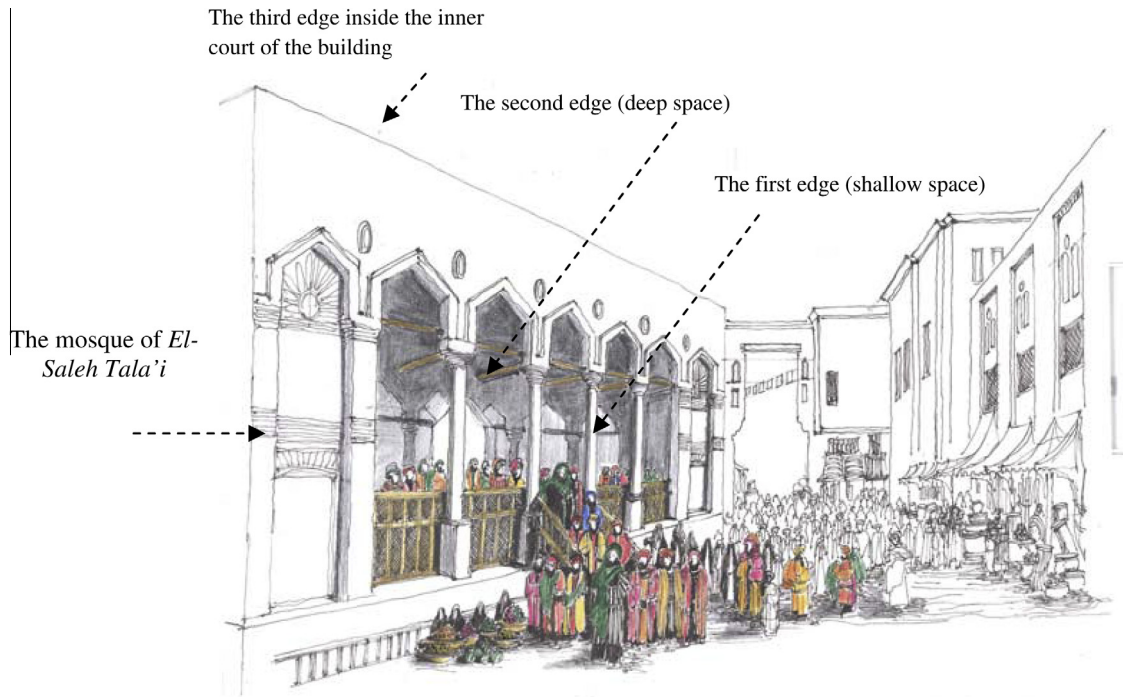


Figure 12. The continuity between shallow and deep spaces, the edges through phenomenal transparency created cultural mutual relation or multi-edges.

