WEB AS A SYSTEM OF ARCHITECTURAL ORGANIZATION: FRANKFURT-RÖMERBERG COMPETITION PROJECT

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I hereby declare that all information in this thesis document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

WEB AS A SYSTEM OF ARCHITECTURAL ORGANIZATION: FRANKFURT-RÖMERBERG COMPETITION PROJECT

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The aim of this thesis is to reveal the potentials of "Web" as a system of achitectural organization. This concept developed by Georges Candilis, Alexis Josic, and Shadrach Woods can be seen as a product of the discourse arose in 1960s, which concieves the city as a continuous and dynamic structure rather than a static entity composed of individual buildings. In this sense, Web appears as a system of architectural organization that responds to this dynamism by enabling growth and change. In this thesis, Frankfurt-Römerberg Competition Project by Candilis-Josic-Woods (CJW) is analyzed to understand the potential of Web in organizing both physical and social relations.

Revealing the potentials of Web requires examination of other concepts introduced by Candilis-Josic-Woods. Therefore, the relationship between Web and its sources (casbah and *bidonville*) and precedents (*habitat évolutif* and Stem) will be constructed. In order to construct this relation and to understand how Web operates as a system of architectural organization, the components and design acts of Web as well as its potentials will be analyzed in the case of Frankfurt-Römerberg Project. In doing so, the project will be seen as the main prototype of Web. The thesis will also put emphasis on *habitat évolutif* as the main idea behind Web. It will be argued that *habitat évolutif* evolved into Web with the help of stem as a connecting element.

Keywords: Web, Candilis-Josic-Woods, Frankfurt-Römerberg Competition Project, system of architectural organization, *habitat évolutif*, Stem, Team 10.

ÖZ

BİR MİMARİ ORGANİZASYON SİSTEMİ OLARAK AĞ: FRANKFURT-RÖMERBERG YARIŞMA PROJESİ

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Bu tezin amacı Georges Candilis, Alexis Josic ve Shadrach Woods tarafından bir tasarım aracı olarak geliştirilen Ağ'ın (*Web*) bir mimari organizasyon sistemi olarak potensiyelinin ortaya çıkarılmasıdır. Ağ kavramı 1960larda ortaya çıkan ve şehrin bağımsız binalar bütünü olarak değil, sürekli ve dinamik bir yapı olarak algılanmasını tartışan kentsel mimarlık söyleminin bir ürünü olarak görülmelidir. Bu bağlamda, Ağ kavramı sözü geçen dinamizme, büyüme ve değişime olanak sağlayarak cevap verebilen bir mimari organizasyon sistemi olarak ortaya çıkmaktadır. Bu tezde, Ağ'ın hem fiziksel hem de sosyal ilişkileri örgütleyebilen esnek yapısını anlayabilmek için Candilis-Josic-Woods'un (CJW) Frankfurt-Römerberg Yarışma Projesi (1963) incelenmiştir.

Candilis-Josic-Woods'un mimari yaklaşımı bitmiş planlar yerine ucu açık organizasyon sistemleri önerir. Ağ, Candilis-Josic-Woods tarafından üretilmiş olan bu sistemler içerisinde en gelişmiş ve karmaşık olanıdır, ancak Ağ'ın potansiyelinin ortaya çıkarılması bu ortaklar tarafından geliştirilmiş diğer kavramların da incelenmesini gerektirmektedir. Bu nedenle, bu tez Ağ'ın öncülleri ve kaynaklarıyla olan ilişkisini kurgulayacaktır. Bu ilişkiyi kurulabilmek ve Ağ'ın bir mimari organizasyon sistemi olarak nasıl işlediğini anlayabilmek için Ağ'ın potansiyellerinin yanı sıra, bileşenleri ve tasarım eylemleri de Frankfurt-Römerberg Yarışma Projesi üzerinden incelenecektir. Tezin diğer bir vurgusu da, Ağ'ın anafikri olarak ortaya çıkan evrilen habitat (*habitat évolutif*) kavramı olacaktır. Teze gore, evrilen habitat kavramı bir bağlayıcı eleman olan gövde'nin (*stem*) de yardımıyla evrilerek Ağ'a dönüşmüştür.

Anahtar kelimeler: Ağ (*Web*), Candilis-Josic-Woods, Frankfurt-Römerberg Yarışma Projesi, mimari organizasyon sistemi, evrilen habitat (*habitat évolutif*), Gövde (*Stem*), *Team 10*.

To My Parents
Nursun and İhsan Beşeli

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INTRODUCTION

1.1 The Aim of the Thesis

The aim of this thesis is to reveal the potentials of "Web" as a system of architectural organization. This concept developed by Georges Candilis, Alexis Josic, and Shadrach Woods, can be seen as a product of the discourse, which arose in 1960s, and conceives the city as a continuous and dynamic structure rather than a static entity composed of individual buildings. In this sense, Web appears as a system of architectural organization that responds to this dynamism by enabling growth and change. In this thesis, Frankfurt-Römerberg Competition Project (1963) by Candilis-Josic-Woods (CJW) is analyzed to understand the potential of Web in organizing both physical and social relations. Joan Ockman explains why CJW's approach maintains its contemporary relevance:

> [T]he firm's relinquishment of formal concerns with the abstract 'space-time' aesthetics of early modernism in favor of the real spatialities and temporalities of everyday life, their interest in a qualitative rather than quantitative rationalism, their *preoccupation with flexibility and growth*, and their concrete but not uncritical embrace of the new realities of advanced industrial society have lost little of their relevance today.[1]

CJW's approach suggests *open-ended systems of organization* rather than finished buildings. Revealing the potentials of Web also requires examination of other concepts introduced by CJW. Therefore, the relationship between Web and its sources (casbah and *bidonville*) and precedents (*habitat évolutif* and Stem) will be constructed. In order to construct this relation and to understand how Web operates as a system of architectural organization, the components and design acts of Web will be analyzed in the case of Frankfurt-Römerberg Project, since the thesis considers the project as the main prototype of Web.

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[1] Joan Ockman, foreword to *Another Modern: The Post-War Architecture and Urbanism of Candilis-Josic-Woods*, by Tom Avermaete (Rotterdam: NAi Publishers, 2005), 9. Emphasis added.

This study is motivated by the contemporary debates, which conceive architecture as a system of organization rather than a building. Such understanding of architecture, was initially expressed by Alison Smithson with the concept "mat-building"[2], and was highlighted by Stan Allen's "field" and "infrastructural urbanism".[3] Today many architects talk about architecture in terms of *mats*, *meshes*, *fields*, *networks* or *matrices*. They see architecture as a *multi-layered system* like the contemporary city itself. These architects are occupied more with suggesting strategies and tactics than producing objects. It is not about function anymore, but about program. As a preliminary concept introduced in 1962, CJW's Web can be situated in this tradition, and can be considered as a precedent of the contemporary architectural debates on *system* and *organization*.[4]

1.2 Concepts Relevant to Web

The concepts listed below, namely mat, field, carpet and matrix belong to the same tradition as Web, which conceives architecture as a problem of *organization* rather than production of objects. In order to situate Web in this tradition, and to understand how it operates as a system of architectural organization, it is necessary to introduce these concepts produced by the same tradition, before defining the historical and intellectual context in which Web concept was developed.

1.2.1 Mat

The category of mat-building was initially introduced by Alison Smithson in 1974. As defined by Smithson, the idea of mat is based on "interconnection, close-knit patterns of association, and possibilities for growth, diminution, and change.[5] Mat-building is

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[2] Alison Smithson, "How to Recognise and Read Mat-Building: Mainstream Architecture as It Has Developed Towards the Mat-building," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. Hashim Sarkis (New York: Prestel, 2001), 90-103.

[3] Stan Allen, *Points and Lines: Diagrams and Projects for the City* (New York: Princeton Architectural Press, 1999).

[4] There are a number of graduate theses previously made in METU Department of Architecture, which can be situated in the same research field as this thesis. Some of them are: Sinem Çınar, *Reading/Unfolding Architectural Form: An Inquiry into the Venice Hospital Project by Le Corbusier* (Unpublished Ph.D. Dissertation, 2005); Melih Yüksel, *The Relevance of Team 10* (Unpublished Master Thesis, 2005; Yasemin Eren, *Exploring the Potential of Mat-Building for the Creation of Universally Designed Environments* (Unpublished Master Thesis, 2004); Emre Kuzlu, *On the Concept of "Field" in Architectural Theory and Practice* (Unpublished Master Thesis, 2004).

[5] Alison Smithson, "How to Recognise and Read Mat-Building," 91.

characterized by the integrated relationship of part and whole, of mat to the context, and of volumes and voids. It aims to establish flexible systems of organization rather than finished objects. Allen states that "mat category" was invented in order to respond to the questions related with the role and responsibility of architect:

> Mat-building is a studied response to a fundamental urbanistic question: how to give space to the active unfolding of urban life without abrogating the architect's responsibility to provide some form of order. Mat-building proposes loose scaffolding based on the systematic organization of parts. Mat-building is based on an operative realism regarding the extent of the *architect's design control*.[6]

According to Hashim Sarkis such flexibility of mat-building is evoked by the act of programming.[7] According to Sarkis the mat approach that emerged in the 1960s maintains its relevance in the contemporary architectural field:

> Today mats are appearing everywhere. We call them *fields*, *grounds*, *carpets*, *matrices*. Whether seen as counterpoint to the preoccupation with sculptural form or as what happens to architecture when it has to cover really large areas, no building type, it could be stated without exaggeration, captures the predicaments but also the imagination of contemporary architecture more fully. The mat answers to the recurring calls for *efficiency in land use*, *indeterminacy in size and shape*, *flexibility in building use*, and *mixture in program*.[8]

Similarly, Allen argues for the contemporary relevance of mat category, and defines mats as "*field-like* assemblages".[9]

1.2.2 Field

Similar to mats, fields are dynamic mediums, which are in constant development and change. In fields, *superimposition of regular and repetitive elements* result in *complex systems of organization* admitting "change, accident, and improvisation."[10] Allen defines field as such:

> To generalize, a field condition could be *any formal or spatial matrix* capable of unifying diverse elements while respecting the identity of each. Field configurations are loosely bound aggregates characterized by porosity and interconnectivity. Overall shape

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[6] Stan Allen, "Mats," in *The Metapolis Dictionary of Advanced Architecture: City, Technology and Society in the Information Age* ed. Manuel Gausa (Barcelona: Actar, 2003), 421. Emphasis added.

[7] Hashim Sarkis, "The Paradoxical Promise of Flexibility" in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival* (New York: Prestel, 2001), 80-89.

[8] Hashim Sarkis, introduction to *Case: Le Corbusier's Venice Hospital and the Mat Building Revival* (New York: Prestel, 2001), 13.

[9] Allen, "Mats," 421. Emphasis added.

[10] Allen, *Points and Lines*, 102.

> and extent are highly fluid and less important than the internal relationship of the parts, which determine the behavior of the field.[11]

Moving from object to field, a system of organization is established that is capable of mediating between the scales or architecture and urbanism.

1.2.3 Carpet

In general, carpet denotes mat-like configurations. The analogy of carpet stems from the definition of mat category as a *horizontal weave of elements*. However, there are also other specific uses of the term. One of them is Willem Jan Neutelings' patchwork carpet.[12] Dirk van den Heuvel explains Neutelings' strategy as such:

> The starting point is that city and landscape are not to be seen as simply opposed to one another, but in terms of multiple layering. In this concept, *infrastructure*, monumental and landscape *fragments*, *open spaces* and *programmatic zones* become the essential carriers of the design of the new urban field.[13]

According to Van den Heuvel, Neutelings' approach draws close to that of Team 10's. Similar to mat, the carpet appreciates the time dimension of design. Van den Heuvel argues that Neutelings' "patchwork carpet is a transformation model, the model of *a field in permanent evolution*."[14] The difference between Neuteling's patchwork carpet and Smithson's mat according to Van den Heuvel, is that the former promotes change more than it promotes growth, whereas the latter promotes growth more than change.[15] Yet, both the mat and Neutelings' carpet respond to the problem of mobility.

1.2.4 Matrix

Whether they are mats, fields or carpets, they are all *spatial matrices*. In "Metapolis Dictionary of Advanced Architecture" the term matrix is defined as a "generative infrastructure."[16] Matrices are established by grids and networks, and they act as

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[11] Ibid, 92. Emphasis added.

[12] Dirk van den Heuvel, "The Diagrams of Team 10," *Daidalos* 74 (2000): 48.

[13] Ibid. Emphasis added.

[14] Ibid., 49.

[15] Ibid.

[16] Manuel Gausa, *The Metapolis Dictionary of Advanced Architecture: City, Technology and Society in the Information Age* (Barcelona: Actar, 2003), 420.

evolutionary systems. Although matrix is a more contemporary term than mat, the term was also utilized by Team 10 members in the beginning of 1970s. Moreover, the Team 10 meeting that took place in Berlin Free University in 1973, was titled as "the matrix meeting." In this meeting the main argument was about the function of grid, which acts as the organizing element in the design of BFU.[17]

1.3 Candilis-Josic-Woods

Candilis-Josic-Woods (CJW) is the name of a partnership founded by Georges Candilis (1913-95), Alexis Josic (1921-), and Shadrach Woods (1923-73).[18] This partnership, which operated in France between 1955-1970, brought together members with different educational backgrounds: Candilis educated in architecture, Josic in painting and architecture, and Woods in literature and philosophy in addition to engineering. The partnership had a multi-national formation in the sense that the members were from different countries: Candilis from Greece, Josic a French born in Yugoslavia, and Woods from United States. Candilis and Woods worked together in Le Corbusier's office during the design and construction of *Unité d'Habitation*. In 1949 they went to North-Africa to take part in the Casablanca branch of ATBAT (*Atelier de bâtisseurs*), which was originally founded in Marseilles (1947) to execute the detailing works of *Unité d'Habitation*.

During their experience in ATBAT-*Afrique*, Candilis and Woods worked on mass-housing projects in Morocco and Algeria, and focused on producing "innovative dwelling typologies".[19] Candilis and Woods turned to France in 1955, and founded the partnership with Josic, who was at that time working at ATBAT's French Headquarters. Tom Avermaete states that, the partners' experience in ATBAT was influential to the subsequent works of CJW:

> Though the ATBAT experiments in North Africa were short-lived, their importance for the approach of the Candilis-Josic-Woods partnership was invaluable.[20]

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[17] Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present* (Rotterdam: Nai Publishers, 2005), 183.

[18] Candilis, Josic, and Woods are the core members of the partnership. Other members who took part in the partnership are: Guy Brunache (1955-60), Henri Piot (1955-60), Paul Dony (1955-65), Manfred Schiedhelm (1965-70). In 1968, Woods moved to New York and continued his practice independent from CJW.

[19] Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 35.

[20] Ibid., 38.

CJW's career started with their winning proposal for the *Opération Million* national competition, in which they focused on *variety and flexibility* of dwelling types.[21] Their success in the competition made it possible for them to be assigned many other housing projects for masses. In addition to mass-housing projects, they also worked on projects with more complex programs such as universities, urban renewal, and tourism projects.

Although some of the concepts introduced by CJW are attributed to a particular member, all three partners were more or less influential in each project produced by the partnership. Candilis remarks that:

> [A]ll concepts came from us three. In the beginning by Shad and me in Morocco, and after this, with Josic. One should never diminish the participation of Josic on our work. I never said that Josic had less participation than Shad or I. This had been as much by Josic as by Shad and me, sometimes more Josic, Shad or me.[22]

However, Candilis and Woods wrote more on their projects than Josic, in architectural periodicals such as *L'Architecture d'Aujourd'hui*, *Technique et Architecture*, *Le Carré Bleu*, Architectural Design, and World Architecture.[23]

Candilis and Woods were among the members of *Congrès Internationaux d'Architecture Moderne* (CIAM, 1928-1956) and participated in the formation of Team 10 with the ninth meeting of CIAM. The partners attended the Team 10 meetings and contributed to the "Team 10 Discourse" as well as being influenced by it. Although it is not sufficient to explain the work of CJW only through the Team 10 discourse, the partnership can be considered as an extension of Team 10. About the relationship between CJW and Team 10, Woods states that:

> Our atelier was, to be sure, entirely autonomous and independent, but without the input from others in Team 10 it is fair to say that these plans would certainly have developed in other ways. So Team 10 generated a climate in which these strange fruits grew.[24]

Considering the reciprocal influence between the work of CJW and the discourse of Team 10, it is important to search for the parallelism between the two. Finding the parallelism

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[21] Ibid., 42.

[22] Alison Smithson, ed. *Team 10 Meetings 1953-1984* (New York: Rizolli, 1991), 131.

[23] Candilis wrote mostly in French, and Woods in English. Candilis took part in the redaction committee of *L'Architecture d'Aujourd'hui*.

[24] Avermaete, *Another Modern*, 27.

between CJW and Team 10 discourse is also important in terms of finding the sources for the issues that are specific to CJW. Therefore, the following part of the thesis aims to situate the work of CJW within the Team 10 Discourse.

1.4 The Historical and Intellectual Context: Team 10 and CJW

1.4.1 Dissolution of CIAM to Team 10

CIAM was the most effective organization of the modern movement in Europe, the influence of which can be observed in cities developed between the pre-war and post-war periods. In *The CIAM Discourse on Urbanism 1928-1960* Eric Mumford states that:

> CIAM, which refers both to the organization and the series of congresses, was a major force in creating a unified sense of what is now usually known as the Modern Movement in architecture.[25]

As they announced particularly in the *Athens Charter*, CIAM's planning approach was based on the principles of "functional zoning" and "isolation". In the ninth congress held in *Aix-en-Provence*, the members of CIAM indicated their sharp criticism towards the early works of CIAM, accusing them of ignoring the social-cultural aspects of architecture and planning, and reducing them to mere functional organizations. Alison and Peter Smithson stated that "human association" was also a significant issue in the modern environment and a "new language of architecture generated by patterns of inhabitation"[26] was necessary. This criticism led the emergence of Team 10 in the tenth meeting of CIAM in 1956.

The break in 1956 was not an instantaneous event; rather it was signalized by a series of shifts in the agenda of CIAM's meetings. In *Modern Architecture: A Critical History* Kenneth Frampton divides CIAM's life-span into three major periods, stating that different tendencies ruled each period.[27] He indicates the first period as the most doctrine one, in which the agenda of the meetings covered the issues of minimum living standards, optimum height and block spacing for the most efficient use of both land and material. In the second

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[25] Eric Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, (Cambridge: MIT Press, 2000), 1.

[26] Ibid., 8.

[27] According to Frampton the first period includes the first meeting to the third (1928-1933), the second period includes the fourth and the fifth meetings (1933-1947), and the third one includes the following meetings until 1956.

Kenneth Frampton, *Modern Architecture: A Critical History*, 3 rd ed. (London: Thames and Hudson, 1992), 270.

period a shift occurred within the agenda of the meetings in terms of scale: while the first period focused more on the "building scale", the second one on "the city scale". In the fourth and fifth meetings the organization was preoccupied with town planning, thus, this was the period in which Athens Charter (1933) and the idea of "Functional City" was presented. As stated by CIAM members, the idea of Functional City was based on the segregation of four main functions in the city: dwelling, working, recreation and transportation, so that the chaotic situation in the pre-war cities would be eliminated by bringing an order.[28]

The third period starts with the sixth meeting in 1947. In this meeting, some of the members started to question the isolating principles of the Functional City. The main criticism of the members was based on the argument that the strategy of functional zoning caused a break between physical forms and social-psychological needs of the community, and also a break within social relations itself. The sixth congress redefined the aim of the organization as "to work for the creation of a physical environment that will satisfy man's *emotional* and material needs and stimulate his spiritual growth.[29] Baykan Günay states that with the sixth meeting "a change in the space understanding of CIAM has occurred from mere functionalism to the consideration of spatial qualities".[30]

With the ninth meeting in Aix-en Provence (1953), criticisms reached the peak point, and it was decided that a group to be formed in order to prepare the agenda of the tenth meeting according to these critical points. This group of young architects, which was appointed the task of defining the agenda of the tenth meeting, included the names Jacob Bakema, Aldo van Eyck, Alison Smithson, Peter Smithson, Shadrach Woods, Georges Candilis and Giancarlo de Carlo. Due to their task, they designated themselves "Team 10".

The tenth meeting was held in Dubrovnik under the theme of "problems of the human habitat". The sub-categories discussed in this meeting were "the problem of organic unity", "the problem of mobility", "the problem of growth and change", and "urbanism as part of the habitat".[31] The congress re-affirmed the insufficiency of the Athens Charter and the related

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[28] Joan Ockman, *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Rizzoli International Publications, 1993), 101.

[29] Ibid.,102. Emphasis added.

[30] Baykan Günay, "History of CIAM and Team 10," *Journal of the Faculty of Architecture* 8 (1988): 30.

[31] Mumford, *The CIAM Discourse on Urbanism*, 239.

arguments put forward by the older generation of CIAM, stating that they all neglected one very important aspect of architecture and planning: human fact. Smithsons criticized the previous works of CIAM for being "too diagrammatic" to respond to human facts, like Candilis who accused CIAM of focusing only on "the quantitative aspects" of the human facts. According to Candilis, now it was time for "replacement of numbers by facts".[32] Smithsons argued that the only way to represent the actual complexity of human facts was to replace the hierarchy of four functions in the Athens Charter by a "hierarchy of associations".[33] The themes of *organic unity*, *mobility*, *flexibility and change*, and *urbanism* discussed in the tenth meeting of CIAM, occupied the agenda of Team 10 for several years.

In the reunion meeting held in Otterlo, 1959, the participants decided that they no longer wanted their activities to be called under the name of the CIAM, thus the organization dissolved leaving the field to the new generation, who continued to meet under the name of Team 10. Although it was supported by publications such as the architectural journals *Forum* and *Le Carré Bleu*, Team 10 was never an official organization as CIAM, rather, it was like a discussion forum supported by individuals, who had different backgrounds but similar concerns related to the problem of human habitat. As Woods explains:

> In 1953 at Aix-en-Provence we came together at CIAM congress with Bakema, then to say that Team 10 was never a chapel but an almost confluence of what can now be seen as individual trajectories. They just happened to be attracted to some common concerns at that particular time. The concerns were such as the interrelationships between the famous four functions, *change and growth*, *mobility and identity*, as these would exert an increasing influence over the habitats we were trying to design.[34]

1.4.2 Team 10 and Human Association

Members of Team 10 argued that any architectural design or planning decision they make should be for the sake of improving human association within the community. They claimed that it was the architect's responsibility to provide an appropriate relation between the physical environment and the community, and also the relation between the community and the individuals.[35] Bakema states that:

> If we don't work for an architecture expressing three-dimensional human behaviour in total life, architects will lose their natural function in society, and they will end as

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[32] Avermaete, *Another Modern*, 8.

[33] Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002), 219.

[34] Avermaete, *Another Modern*, 47. Emphasis added.

[35] Melih Yüksel, "The Relevance of Team 10" (Master's thesis, Middle East Technical University, 2005), 9.

> decorators of mechanization-administration schemes. If we don't realize total architecture we will end in no architecture.[36]

According to Cornelis Wagenaar, Bakema's approach was one, which resolves "the fundamental dichotomy between the individual and the collective".[37] Like Bakema, Smithsons argued that architecture meant "a constant rediscovery of constant human qualities translated into space".[38] Smithsons also claimed that only their "association diagram" represented the true complexity of human relations within a community, thus they suggested that "functional hierarchy of Athens Charter" to be replaced by a "hierarchy of human association" if an architect is to satisfy the needs of the individuals.[39]

Although all Team 10 members were interested in human association, Alison and Peter Smithson were more passionate about the concept. In the Doorn Meeting, they presented the concept with an association diagram, which they developed according to Patrick Geddes' valley-section diagram. In the book "Ordinariness and Light", Alison Smithson explains the social theory behind their interest in human association as a fundamental determinant of the architectural design and planning process:

> To the social psychologist society presents primarily a picture of a *network of human relations*. The strength and direction of those relationships not only determine the coherence and effectiveness of society -they also are the primary source of individual satisfaction. The function of social planning is primarily to strengthen and direct these relationships"[40]

In order to establish a hierarchy of associations Smithsons developed another diagram through which they represented the relationship between different scales of elements that make up the city. (Figure 1.1) The diagram proposed that degree of association should begin with the "house", develop through "street" and "district" and then finalize with the "city". However by house, street, district and city, Smithsons did not mean the reality of the terms

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[36] Cornelis Wagenaar, "Jaap Bakema and the Fight for Freedom," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, eds. Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 266.

[37] Ibid., 272.

[38] Alison Smithson ed., *Team 10 Primer* (Cambridge: The MIT Press, 1960), 20.

[39] Charles Jenks and Karl Kropf eds., *Theories and Manifestoes of Contemporary Architecture.* (Chichester: Wiley-Academy, 2006), 219.