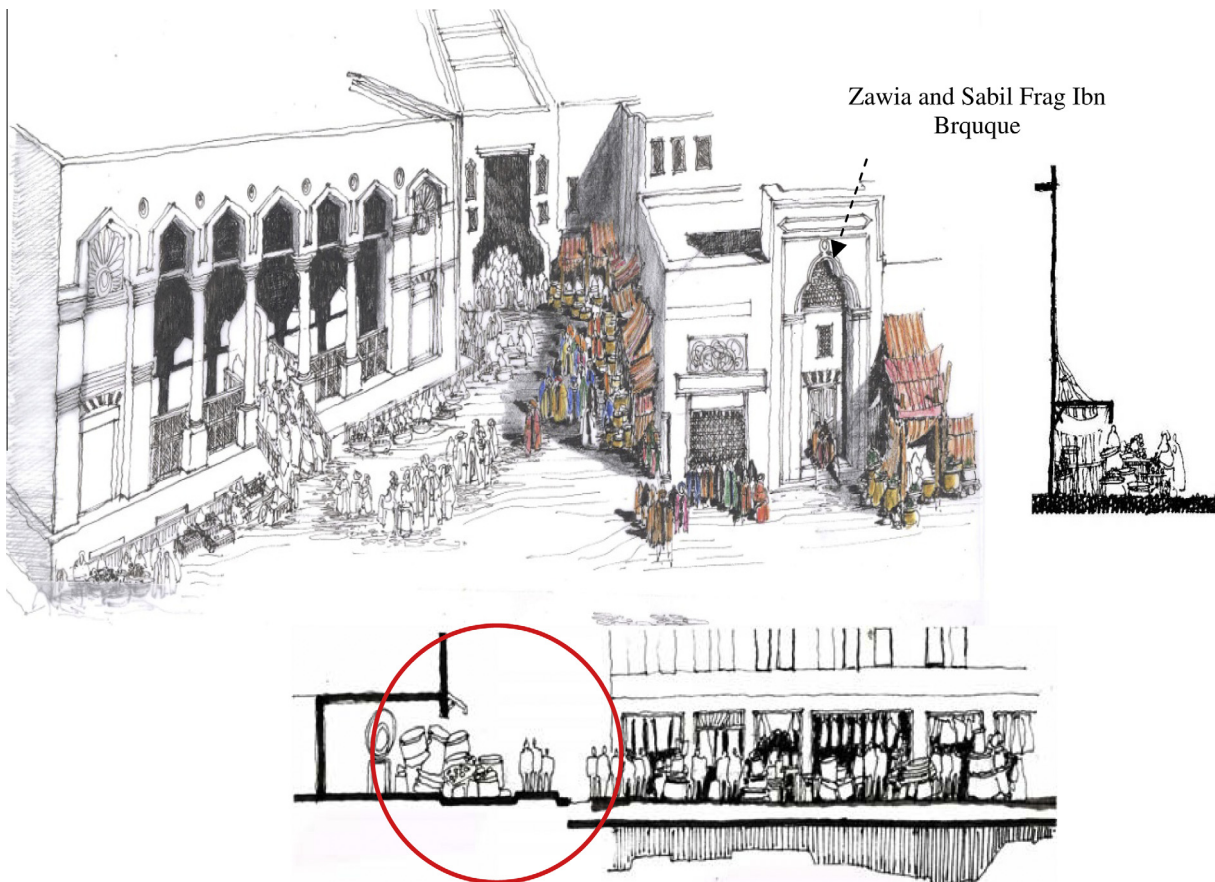


Figure 13. Commercial mutual relation edges or interactive moveable edges; in the traditional shops all transactions and active interaction with passersby is generated at the edge, not inside the shops.

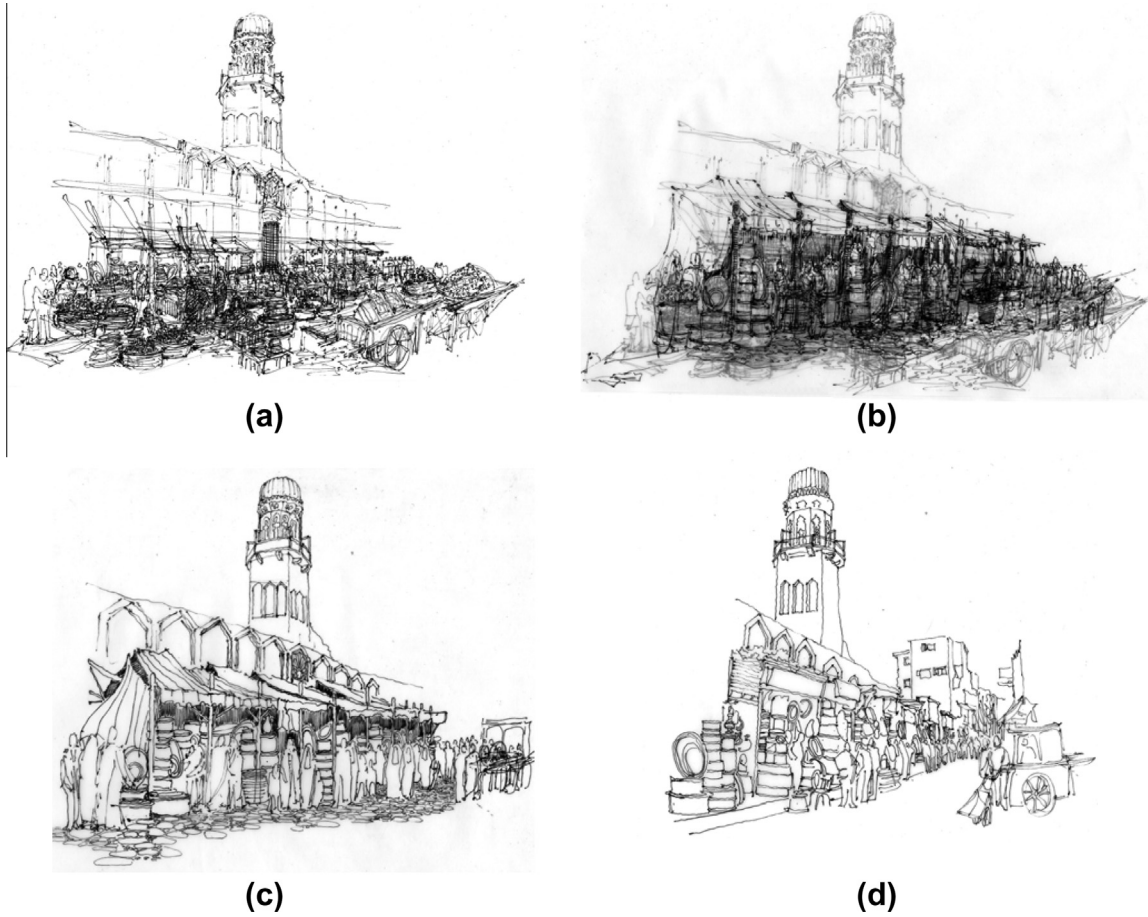


Figure 14. (a), (b), (c) and (d): The effect of the change of the responsibility distribution on the transaction sphere in the front of El-Saleh Ayyub complex. In the market place; vendors and paddlers were subjected to possessive model of responsibility and the building expression dominated the space. Then, the market place transformed into built in shops and the vendors became shop owners subjected to the unified and permissive model of responsibility. So building expression transformed to the territorial expression.

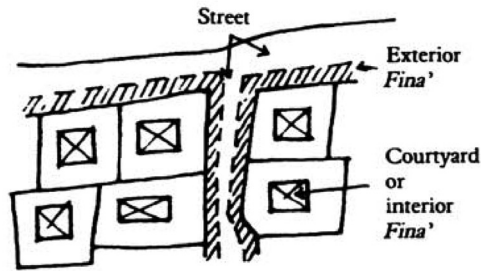


Figure 15. (a) and (b): Space Been El-Qasreen in 1924 shows how inhabitants used the fore-space, fina', as a shared place for commercial purposes; sources; <http://www.egyptedantan.com/egypt.htm> [accessed 05/2009], and Hakim (2008).

networks, which were conductors of the social pattern language, were the practical form of the feeling of neighbouring (Jacobs, 1961; Kim, 2001; Talen, 2006). Social interaction and neighbouring were also seen in one of the most important conventions that regulated the workshops on the ground floor of El-Khymia in the third case study

(Fig. 17): the right of a neighbour that regulated edges between the next neighbour and the limits at which the territorial expression of a shop occupier should stop. This convention prohibited crossing into the territory of neighbours either on the sides or at the front, so it is evidence of the success of the growing feeling of neighbouring,



Figure 16. Example of traditional gated community, the village of Vejer de la Frontera, Cadiz province, Spain shows the *finca* on both sides of the street which is cleaned by the residents; source Rudofsky (1987).

which helped to establish casual acquaintances (Nasar and Julian, 1995).

Amongst all these aspects of ‘the sense of community’ of this traditional built environment, there are two that were regarded as important motivators: the environment of opportunity for the community member, and the collective management of the environment.