[40] Alison Smithson and Peter Smithson, *Ordinariness and Light; Urban Theories 1952-1960 and Their Application in a Building Project 1963-1970* (Cambridge: The MIT Press, 1970), 42. Emphasis added.

but only the idea of them. They believed that new concepts should be evolved which may represent the level of physical and social complexity of the terms:

> It is important to realize that the terms used: Street, District, etc., are not to be taken as the reality, but as the idea, and that it is our task to find new equivalents for these *forms of association* for our new, non-demonstrative, society.[41]

Based on the scale of association diagram, Smithsons decided that a specific pattern of association should be established for each community. They insisted that for every form of association there was an "inherent pattern of building" likewise "forms of association were created by patterns of buildings."[42]

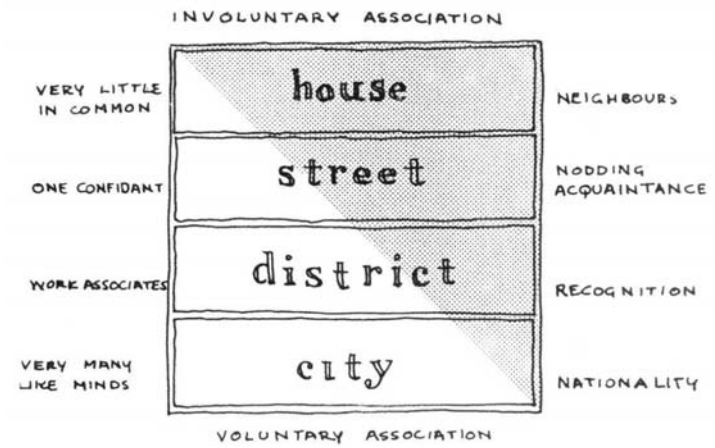

Figure 1.1 Scale of Association Diagram by Alison and Peter Smithson. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10:1953-81, in Search of a Utopia of the Present* (Rotterdam: Nai Publishers, 2005), 52.

Smithsons adopted the idea that the contemporary city was a *multi-layered field*, "a heterogeneous, non-continuous space defined by *non-linear interactions*".[43] Thus these non-linear interactions, by which they mean human association, should be represented with *multi-layered patterns of association*. These layers, making up the complexity of the city, should

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[41] Alison Smithson, *Team 10 Primer*, 76.

[42] Alison Smithson and Peter Smithson, *The Charged Void: Urbanism* (New York : Monacelli Press, 2005), 32.

[43] Van den Heuvel, "The Diagrams of Team 10," 42. Emphasis added.

be organized as a new totality, in which each layer is allowed to develop independently and at the same time should serve for an appropriate scale of association as a totality. [44]

Besides Smithsons, other members of Team 10 were also interested in the problem of association. In Candilis-Josic-Woods' Free University of Berlin, the whole design idea was evoked by the necessity of association; association between different departments of the university, between the students and instructors, and between the individuals and the built environment.[45] Whether a university or a residential complex, Team 10 members tried to express and respond to the social complexity of community by searching for systems that are capable of producing appropriate patterns of association.

1.4.3 Team 10 and the Search for Systems

Scales of Association Diagram not only represents the relation between different scales of elements that make up the built environment, but also implies a similar relation between architecture, urbanism, and planning as disciplines. In both cases this relation is hierarchical in terms of scale but mutual. That is to say that, the three disciplines are interdependent to each other, like the house, the street, the district and the city are. The inseparability of the disciplines indicated by the diagram was parallel to one of the main tendencies of 1960s. Alan Colquhoun explains this tendency as follows:

> The city was no longer thought to consist of individual buildings but conceived as a *continuous and growing structure*, which dissolved the distinction between architecture and town planning [...][46]

According to Colquhoun, this attitude towards dissolution of the disciplinary boundaries "was an enormous extension both of architecture's physical scale and of its imagery".[47] Based on the same argument, unlike CIAM, Team 10 members argued that architecture and urbanism should be united within a single discipline. Van Eyck called this union as "indispensable", and stated that one "must stop splitting the making of a habitat into two disciplines- architecture and urbanism.[48] Like van Eyck, according to Candilis "[a]rchitecture and urbanism are a single and same entity. The scale changes; the spirit remains the same".[49]

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[44] Ibid

[46] Alan Colquhoun, "Frames to Frameworks" in *Essays in Architectural Criticism: Modern Architecture and Historical Change* (Cambridge: The MIT Press, 1981), 120. Emphasis added.

[47] Ibid.

[48] Alison Smithson, *Team 10 Primer*, 27.

Team 10 members were aware of the tight relation between architecture, urbanism, and town planning, however the important question was "whether it was possible for an architect to retain control over a plan of that scale, and hence of where architects ought to concentrate their energy and attention".[50] As a response, they began an *experimental search for systems of organization* which would help to establish an appropriate relation between the three scales. They argued for the idea of *architecture as a system* rather than *architecture as an object*. Jean-Louis Violeau states that, for Team 10 members "focal concern was no longer the house but the architectural complex".[51] Here, by architectural complex, Violeau does not mean a building complex made up of independent parts but an architectural system of organization, which acts as a total entity. Avermaete argues that:

> The important criterion [for CJW] is the quality of the designed environment, rather than the value of the individual composing elements. The very essence of the idea is the investigation of an *Urban Architecture*.[52]

According to Team 10, such system of organization has to provide a unity within itself, and at the same time with other scales namely, urban and town planning. Van Eyck indicates that this is a new kind of unity, which necessitates "reciprocal determination between the part and the whole".[53] Likewise, Bakema states "[e]verything that man organizes and constructs for living in, is an organized whole, and not the addition of independent parts".[54] Thus, the *architect's responsibility* is to introduce a system, a pattern of association capable of establishing relations between different scales rather than trying to control each scale independently.

Team 10 faced another question considering the responsibility of the architect. The question was how much of an architectural complex or a system could be totally designed by the architect. These discussions stem from the idea that it is not possible for the architect to fully anticipate future changes or identity differences within the society. These ideas occupied the

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[49] Tom Avermaete, "Mat-building: Team 10's Reinvention of the Critical Capacity of the Urban Tissue," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada, (Rotterdam: Nai Publishers, 2005), 308-311.

[50] Van den Heuvel and Risselada, *Team 10 1953-81*, 101.

[51] Jean-Louis Violeau, "A Critique of Architecture: The Bitter Victory of the Situationist International," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, eds. Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 250.

[52] Avermaete, "Mat-building," 309. Emphasis added.

[53] Van den Heuvel, "The Diagrams of Team 10," 46.

[54] Violeau, "A Critique of Architecture," 246.

agenda of Team 10 in several meetings. Van den Heuvel states that two main discussion points in Team 10's Royaumont Meeting (1962) were "whether it was possible for a fully designed complex to fully *anticipate* changes during or after completion" and "whether future residents would be able to inhabit and *appropriate* the complex in an individual, spontaneous way".[55] These discussions among Team 10 members evoked the principle that an architectural complex should not be totally designed rather it should be anticipatory. Yet, as Giancarlo De Carlo states, this attitude required invention of new design methods:

> In order to attain these objectives (an intelligent and progressive action, an urban system, rich in architectural qualities capable of producing creative communications and participatory experiences) and those stemming from them (namely, multiplicity of choice, flexibility and developmental coherence over time), we must apply "design" methods different from those that we generally use.[56]

To embody this new architectural design attitude, Team 10 members came up with different *proposals for systems of organization*; different solutions sensitive to similar concerns.

1.4.4 Main Concerns of Team 10

Besides association, the members of Team 10 -and specifically CJW- were also preoccupied with the notions of mobility and identity. These concerns were the main discussion topics of 1960s, and were also shared by other post-war architects and critiques.

1.4.4.1 Mobility

One of the main concepts on which Team 10 focused was mobility. Rapid transportation and circulation of individuals, continuous relocation of communities, and the temporal characteristic of time and space were all considered related to the concept of mobility. Team 10 members argued that mobility was the characteristic of the post-war period, thus, any design strategy produced by an architect or planner had to consider mobility as one of the crucial aspects of a design problem.[57] In "Team 10 Primer", Alison Smithson explains the significance of the concept as such:

> For architects, mobility has several connotations; in terms of movement it signifies the shift from 2 ½ miles per hour to 60, 100, 500 miles per hour. In terms of time it

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[55] Van den Heuvel and Risselada, *Team 10 1953-81*,101. Emhasis added.

[56] Violeau, "A Critique of Architecture," 250.

[57] Felicity Scott, "Bernard Rudofsky: Allegories of Nomadism and Dwelling" in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, eds. by Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 217

> means the appreciation of fourth dimension, i.e. change on a short-time cycle. In terms of economy, it means rapid mass-distribution, consonant with the potentialities of mass production and mass consumption. In terms of housing, it means the easy, unquestioning rootlessness of the urban population. Architects and planners are principally concerned with mobility, in all its connotations, as *a diagnostic tool to new forms*.[58]

These different connotations stated by Smithson, lead to emergence of new concerns and introduction of *new design criteria* to architecture and town planning: "freedom of movement" and "flexibility of growth and change". These concerns emphasized by Team 10, were also shared by other post-war architects and critics such as the Situationists, Metabolists, and Non-Plan architects.

- **Freedom of Movement:**

One of the criteria introduced and emphasized by Team 10 is *freedom of movement*. For Team 10 members, increased mobility seen in the post-war period signifies not only the ease of moving from one place to another but also the opportunity to improve human association.[59] According to Team 10, individuals are social actors capable of establishing their own relationship with the community and with the built environment; thus, they should have the ability and right to move around freely in the city.

In Smithsons Berlin-Haupstadt Project, such freedom of movement is provided by an elevated pedestrian network, which structures the urban life within the district. This non-orthogonal network segregated from the vehicular circulation, is connected to the ground by urban escalators from several points, providing multiple nodes of access for the pedestrians. With its non-linear scheme and flexible connections to the building blocks, Berlin-Haupstadt Project allows for a various combination of movement patterns and gives the pedestrians the opportunity to draw their own paths. (Figure 1.2) A similar use of a pedestrian network system can be seen in the Free University of Berlin and Frankfurt-Römerberg Projects of Candilis-Josic-Woods, however in the form of an orthogonal geometry. (Figure 1.3) Regardless of its geometrical features, in all cases, the aim is to provide the pedestrians with freedom of movement and give them an active role in establishing their relationship with the built environment.

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[58] Alison Smithson, *Team 10 Primer,* 92. Emphasis added.

[59] Ibid.

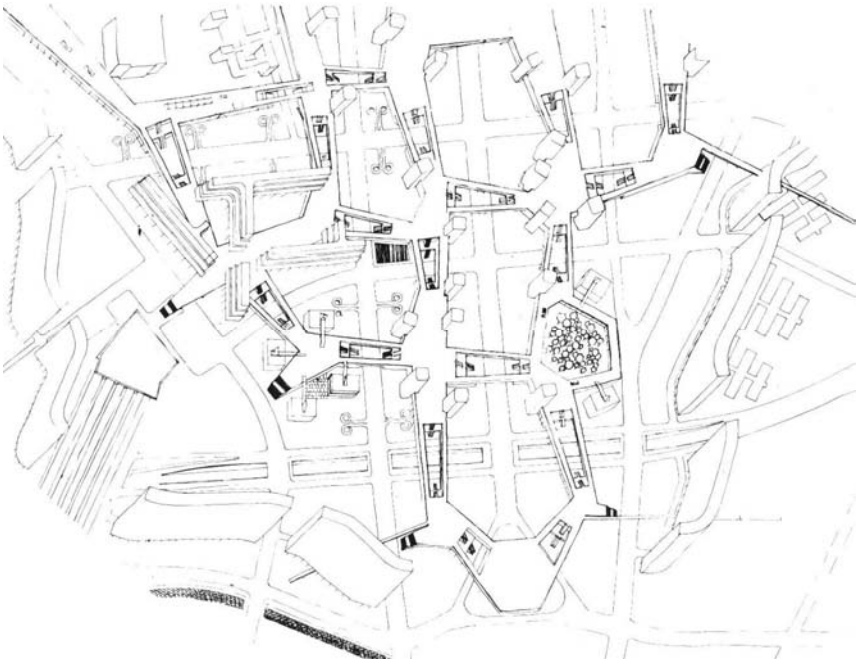

Figure 1.2 Berlin-Haupstadt Project by Smithsons. Source: Kenneth Frampton, *Modern Architecture: A Critical History*, 3 rd ed. (London: Thames and Hudson, 1992), 275.

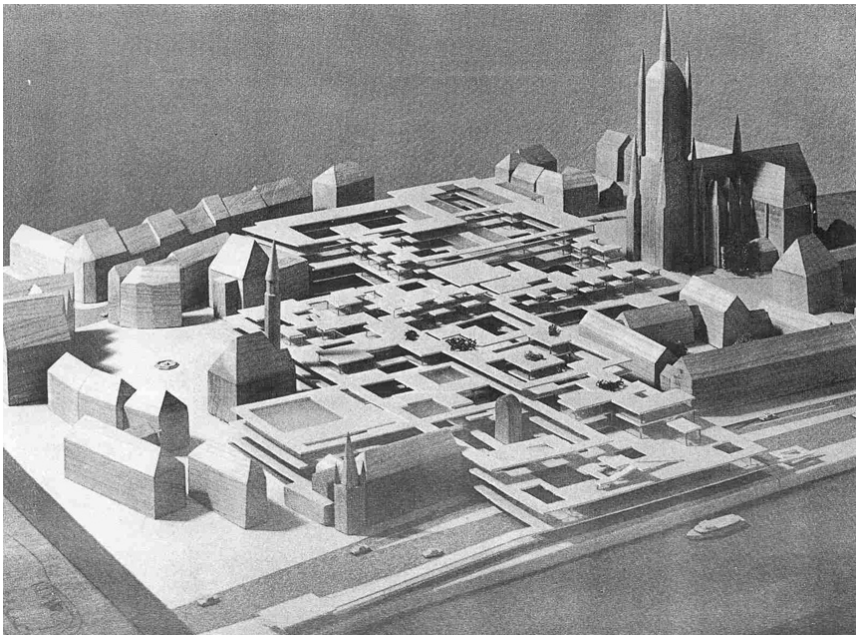

Figure 1.3 Frankfurt-Römerberg Project by CJW. Source: Jürgen Joedicke, "Candilis-Josic-Woods," in *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 205.

In this sense, Team 10 has a similar approach with Situationists, who argued that the pedestrian was not a passive spectator but an active participator in the daily life. Violeau states that Smithson's Berlin-Haupstadt project exemplifies the parallelism between Team 10 and situationist theory, however, makes it clear that "it was not Situationist-inspired architecture, but rather an architecture that drew on the same intellectual sources drawn upon by the period's artistic avant-garde".[60] Like Violeau, according to Goldhagen, both Team 10 and situationists "focused on shaping an architectural idiom that would foster personal freedom, reinforce a sense of place, and strengthen communal bonds."[61]

- **Flexibility of Change and Growth:**

Another criteria evoked by mobility is *flexibility of change and growth*. According to Team 10, post-war period was a time of technological and socio-cultural changes and it required "the time dimension" to be considered as "the fourth dimension" of a design problem. If architecture was to satisfy human needs, it had to be responsive to the mobile character of the post-war years. Team 10 members argued that architecture should be capable of accepting physical and functional changes, which might occur in short-time cycles. For them, the "ability to last" was directly proportional to "ability to change".[62] According to Team 10, flexibility should exist in a larger scale than single buildings:

> The object is not to make the building flexible but to make the *urban complex flexible enough to foster short-life buildings as well as long-lived ones*.[63]

With the term "flexibility", Team 10 members do not mean mere flexibility of the plan, but flexibility in three dimensions. Therefore, they argued that architects could no longer count on the concept of *plan masse* because it was a "predetermined, congealed form, incapable of change in a changing milieu".[64] For them it was time to replace the static formed *plan masse* with new *dynamic systems*:

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[60] Violeau, "A Critique of Architecture," 243.

[61] Sarah Williams Goldhagen, "Coda: Reconceptualizing the Modern," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, eds. Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 312.

[62] Avermaete, *Another Modern*, 126.

[63] Alison Smithson, *Team 10 Primer*, 71. Emphasis added.

[64] Ibid., 92.

> The question is not to build flexible buildings but to establish an environment in which buildings appropriate to their function may occur, and to encourage an interaction between these buildings and their environment. It is clear that no formal composition can provide an answer to this problem; for the nature of all formal composition is static, precise, and fixed.[65]

The search for flexibility stemming from the mobile character of the era was a concern shared by many other post-war architects. One of them is Cedric Price, who argued that the architect's role was to provide the users possibilities and realize an "ephemeral subjectivity" through user participation.[66] Price argued that it was not enough to provide possibilities for the present time only. The architect should also be responsible for providing possibilities for the future.[67] Goldhagen states that, Price aimed more for "infinitely transformable spaces" rather than buildings.[68]

Another architect, who was preoccupied with flexibility was Yona Friedman, who defines architecture as a dynamic process regulated by three major elements: function maps, envelopes, and the supporting structure.[69] However, this process should not be imposed by the architect as a rigid procedure; it should be established as *a variety of alternatives for future uses*. Friedman argues that in order to provide different alternatives for change and growth, the function maps and the architectural envelope(s) of a building should be modifiable independent from its structural system. For Friedman, "mobile architecture" is about developing "techniques of making the alteration of form and function easily, within a rigid, pre-existing *infrastructure*.[70]

The need for flexibility was also emphasized by Metabolist architects.[71] These architects including Kisho Kurokawa, Kenzo Tange, and Fumihiko Maki regarded the city as "a living

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[65] Ibid., 71.

[66] Goldhagen, "Coda: Reconceptualizing the Modern," 316.

[67] Jenks Kropf, *Theories and Manifestoes of Contemporary Architecture*, 217.

[68] Goldhagen, "Coda: Reconceptualizing the Modern," 316.

[69] Yona Friedman attended the Team 10 Meeting at Bagnols-sur-Cèze, 1960.

[70] Yona Friedman, "Function Follows Form" in *Non-Plan: Essays on Freedom, Participation, and Change in Modern Architecture and Urbanism* eds. Jonathan Hughes and Simon Sadler (Boston: Architectural Press, 2000), 111. Emphasis original.

[71] Kisho Kurokawa attended the Team 10 Meetings at Royaumont, 1962 and at Urbino, 1966. Kenzo Tange attended the meeting at Otterlo, 1959 and Toulouse-Le Mirail, 1971.

organism subject to a continuous cycle of growth and change", and sought for architectural solutions "responsive to dynamic patterns of urban flow and changing function".[72] Thus, they used autonomous clip-on-modules, which were capable of *changing individually, without modifying the structure*.

These architects mentioned above did not see mobility as a secondary issue, but considered it as the main aspect of a design problem to which the architect should respond:

> Now mobility is not merely an aspect of city life, it is of the very essence of human association, whilst cities in principle are meant to provide the framework for human association in its most complex and varied form.[73]

However, responding to mobility does not only mean solving a problem but also taking advantage of it. Although mobility is the main problematic for them, none of these architects regard it as a negative phenomenon or a mere problem to be solved. On the contrary, they utilize it as a tool to conceptualize a new architectural design attitude, which aims at establishing open-ended systems rather than producing finished objects. These architects are interested more in producing "ideas" than "concrete architectural objects". As Woods states:

> Our primary concern is neither the making of objects in space, nor the enclosure of spaces, however significant these may be. Our concern is the organization of places and ways for dwelling today, and to the extent of our possibilities, tomorrow.[74]

1.4.4.2 Identity

Another concept significant for Team 10 was "identity". For Team 10 members, identity has two connotations: individual identity and collective identity. For them, any pattern of association should be specific to the collective identity of each community, whereas, any individual unit should be specific to the identity of its inhabitants. According to Candilis, "[h]abitat is always collective; habitation has to be individual at all times". [75]

- **Variety:**

The fact that habitation is an individual act highlights the need for *variety*. Working on the problem of habitat, Team 10 members argued that a variety of housing units should be

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[72] Ockman, *Architecture Culture 1943-1968*, 325.

[73] Ibid., 355.

[74] Avermaete, *Another Modern*, 131.

[75] Ibid., 110.

developed in order to accommodate different groups in a community: In a study by ATBAT, *Habitations musulmanes/européennes/israélites* (1953), different types of housing units were developed by Candilis and Woods, considering the identity of different groups. Here, "type" denotes a model of spatial relations between "public and private" and between "open and closed spaces" specific to a group in the community. ATBAT architects were aware that the problem of accommodating a great number of people was not solely a problem of "repetition" but also "variation". Therefore, for them, another issue was to produce a variety of housing units out of a single type. These units were clustered and organized within an organic whole.

- **User Participation:**

For Team 10, another concern related with the concept of identity is *user participation*. The partnership CJW was preoccupied with this concern. They stressed that the inhabitants of the house should be given an active role in designing the place they live in. The inhabitants should be able to define and re-define their own architectonic space to improve the sense of belonging in such a mobile society. Therefore, they also questioned *the role of the architect* in designing homes and decided that "flexible and transformable housing units" should be formed to allow the inhabitants shape their homes according to their own wills, and re-shape it according to future changes in their family life:

> They [CJW] believed that architects should offer dwelling environments that are only basic facilities and do not correspond to any preset ideas on dwelling. In this light the dwelling a real *habitat évolutif*: *a living environment that has to be appropriated, annihilated and re-appropriated*, and thus invites the inhabitants to be '*architects chez eux*' [architects in their own homes].[76]

1.5 Structure of the Thesis

This chapter introduces the aim of the study, and gives brief information about CJW, Team 10, and relevant discussions of 1960s in order to situate CJW and Frankfurt-Römerberg Competition Project into a historical context.

The second chapter of the thesis analyzes the sources and precedents of Web. Within the scope of this thesis, the casbah and *bidonville* are accepted as the sources of Web, whereas *habitat évolutif* and Stem are accepted as the precedents. The aim of this chapter is to derive the knowledge that is required to structure the following chapter.

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[76] Avermaete, *Another Modern*, 174. Emphasis added.

Chapter three focuses on Frankfurt-Römerberg Project as the main prototype of Web. Although the project is accepted as the main prototype of Web, *habitat évolutif* appears as the first to attempt to establish a system of architectural organization, which later evolves into Web. The first part of this chapter reads Web as a product in order to reveal its potential. The second part reads Web as a diagram in order to extract the components and design acts which make Web a multi-layered system of architectural organization.

The final chapter constructs the relationship between Web and its sources and precedents, and discusses the significance of these concepts in the emergence of Web as a system of architectural organization rather than an object. This chapter also brings into discussion other concepts related with the issue of system of organization.

CHAPTER 2

SOURCES AND PRECEDENTS OF WEB

Web can be understood as a result of a long-term research for new systems of architectural organization that was highly stimulated by invention of Stem as a minimum structuring device. While Woods states that he uses the word Web "to designate Stem to the next degree, a Stem-squared"[77] the two concepts differ in some of their formal and organizational characteristics. In order to reveal these differences and find other sources of inspiration for the invention of Web, the concept should be considered as a product of a progressive research initiated well before the establishment of the firm CJW, specifically with the participation of Candilis and Woods in ATBAT's branch in Casablanca. Therefore rather than merely focusing on the latest acts of the partnership CJW, a broader time-line including the former activities of the members is to be investigated.

This chapter proceeds in two directions focusing on the "sources" and "precedents" of Web. While the sources include knowledge, which Candilis, Josic, and Woods derived from the analysis of the existing indigenous settlement patterns in North Africa during their experience in ATBAT (1949-1955), the precedents include the concepts and strategies developed by the members themselves. Within the first part, two indigenous forms of settlements are analyzed as the sources of the system approach conducted by CJW: casbah (traditional settlement pattern in North Africa) and *bidonville* (squatter settlements that appeared due to rapid industrialization of North African towns in 1950s). In the second part, the thesis discusses the concepts introduced by CJW before the development of the Web: *Habitat Évolutif* and Stem. The chapter aims to relate the sources and precedents through conceptual diagrams, in other words to relate what CJW observed and what they produced. The evaluation of sources and precedents aims to emphasize the significant points that will later be related to the Web in chapter 3 and 4. The evaluation is accompanied by relevant diagrams.

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[77] Shadrach Woods, "Urban Environment: The Search for System," in *World Architecture 1*, ed. John Donat (New York: Viking Press, 1964), 153.

2.1 Indigenous Settlements as a Source of Inspiration: *Casbah* and *Bidonville*

Within *ATBAT-Afrique*, Candilis and Woods were involved in housing projects for masses in order to compensate for the shortage of housing in recently industrialized North African towns. Their task was to develop new housing typologies to accommodate the new immigrants of these towns, because the traditional tissue was inadequate for housing the rapidly rising population. According to the partners, the problem of the "Greatest Number" required development of new ideas about dwelling.[78]

During their search for new housing typologies, Candilis and Woods were impressed with the associative and evolutionary potential of the existing indigenous settlements in these North African towns, and envisaged that they carried the potential to influence development of new dwelling models. Strategies that could be derived from the analysis of the traditional tissue could assist them in the conceptualization of "dwelling culture" as opposed to a mere "function of living".[79] According to Avermaete, the partners' experience in ATBAT became influential on their design approach:

> [A] situation highly different from that in Metropolitan France led them inevitably, not only to discover and propose new solutions, but to establish themselves a work and research method; or you could say, taking up an expression they used a lot: 'a way of thinking'.[80]

In this sense, ATBAT-Afrique operated as a laboratory for developing new design strategies derived from the analyses of the indigenous settlements, namely the *casbah* and the *bidonville* as examples of collective forms capable of growth and change. The analyses of *casbah* and *bidonville* lead to emergence of "habitat" as a new dwelling model. Here, habitat is a term used "to describe not only the home but also its environment and everything appertaining to it".[81]

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[78] Avermaete, *Another Modern*, 217.

[79] Ibid., 138.

[80] Ibid., 38.

[81] Alison Smithson and Peter Smithson, "Collective Housing in Morocco", *Architectural Design* 25 (January 1955), 2-7 cited in Monique Eleb, "An Alternative to Functionalist Universalism: Écochard, Candilis, and ATBAT-Afrique" trans. by Neville Saulter, in *Anxious Modernisms: Experimentation in Postwar Architectural Culture,* eds. Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 55.