3.1.2.1. An environment of opportunity for community members. Opportunity was an important contributor to the sense of community, connecting the elite with lower class people in a friendly relationship. It was the responsibility of the elite in these contexts not only to build projects which would carry their names, but also to offer jobs, places inside buildings and around their edges and accommodation for workers, stipulating that all should be residents in the same quarters. So this traditional built form produced a unique mixed use pattern, for example in El-

Wikala built by Nafissa El byyda in 1790s, the workshops underneath the El-Mu’aid complex built by the king during 1420s in the second case study (Fig. 18), and El-Khymia in the third case study. This engagement between the levels of the community was also achieved through endowment institutions, which offered regular educational opportunities for the quarter’s orphans and jobs for adults as teachers, as in the Sabil buildings.

3.1.2.2. Managing the environment collectively. These projects and the opportunities they offered played a key role in increasing the feeling of membership by involving personal investment (McMillan and Chavis, 1986), for example by people showing themselves willing to defend and to sacrifice for the group, through which they could achieve group acceptance, gain the right to belong. This was evident during Napoleon’s campaign in Egypt in 1798, when the strongest resistance came from these shared places.

Whereas the role of the previous aspect of ‘the sense of community’ connected people in friendly relationships, this aspect of ‘the sense of community’ also connected everyone in a continuing dialogue, giving the community a dynamic mode and making it ‘alive.’ It is an important strand in the traditional built environment, generating and protecting its sustainability and helping to form its urban language and social pattern. Traditional communities in Cairo shared a collective feeling of responsibility. This collective feeling emphasised the role of each individual to be an effective member of the community, and also ensured the role of groups or stakeholders involved in reciprocal influential relations with those individuals. This strand in the community’s fabric also governed an individual’s ability to influence the group or vice versa, creating a community characterised by social consensus and solidarity (Bauman, 2001). This generated a kind of common language, relations and strong bonds between the community’s members, which have been described as shared emotions (McMillan and Chavis, 1986).

These shared emotions distinguished these traditional communities and gave them their unique and interconnected domains: community attachment; community iden-

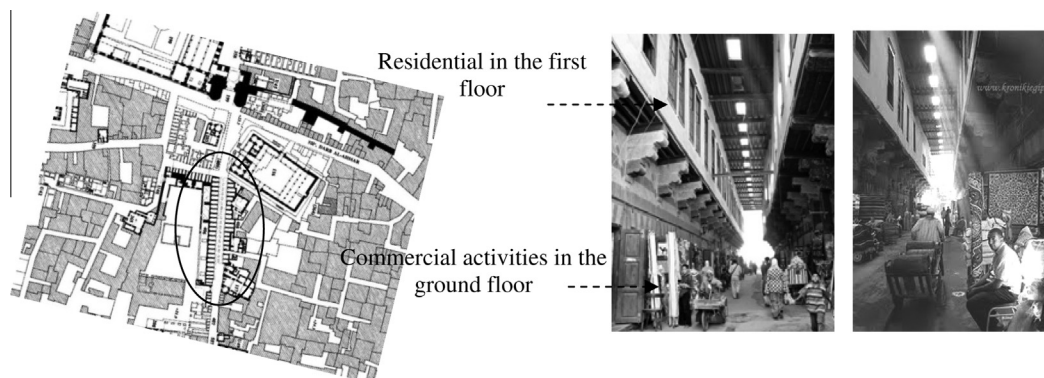


Figure 17. The convention of ‘the right of neighbour’ controlled mixed use pattern.

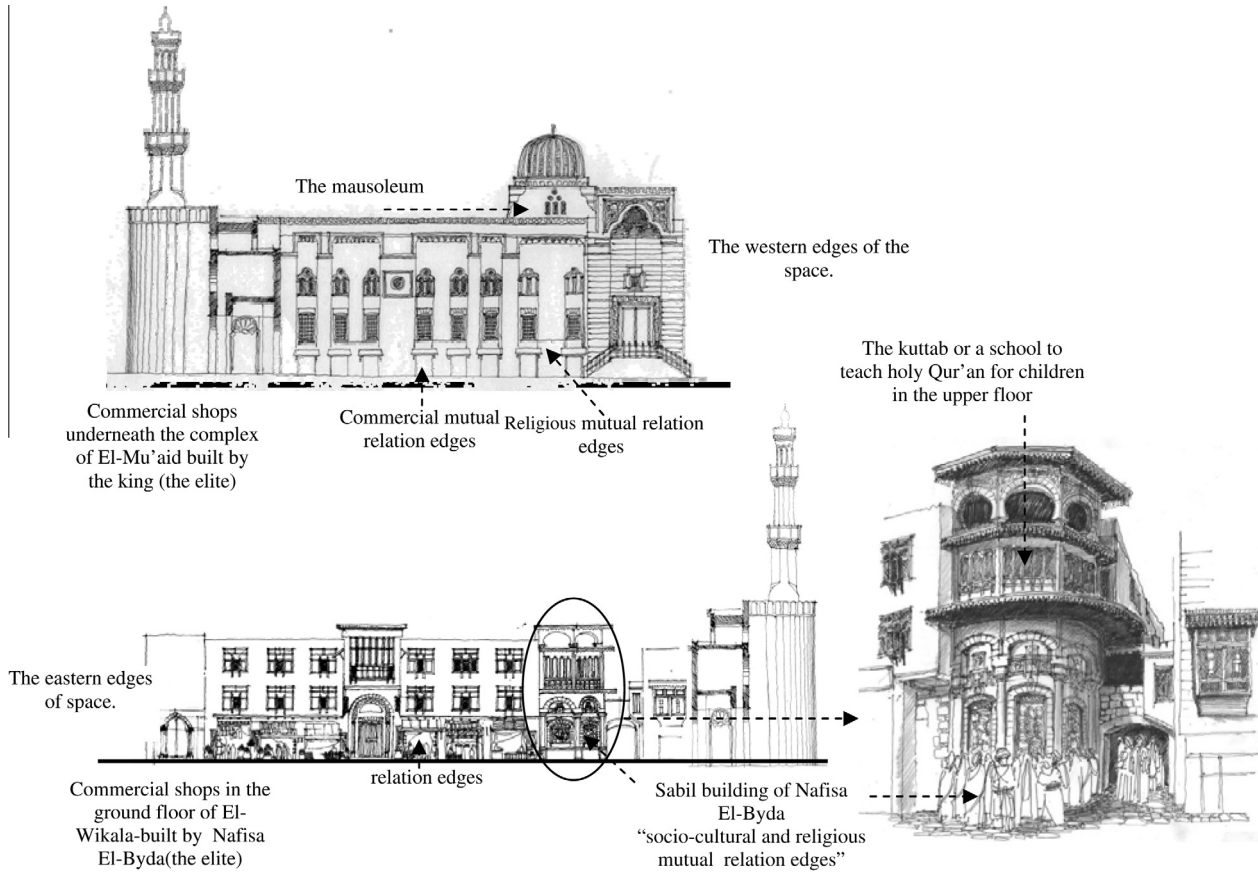


Figure 18. An environment for opportunity, a unique mixed use pattern and full investments of the edges in the built environment, space of El-Sokaria.

tity; social interaction; and pedestrianism (Kim and Kaplan, 2004). These four domains relied on the edges of spaces fostering street side and edge activities. They were hidden elements, particularly in the second and third case studies, which increased the feeling of belonging of residents, who were thus encouraged to make three consequential steps enhancing and emphasising their roles in their built environment: to explore their community; to try and invest in the opportunities available; and then to act. The most suitable places for these three steps to be exercised freely were the edges of spaces. This can be seen when residents used vacant land in the northern part of the space of El-Sokaria, gradually erecting built-in shops attached to the walls (Fig. 19).

Also, they can be seen in the development of the dead land abutting the edges of dilapidated walls of the city, outside the gate of Bab Zewila, where vendors and local people converted it into a mixed use building called the house of Al-Alyli (Fig. 20). In these two areas, people brought life to these dead and neglected edges, making them liveable, safer and walkable edges (Shafer et al., 2000; Southworth, 2005).