In the ninth meeting of CIAM, Candilis and Woods presented the outcome of their research on casbah and *bidonville* settlements in "*Habitat du Plus Grand Nombre* Grid" together with other members of *Groupe d'Architectes Modernes Marocains* (GAMMA). Following this meeting, several members of Team 10 developed an interest in indigenous settlements as a source of knowledge and inspiration for new design strategies. In "Casbah: A Brief History of a Design Concept", Robert Oxman, Hadas Shadar and Ehud Belferman assert that these architects believed in "the instrumental value of the structural and organizational knowledge that might be derived by research from the history of human settlements".[82] This attitude was called "casbahism", a term that indicates re-conceptualization of both the traditional casbah settlements of North African towns, the *bidonvilles*, and medinas and souks of Islamic culture.[83]

Although Candilis and Woods do not mention a direct influence of casbahism on their Web concept, Alison Smithson considers it as a formative influence on the "system approach" conducted by Team 10 members.[84] The formal influence of casbahism is evident especially in van Eyck's configurative discipline and CJW's habitat and web projects. As a low-rise, dense tissue composed of variable modular units, the formal influences of casbah are mentioned both in Smithsons' and Oxman's texts. However there exists no deep discussion on the conceptual influence of casbah and *bidonville* on Web concept. Therefore, this part of the thesis aims to reveal the possible influences of casbah and *bidonville* on the subsequent works of CJW, through formal and conceptual analysis. (Figure 2.1, 2.2)

Figure 2.1, 2.2 From left o right: Casbah and Bidonville. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 26.

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[82] Robert Oxman, Hadas Shadar and Ehud Belferman, "Casbah: A Brief History of a Design Concept," *Architectural Research Quarterly* 6, no. 4 (2002): 322.

[83] Ibid., 321-336.

[84] Alison Smithson, "How to Recognise and Read Mat-Building," 90-103.

2.1.1 Casbah

The term casbah, which originates from the name of the historical settlement carved into the hills of ancient Algiers, can also be used to indicate the indigenous settlements clustered around the citadels of other North African towns and the medina quarters.[85] When compared to the new towns constructed with the principles of CIAM, traditional casbahs display a settlement pattern, which provokes association rather than isolation. In casbah settlements, the open spaces do not stand as left over spaces, but they act as arenas for social interaction. Oxman argues that the integrated public space inherent in the character of casbahs strengthens the sense of community among individuals and leads to social enhancement.[86] The contiguous character of the settlement also prevents the community from isolation and social alienation. Mumford states that at Aix-en Provence, Candilis appreciated the fortified type of Moroccan casbah "with its traditional courtyards and complex multi-storied spatial organization, as appropriate for dense multifamily housing, where many people can live in close proximity while respecting family privacy".[87]

Similar to Smithsons' principle related with hierarchy of associational elements, the collective form of casbah provides a hierarchy of open and built spaces, which mediate between the private and public, and between the individual and collective. This autonomous hierarchy enables different degrees of privacy to exist within the settlement; the degree of privacy being inversely proportional to the degree of association. The degree of privacy is at the maximum level in the interior spaces of the house however, it decreases in the courtyard. The courtyard is the element of association where the family can socialize without being seen from the outside. According to Candilis, the courtyard is "a veritable family heart, a living room, it has the function of bringing people together".[88] Starting with the courtyard, the degree of association tends to rise and contributes to communal life within the whole settlement.

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[85] Zeynep Çelik, *Urban Forms and Colonial Confrontations: Algiers under French Rule* (Berkeley: University of California Press, 1997), 11.

[86] Oxman, Shadar and Belferman, "Casbah," 324.

[87] Eric Mumford, "The Emergence of Mat or Field Buildings," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. Hashim Sarkis (New York: Prestel, 2001), 57.

[88] Georges Candilis, "Habitat Collectif Marocain 'Etude Atbat-Afrique'3 Immeuble Types", *L'Architecture d'aujourd'hui* 46 (February-March 1953), 98-99 quoted in Monique Eleb, "An Alternative to Functionalist Universalism: Écochard, Candilis, and ATBAT-Afrique" translated by Neville Saulter, in *Anxious Modernisms: Experimentation in Postwar Architectural Culture,* eds. Sarah Williams Goldhagen and Réjean Legault (Cambridge: The MIT Press, 2000), 61.

In her book "Urban Forms and Colonial Confrontations: Algiers under French Rule", Zeynep Çelik mentions some critical points about the social life of the muslim women within casbah. According to Çelik, the courtyard is an indispensable element for the domestic life of casbah due to the introverted life style of muslim women.[89] Another essential element for the women's life is the roof terrace because the contiguous tissue of casbah makes it possible for them to pass from one terrace to another without having to come across with men in the streets.[90] Çelik states that, in this sense, casbah is divided horizontally into two realms: the streets occupied by men, and the rooftops occupied by women as "an alternative public realm":

> The rooftops of the casbah functioned as an alternative public realm that extended over the entire city. In contrast to the interiorized court and the relatively contrived rooms, the rooftops opened up to the city, to the sea, to the world.[91]

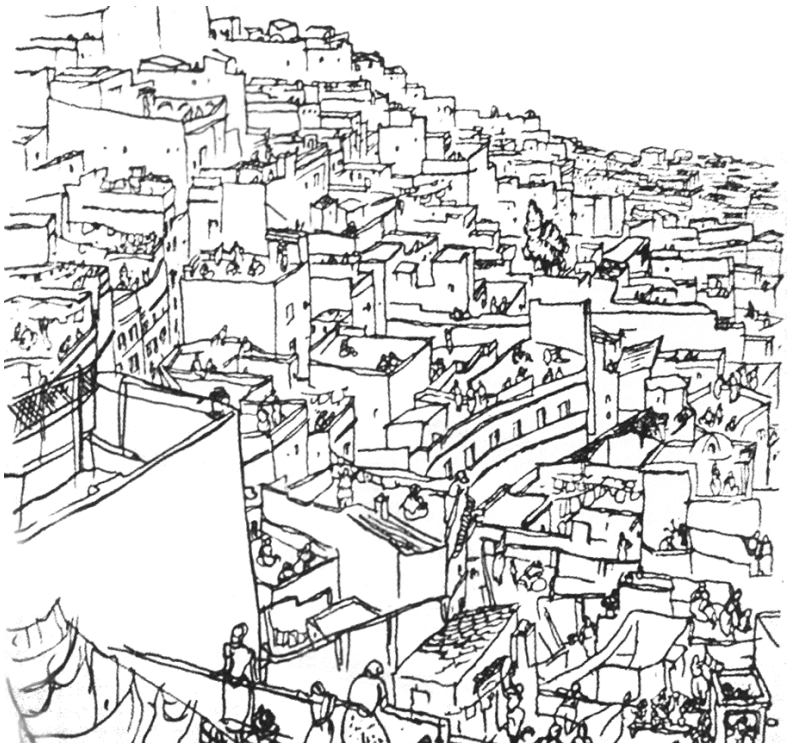

Figure 2.3 Rooftops as public realm, sketch by Charles Brouty, 1933. Source: Zeynep Çelik, *Urban Forms and Colonial Confrontations: Algiers under French Rule* (Berkeley: University of California Press, 1997), 20.

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[89] Çelik, *Urban Forms and Colonial Confrontations*, 18.

[90] Ibid., 19.

[91] Ibid.

Based on Çelik's argument, it can be said that, there are two layers of association in casbah: one for women (i.e. roof terrace) and one for men (i.e. street). For both genders, the rooms are spaces for private and individual activities while the courtyard is the space where the family activities take place. In this sense, courtyard is the element of association in the casbah house. However, outside the house, men and women socialize in different realms. For women, roof terrace is the medium where they interact with their neighbors, whereas for men, it is the street. The continuous linkage of roof terraces provides an alternative "ground floor" for the women of casbah, where the real ground floor belongs to men. These two different realms are connected via the house, specifically, via the stairway physically and via the courtyard visually.

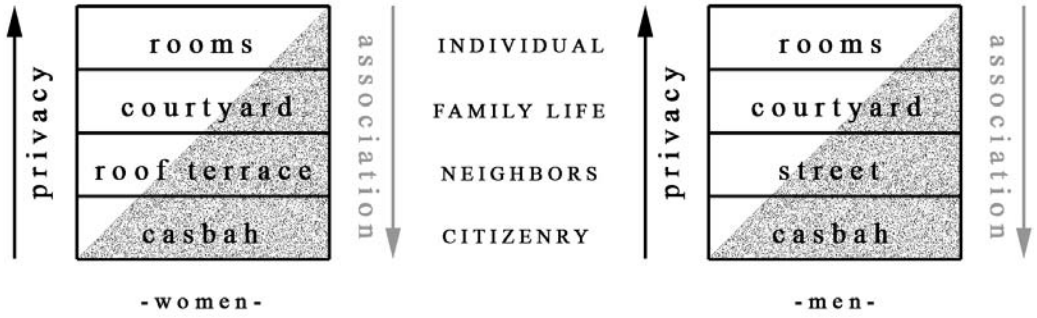

Figure 2.4 Diagram showing the scales of human association in casbah. Produced by the author.

The open spaces in casbah (roof terraces and streets) are modulated yet flowing in three dimensions, and they are tightly integrated with the closed spaces. This constitutes what Oxman calls an "integrated public space".[92] This integrated public space strengthens the communal bonds and the sense of citizenry. Considering its associative character, it can be said that casbah is a representation of a collective form: collectivity not only in physical sense but also in social. In casbah, co-existence of collectivity and individuality is possible through a hierarchy of associational elements: the courtyard, the street and the roof terrace. In this sense it can be said that casbah constitutes an inspiration for the system approach conducted by CJW, who aims at establishing a total pattern of association.

[92] Oxman, Shadar and Belferman, "Casbah," 322.

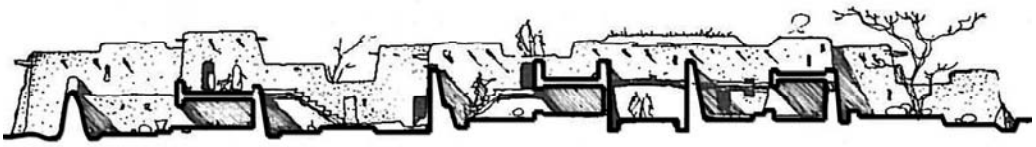

Figure 2.5 Section showing the multi-level spatial organization of casbah. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 270. Edited by the author.

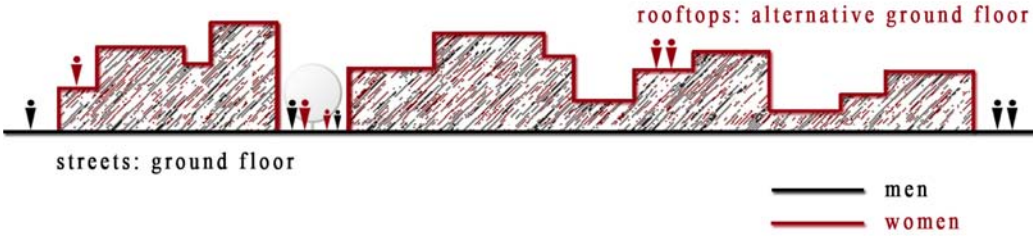

Figure 2.6 Diagram showing the two layers of circulation in the traditional casbah: streets dominated by men, and rooftops dominated by women. Produced by the author.

With streets and courtyards on the ground level, and terraces on the roof level, casbah has a multi-level spatial organization. This multi-level organization provokes three-dimensional spatial relations on the section plane and allows for different degrees of visual, physical, and social relations. In other words, casbah is a three dimensional collective form, where space production takes place not only on the horizontal ground plane, but also on the section plane. Different cross-sections with similar logic of spatial relations come together, and produce a multi-level collective form with complex spatial relations. The multi-level organization in casbah leads to the formation of a complex circulation network that provides freedom of movement to its inhabitants. The inhabitants of casbah don't have to follow pre-determined circulation routes, instead, they are free to choose and draw their own paths using the two levels of circulation, namely the ground floor and the roof terraces. In this sense, casbah features a *multi-level* and *multi-directional circulation* system for pedestrians.

Another significant characteristic of the casbah settlements is their "open form". Casbahs are not finished forms; on the contrary, they are dynamic settlements in which change and growth occur spontaneously. In a casbah settlement, change and growth take place without disturbing the organic unity of the collective form. Although a variety of housing units exist within the settlement, it can still be perceived as an organic whole, a continuous tissue. The

individual housing units do not appear as separate entities because they are organically formed to fit in the site on which they are located. According to Çelik "[t]he casbah was so intertwined with landscape and nature that it *made* the site".[93]

Casbah is a product of an additive process in which repetitive forms are stacked horizontally and to a lesser extent vertically. Yet, casbah is not a horizontal arrangement; it is a three-dimensional organization of similar modular units with similar spatial relations. In casbah, it is not only the volumes that repeat, but also the voids. The built and open spaces are integrated with each other, and they repeat dependently. Casbah is a three dimensional combination of modular units (both built and open spaces) repeating within variation.

A study by CJW illustrates how its inhabitants, construct a rural casbah house. As it is shown in figure 2.7, in the primary stage, the house is composed of a single room located at one corner of the plot. In the intermediary stage, this room is demolished, and another room at the same size is constructed at another corner, and three more rooms are added adjacent to another side of the same plot. In the final stage, one more room is added to each side, defining two courtyards connected to each other. This study shows that, the inhabitants of casbah can construct and re-construct their home within the same boundaries in several ways by using similar modules. User-participation is inherent in these settlements.

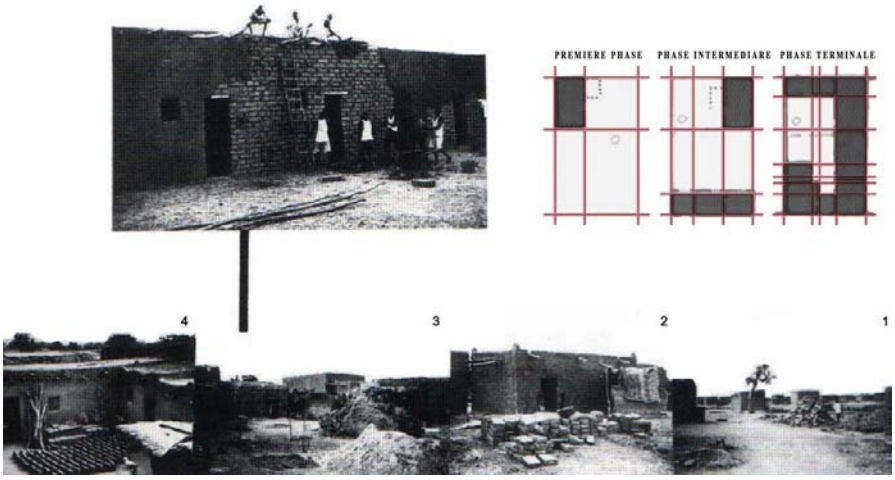

Figure 2.7 Evolution of the habitat, analysis by ATBAT. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 93. Edited by the author.

[93] Çelik, *Urban Forms and Colonial Confrontations*, 25.

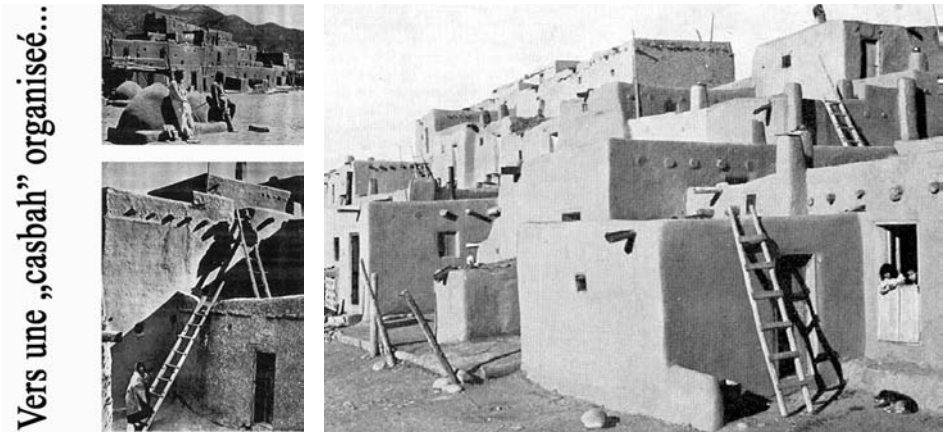

Figure 2.8 Left and right: Illustrations of Taos Pueblo from the Forum Magazine showing the three-dimensional collective form. Source: "Casbah: A Brief History of a Design Concept", by Robert Oxman, Hadas Shadar and Ehud Belferman, *Architectural Research Quarterly 6*, no. 4 (2002): 322, 325.

With their associative and evolutionary potential, casbahs served as a source of inspiration not only for CJW but also for other members of Team 10. In "*Vers une casbah organisée*" (Toward an organized casbah), Van Eyck emphasized the necessity to invent new systems of organization based on the knowledge derived from the traditional *casbahs*.[94] Oxman states that, for Team 10 members, the idea of "organized casbah" denotes the "spatial complexity realized by employing additive, repetitive principles of composition".[95] In the thesis it will be argued that CJW saw the archetypal image behind these indigenous settlements, and utilized the principles derived from their analysis to develop new systems of organization.

Analyzing casbah, some issues appear as significant aspects of the settlement in relation to CJW's system approach:

- Three-dimensional, multi-level and non-centric organization,
- Multi-level and multi-directional circulation network,
- Courtyard, street, and roof terraces as elements of association,
- Repetition of volumes and voids within a variety.

In the evaluation section, these points listed above will be summarized under four categories: spatial organization, circulation, association, and multiplication. Before the evaluation, it will be wise to recall some of the figures that contributed to the derivation of the points listed above. (Figure 2.9)

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[94] Oxman, Shadar and Belferman, "Casbah," 323.

[95] Ibid.

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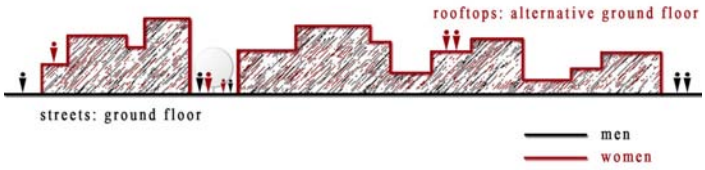

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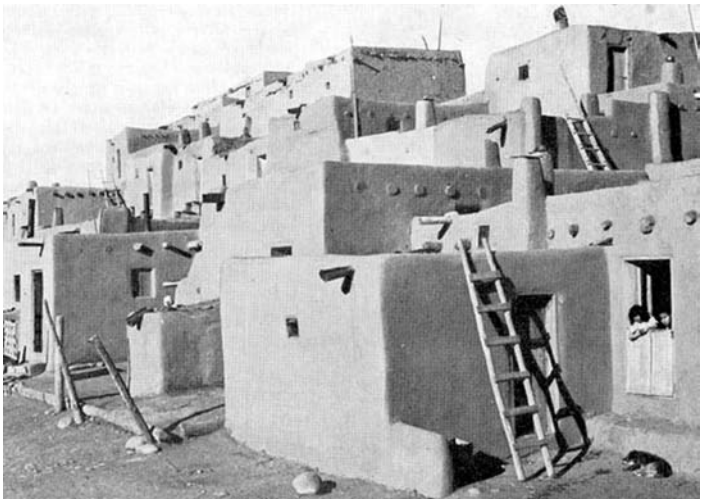

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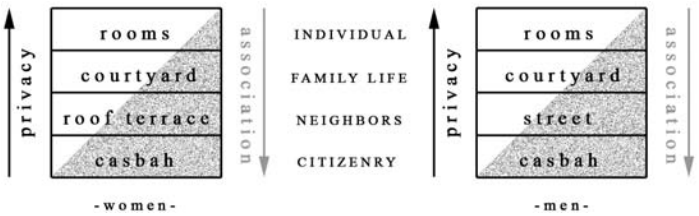

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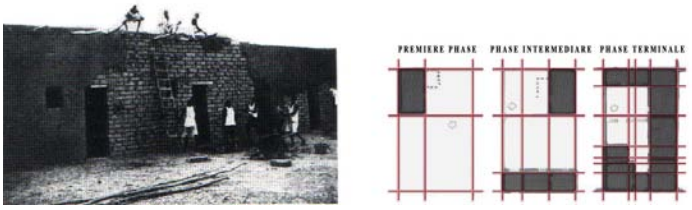

e.

Figure 2.9 Casbah a. Section showing the multi-level spatial organization of casbah, b. Diagram showing the two layers of circulation in traditional casbah, c. Illustrations of Taos Pueblo from the Forum Magazine showing the three-dimensional collective form, d. Diagram showing the scales of human association in casbah, e. Evolution of the habitat, analysis by ATBAT.

2.1.1.1 Evaluation: What is derived from casbah?

Spatial organization: Three-dimensional, multi-level and non-centric organization

- casbah is a three-dimensional collective form in which open and closed spaces are tightly integrated with each other
- multi-level organization provokes three-dimensional spatial relations on the section plane and allows for different degrees of visual, physical, and social relations

Circulation: Multi-level and multi-directional circulation network

- two layers of circulation: streets (for men) and rooftops (for women)
- the continuous linkage of roof-terraces acts as an alternative ground floor
- the organic and flexible circulation network provides freedom of movement for the inhabitants of casbah (no pre-determined routes to follow)

Association: Courtyard, street, and roof terraces as elements of association

- courtyard is the element of association that supports the family-life within the house
- street and roof-terrace are the elements of association on which the inhabitants interact with their neighbors
- modulated yet flowing open spaces (streets, courtyards, and roof-terraces), which are tightly integrated with enclosed spaces, constitute a total and integrated public space
- the integrated public space in casbah provokes physical and social collectivity, and generates communal life

Multiplication: Repetition of volumes and voids within a variety

- casbah is a product of an additive process in which repetitive forms are stacked horizontally and vertically (to a lesser extent) in coherence with the topography
- it is not only the volumes that repeat, but also the voids
- casbah is a three dimensional combination of modular units (both enclosed and open spaces) repeating within variation
- the inhabitants of casbah construct their houses via addition of modular units around a courtyard

2.1.2 *Bidonville*

Bidonville is another type of indigenous settlement with which Candilis and Woods get acquainted during their experience in ATBAT- Afrique. In 1950s, due to the rapid industrialization of North African towns, the traditional casbahs became too overcrowded to house the new immigrants. As a result, squatter like settlements called the *bidonville* were formed at the borders of these towns.[96] The problem with the *bidonvilles* was that, they lacked hygienic qualities due to infrastructural insufficiency. Thus, the inhabitants had to be re-housed in dwellings, which would provide them -at least- the basic technical requirements for living. ATBAT-Afrique was responsible for producing new housing projects to re-house the great number of *bidonville* dwellers. Despite its deficiencies, Candilis and Woods argued that the *bidonville* settlements carried some potential that could be utilized in developing new dwelling models.

The issue of *bidonville* was covered in detail in the ninth meeting of CIAM. Together with the *Habitat du plus grand nombre* Grid by GAMMA, *Bidonville Mahieddine* Grid illustrating the analysis of a *bidonville* quarter was presented by CIAM-Alger Group.[97] Çelik states that, addressing the problem of squatter settlements, CIAM-Alger Group did not see the *bidonvilles* as a "topographic and social threat, but as vibrant, creative, dignified and modern developments" although they lacked infrastructural services.[98] According to Çelik, members of GAMMA (including Candilis and Woods) also searched for the potentials of *bidonville* instead of its defects. [99] About the two grids presented in the CIAM meeting, Çelik makes another point stating that "the squatter settlement and the squatter house are offered here for the first time as valuable paradigms for modern architecture and urbanism".[100]

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[96] Çelik, *Urban Forms and Colonial Confrontations*, 45

[97] Members of the CIAM-Alger Group listed in *Bidonville* Mahieddine Grid includes P.A. Emery, M. Gut, J. Lambert, L. Miquel, L. Ouhayoun, J. de Maisonseul, J. Wattez, R. Simounet, and L: Tamborini.

Zeynep Çelik, "Bidonville Mahieddine Grid, 1953," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 22.

[98] Çelik, "Bidonville Mahieddine Grid, 1953," 22.

[99] Zeynep Çelik, "The Ordinary and the Third World at CIAM IX," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 276.

[100] Zeynep Çelik, Abstract of "Learning From the Bidonville: CIAM Looks at Colonial Algiers," Graham Foundation for Advanced Studies in Fine Arts, 2002.

When the *Habitat du plus grand nombre* Grid is examined, it is seen that, different from the traditional casbah, in *bidonville* settlements, one building plot is shared by more than one family. In figure 2.10, one building plot shared by two families is illustrated by GAMMA. In this figure it is seen that two rectilinear shacks are organized around a courtyard. In a *bidonville* house the area of the enclosed cells is minimized, and these cells are only used as shelters during the night. Other activities like cooking and dining take place in the courtyard. Different from the casbah, in *bidonville*, the courtyard acts as a living space for more than one family, and increases human association. The figure also illustrates the relationship between the built environment and the human scale.

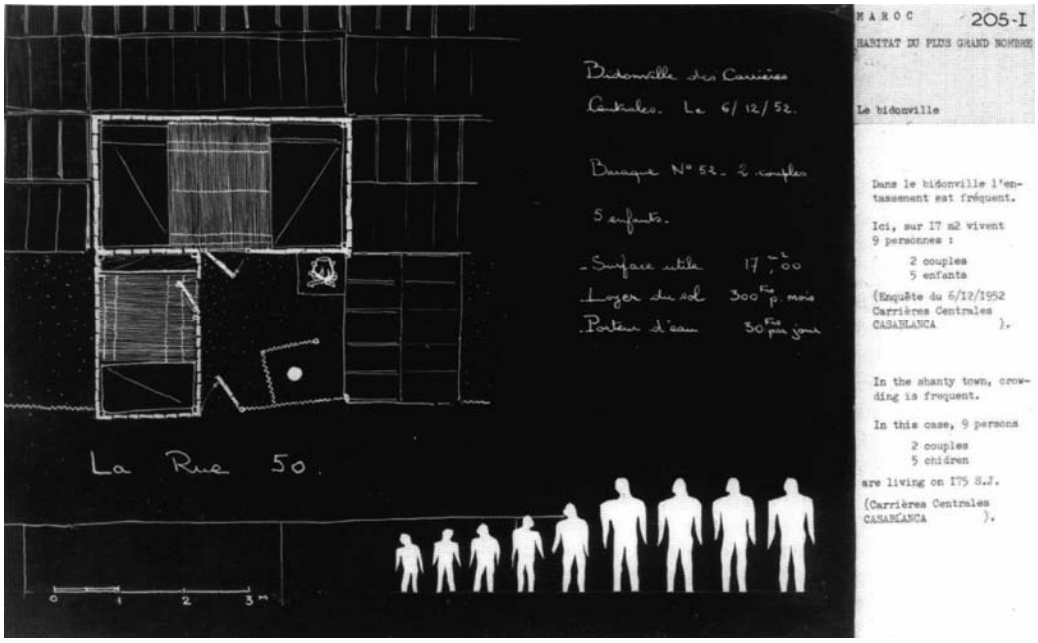

Figure 2.10 Analysis of *bidonville* by GAMMA showing the dwelling logics. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 85. Extracted by Avermaete from the *Habitat du plus grand nombre* Grid developed by GAMMA.

Similar to casbah, inhabitants of *bidonvilles* are architects of their own houses. In *bidonvilles*, each building plot can be organized by its own dwellers according to their own needs. When the number of family members inhabiting on the building plot increases, the area can be re-organized in a way to increase the number of rectilinear shacks by modular multiplication, or the existing shacks can be modified to accommodate the new members. The opposite is also possible: when the population of the building plot decreases, the shacks

can be demolished, and the area of the courtyard can be increased. It can be said that, in a *bidonville* settlement, building one's home means a continuous process of organizing the building plot. The *building plot appears as a flat plane* on which the dwellers organize the closed cells according to their own changing needs and wills within the same boundaries. During this continuous process of adaptation, the *rectilinear shacks appear as indeterminate elements*, and they are subject to change in short time periods. The only *determinate element is the building plot*, *the horizontal plane* on which modular units/cells are added.

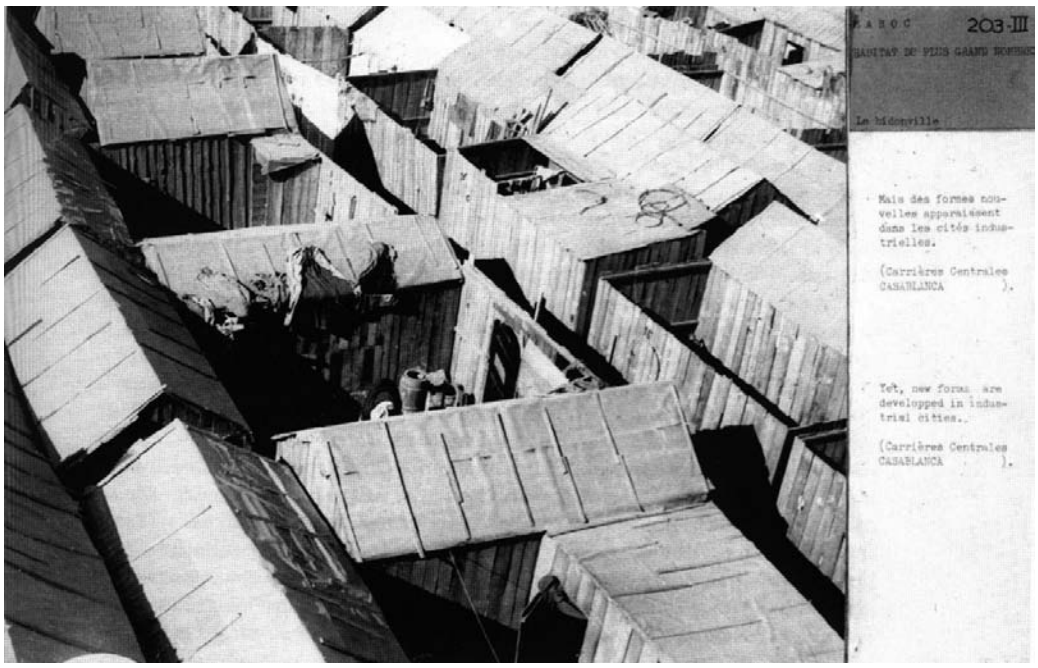

Figure 2.11 Photograph by GAMMA showing the organization of rectilinear shacks around a courtyard. Source: *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* by Tom Avermaete, 137. Extracted by Avermaete from the *Habitat du plus grand nombre* Grid developed by GAMMA.

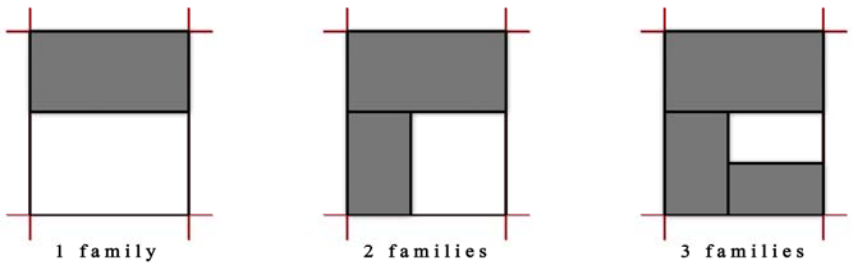

Figure 2.12 Possible organizations of the dwelling plot. Produced by the author.

In *bidonville* settlements, each *building plot acts as a generic plane* on which different everyday activities take place. While the enclosed cells are used as sleeping areas, the courtyard is used for any other activity. In this sense the *courtyard is a generic space* that is continuously articulated to accommodate different activities during the day. It is the living room for the families to socialize, the play area for the children, the kitchen, the dining room, the storage or the space for any domestic work (Figure 2.13).

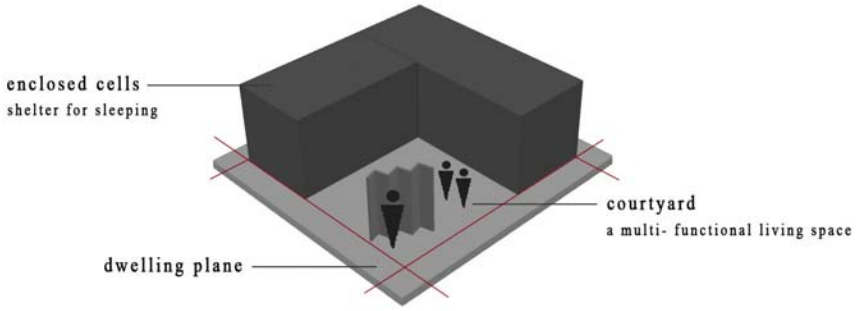

Figure 2.13 Diagram of the activity plane showing how the cells are added on the generic dwelling plane. Produced by the author.

In a *bidonville* settlement, different from casbah, the building plot appears as temporary in terms of their users because the dwellers are nomads, and there's no land ownership in squatter settlements. Avermaete asserts that, *Habitat du plus grand nombre* Grid depicted *bidonville* as "the product of continual dwelling, building, alteration and demolition", and as an "everyday built environment".[101] A *bidonville* has a higher degree of indeterminacy when compared to the traditional casbah house, and it is made of more fragile and poor quality materials such as reed, zinc sheets or metal containers, whereas the casbah house is usually made of mud-brick or a similar material. A *bidonville* is a temporary construction made of non-durable materials and in this sense, it can be considered as a natural product of mobility arose in the post-war period. Alison Smithson argues that, the spontaneity of Arab towns had a considerable influence on the system approach conducted by Team 10 members, as they responded organically to the concern of flexibility.[102]

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[101] Tom Avermaete, "*Habitat du plus grand nombre* Grid, 1953," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada, (Rotterdam: Nai Publishers, 2005), 26.

[102] Alison Smithson, "How to Recognise and Read Mat-Building," 90-103.

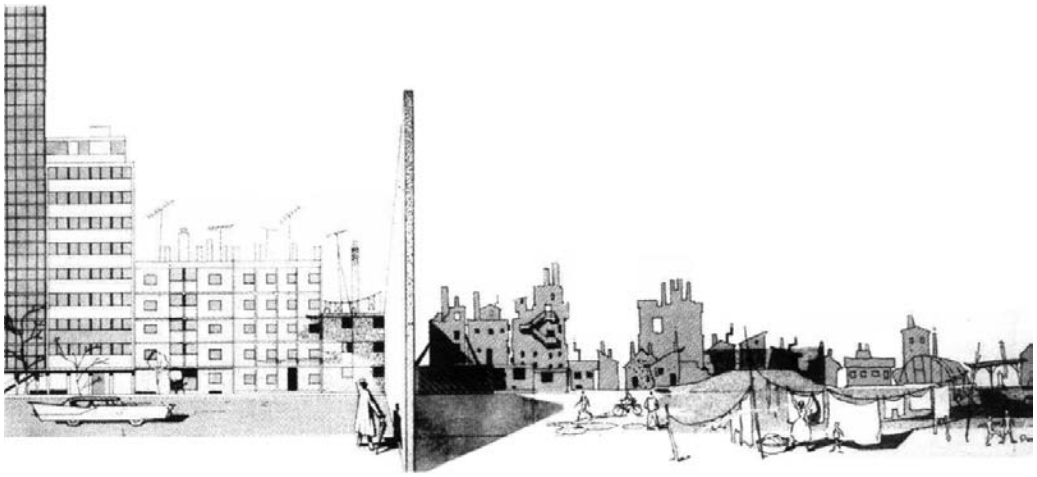
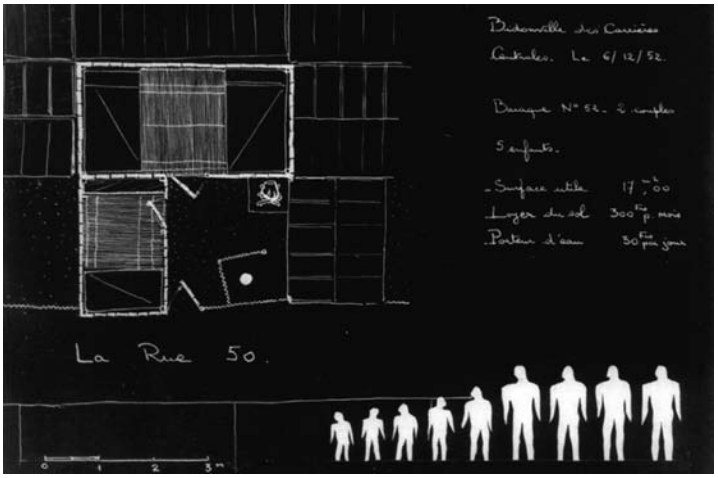


Figure 2.14 Sketch by Alexis Josic showing the rupture between building and human scale in industrialized North African cities. Source: *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* by Tom Avermaete, 129.

Examining the grid presented by GAMMA and the subsequent works of CJW, the issues listed below are considered as significant aspects of *bidonville* in relation to CJW's system approach, specifically to Web:

- Single-storied and horizontal form of organization,
- The dwelling plane, rectilinear cells, and the courtyard as elements of organization,
- Courtyard as a means to human association,
- Courtyard as a multi-functional living space used by a number of families,
- Building plot as a generic plane continuously appropriated by its dwellers,
- Addition of modular cells on the building plot.

In the evaluation part, these points listed above will be summarized under six categories: spatial organization, elements of organization, association, multi-functionality, adaptability, and multiplication. Different from casbah, multi-functionality and adaptability of the building plot (dwelling plane) appear as the most significant aspects of *bidonville* in relevance to Web. This relation between *bidonville* and Web will be revealed after a complete analysis of Web in the following chapter. Before the evaluation of *bidonville*, it is again crucial to recall some of the figures that contributed to the derivation of the points listed above. (Figure 2.15)



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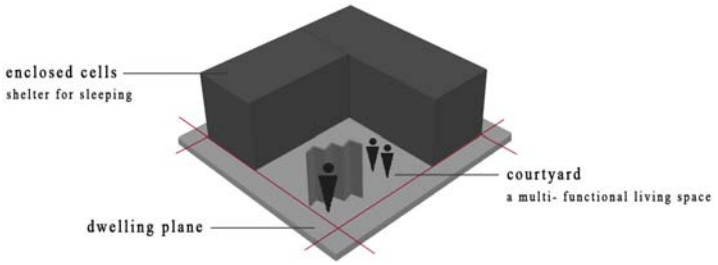

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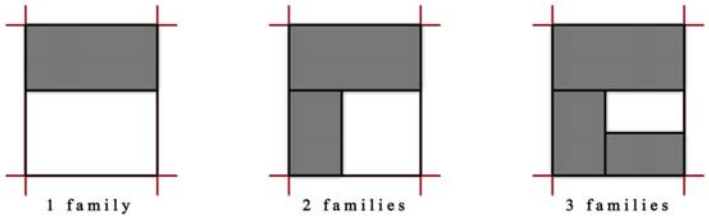

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Figure 2.15 ***Bidonville*** **a. Analysis of** ***bidonville*** **by GAMMA showing the dwelling logics, b. Diagram of the activity plane showing how the cells are added on the generic dwelling plane, c. Photograph by GAMMA showing the organization of rectilinear shacks around a courtyard, d. Diagram showing Possible organizations of the dwelling plot.**

2.1.2.1 Evaluation: What is derived from *bidonville*?

Spatial organization: Single-storied and horizontal form of organization

- on each building plot, rectilinear cells (shacks) are clustered around a courtyard

Elements of organization: The dwelling plane, rectilinear cells, and the courtyard

- determinate element: the dwelling plane (plot)
  (physically determinate, functionally indeterminate)
- indeterminate elements: rectilinear cells (shacks) and the courtyard
  (physically and functionally indeterminate)

Association: Courtyard as a means to human association

- the courtyard acts as a living space for more than one family

Multi-functionality: Courtyard as a multi-functional living space used by multiple families

- courtyard is a generic space that is continuously articulated to accommodate different activities during the day
- any activity except sleeping takes place in the courtyard
- courtyard is the living room for the families to socialize, the play area for the children, the kitchen, the dining room, the storage, the bathroom, or the space for any domestic work

Adaptability: Building plot as a generic plane continuously appropriated by its dwellers

- the degree of indeterminacy:
  - courtyard is the most indeterminate element in the sense that it is continuously appropriated and re-appropriated during the day
  - the cells are the less indeterminate elements in that they are temporary constructions which are easy to construct and re-construct
  - the dwelling plane is physically the most determinate element of *bidonville*

Multiplication: Addition of modular cells on the building plot

- each building plot can be organized by its dwellers through addition of modular cells around a courtyard (clustering of shacks)
- according to the changes in the population, the number of rectilinear cells can be increased by addition of similar modular units

2.2 Precedents

2.2.1 *Habitat Évolutif*

The idea of an "evolving habitat" was developed by CJW during the search for flexible and transformable housing schemes for masses. The partnership argued that the new concerns "mobility" and "identity" arose in the post-war period, required re-consideration of the design of the house as the basic unit of a dwelling culture rather than a mere function of living.[103] Candilis stated that, the design of the post-war house was possible only through a new way of thinking about the habitat:

> In the past, the criterion for the value of a house was its *ability to last*; in the future, it will be its *ability to change*. Starting from this reality, the entire concept of habitat is turned upside down.[104]

Therefore, starting with *Opération Million* Competition (1955), the partnership focused on "simple housing typologies that would allow change and diversification".[105] In 1959 while the partners were working on Bagnols-sur-Cèze Urban Extension Project (1956-1961), they introduced a new concept called "*habitat évolutif*": a habitat that is capable of evolving according to the needs and wills of its inhabitants. This part of the thesis aims to read the idea of *habitat évolutif* through the diagrammatic sketches drawn by the partners, and to examine its relevance to their subsequent Stem and Web projects. The thesis discusses that *habitat évolutif* concept is a precedent of Web, however in Web, the principles are transferred to a different medium: from housing to a multi-functional program.

The elements, which make up the *habitat évolutif,* are categorized in two groups as "determinate" and "indeterminate" elements. The determinate elements are the elements, which are not changeable such as the technical services and access points. The indeterminate elements include all the living spaces, which should be easily changeable according to their user's wills. By drawing a distinction between these two groups, *habitat évolutif* re-defines the position of both the architect and the user. Besides the architect, the users are given an active role in the design of their own space. While the architect is responsible for the determinate elements, the users are responsible for the indeterminate ones. That is to say, in

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[103] Avermaete, *Another Modern*, 130-134.

[104] Ibid., 126. Emphasis added.

[105] Tom Avermaete, "Bagnols-sur-Cèze Urban Extension, 1956-61," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 86.

habitat évolutif "an architect prepares housing up to the point that man can take over, he provides *a framework in which man can design his own home*".[106]

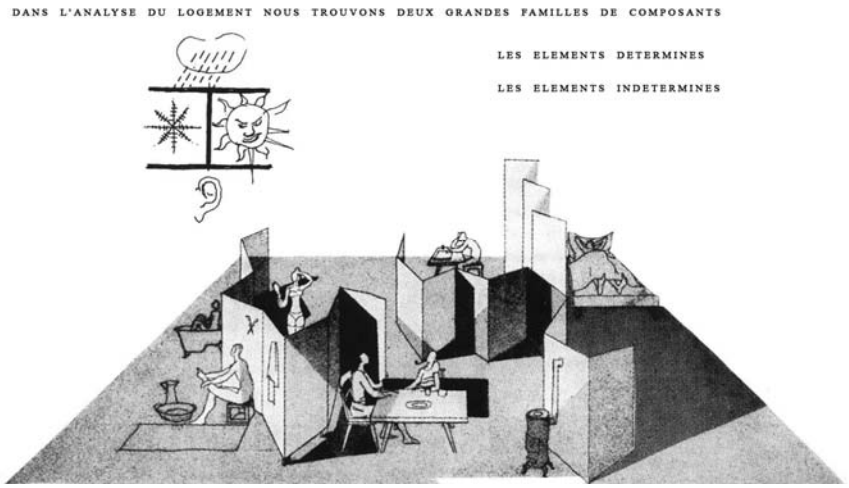

Figure 2.16 Sketch of *habitat évolutif* showing the determinate and indeterminate elements. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 176.

A prominent idea behind *habitat évolutif* is enabling user-participation. Opportunity of participation is significant both in terms of efficient use of the dwelling unit and of evoking a sense of belonging. Enabling user-participation means, in Boyer's words, "not excluding the energy of a tenant's initiative, and helping the individual identify with the collective".[107] In *habitat évolutif* user participation is possible through utilization of indeterminate elements. The existence of indeterminate elements renders the scheme flexible for future changes, which cannot be anticipated by the architect. Only the basic facilities are determined by the architect. The other spaces can be appropriated and re-appropriated in accordance with the spatial requirements or changes in the inhabitants' lifestyles. In this sense *habitat évolutif* is a *non-narrative surface plane* that is shaped by its users or in Avermaete's terms "a neutral scene that supports the occurrence of dwelling practices."[108] (Figure 2.16)

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[106] Christine Boyer, "The Team 10 Discourse: Keeping the Language of Modern Architecture Alive and Fresh," in *Team 10:1953-81, in Search of a Utopia of the Present*, eds. Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 267. Emphasis added.

[107] Ibid.

[108] Avermaete, *Another Modern*, 174.

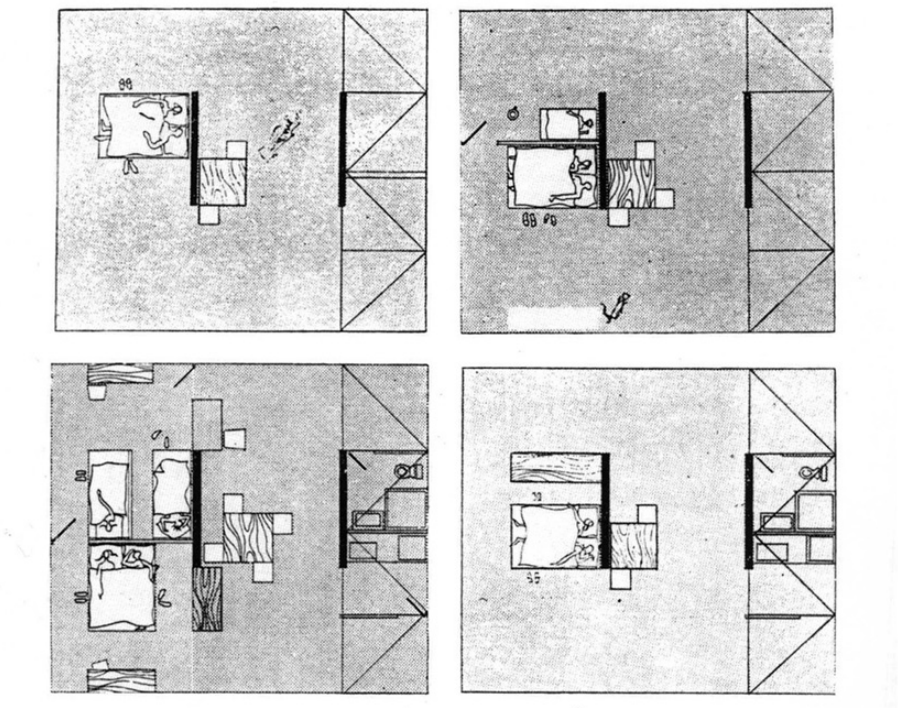

Figure 2.17 Sketch plans of *habitat évolutif*: possible organizations of the generic dwelling plane. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 176.

Another attribute of *habitat évolutif* idea is that it questions norms of partition in modern dwelling. By norms of partition CJW means allocation of separate rooms for different functions (sleeping room, living room, kitchen, etc.).[109] CJW rejects these norms because they are "[a]rbitrary norms that break up the dwelling instead of creating a biological unity".[110] In *habitat évolutif*, there are no rooms, no pre-determined partitions. (Figure 2.17) The dwelling is a continuous universal space in which spaces and activities merge into each other. In everyday life, spaces can be defined by temporary partitions in order to provide privacy without interrupting the continuity of the total space. Avermaete explains the potential of *habitat évolutif* as such:

> Free spaces of variable size and programmatic function can be arranged in a rational way using, standard, manufactured elements according to the means and needs of the family, independently of the established norms of partition.[111]

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[109] Avermaete, *Another Modern*, 170.

[110] Ibid., 170-171.

[111] Avermaete, "Bagnols-sur-Cèze Urban Extension," 86.

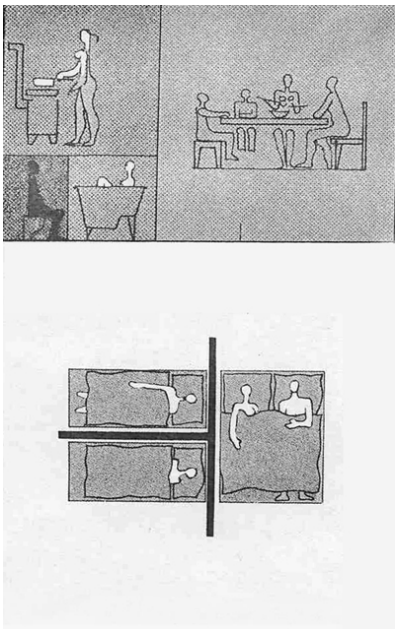

Figure 2.18 Sketch of *habitat évolutif* showing that spaces are defined by the activities they accommodate. Source: Jürgen Jeodicke, Candilis-Josic-Woods: A Decade of Architecture and Urban Design, (Bern: Kramer, 1968), 126.

In *habitat évolutif*, spaces are defined by activities not by norms. There is no physical and visual isolation of functions within the dwelling. Different activities can take place in the same space at different times of the day, by the manipulation of indeterminate elements, or the temporary partitions. (Figure 2.18) Due to this appropriation and re-appropriation process, there occurs a continuous interaction between the users and the built space. Elimination of pre-determined partitions or separated rooms also encourages interaction between the family members; as a result, the individual is never detached from the collective. In this sense *habitat évolutif* acts as a solution to the issue of human association.

Another significant feature of *habitat évolutif* is that the dwelling unit is interpreted as a "plane" that is capable of accommodating different everyday activities. (Figure 2.16) Jürgen Joedicke argues that the characteristic feature of CJW's architecture is that they "*fashion space with plain surfaces*":

> The point of departure is the organization of the *ground plan* or, more precisely, of the human activities carried on in and around the home and its extensions.[112]

[112] Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 9. Emphasis added.

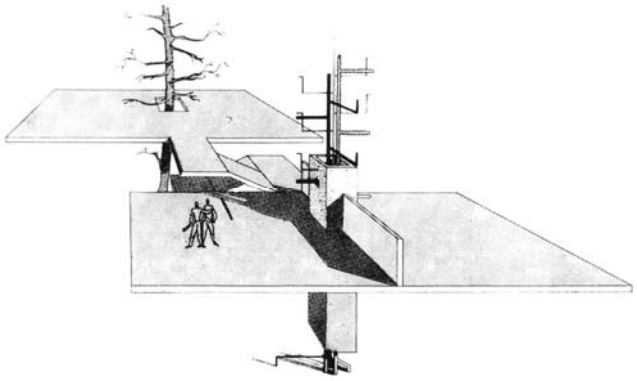

Figure 2.19 Sketch of *habitat évolutif* showing how the dwellings are conceived as planes. This figure also illustrates the column of services piercing the planes. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 177.