4. The edge environment and its fine tuning

The study of the balance between the two decision-making in traditional built form helps the researchers who are

interested in sustainability in the built environment in reading both social life and urban process, showing how they are interlocked in a way that clarifies ideologies and their implications for the physical form of the city. This reading is capable of envisioning and analysing the relationship between the cohesive social pattern language of traditional built environment and its physical expression, relying on a new reflective and exploratory concept, the edge environment. This concept illuminates the relationship between the values hidden beneath the physical edges of spatial morphology in Middle Eastern urban contexts like Cairo, and allows those values to be understood in terms of modern ideologies relating to the human community. It can be used in highlighting a better understanding and deeper interpretation of urban morphology of the built environment. It may assist to explain the spatial morphology of the lower spaces by showing how the edges were occupied, controlled and managed as representative samples for the whole environment.

This concept focuses on the edges of space, defined here as the interface of architectural and urban space, a key relation of spatial urban morphology and central in understanding the balance between top-down and bottom-up approaches in urban change within the scope of social sustainability. According to this concept, top-down approaches deliver the backbone of spatial morphology of space, conceptualised as the dead load of space. Mean-

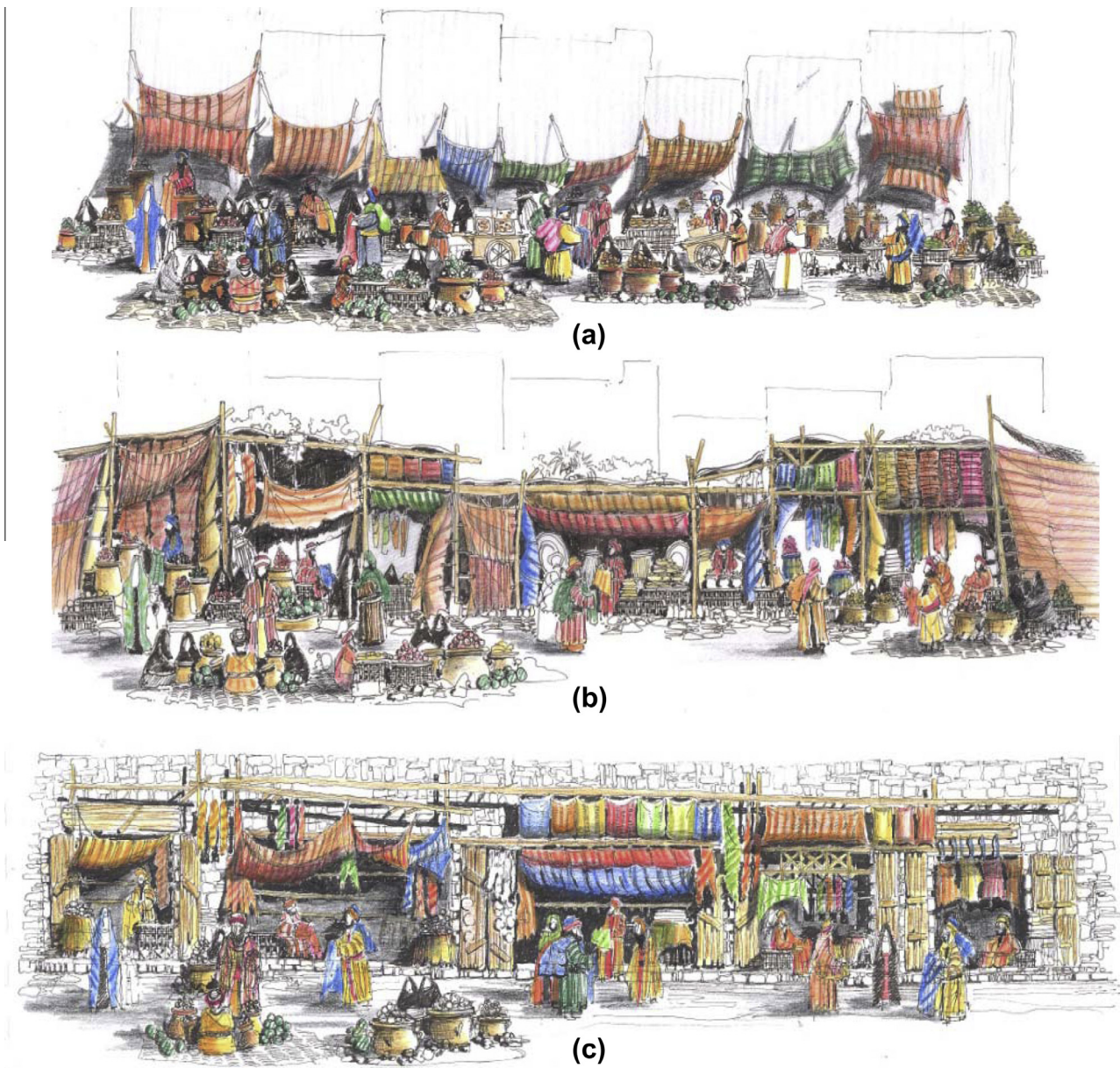