In *habitat évolutif* the dwelling units are linked together in order to produce a continuous ground floor that is supported and organized by the determinate elements of the system. Avermaete states that:

> [*Habitat évolutif*] was conceived as a combination of vast surfaces punctured by vertebral columns of "networks of movement, inflow and outflow, as well as basic facilities".[113]

The emphasis on the continuity of the ground floor can also be seen in the sketch by Josic, which was originally published in the article "*Repenser le Problème*" in 1959. (Figure 2.20) Josic's sketch can be interpreted as a section passing through daily life: the day starts in one of the dwelling units of *habitat évolutif* and ends in the same unit, but the spatial articulation of the dwelling changes according to time and spatial requirements of the inhabitants. This diagrammatic section represents the evolutionary potential of *habitat évolutif*, indicates the continuity between individual and collective life, and depicts everyday life as a continuous ground floor on which a variety of activities take place. This idea of a multi-functional ground floor capable of evolving is the essence of *habitat évolutif*, and to a greater extent of Web and Frankfurt-Römerberg. Joedicke argues that the ground plan idea developed for housing is also relevant for different programs:

> This principle is equally valid in buildings for community and other purposes, *the ground plan system* being developed here also from the *integration of general and specific activities*.[114]

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[113] Avermaete, *Another Modern*, 174.

[114] Joedicke, *Candilis-Josic-Woods*, 9.

Figure 2.20 Sketch by Alexis Josic depicting an ordinary day in the *habitat évolutif*. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 128-129.

When CJW's diagrams are examined in detail, the following points come out as prominent features of the *habitat évolutif*:

- Determinate elements / indeterminate elements,
- Planar organization,
- A continuous plane of association freed from pre-determined partitions,
- A flexible multi-functional plane that generates everyday activities,
- A non-narrative surface appropriated and re-appropriated by its dwellers.

In the evaluation part, these points will be summarized in five categories: elements of organization, form of spatial organization, association, multi-functionality, and adaptability. (Figure 2.22)

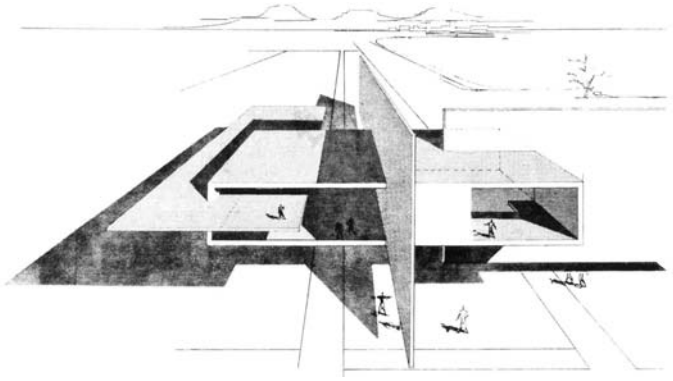
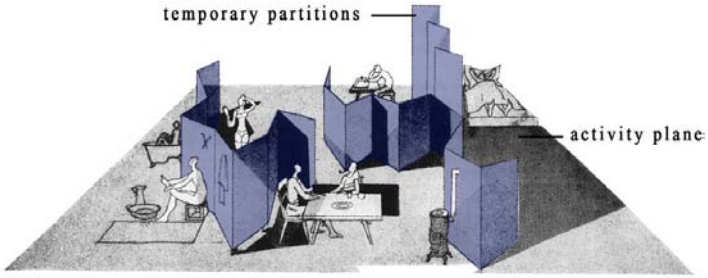


Figure 2.21 Sketch of *habitat évolutif*. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 177.

The points listed above are significant in understanding the Web, because it is possible to read the Web on the basis of the principles that exist in *habitat évolutif*. The thesis argues that *habitat évolutif* is the first attempt to develop a system of architectural organization that later evolves into Web. In this respect, Web can be perceived as a system of organization composed of planes or "ground floors", which are not isolated from each other physically or functionally. Similar to *habitat évolutif*, these ground floor planes in Web encourage association and interaction. It is also possible to read the determinate and indeterminate elements in Web with reference to *habitat évolutif*. The thesis argues that the idea of *habitat évolutif* evolved into Web with differences in scale and program: in Web, the idea is transferred into an urban scale, and into a more complex program. The parallelism between *habitat évolutif* and Web will be further discussed in the following chapters.



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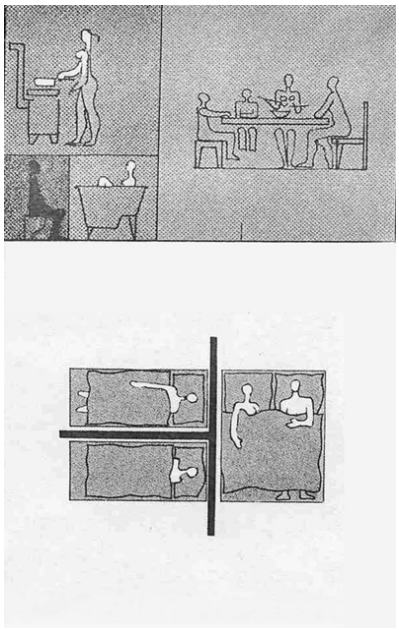

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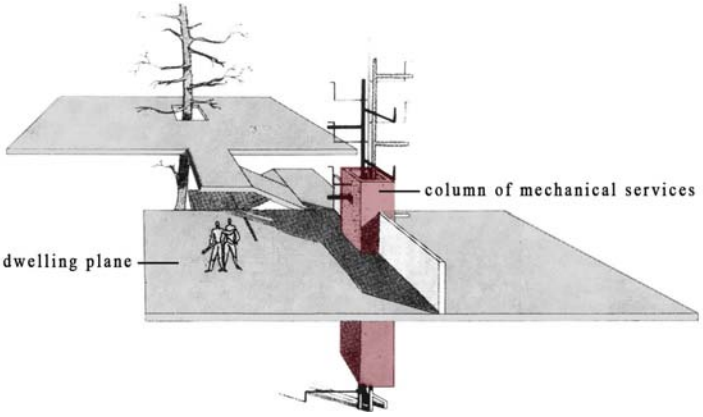

c.

Figure 2.22 ***Habitat évolutif*** **a. Sketch of** ***habitat évolutif*** **showing the determinate and indeterminate elements, b. Sketch of** ***habitat évolutif*** **showing that spaces are defined by the activities they accommodate, c. Sketch of** ***habitat évolutif*** **showing how the dwellings are conceived as planes.**

2.2.1.1 Evaluation: Potentials of *Habitat Évolutif*

Elements of organization: Determinate elements / indeterminate elements

- determinate elements: elements that are not easily changeable = permanent elements (dwelling plane, envelope, technical services, circulation elements, and access points)
- indeterminate elements: elements that are easily changeable = temporary elements (temporary partitions, living spaces, sleeping spaces, etc.)

Form of spatial organization: Planar organization

- a variety of everyday activities organized freely on a plain surface

Association: A continuous plane of association freed from pre-determined partitions

- there is no physical separation/isolation of functions (elimination of the "room")
- a continuous universal space, in which spaces and activities merge into each other
- a plane that provokes interaction between family members, and between the dwellers and the dwelling (both voluntary and involuntary association)

Multi-functionality: A flexible multi-functional plane that generates everyday activities

- the generic plane can be organized and re-organized with temporary partitions during the day in a way to produce temporary spaces for different activities
- the spaces for specific activities are determinate elements of the *habitat évolutif*, whereas the spaces for general activities are indeterminate
- in *habitat évolutif* spaces are defined by activities, not by norms of partition

Adaptability: A non-narrative surface appropriated and re-appropriated by its dwellers

- determinate elements (basic facilities/services) are defined by the architect and they are not open to changes
- indeterminate elements (served spaces) are shaped by the users according to their changing needs and wills by using temporary elements (user-participation)
- the dwelling plane appears as a determinate element of *habitat évolutif*, however its organization is indeterminate (physically determinate, functionally indeterminate)

2.2.2 Stem

Stem concept was introduced by CJW as an alternative to concentric forms of organization, which have limited capacities of accepting change and growth (1960).[115] According to Woods, although the concentric scheme allows expansion on the periphery, the core, which houses communal and cultural services supporting the social life, is incapable of growth.[116] Instead of a concentric scheme, Woods argued that the supporting services of the city life should be arranged within a linear scheme, which is capable of extending proportional to the population growth.[117] (Figure 2.23) Then, CJW focused on the traditional street as a model of linear organization and, decided to explore the potential of street, in Avermaete's terms "as a *social condenser* and as a figure that structures the development of urban form."[118]

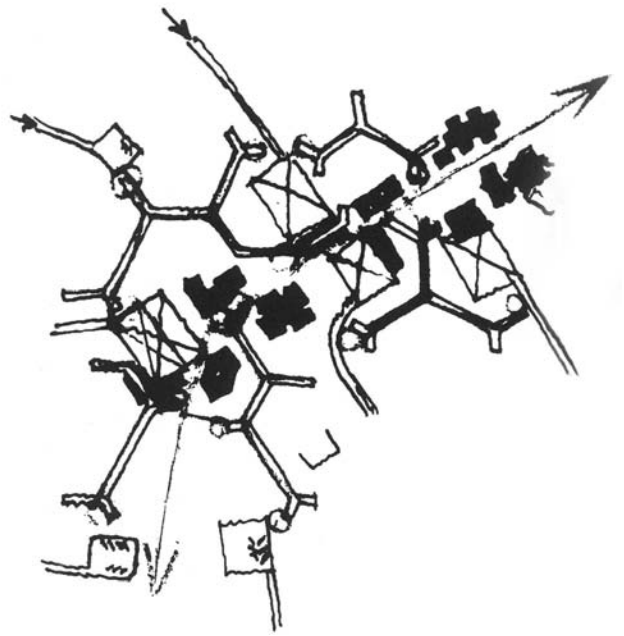

Figure 2.23 Conceptual sketch of Caen-Hérouville as the first applied example of Stem, 1961. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 247.

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[115] "Stem" with capital "S" denotes the concept, whereas "stem" denotes the element.

[116] "Toulouse – Le Mirail: Candilis Josic Woods," *The Architectural Forum*, June (1963): 108-111.

[117] Ibid.

[118] Tom Avermaete, "Caen Hérouville, Bilbao Val d'Asua, Toulouse-Le Mirail Urban Studies, 1961-62" in *Team 10 1953-81: In Search of a Utopia of the Present* eds. by Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 96. Emphasis added.

Likewise, Smithsons also believed in the potential of street in generating urban life. For Smithsons, "the street is not only a means of access but also an arena for social expression":

> In the old tradition, the street outside the house is the first point of contact where children learn for the first time the world outside. Here are carried on those adult activities, which are essential to everyday life.[119]

This attitude towards the street as a valuable element for urban life was in direct opposition with the ideas of Le Corbusier and CIAM who called for the abolition of the street and its replacement with wide green areas. According to Smithsons and other members of Team 10, these green areas were devoid of the associative characteristic of the traditional street, thus, appeared to be inadequate in terms of supporting communal life. Criticizing the approach of their colleagues, Smithsons argued that it was necessary to re-consider the potential of the street as an element of association. However, as they explained in the scale of association diagram, what Smithsons mean is not the revival of the street in literal sense, but re-conceptualization of the idea of the street as a medium for human association:

> It is the idea of street not reality of street that is important –the creation of effective group-spaces fulfilling the vital function of identification and enclosure, making the socially vital life-of-the-streets possible.[120]

Likewise, according to CJW the street had to be confined from its formal characteristic and re-conceptualized as a tool for structuring the physical and social realm. Candilis argued that they had to "rediscover the 'linear city center street' as the basic structure for a city plan".[121] According to Manfred Schiedhelm, CJW saw the street "as a void which allows the flow of people, goods, and facilities. [...] As long as this void was kept clear, the rest could be adapted to changing needs".[122] Departing from the idea of the linear city center street, CJW introduced the concept Stem as a minimum structuring device for linear association of activities:

> We started with a line –as *a way of organizing things*- and began by saying what was on the line and what the line was; a group of human activities which have to be discovered: it is an attempt to find out what will be the relationship between things.[123]

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[119] Alison Smithson and Peter Smithson, *The Charged Void: Urbanism*, 24.

[120] Alison Smithson and Peter Smithson, *Ordinariness and Light*, 42.

[121] Van den Heuvel and Risselada, *Team 10 1953-81*, 96.

[122] Manfred Schiedhelm, "Architect's Statement: The Berlin Free University Experience," in *Free University, Berlin: Candilis, Josic, Woods, Schiedhelm* (London: Architectural Association, 1999), 97.

[123] Shadrach Woods, *Team 10 Meetings 1953-1984* ed.Alison Smithson (New York: Rizolli, 1991), 89. Emphasis added.

Stem is a path, a linear element of organization, which includes the ancillary functions that support the dwelling practices. With reference to Louis Kahn, Woods also names the ancillaries as the "servants" and the dwellings as the "served" spaces of the urban realm.[124] The ancillaries include all the functions that are necessary to generate an urban life: cultural, social, commercial, and leisure activities, and technical services. These ancillaries or the spaces for collective activities are aligned along the stem in a way to support the spaces for individual activities, the dwellings. (Figure 2.24) Stem acts as a mediator between these two categories: ancillaries and dwellings or served and the servant or the individual and the collective. It is a *structural tool* relating the two components namely the ancillaries and the dwellings, thus it enables the scheme to work as a system.

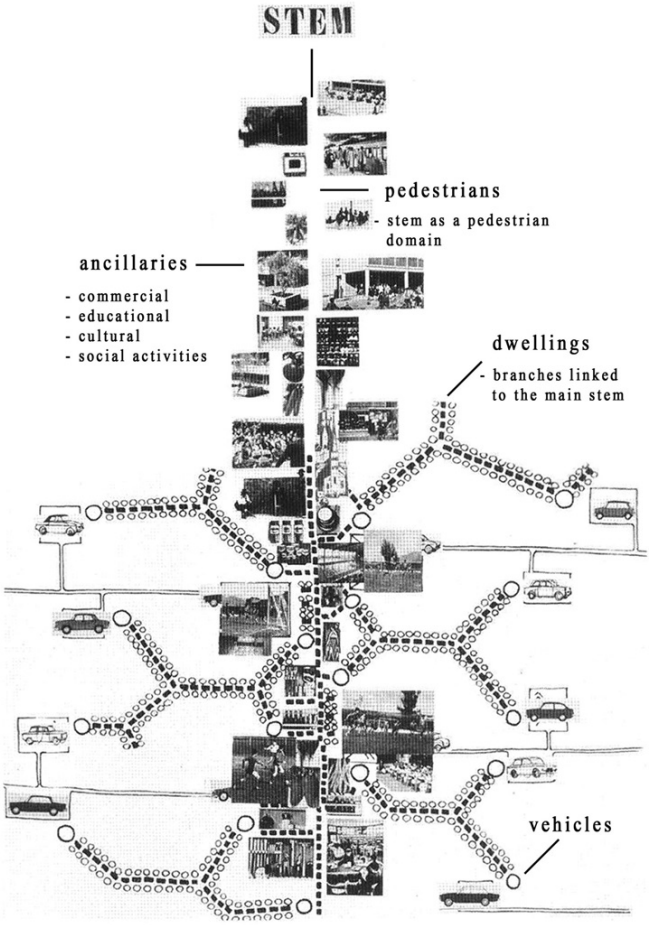

Figure 2.24 Stem. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 245. Edited by the author.

[124] Shadrach Woods, "Urban Environment: The Search for System," in *World Architecture 1*, ed. John Donat (New York: Viking Press, 1964), 153.

The ancillaries are, in Woods' terms "the determinants" of the scheme in that they determine the location, density and rhythm of the dwelling blocks, and give an order to the system.[125] According to Tom Avermaete location of the ancillaries draws a pattern for the implantation of the housing blocks as "branches grafted onto the stem," and defines a framework for further developments.[126] In Avermaete's terms:

> The size, character, and spacing of the collective functions gives structure to the implantation of the whimsical housing blocks and thus determine the character and density of the urban layout to a certain extent.[127]

Although the ancillaries are the determinants of the system, they are not totally determinate themselves. In Stem organizations, the ancillaries are made into "space clusters" instead of single monumental buildings. These ancillary clusters are capable of growing by addition of modular units to satisfy the spatial and technical requirements of the present and the future. The fact that the ancillaries are clustered as "fragments" renders the whole complex more adaptable to short and long-term changes. (Figure 2.25) In this sense, the ancillary clusters in Stem differ from the monumental public buildings: the monumental buildings are more determinate than the space clusters, in that they have a very limited capacity to accept physical and functional changes. However, the space clusters in Stem are more indeterminate because the fragments are more open to change and multiplication. With a similar terminology Smithsons call the monumental buildings as the architectural "fixes" of the built environment, whereas they call the smaller buildings as the "transients" which can be "added to, altered, or completely re-built on a short-term cycle of change".[128]

The cluster idea can be observed in CJW's Caen-Hérouville Project. In Caen-Hérouville the ancillary activities are connected to the main stem in the form of space clusters. A piece of land is allocated for each ancillary activity, and these activities are organized into clusters through combination of smaller cells on the allocated land. In Caen-Hérouville, it is foreseen by the architects that the technical and spatial requirements for the collective activities can change in short-time periods therefore the ancillaries should allow growth and change. It can be said that, the plan of Caen-Hérouville responds to this concern of flexibility by providing

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[125] Ibid., 153.

[126] Avermaete, *Another Modern*, 254.

[127] Ibid.

[128] Alison Smithson and Peter Smithson, *Ordinariness and Light*, 177.

a piece of land, a plane, on which each ancillary space cluster can grow via addition of modular units ((Figure 2.25).

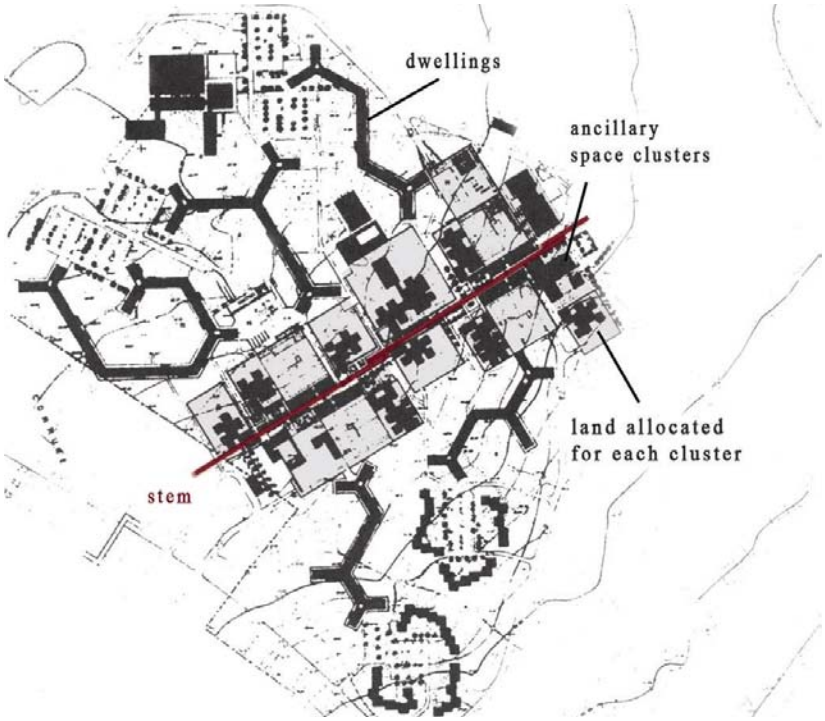

Figure 2.25 Caen-Hérouville, 1961. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 250. Edited by the author.

The fact that all commercial, cultural, educational, and leisure activities are directly accessible from the stem level, contributes to the idea of street as a "social condenser" in Avermaete's term.[129] "Social condenser" is based on the idea of Russian Constructivists that architecture has the ability to influence social behavior of the individuals. In "Content", Rem Koolhaas defines social condenser as "programmatic layering upon vacant terrain to encourage dynamic coexistence of activities and to generate through their interference, unprecedented events".[130] A social condenser increases interaction among individuals and generates urban life. Therefore, it can be said that, a social condenser is a tool for human

[129] Tom Avermaete, "Caen Hérouville, Bilbao Val d'Ausa, Toulouse-Le Mirail Urban Studies 1961-62" in *Team 10 1953-81: In Search of a Utopia of the Present* ed. by Dirk van den Heuvel and Max Risselada (Rotterdam: Nai Publishers, 2005), 96.

[130] AMOMA, *Content* (Köln : Taschen, 2004), 73.

association, so is stem. In this sense, stem operates as a tool for human association rather than merely being a means of access:

> Stem then, is considered not as a simple linking mechanism between additive cells but as a *generator of habitat*. It provides the environment in which the cells function.[131]

With the diversity of activities it accommodates, stem is the "social and physical infrastructure" of the habitat.[132] Stem is a multi-functional line that generates urban life.

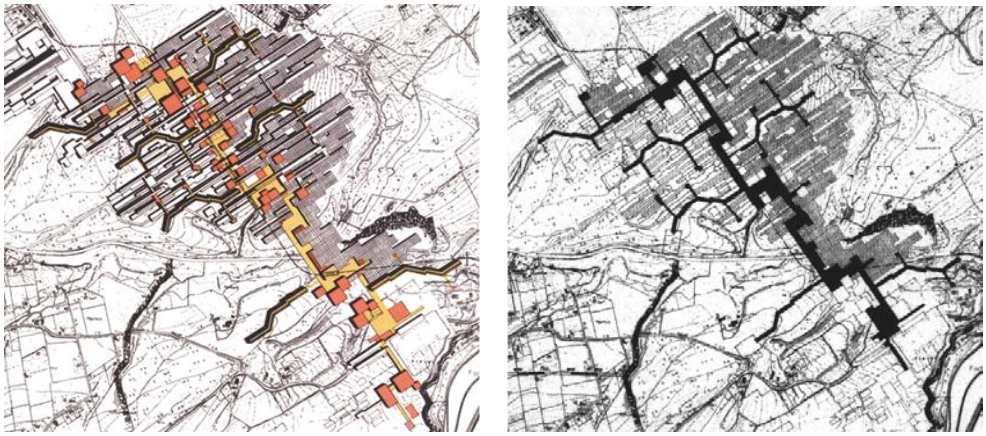

Figure 2.26 Bochum University. 1. Ancillaries distributed along the stem. 2. Pedestrian network: stem and elevated streets. Source: Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 110,111.

Stem is a public domain only for the pedestrians. While the road appears as the structuring element of the city in the CIAM discourse, in CJW' plans the emphasis shifts from the automobile to the pedestrian. Vehicular traffic is segregated from the pedestrian circulation, namely from the stem and the secondary paths, and kept at the peripheries of the project areas. The aim here is to give the pedestrian freedom of movement without being interrupted by the motor traffic, and to facilitate human association. The stem also continues within the dwelling blocks in certain levels in a way to form a continuous pedestrian network that provokes association in different degrees: less public in the dwelling blocks than the main stem. The elevated decks, which continue in the dwelling blocks are supported by the activities on the stem; therefore, they provoke human association and contribute to the communal life.

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[131] Shadrach Woods, "Urban Environment: The Search for System," 153. Emphasis added.

[132] Avermaete, *Another Modern*, 255.

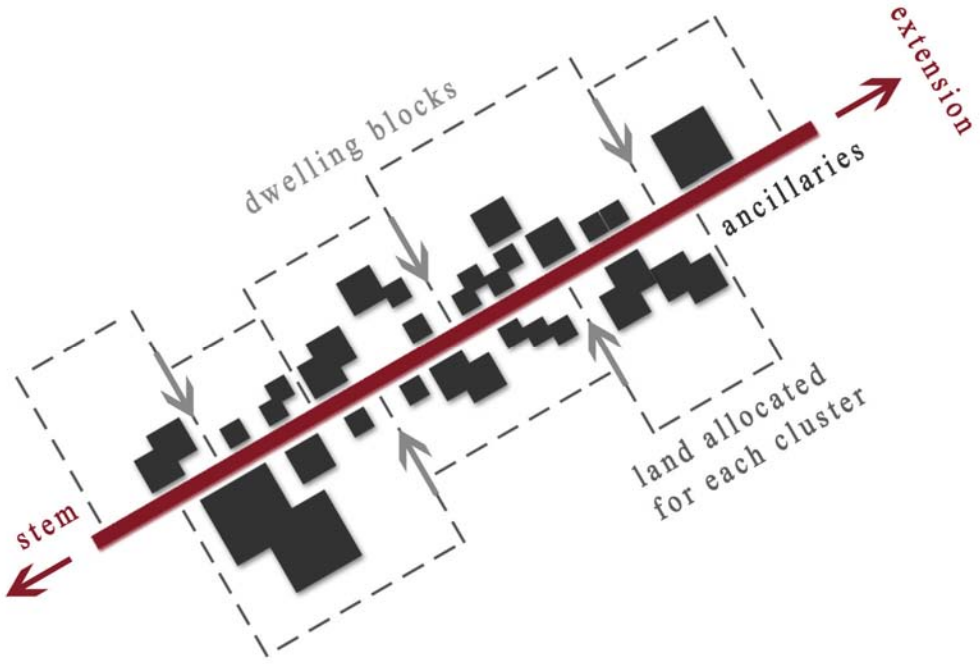

Figure 2.27 Diagram showing the relationship between the stem, the ancillaries, and the dwellings blocks. Produced by the author.