Figure 19. Marketplace transformed into built in shops through three consequential steps; to explore their community, to try and invest in the opportunities available, and then to act. (a) The vendors possessed territories by placing their goods. (b) Over time the vendors were given more control and power and started to add some moveable and light structures to their places. (c) The light structures were transformed into built in shops with durable buildings material then the vendors became shop owner.

while, bottom-up conventional decisions are mainly necessary to delivering the acts and social process added by users, conceptualised as the live load of space.

The application of this concept might help in the design education and site analysis as a way of understanding the significance of changes which may occur to the edge environment. This is through a procedural phase in which several procedural steps are necessary to prepare (anatomise) conceptualisation of a space: to define different types of ownerships and possessive cases; to define the line between official walls and local people's buildings; to set the forms of edges in the space; and to determine the design requirement for increasing social interaction of the built environment. This might include increasing the liveability of the

space, conserving and maintaining authentic urban and social character, preserving and retaining some traditional activities that might disappear, or returning to an original spatial structure. So it may be used in conservation and up-grading programmes, as an analytical tool.

As a design method, it can be used by underlining the significance of particular and careful interventions at edges by fine tuning of the edge environment. This is through the proposal or the design phase in which the fine tuning process deals with each type of edges of space individually based on the design requirements. This helps to rectify any defects occurring there by forging solutions, particularly through the fine tuning of bottom-up issues like mechanisms of control, use and ownership. Beneficial change