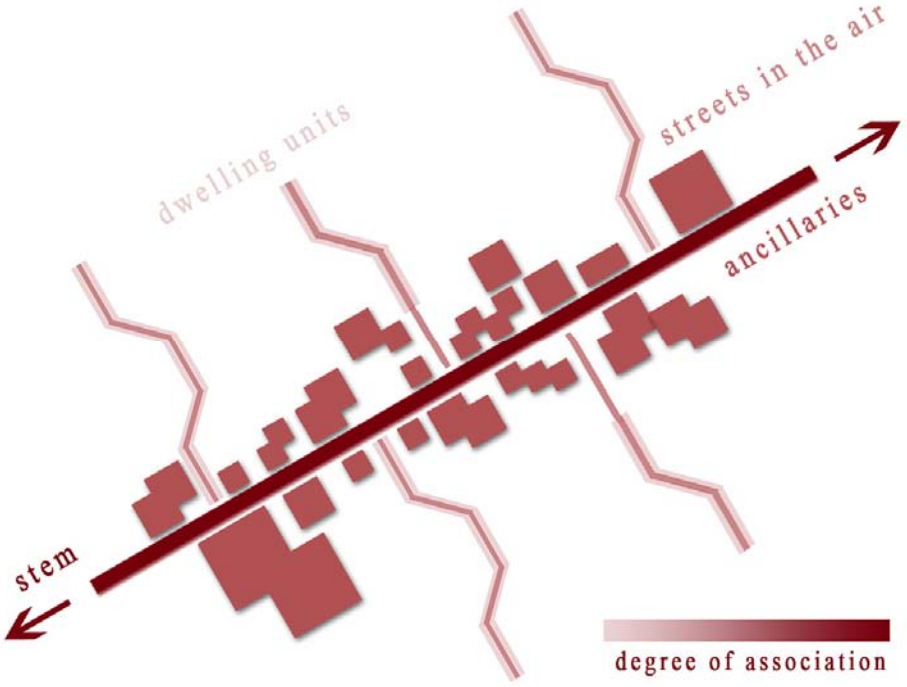

Figure 2.28 Diagram showing the degrees of association in the Stem. Degree of association decreases from the stem to the dwelling units, so as collectivity. Produced by the author.

Besides CJW, Smithsons also emphasized the significance of establishing continuous pedestrian networks, especially in terms of human association. Therefore, they proposed elevated pedestrian decks, which continue within the dwelling blocks as extensions of the streets on the ground. Smithsons calls these decks "streets-in-the-air". These elevated streets have flexible connections to ground at several points that increases accessibility in the whole residential complex. Another feature of the streets-in-the-air concept is that, it forms an extendable network with a capacity of growth; it is a significant feature considering Smithsons' preoccupation with the concept mobility. The streets-in-the-air concept is applied in Smithsons' Golden Lane Project. (Figure 2.29, 2.30) In Golden Lane, the elevated streets act as transition spaces between individual and collective activities, and appear as the prominent elements of organization in terms of association. Heuvel states that "[t]his spacious gallery giving access to the flats was conceived as a conduit for the playfulness of human association".[133]

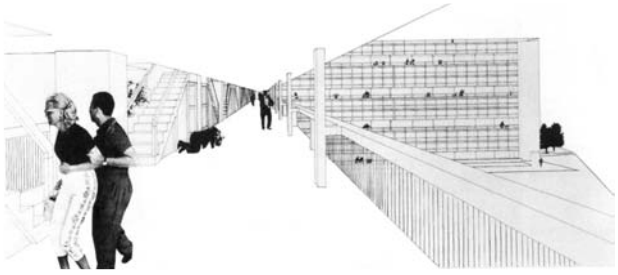

Figure 2.29 Golden Lane Project: streets-in-the-air, view from the gallery. Source: SzeTsung Leong and Ghuihua Judy Chung, ed., The Charged Void: Architecture, Alison and Peter Smithson, (New York: The Monacelli Press, 2001), 87.

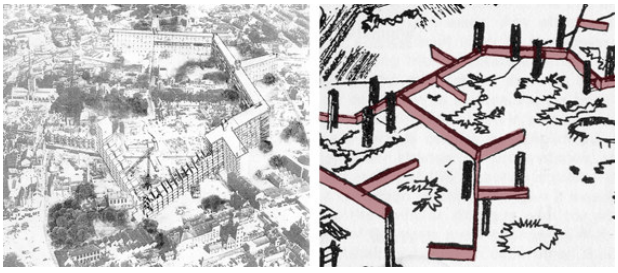

Figure 2.30 Golden Lane Project: streets-in-the-air. Source: Melih Yüksel, "The Relevance of Team 10" Unpublished Master Thesis in Architecture (Middle East Technical University, Ankara, 2005), 56. Edited by the author.

[133] Van den Heuvel and Risselada ed., *Team 10 1953-81*, 30.

However, according to Frampton, these elevated one sided-galleries turn out to be inadequate in provoking association because they are too linear to engender a sense of place and have too little continuity with the existing streets on the ground.[134] For Frampton, it was clear that "the street, itself, now divorced from the ground, could no longer accommodate community life".[135] The fact that these galleries are adjacent to the housing blocks on one side also constrains the spatial use of these elevated streets for any public activity. Smithsons' streets-in-the air differs from Stem in this sense.

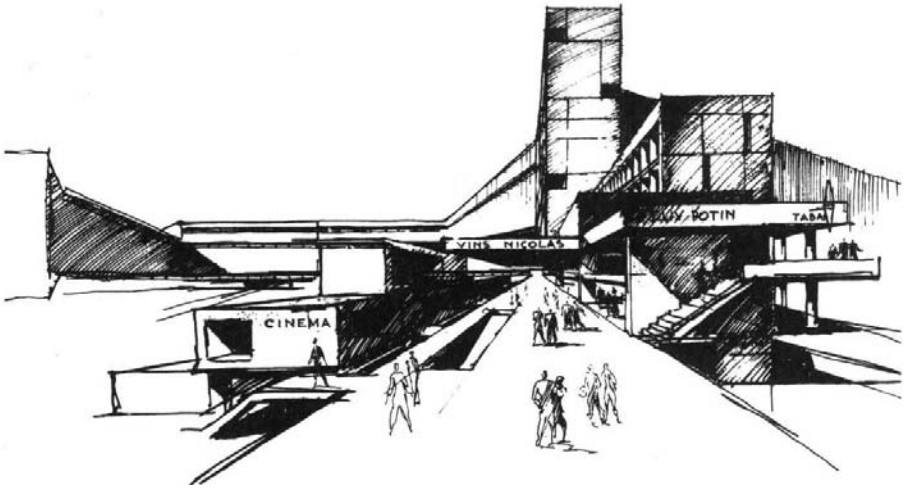

Figure 2.31 Sketch of Toulouse le Mirail by CJW. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 275.

Stem is a linear path, it is not a concrete element, and it "acquires its actual form and span from the alignment of entities that are both built architectural volumes and collective functions".[136] A significant attribute of stem is that it is not a single-leveled path. The ancillaries and dwelling blocks are connected to the stem at different levels in a way to establish a multi-level organization of activities. (Figure 2.31) In this sense, stem is in Avermaete's terms "a vertebral spine",[137] but a spine that serves to different levels. Adapting

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[134] Frampton, *Modern Architecture: A Critical History*, 272.

[135] Ibid., 272.

[136] Avermaete, *Another Modern*, 243.

[137] Ibid., 251.

itself to the topographical features and opening the roof terraces to circulation, stem represents a three-dimensional understanding of the urban realm rather than the two-dimensional space understanding of CIAM. By means of Stem, both the open and closed spaces acquire three-dimensional characteristics. The stem, which was directly situated on the ground in the preliminary stages of the idea, was later adapted in the form of an elevated platform.[138]

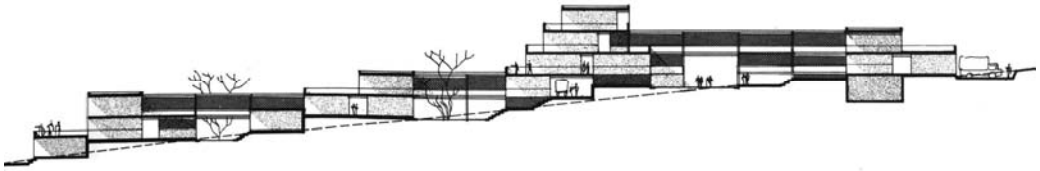

Figure 2.32 Section of Bochum University. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 111.

By utilizing Stem, CJW establishes a *pattern of association* capable of relating itself with smaller and larger scales, and an open-ended organization capable of adapting to growth and change. The rhythm and density of solid-void relationship on the main stem, draws a pattern for future developments:

> Perhaps the most striking feature of Le Mirail's plan, however, is that it almost calls for change, for adaptation to the kind of natural urban growth that no amount of long-range planning can precisely forecast. With its moving, reaching stems and tendrils, Le Mirail is the *direct opposite of the closed urban composition*.[139]

In this sense, stem is a tool for an open-ended organization, in other words a tool for flexibility and growth. Woods explains why the stem, or the line was chosen as the major structuring element: "[a] line is *open-ended*; it has no dimension; it can change direction at will".[140] Stem is a *structuring device* that weaves a diversity of activities in a linear way. It is a system of functional and physical linkage that is open to short or long term changes and developments.

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[138] Gabriel Feld, "Shad's 'Idée Fixe: Berlin Free University and the Search for Principles of Organization." in *Free University, Berlin: Candilis, Josic, Woods, Schiedhelm* (London: Architectural Association, 1999), 111.

[139] "Toulouse – Le Mirail: Candilis Josic Woods," *The Architectural Forum*, June (1963): 108-111. Emphasis added.

[140] Shadrach Woods, "Urban Environment: The Search for System," 153.

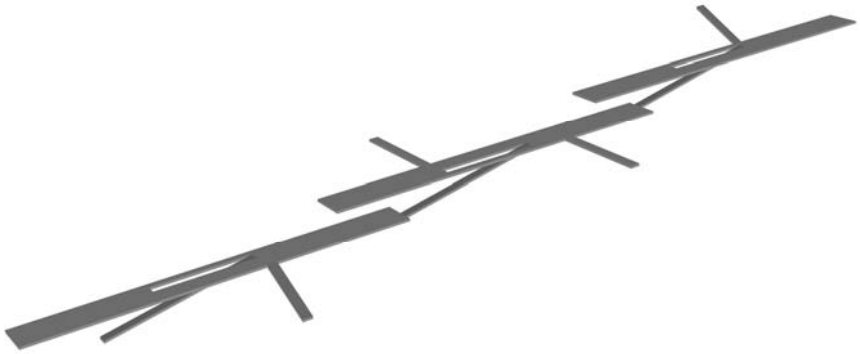


Figure 2.33 Model of stem as a linear and multi-level circulation element. Produced by the author.

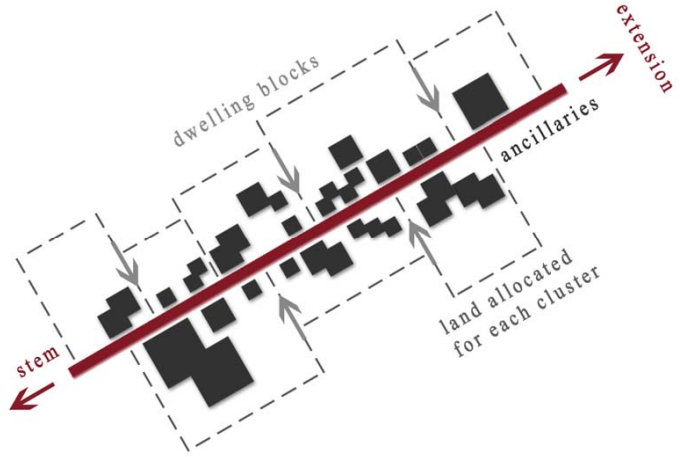
The issues listed below appear as the most significant features of Stem in relevance to CJW's system approach:

- Dwellings, ancillaries, stem as elements of organization,
- Linear-centric organization,
- A continuous pedestrian network freed from vehicular traffic,
- Stem as an element of association, a social condenser, and a generator of habitat,
- Stem as a multi-functional spine that accommodates collective activities,
- An open-ended organization rather than a closed form,
- Ancillary space clusters that are capable of growing by modular multiplication.

In the evaluation of Stem, these issues will be summarized in seven categories: elements of organization, form of spatial organization, circulation, association, multi-functionality, adaptability, and multiplication. (Figure 2.34)

These points mentioned above are also crucial in terms of analyzing and evaluating Web because Woods states that he uses the word Web "to designate Stem to the next degree" and defines it as "Stem squared".[141] Stem and Web have some differences in formal and spatial characteristics as well as they have similarities. These similarities and differences will be revealed after a detailed analysis of Web in the following chapter. In this part of the thesis, it will be sufficient to state that both Stem and Web are systems of architectural organization, and Stem along with *habitat évolutif* is a precedent of Web.

[141] Ibid.



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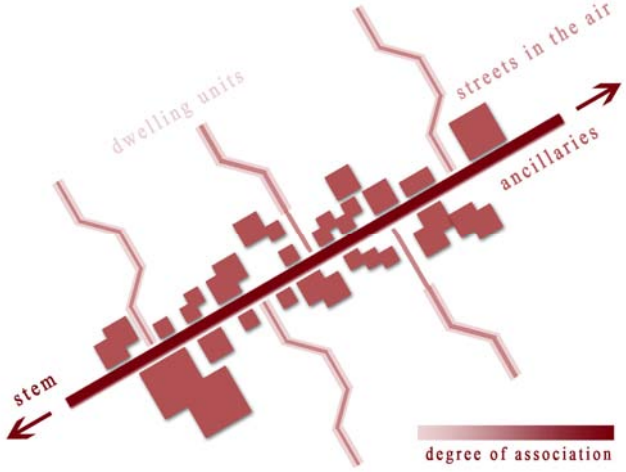

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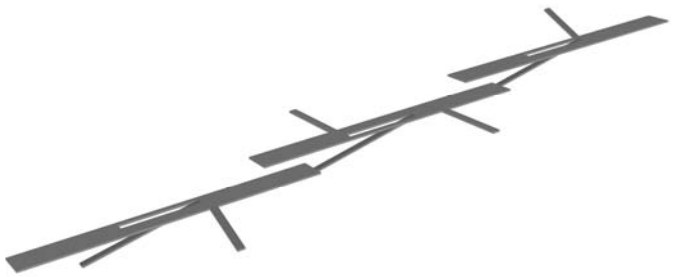

c.

Figure 2.34 Stem a. Diagram showing the relationship between the stem, the ancillaries, and the dwellings blocks, b. Diagram showing the degrees of association in the Stem., c. Model of stem as a linear and multi-level circulation element.

2.2.2.1 Evaluation: Potentials of Stem

Elements of organization: Dwellings, ancillaries, stem

- dwellings: served spaces
- ancillaries: serving spaces
- stem: linear structuring element surrounded by ancillaries

Form of spatial organization: Linear-centric organization

- ancillaries are clustered and aligned along the linear stem
- dwellings are connected to the main stem in the form of linear but diverted branches

Circulation: A continuous pedestrian network freed from vehicular traffic

- a multi-level and multi-directional pedestrian system
- elements of the circulation system: stem, secondary paths, and elevated decks
- density of pedestrian activity is maximum on the stem, but less on others

Association: Stem as an element of association, a social condenser, and a generator of habitat

- stem is a means to human association rather than a mere element of access
- as the main pedestrian route, stem provokes both voluntary and involuntary association between individuals

Multi-functionality: Stem as a multi-functional spine that accommodates collective activities

- with the ancillaries aligned on it, stem includes all the functions that are necessary to generate urban life (cultural, social, educational, commercial, etc)
- as a medium for pedestrians, stem provokes occurrence of non-planned activities
- co-existence of different activities on stem contributes to human association

Adaptability: An open-ended organization rather than a closed form

- a line is flexible in that it has no dimension and no limit
- as a line, stem is capable of extending in a way to accommodate the rising population

Multiplication: Ancillary space clusters are capable of growing by modular multiplication

- the ancillaries on stem are defined in the form of space clusters
- a piece of land (a bounded plane) is allocated for each specific space cluster

- the space clusters can be expanded to accommodate more people or new activities through addition of smaller cells (fragments) on the bounded plane

2.3 Relevance of the Sources and Precedents

This chapter of the thesis examines the references of CJW's Web concept. Although Woods considers Web as a "Stem-squared", these two have different spatial and formal characteristics. These differences tempted the thesis to search for other sources and precedents of Web. This chapter is an effort for examining the influences of the sources and precedents, and preparing a base for relating them to Web.

It is written by many architectural critics that Team 10 was influenced by indigenous form of settlements while producing their theoretical and practical works. Similarly, it is known that CJW was specifically influenced by casbah and *bidonville* settlements, and utilized them as references for the residential projects they conducted in North Africa. However, during the research, the author of this thesis did not come across to a text, which analyzed the relevance of these indigenous settlements in the specific case of Web.[142] Therefore, in the sources section, these two indigenous settlements are analyzed with conceptual diagrams produced by the author, in addition to the drawings produced by GAMMA.

Another contribution of this chapter is that *habitat évolutif* is considered as a precedent of the Web. The thesis argues that *habitat évolutif* concept is significant because it is the initial idea behind Web yet in a different scale, with a different program. Conceptual and formal analysis of Stem was also essential for this chapter not only to find out what makes the Web a Stem-squared but also to find out other references for Web.

This thesis considers Web as a product of a research project for alternative systems of organization, therefore, the following chapter on Web is structured according to the principles derived from the sources (casbah and *bidonville*) and the precedents *(habitat évolutif* and Stem). In this sense, the evaluation parts appear to be crucial in terms of understanding the Web, and revealing the relevance of the sources and precedents. The relation of casbah, *bidonville*, *habitat évolutif*, and Stem will be clarified after a complete and detailed analysis of Web in the following chapter.

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[142] In "Casbah: A Brief History of a Design Concept," Robert Oxman, Hadas Shadar and Ehud Belferman discuss the relevance of casbahism specifically in terms of van Eyck's configurative discipline and carry it to Smithson's mat-building and the megastructural approach.

CHAPTER 3

READING THE WEB:
FRANKFURT-RÖMERBERG COMPETITION PROJECT

Another concept introduced by CJW during the search for systems of organization is Web. Following the partners' experience with Stem, Woods wrote an article introducing the Web, which was published in the architectural periodical *Le Carré Bleu* in 1962. When compared to the previous concepts -namely *habitat évolutif* and Stem-, Web appears as the most mature and complex system produced by CJW. The aim of this chapter is to reveal the potentials of Web and try to understand how it operates in a way to produce complete architectural systems of organization. To do so, the Frankfurt-Römerberg Project will be examined in detail, through formal and conceptual analysis.

As a method of analysis, the chapter will initially focus on Frankfurt-Römerberg Project as a *product* to reveal the design potentials of Web. As a product, Frankfurt-Römerberg will be examined as a multi-level organization, a ground-scraper, a pattern of association, a non-centric scheme, a multi-functional entity, an open-ended system, and as an infill. It should be clarified that these categories are not imposed as labels but they are determined during the thesis research, specifically with reference to knowledge derived from the Team 10 discourse and from the analysis of the sources (casbah and *bidonville*) and precedents (*habitat évolutif* and Stem).

Later, the thesis will concentrate on Frankfurt-Römerberg as a *diagram*, and decompose it, in order to find out the components that enable the formation of Web as a system of organization. The components of Web will be categorized into two groups as *determinate elements* and *indeterminate elements*, based on the analysis made in the previous chapter. In this section, utilization of a consistent terminology with the previous chapter becomes important in terms of revealing the parallelism between Web and its sources and precedents. In doing so, the thesis aims to figure out the *process*, *which transforms the diagram into the product*. Therefore, *design acts* of Web will be read through the analysis of Frankfurt-Römerberg Project.

During the analysis of Frankfurt-Römerberg, similar projects of CJW such as the Free University Berlin and University of Toulouse will also be brought into the discussion in order to clarify some significant points, however Frankfurt-Römerberg will be taken as the main focus of the study. (Figure 3.1, 3.2, 3.3) The reasons behind the choice of Frankfurt-Römerberg will be mentioned in the following pages.

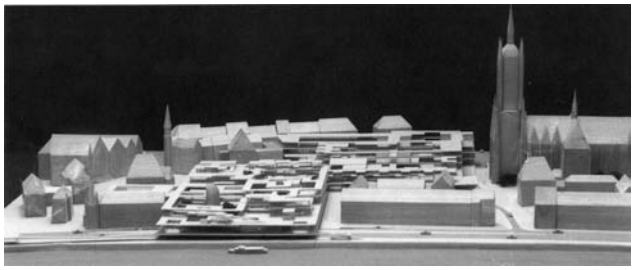

Figure 3.1 Frankfurt-Römerberg Competition Project. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 133.

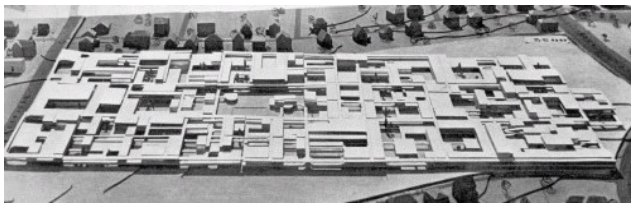

Figure 3.2 Free University of Berlin. Source: Jürgen Jeodicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design*, (Bern: Kramer, 1968), 211.

Figure 3.3 Toulouse University. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 164.

3.1 Frankfurt-Römerberg Competition Project

Despite the fact that it is an un-built project, Frampton denotes Frankfurt-Römerberg as the major work of the partnership CJW:

> Frankfurt-Römerberg, although it remained a project, was without doubt the greatest accomplishment of Woods' career, and is probably one of the most important *prototypes* developed by Team 10.[143]

Although Free University of Berlin (BFU) is a more often quoted project of CJW, in this thesis Frankfurt-Römerberg Project is credited as *the main prototype of Web*. The reason is the differences in the spatial organization of the two schemes. Although the schemes of Frankfurt-Römerberg and BFU look similar at the first sight, when analyzed in detail, it is seen that they have different characteristics. While Frankfurt-Römerberg is an absolute "Stem-squared" (which is Woods' definition of Web), BFU is composed of main stems and secondary paths that are perpendicular to the main stems. (Figure 3.4, 3.5) Woods mentions these two projects as different approaches to the search for organic systems and structures:

> In the Frankfurt center proposal the organization takes the form of a multi-level grid of pedestrian ways, linking and serving the various activities with the private dwellings on the upper floors. In the Berlin Free University scheme, a series of parallel pedestrian stems is developed, serving the zones which can be considered as the most active, with a secondary system of perpendicular ways leading to the more tranquil areas.[144]

The main stems and the secondary paths in BFU provoke a hierarchical organization in which the main stems have higher density than the secondary paths in terms of pedestrian activity. However, the scheme of Frankfurt-Römerberg is more neutral when compared to BFU, because it is a non-hierarchical structure composed of stems of equal dimension and equal density. As a result, the scheme of Frankfurt-Römerberg is more generic than the scheme in the Free University of Berlin. Frankfurt-Römerberg is a Stem-squared, so it is the ideal prototype of Web.

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[143] Frampton, *Modern Architecture: A Critical History*, 272. Emphasis added.

[144] Shadrach Woods, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design*, (Bern: Kramer, 1968), 200.

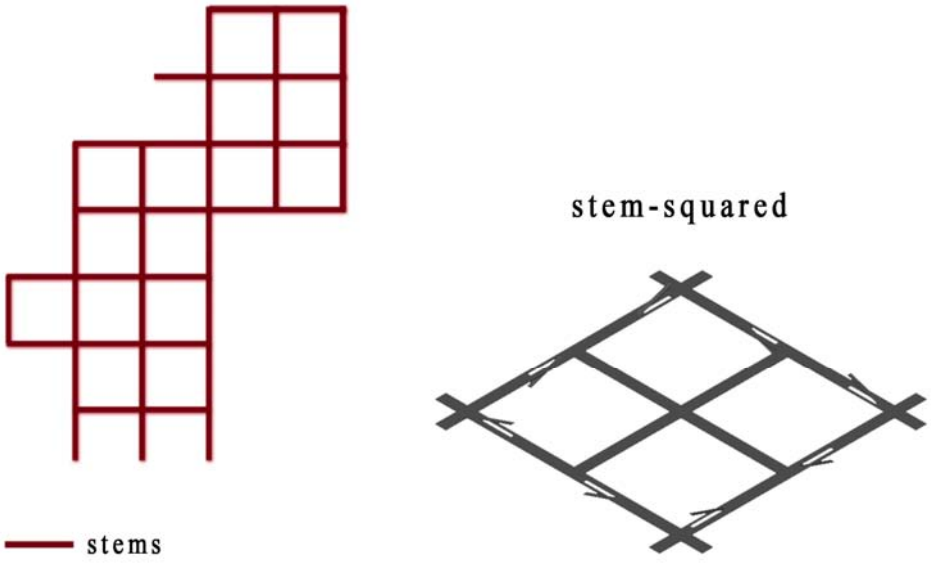

Figure 3.4 Circulation scheme of Frankfurt-Römerberg Project is composed of squared stems. All stems are equal in terms of size and density. There is no pre-determined hierarchy imposed to the system. Produced by the author.

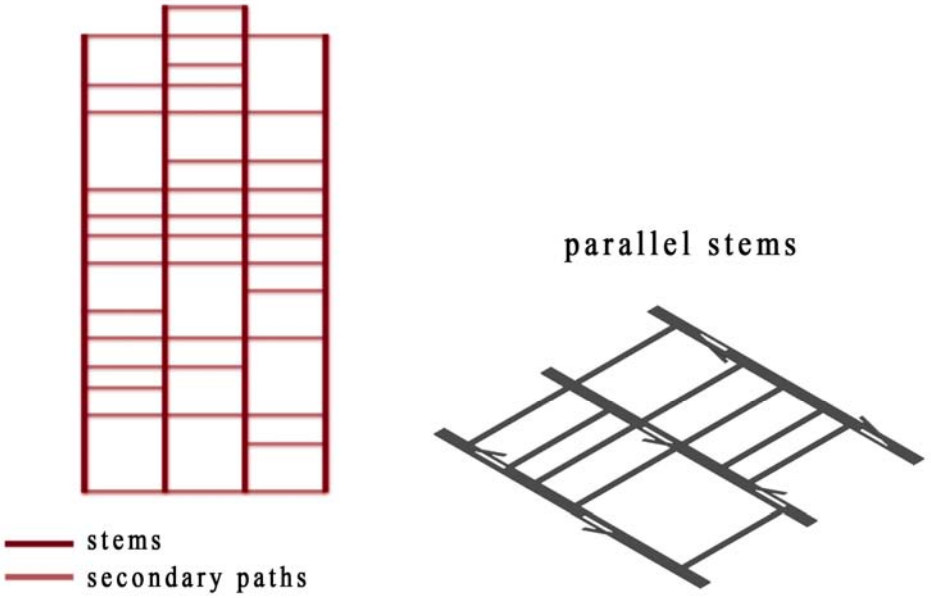

Figure 3.5 Circulation scheme of Free University is composed of parallel stems and secondary paths perpendicular to the main stems. The secondary paths are narrower, and they are planned to be less dense when compared to the main stems. Produced by the author.

Another reason behind the choice of Frankfurt-Römerberg is that the Free University is devoid of an urban context. While Frankfurt-Römerberg is situated in the city center, in a crowded area surrounded by historical buildings, BFU is situated in a suburban area in Dahlem. Frankfurt-Römerberg establishes a tight relationship with its context, and with the larger scale of the city. Therfore, Frankfurt-Römerberg acts as an urban infill, integrated into the site on which it is located. This characteristic of Web is missing in BFU. Although the main stems in BFU were juxtaposed with the existing streets on the plan drawings, after the construction of the university, it was observed that, BFU could not integrate itself into the social life of Dahlem.[145] (Figure 3.6, 3.7)

Appreciating Frankfurt-Römerberg as "the greatest accomplishment" of CJW, Frampton calls attention to the absence of the urban context in BFU:

> That this Frankfurt scheme as built out in the Free University of Berlin in 1973 lost much of its conviction stems largely from the *absence of an urban context*. In Berlin-Dahlem it was deprived of that urban culture for which it had been conceived and to which it would have responded had it been built in Frankfurt. However much a university may function like a city in microcosm, it cannot generate the animated diversity of the city proper.[146]

Lastly, the fact that Frankfurt-Römerberg remained an un-built project also makes it appealing for the thesis research. Unlike BFU, which is claimed to have lost some of its potentials when it was transferred into the built form, Frankfurt-Römerberg preserves its originality as a diagram. Besides, it is stated by the project architects that, what lies in the root of BFU is the scheme of Frankfurt-Römerberg.[147] Berlin Free University: a reduced version of their more significant Frankfurt-Römerberg urban infill project.[148] These issues mentioned above influenced the choice of Frankfurt-Römerberg as the main case study of this thesis.

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[145] Alexander Tzonis and Liane Lefaivre, "Beyond Monuments, Beyond Zip-a-tone," in *Free University, Berlin: Candilis, Josic, Woods, Schiedhelm* (London: Architectural Association, 1999), 138.

See George Baird, "Free University, Berlin," *AA Files* 40 (Winter 1999): 66-71. In this article Baird discusses the contextual relation of BFU with reference to the critiques of Frampton, Tzonis and Lefaivre.

[146] Frampton, *Modern Architecture: A Critical History*, 277. Emhasis added.

[147] Schiedhelm, "Architect's Statement," 97.

[148] Mumford, "The Emergence of Mat or Field Buildings," 58.

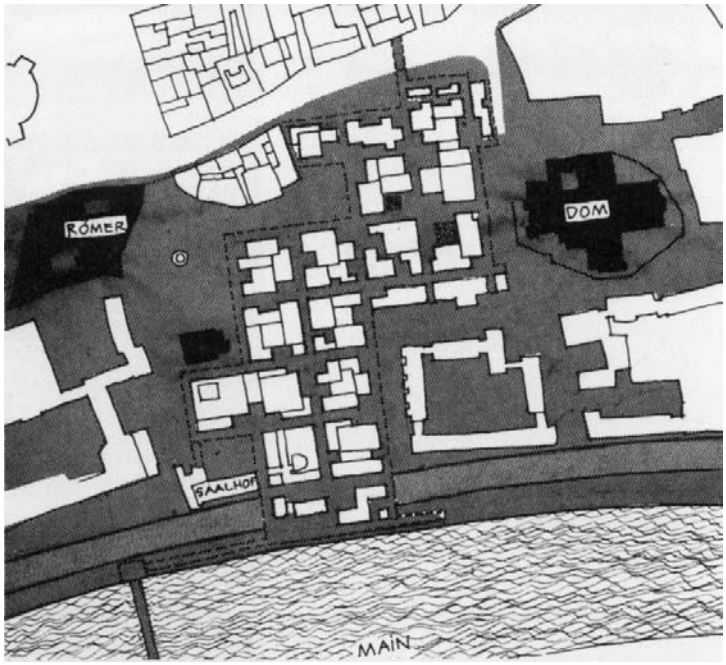

Figure 3.6 Frankfurt-Römerberg Competition Project and its relation with the context. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 132.

Figure 3.7 Free University of Berlin and its relation with the context. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 135.

3.2 Reading the Product: Potentials of Web

This part of the thesis focuses on Frankfurt-Römerberg Project as a *product* in order to reveal the design potentials of Web. The aim is to read Frankfurt-Römerberg within the framework defined by the Team 10 discourse as mentioned in chapter 1 and by previous works of CJW as discussed in chapter 2. This section evaluates Frankfurt-Römerberg Project as a multi-level organization, as a ground-scraper, as a multi-functional entity, as a pattern of association, as a non-centric scheme, as an urban infill, and as an open-ended system.

3.2.1 Frankfurt-Römerberg as a Multi-Level Organization

Frankfurt-Römerberg Project has a multi-level spatial organization in which open and closed spaces are produced within a three-dimensional understanding of space-making. (Figure 3.8) In other words, the scheme of Frankfurt-Römerberg develops through the section as well as through the plan. This three-dimensional understanding allows for production of three-dimensional open spaces, as opposed to the two-dimensional understanding of CIAM, which results in formation of two-dimensional open spaces without scale. The three-dimensional approach in Frankfurt-Römerberg also leads to integration of open and closed spaces both on the ground floor and other floors. Three-dimensional physical and visual relations are established between open spaces and enclosed cells.

Frankfurt-Römerberg is composed of 4 main floors and 2 basement floors. On the ground floor, open and closed spaces are organized by the *tracés*, which are introduced as continuations of the existing street pattern in the surrounding area. These *tracés* on the ground floor are also repeated in the upper levels in a way to produce a continuous circulation network connected via escalators and circulation cores. These *tracés* generate movement on the upper floors, which are not directly connected to the ground, and weave the open spaces and enclosed cells within a single system. With the *tracés* and the escalators connecting them, a flexible movement pattern is introduced in Frankfurt-Römerberg in which users are free to draw their own routes.

The multi-level organization of Frankfurt-Römerberg contributes to the accessibility and connectivity of the whole system. The system of Frankfurt-Römerberg is accessible from different levels by the help of *tracés* not only on the ground floor but also on the first floor. These *tracés* connect the new system introduced by CJW to the existing system of Frankfurt-Römerberg by following the existing street pattern. In other words, the multi-level

organization of Frankfurt-Römerberg both increases the connectivity within the new system and also the connectivity between the new system and the existing system.

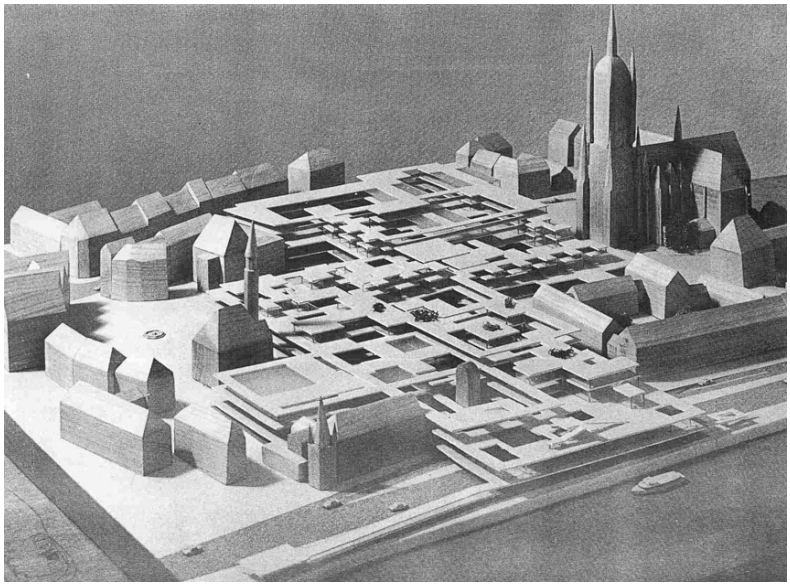

Figure 3.8 Model of Frankfurt-Römerberg Project showing the multi-level organization. Source: Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 205.

In Frankfurt-Römerberg Project, rooftops are also open to use. Rooftops are either accessible from the inner cores of the enclosed cells or from the *tracés* repeated on the roof-level. Including the roof-level, *each floor in Frankfurt-Römerberg act as a plane on which movement and activities flow in three dimensions*. The fact that all activities are distributed on different planes, allows the users to experience the whole system from different levels. In this respect, it can be said that the *tracés* in Frankfurt-Römerberg form a multi-level and multi-directional medium that generates mobility.

While the circulation decks and escalators contribute to three-dimensionality of the scheme by providing physical continuity, the incisions and open spaces contribute to it in visual terms. The incisions and courtyards in Frankfurt-Römerberg enable establishment of visual relations between different levels. So, the 4 main levels of Frankfurt-Römerberg appear as horizontal planes that are linked physically and visually.

Looking at Frankfurt-Römerberg Project it is possible to say that the idea of multi-levelness in Stem is further developed in Web in the form of a Stem-squared. Different from Stem organizations (i.e. Caen-Herouville, Bochum University, or Toulouse-le Mirail as mentioned in chapter 2), in Web, the whole system appears as a multi-level organization, a multi-level whole, in which enclosed spaces and space clusters are also themselves multi-leveled. However in Stem organizations, the stem appears as the multi-level element of organization to which building blocks are attached. That is to say, the only multi-level element in Toulouse-le Mirail is the stem itself, whereas in Frankfurt-Römerberg, the whole system acts as a multi-level organism. (Figure 3.9)

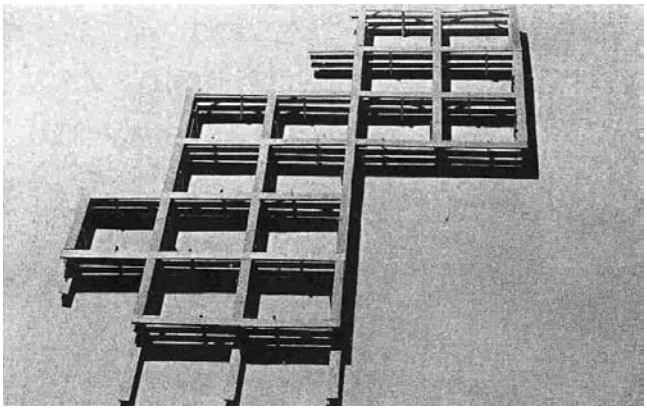

Figure 3.9 Model of the multi-level circulation system. Source: Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 206.

3.2.2 Frankfurt-Römerberg as a Ground-Scraper

Although it is a multi-level system of organization, Frankfurt-Römerberg is not a high-rise building, but a ground-scraper that spreads horizontally on the ground. If the main point behind the skyscraper idea is the "strategic use of the vertical dimension"[149] in order to reduce the land occupied by the built masses, it is the opposite in a ground-scraper: strategic use of the horizontal dimension. In other words, while the horizontal dimensions are minimized in a skyscraper by increasing the vertical dimension, the horizontal dimensions are maximized in a ground-scraper in order to minimize the vertical dimension. Due to the fact that Frankfurt-Römerberg Project fills the site in horizontal dimensions, and only raises 4 levels above the ground, it can be considered as a ground-scraper.

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[149] Gausa, *The Metapolis Dictionary*, 86.

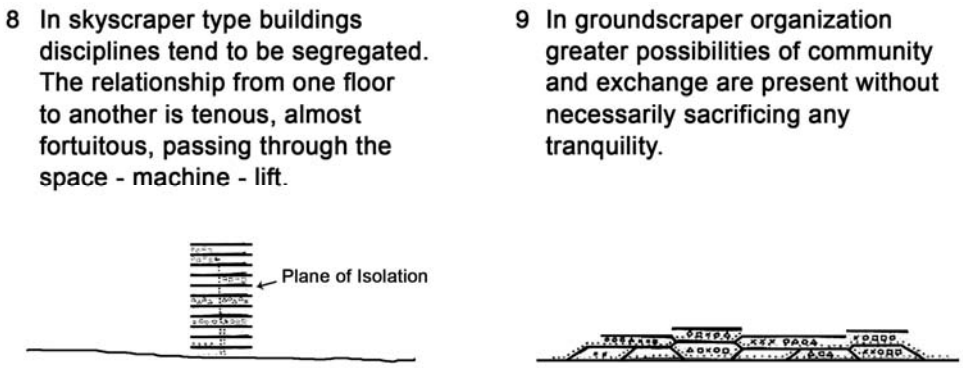

Figure 3.10 The idea of ground-scraper. Source: "Portfolio: Architecture," *Perspecta* 11 (1967): 213.

As a ground-scraper, in Frankfurt-Römerberg, the density of built volumes is distributed on the horizontal floor planes rather than being concentrated vertically - as it is the case in the skyscrapers. Another issue related with the ground-scraper idea is that the horizontal floor planes flow into each other. This aspect of the ground-scrapers is explained in the project report of Free University of Berlin Competition Project. (Figure 3.10)

CJW designates the floor planes in a skyscraper as "planes of isolation". These floor planes are separated from each other both physically and visually, thus they serve for isolation rather than association. However, the floor planes in a ground-scraper act as *planes of association* because in a ground-scraper, spaces and activities merge into each other. In BFU, CJW utilized the idea of ground-scraper in order to provide tight connection between disciplines, between activities, and between individuals. As a ground-scraper, in BFU, all three floor levels are connected to each other physically and visually in a way to enable flow of "general and specific information" as well as individuals. About BFU, Sarah Williams Goldhagen states that:

> CJW, working on the institutional and urban scale, described their gridded "ground scraper," with its highly inflected plan, as promoting free movement between individuated departments to foster interdisciplinary academic and social communication.[150]

Similar to BFU, in Frankfurt-Römerberg Project, the floor planes flow into each other by the help of punctual (vertical circulation cores) and linear connections (escalators).

[150] Goldhagen, "Coda: Reconceptualizing the Modern," 313.

Unlike the planes of isolation in the skyscrapers, each floor plane in Frankfurt-Römerberg acts as ground floor that generates activities and movement. Linkage of these ground floor planes constitutes what CJW calls a ground-scraper. Within this context, it can be argued that Frankfurt-Römerberg Project was planned to become a ground-scraper, a multi-level organization of horizontal planes that flow into each other.

3.2.3 Frankfurt-Römerberg as a Multi-Functional Entity

Frankfurt-Römerberg is a mix-use building, which includes a variety of functions. (Figure 3.11) The program covers both re-installation of the pre-existing functions such as public functions and dwelling, and introduction of new functions such as parking and commercial facilities.[151] It accommodates spaces that serve for specific and general functions, for individual and collective activities. The diversity of activities housed in Frankfurt-Römerberg shows that the building acts as a city within itself:

> The four above-ground levels of this three-dimensional jigsaw puzzle house all the diverse activities one would expect in a small city: offices, shops, libraries, galleries, museum, music school, youth center, cinema, restaurants, exhibit spaces, cafés- as well as private dwellings.[152]

In this sense, Frampton calls Frankfurt-Römerberg Project "a city in miniature".[153]

Besides the diversity of planned activities, the scheme of Frankfurt-Römerberg also acts as a medium for un-planned activities or events through multi-functional use of generic spaces. While the enclosed cells serve for specific functions, the circulation decks, courtyards and inner balconies serve for general functions such as gathering, wandering or awaiting. These spaces that serve for general activities are the focus of un-planned activities or coincidental events. Frankfurt-Römerberg is expected to enable involuntary association between the users and passer bys, in other words association between people who do not have much in common, except from inhabiting in the same city.[154] If Stem is a social condenser, so is the Web of Frankfurt-Römerberg, in fact at a higher degree.

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[151] Avermaete, *Another Modern*, 306.

[152] "Frankfurt: Candilis Josic Woods," *Architectural Forum*, no. 120 (1964): 203.

[153] Frampton, *Modern Architecture: A Critical History*, 277.

[154] The term "involuntary association" is used with reference to Smithson's Association Diagram.

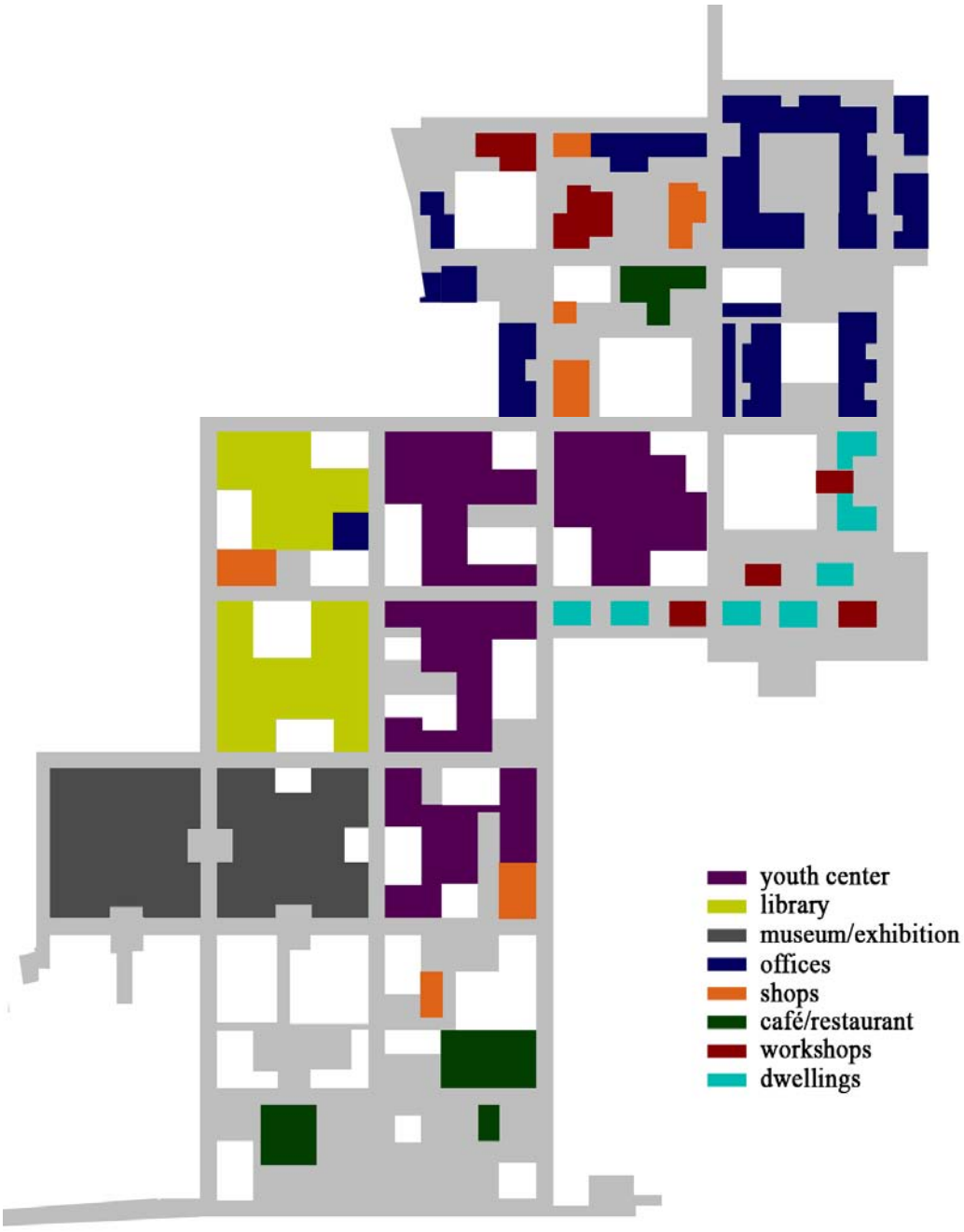

Figure 3.11 Frankfurt-Römerberg as a multi-functional entity. Plan of the 2nd Floor. Produced by the author.

In Frankfurt-Römerberg, served spaces (dwellings) and serving spaces (ancillaries) co-exist within the same scheme. The ancillaries are distributed to each floor level, whereas the dwellings are concentrated more on the upper floors. While the upper floors house both private and public functions, the ground floor houses only the public functions and the basement floors only house the technical and mechanical services. The services collected in the basement are distributed to each floor by the help of vertical cores:

> An underground service-level feeds stores and offices above, providing storage space as wells as direct access for trucks. Also underground is the core of the mechanical system, which circulates upward through a network of horizontal and vertical ducts, forming the main distribution grid.[155]

Considering that the upper floors act as a city in miniature, it can be said that the basement floors act as the infrastructure of this city.

3.2.4 Frankfurt-Römerberg as a Pattern of Association

Like the other members of Team 10, CJW promoted association rather than isolation. They argued that a system of architectural organization should contribute to social life within the whole system, and in addition, to the social life of the city. They saw architecture as a means to social enhancement, and in Smithsons' terms as a means to human association. It can be argued that Frankfurt-Römerberg Project responds to such concerns of CJW, by providing a pattern of association that relates the part and the whole, individual and collective, and specific and general activities.

Frankfurt-Römerberg Project displays a pattern of association, which establishes physical, visual and geometrical relations between the parts, and between the parts and the whole. The whole maintains its identity during the implantation of individual spaces, while the individual spaces also maintain their identities although they vary. As Woods states:

> The purpose of any putting-together, *to create a whole which is greater than the sum of the parts*, is only possible if we can guarantee a whole- a total synthetic order of all the functions.[156]

In Frankfurt-Römerberg the enclosed spaces are not formed as independent cells, but they are made into space clusters, which are perceived as sub-systems that make up the greater system of Frankfurt-Römerberg. When it is evaluated in the scale of the city, it can be said that Frankfurt-Römerberg also appears as a sub-system within the greater system of the city.

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[155] "Frankfurt: Candilis Josic Woods," *Architectural Forum*, no. 120 (1964): 203.

[156] Avermaete, *Another Modern*, 303. Emphasis added.

In this respect, Web is a pattern of association that relates the fragments of Frankfurt-Römerberg as a single organism, and also relates Frankfurt-Römerberg to the existing pattern of the city.

Another issue related with association is the relation of individual and collective. In Frankfurt-Römerberg, on each floor plane, individual and collective spaces are organized without isolation. A hierarchy of private and public spaces is formed in a way to accommodate both individuals and groups in the same system. According to CJW:

> The relationship of group and individual must also be considered. Areas of activity and areas of tranquility must be provided. If the group is everywhere, there is no group because there is no individual.[157]

In Frankfurt-Römerberg specific and general activities are combined within a single system. While the spaces for specific activities provide voluntary association, the spaces for general activities enable involuntary association. The associative potential of street is doubled in Frankfurt-Römerberg through squaring of stems. These squared stems act as stages for involuntary association, thus for un-planned activities. The open spaces (courtyards and terraces) also serve for involuntary association, while the enclosed cells serve for voluntary association. Then, Frankfurt-Römerberg provokes both voluntary and involuntary association, and generates both planned and un-planned activities (coincidental events). The diversity of activities contributes to associative character of the whole system.

The fact that Frankfurt-Römerberg is a ground-scraper also supports human association. As stated before, for CJW horizontal forms of organization denote association, while the vertical ones denote isolation. Frankfurt-Römerberg has an association pattern in which diversity of programmatic units, or open and closed spaces are weaved within a horizontal form of organization. Each floor plane acts as a plane of association (voluntary/involuntary), in other words as a ground floor that accommodates a diversity of activities: individual/collective, general/specific, and planned/un-planned. These floor planes are connected to the ground at several points, in a way to integrate the project to the urban life of Römerberg. As a result, Frankfurt-Römerberg appears as a multi-level pattern of association that enables occurrence of what Heuvel calls "non-linear interactions[158]". (Figure 3.12, 3.13)

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[157] "Portfolio: Architecture," 212.

[158] Van den Heuvel, "The Diagrams of Team 10," 42.

Figure 3.12 The plane of association. Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 250. Plan of the 1st floor, edited by the author.

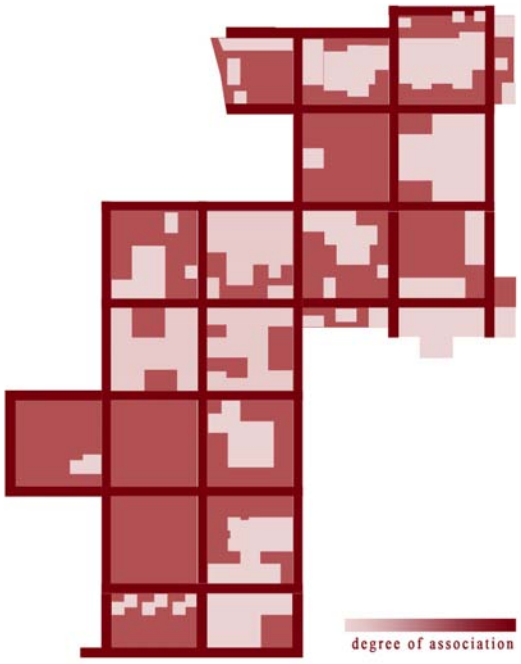

Figure 3.13 Diagram showing the scales of association in Frankfurt-Römerberg Project. Produced by the author.