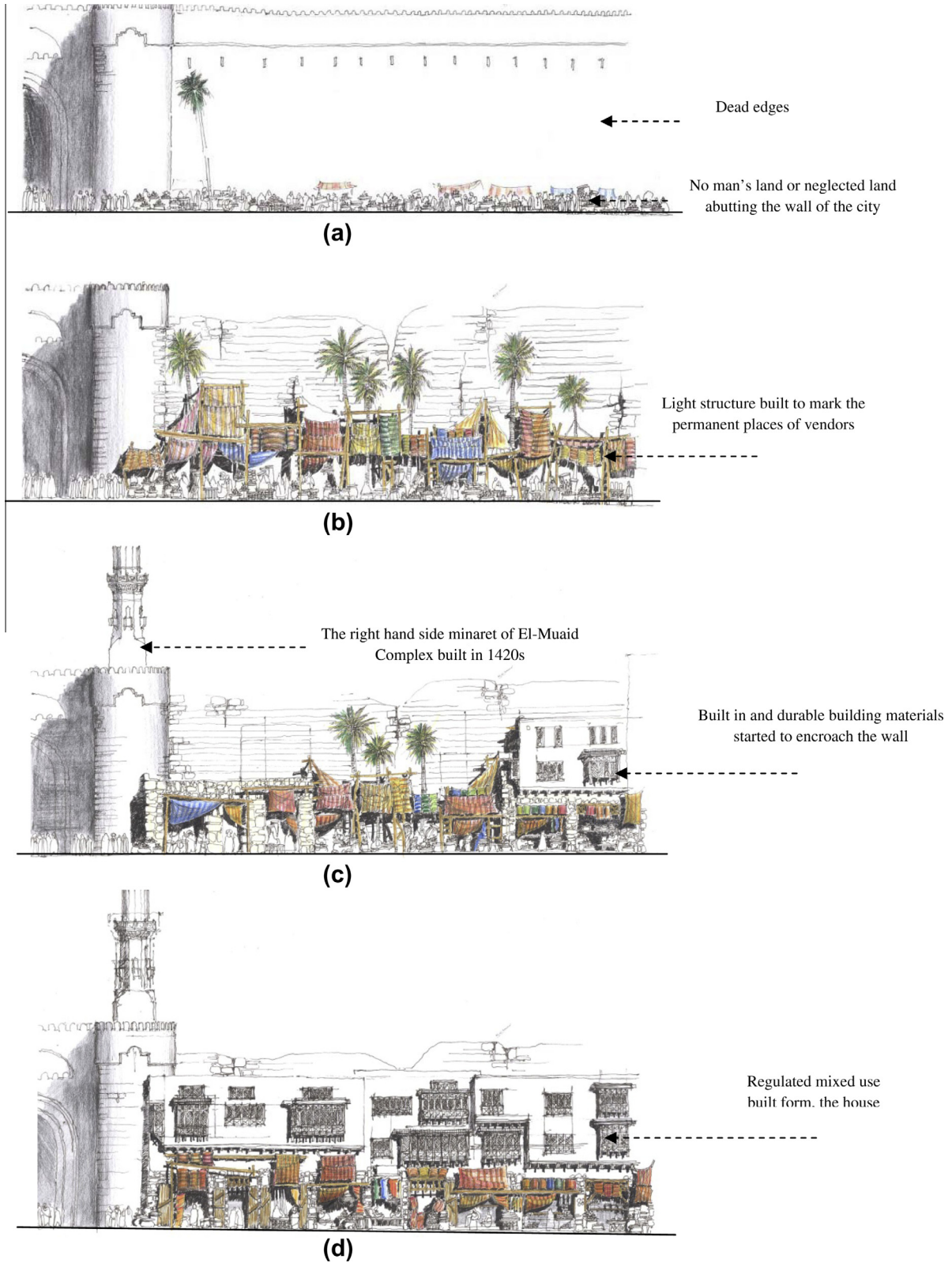


Figure 20. The dead edges of the dilapidated walls converted into liveable mixed use edges, through three consequential steps; to explore their community, to try and invest in the opportunities available, and then to act: the vendors began to gather together along the dilapidated walls as there was no top-down- or bottom-up responsibility towards these places. (a) The vendors began to gain more power to possess places which they could mark by light structures. (b) The vendors began to control their places informally provided not to cause no harm to passersby. (c) The authority invested in the area when it realised its economic value, and started to confer vendor formal ownership.

may be brought about through the management of the two models of responsibility, building and territorial expressions, and by fine tuning physical, spatial structures and issues related to the way buildings and spaces are occupied, managed and controlled.

Therefore, it might need cooperation between architects and urban designers to focus on the interface of architectural and urban space and develop new disciplines, perhaps in a new discipline of “edge designers or edge architects.”

5. Conclusion

The study of traditional Middle Eastern contexts has shown a strong bond and integration between the physical built environment, the ideologies of its inhabitants and the values of its society. The rare absence of this integration in the traditional built environment, and more frequently in modern development, leads to a clear impact on the built form as well as on the well being of people who live in these environments. Arguably, it is the practical combination of the ideologies and their physical products which has generated elements that are responsible for the durability of these communities, both environmentally and socially, in a form of social pattern language.

To read and understand the mechanism and sustainable development of the built form, and to derive lessons that could be learnt, researchers involved in the process of spatial management and urban conservation should examine the traditional built form in order to understand its social pattern language. Reading this social pattern language in case studies has shown that several aspects of sustainability were generated in these cases. All these aspects of sustainability were developed through a balance between two forms of decision-making, top-down and bottom-up, and through a reciprocal relation between the dead and live loads of spatial urban morphology. They were pushed towards and concentrated on the edges of spatial form. So another way of reading this pattern is to say that the edges of the traditional built environment witnessed all kinds of interactions, transactions and mutual relations between people and their physical surroundings, or among people themselves, making these edges more liveable than other morphological elements of the built environment. These edges were a real meeting point between architectural and urban spaces, which is why they have been termed an edge environment, a key player in morphological transformation.

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