3.2.5 Frankfurt-Römerberg as a Non-Centric Scheme

Plan organization of Frankfurt-Römerberg displays a non-centric scheme with intensity of activities and built volumes homogenously distributed on each floor plane. The scheme of Frankfurt-Römerberg is composed of equal sized squares, defined by stems with equal dimensions and equal density. None of the stems is planned to be denser than the others in terms of activity or movement. With its non-centric organization, Frankfurt-Römerberg eliminates predetermined hierarchies that prevent flexible use of the system. With Frankfurt-Römerberg Project, CJW took a further step in the search for non-hierarchical and flexible structure. In this project, flexibility potential of line is doubled by squaring the Stem, which was initially proposed as an alternative to concentric forms of organizations. (Figure 3.14) According to CJW:

> A point is static, fixed.
> A line is a measure of liberty.
> A *non-centric web* is a fuller measure.[159]

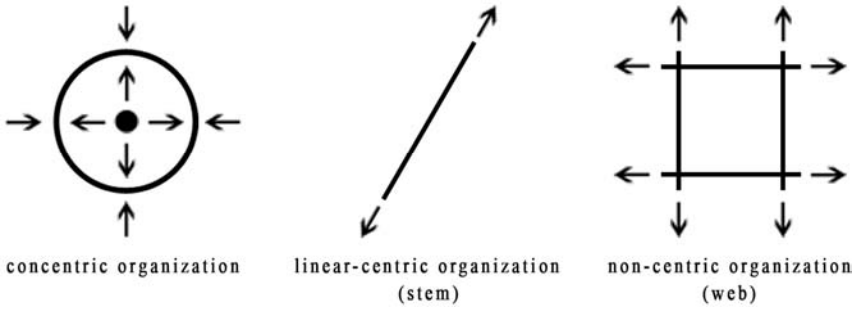

Figure 3.14 Comparison of concentric, linear-centric, and non-centric forms of organization. Produced by the author.

The partnership explains why they are opposed to predetermined hierarchies in architectural organizations:

> When we pre-determine points of maximum intensity -centers- we are fixing a present or projected state of activities and relationships. We are perpetuating an environment where some places are central and others are not, without, however, any competence for determining which things belong in which places. We compromise the future, closing doors instead of opening them.[160]

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[159] Shadrach Woods, "Urban Environment: The Search for System," 153. Emphasis added.

[160] Ibid.

In Frankfurt-Römerberg there aren't any centers imposed into the system, however, the organization is expected to turn into a poly-centric scheme through use.[161] Different centers will be defined for different activities, and these centers will be able to shift in time according to programmatic changes.

3.2.6 Frankfurt-Römerberg as an Urban Infill

In "The Crisis of the Object: The Predicament of Texture", Fred Koetter and Colin Rowe define "infill" as a strategy that is derived from an alternative reading of figure-ground relationships in the city.[162] According to Koetter and Rowe, there are two readings of this relationship: "a city of isolated solids in a continuous void" and "a condition of defined voids (streets, squares, etc) contained within a virtually continuous built solid".[163] The two designates contrary attitudes: "building as an object" and "building as an infill". In her Ph.D. dissertation, Sinem Çınar summarizes the infill strategy as such:

> Rowe and Koetter propose a formal strategy that enables a continuous fluctuation between an "interpretation of the building as object and its reinterpretation as texture." For them, this can be achieved by creating an object that is absorbed into the texture of the city and responsive to the voids. Rowe and Koetter call this "building as infill".[164]

Based on Koetter and Rowe's definition, it is possible to say that Frankfurt-Römerberg acts as an infill rather than an independent object. As seen in figure 3.15 Frankfurt-Römerberg appears as "a virtually continuous built solid" that is composed of defined voids. This attitude is also implicit in the representation technique of the site plan in that the solids are represented in white, whereas the voids are represented in black. This technique implies that CJW aimed to reverse the figure-ground relationship of the modern city with a different approach. The important point in the plan of Frankfurt-Römerberg is continuity of the voids that provoke association and movement rather than individual solids.

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[161] Ibid., 155.

[162] Fred Koetter and Colin Rowe, "The Crisis of the Object: The Predicament of Texture," *Perspecta* 16 (1980): 109.

[163] Ibid., 109-141.

[164] Sinem Çınar, "Reading/Unfolding Architectural Form: An Inquiry into the Venice Hospital Project by Le Corbusier" (Ph.D. diss., Middle East Technical University, 2005), 91.

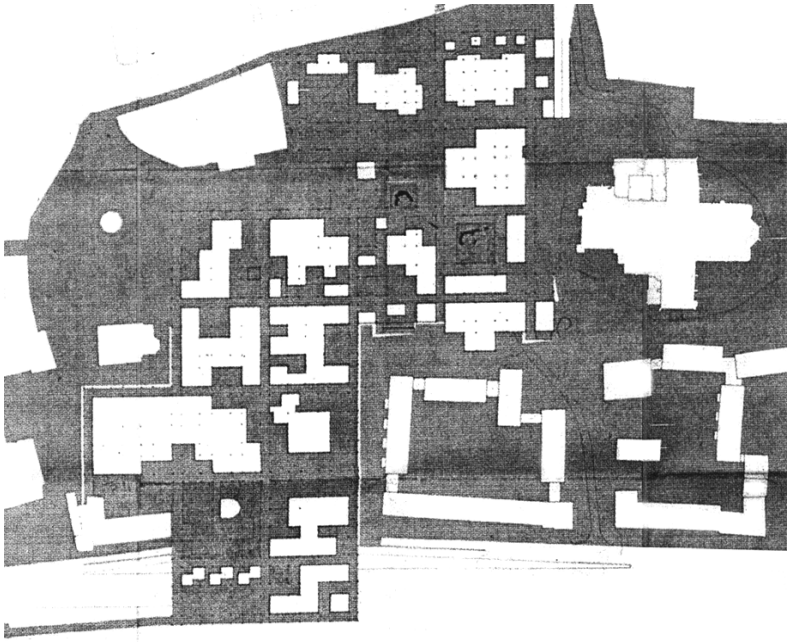

Figure 3.15 Figure-ground relationship of Frankfurt-Römerberg. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 133.

Besides Koetter and Rowe's definition, Frankfurt-Römerberg is literally an urban infill, that is to say, it is made to fit into the site on which it is located. Frankfurt-Römerberg fills the voids on the site and integrates itself into its context. The *tracés* (as the continuation of the existing street pattern) on the ground floor take their reference from the surrounding buildings. In this sense, the surrounding buildings, streets and natural formations act as *contextual fixes* that influence the formation of the project. The *tracés* continue on each floor level, and carry the urban life, generated in the urban voids of the city, into the project area. After the basic square modules are imposed onto the project area, these main stems are extended in a way to make infill. (Figure 3.16) The project also adapts itself to the topography, through extension or modification in order to provide connections to the ground in multiple points. The multi-level organization of Frankfurt-Römerberg enables the condition of infill not only on the plan but also on the section plane.

Frankfurt-Römerberg is in harmony with the existing tissue in terms of scale, height and density. As mentioned before, the scheme of Frankfurt extends more on the horizontal plane than in the vertical dimension, and do not contradict with the scale of the existing environment. As a result, Frankfurt-Römerberg appears as an organization, which makes an urban infill into the existing pattern of the city.

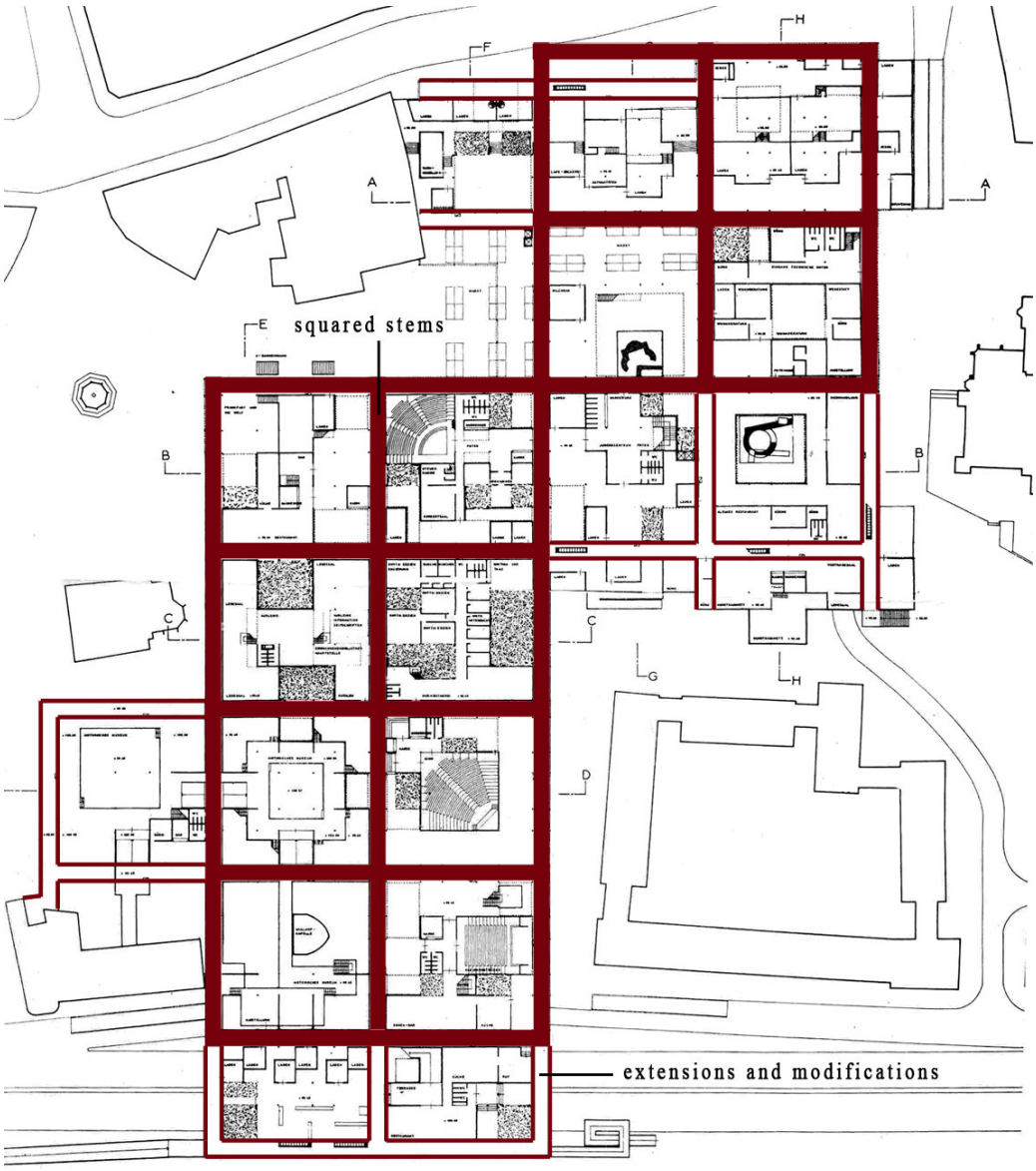

Figure 3.16 Frankfurt-Römerberg as an urban infill. Source: Jürgen Jeodicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design*, (Bern: Kramer, 1968), 211. Plan of the ground floor, edited by the author.

3.2.7 Frankfurt-Römerberg as an Open-Ended System

Frankfurt-Römerberg Project is formed by addition of basic modules that are composed of squared stems, therefore, it can be extended through a repetitive process. As it acts as an urban infill, scheme of Frankfurt-Römerberg is capable of growing by infiltrating into the voids that exist in the urban tissue. Accordingly, it can be argued that the infill strategy also suggests possibilities for future extensions. Through repetition of the squared-stems, it is possible to introduce additional programs to support the urban life or expand the capacity of the existing programs in a way to accommodate a larger population. In this sense Frankfurt-Römerberg acts as an open-ended system rather than a finished object (figure 3.14).

In the article "Urban Environment: The Search for System," Woods states that architectural systems should have the ability to accept growth and change, and the capacity to relate themselves to greater and smaller systems:

> The systems will be sufficiently flexible to permit and encourage growth and change within themselves throughout the course of their lives. The systems will remain open, both in respect to smaller systems within them and in respect to greater systems around them. Smaller systems must be able to connect to them freely and they themselves must be able to connect freely to greater systems.[165]

As an open-ended system, Frankfurt-Römerberg allows for such growth and change.

The non-centric scheme of Frankfurt-Römerberg renders it more adaptable to physical and programmatic changes. For CJW pre-determined centers or focus of activities "close the door" to future changes. Thus, to leave the door open, one should avoid introducing pre-determined hierarchies to the systems. The non-hierarchical organization structure of Frankfurt-Römerberg -with equal size and equal dense stems-, defines *a non-narrative system that enables shift of programs without interrupting the totality of the system.* In other words, the parts are changeable, and the system is extendable without damaging the identity of the whole. Woods explains the potentials of Web as such:

> Web is a highly *flexible system* in a rapidly changing world. On the scales at which we are required to operate today, treating of the environment of tens or hundreds of thousands, it is not possible to conceive of long-range plans being based on any fixed spatial or compositional relationships. Even as the first part of a plan is realized, it changes the conditions which govern the next stage, and, by continuous feedback, the whole plan. The *non-centric*, *open-ended Web* will respond to this life process.[166]

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[165] Shadrach Woods, "Urban Environment: The Search for System," 155.

[166] Ibid. Emphasis added.

Quoting from the project report, "Architectural Forum" makes a review of Frankfurt-Römerberg:

> "The city expresses life, it is a living, changing organism." So say the architects of this competition entry for redeveloping a bombed-out sector in the center of Frankfurt, Germany. Their objective, therefore, was to create a system, which has a *built in potential for growth and change*.[167]

In this review Frankfurt-Römerberg Project is designated as "three dimensional grid for varied, flexible growth".[168]

This concern of flexibility is parallel to the arguments that formed the Team 10 discourse. CJW was aware of the mobility of the era, therefore, they focused on inventing systems that will respond to the concerns brought by mobility. The role of the architect turned out to be important, since such changes that may take place in the future cannot be estimated in the design process. Stemming from this situation the partners argued that any alternative concept developed to guide the urban architectural organization should operate through the notions of "flexibility" and "adaptability". Similar to Frankfurt-Römerberg, the partners also considered the aspects of mobility in Free University of Berlin, and they proposed a plan that could be extended in three directions. It was also foreseen that one more story could be added in order to accommodate more lofts. However, these possibilities of extension proposed in BFU were never realized.

It will be argued in the next section that, open-endedness of Web is enabled through utilization of determinate and indeterminate elements, because co-existence of these two categories of elements allows for a system of organization that is capable of physical and programmatic changes.

3.3 Reading the Diagram: Components and Design Acts of Web

Having evaluated Frankfurt-Römerberg Project as a product, and having revealed its potentials, this thesis argues that, it is necessary to (re-)read Frankfurt-Römerberg as a diagram in order to explore the generative process behind these potentials, and to understand how Web operates as a complete architectural system of organization. Such reading is also indispensable; because it is the only way that Web can be related to its sources and precedents, as well as to the system approach in architecture. In other words, reading

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[167] "Frankfurt: Candilis Josic Woods," *Architectural Forum*, no. 120 (1964): 203. Emphasis added.

[168] Ibid.

Frankfurt-Römerberg as a diagram prepares the ground not only for discovering the generative potency of Web, but also for deriving the tools that are necessary to situate the project within a larger context: within the works of CJW, Team 10 discourse, parallel post-war discussions, and within the contemporary architectural debates on system and organization.

Here, the term diagram is used to indicate the potentials of Web in suggesting flexible solutions for complex programs. Such potential results from the fact that a diagram is always generic. Quoting Allen:

> A diagram is therefore not a thing in itself, but a description of potential relationships among elements; not only an abstract model of the way things behave in the world, but *a map of possible worlds*.[169]

So, it is these "map of possible worlds" defined by the diagram that renders Frankfurt-Römerberg an open-ended system rather than a finished object. Although Web implies certain spatial, contextual, or configurative relations within the system, it does in a way to provoke variety and flexibility. It does not indicate a method; it just *suggests* a set of elements and actions, through which a system of organization and a pattern of association can be established.

In this thesis, Frankfurt-Römerberg is introduced as the main prototype of Web among the projects of CJW. However, if Frankfurt-Römerberg is approached as a diagram, it becomes only one of the possible interpretations of Web. According to Allen:

> Simplified and highly graphic, diagrams support multiple interpretations. Diagrams are not schemas, types, formal paradigms, or other regulating devices, but simply place-holders, *instructions for action*, or *contingent descriptions of possible formal configurations*. They work as abstract machines and do not resemble what they produce.[170]

At this point, reading Web as a diagram requires exploration of both the "components" and the "design acts". While the components indicate the elements by which Web operates, the design acts indicate how this operation proceeds so as to translate an idea (diagram) into an architectural object (product). Such analysis of Web as a diagram will clarify the source of the potentials discussed in this chapter under the title of "Reading the Product".

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[169] Stan Allen, "Diagrams" in *The Metapolis Dictionary of Advanced Architecture: City, Technology and Society in the Information Age* (Barcelona: Actar, 2003), 162. Emphasis added.

[170] Stan Allen, "Diagrams Matter," *Any* 23 (2000): 16. Emphasis added.

3.3.1 Components of Web: De-composing the Diagram

The first stage of the analysis includes de-composition of the diagram into its basic components. In this analysis the components are categorized into two main groups: determinate elements and indeterminate elements. Such categorization is made with reference to *habitat évolutif*, because as previously argued in chapter 2, *habitat évolutif* is considered as the precedent of Web. While Web is an effort for establishing a system of organization in the urban scale, *habitat évolutif* is an effort in the scale of a single dwelling. However, the drawings of *habitat évolutif* also imply that the system can be transformed into a larger scale in order to accommodate a more complex program in addition to dwelling. Hence, in this thesis, *habitat évolutif* is accepted as the first attempt of a system approach in the smallest scale; and Web as the most mature attempt is analyzed according to the features derived from the analysis of *habitat évolutif*.

In the case of Web, similar to *habitat évolutif*, the determinate elements indicate the elements that are not changeable. These elements that are physically and functionally determinate, establish the infrastructure on which the indeterminate elements operate. As opposed to the determinate elements, the indeterminate elements are changeable; thus, they are the elements that respond to the forth dimension of design: the time dimension. In Frankfurt-Römerberg, co-existence of these two categories answers to the concerns brought by mobility and identity. (Figure 3.17) In other words, the interaction between these two categories (determinate and indeterminate elements) lies at the root of the potentials (discussed in the previous section, in which Frankfurt-Römerberg is read as a product).

COMPONENTS OF WEB	
Determinate Elements	Indeterminate Elements
Grid Circulation network Floor planes Contextual fixes	Volumes Voids

Figure 3.17 Components of Web. Produced by the author.

3.3.1.1 Determinate Elements

- **Grid**

If Frankfurt-Römerberg Project is analyzed as a diagram, it is seen that the architectural organization is built upon two different grids that are orthogonal to each other: a main grid that structures the circulation network, and a secondary grid that structures the cells, courtyards, and incisions:

> The system they [CJW] have devised consists of a multi-level "distribution grid" of mechanical services, integrated with a circulation net of horizontal and inclined ways. A secondary structural grid for actual buildings is inserted, or "plugged into" this main grid, which is composed of 110 feet on a side, bordered by 12-foot-wide rights of way.[171]

Considering the categorization of determinate and indeterminate elements, it can be said that, the determinate elements are guided by the main grid, whereas the indeterminate elements are guided by a secondary structural grid. Here, it should be noted that, such interpretation is only possible if Frankfurt-Römerberg Project is read as a diagram. If Frankfurt-Römerberg is read as a product rather than a diagram, one may be mistaken that the project is established on a homogenous grid system. However, it is significant for the thesis that determinate and indeterminate elements are organized through different structural systems. Co-existence of these two systems contributes to the potentials of Web to a greater extent. (Figure 3.18)

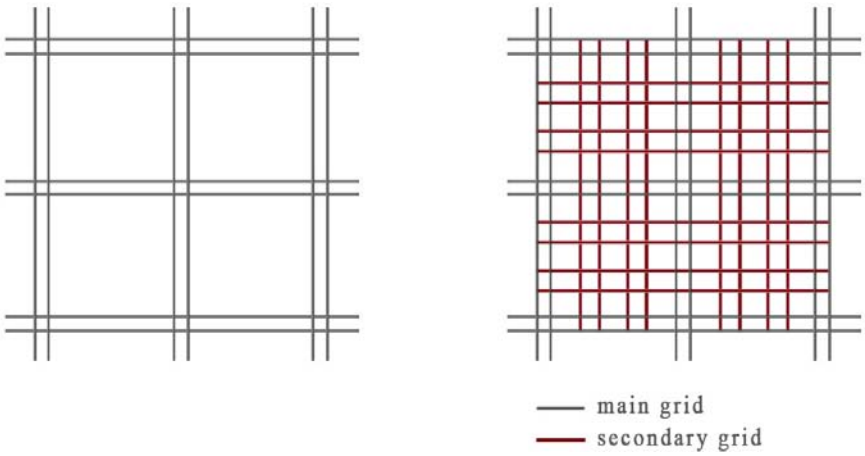

Figure 3.18 Superimposition of the main grid (distribution grid) and the secondary grid (modulation grid) in Frankfurt-Römerberg Project. Produced by the author.

[171] "Frankfurt: Candilis Josic Woods," *Architectural Forum*, no. 120 (1964): 203.

Since the main grid organizes the determinate elements of the scheme, its dimensions are constant, and they only change according to the contextual features. On the contrary, the dimensions of the secondary grid are flexible, and they change according to spatial requirements as well as the contextual ones. Despite its flexibility, the secondary grid sticks to a certain modulation system. Utilizing this modulation system, open and closed spaces of different size can be organized within the squares defined by the main structural grid. (Figure 3.19) Together, these two grids (main grid and the secondary grid) form a *grid system* on which determinate and indeterminate elements operate so as to produce a complete system of organization. This grid system in Frankfurt-Römerberg acts as a structural and conceptual tool.

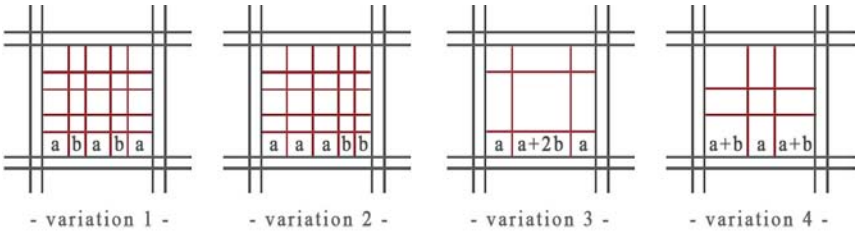

Figure 3.19 Possible variations of the secondary grid used in Frankfurt-Römerberg Project. The modulation system is derived from the golden ratio: a+b/a ≈ a/b ≈ 1.6180339887. Produced by the author.

In Alberto Pérez Gómez's "Architecture and the Crisis of Modern Science" it is possible to find the clues of interpretations of grid as a conceptual tool and a representational tool in different periods of history. Gómez attributes the interpretation of grid as a conceptual tool mainly to Jacques-Nicolas-Louis Durand, and states that:

> The use of the grid in design was, of course not Durand's invention. In Cesarino's edition of Vitrivius (1521) the famous Vitruvian man was superimposed on a grid, and later Philibert de l'Orme used it in his system of Divine Proportion. In all these instances however, and even in these more ambiguous applications that we encountered in eighteenth-century treatises, the grid's character as an instrument of design was secondary to the symbolic value of the order it denoted. Only in the case of Durand's *mécanisme* did the grid become an instrument whose sole value was as a tool in a technological process. This grid represented lived space finally transformed into a concept.[172]

[172] Alberto Pérez Gómez, *Architecture and the Crisis of Modern Science* (Massachusetts: The MIT Press, 1983), 307-308.

According to Durand, the aim of the architectural theory was to ensure efficiency and economy, and to attain such quality, a simplification was necessary in the design process. Therefore, he taught his students what he calls *mécanisme de la composition*, which was a method based on the utilization of the grid. Durand utilized the grid in the design of façades and roofing, in volumetric studies, in *parti* generation, and especially in disposition of architectural elements on the plan: "Columns were to be placed at the intersections, walls on the axes, and openings at the centers of the modules".[173] Based on Durand's interpretation of the grid as a conceptual tool, it can be said that the grid system in Frankfurt-Römerberg does not only form the structural system but also acts as regulating lines for modulation. That is to say, grid denotes more than the post and beams, and plays an active role in the spatial organization. In Durand's words, grid is a "generator for the plan". [174]

In Frankfurt-Römerberg Project, grid is also utilized as a tool for responding to mobility and flexibility. Related with CJW's Web concept, Avermaete states:

> The web was intended to provide flexibility in planning for a range of actions over time, thus assuring its own longevity; its very realization is spread out and subject to revision over time.[175]

In the case of Web, it is the grid, which enables such flexibility for programmatic and dimensional changes, because as Krauss states: "[l]ogically speaking, the grid extends, in all directions, to infinity."[176] Moreover, according to Krauss grids "are visual structures that explicitly *reject narrative or sequential reading* of any kind.[177] This "non-narrative" and "limitless" character of the main grid renders Frankfurt-Römerberg "non-centric" and "open-ended". Although the main grid in Frankfurt-Römerberg is determinate and determining, the secondary grid provides flexibility of modulation. Utilizing the secondary grid, it is possible to define open and closed spaces within the boundaries of the main grid according to the spatial and dimensional requirements. The secondary grid act as a generator of diversities: as a tool for repetition; not repetition of the same but repetition of the difference. While the secondary grid enables differentiation and variation within the system, the main grid guarantees their totality. It associates the two categories of components namely the

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[173] Ibid., 304.

[174] Ibid., 308.

[175] Avermaete, *Another Modern*, 303.

[176] Rosalind E. Krauss, "Grids" in *The Originality of the Avant-Garde and Other Modernist Myths* (Massachusetts: The MIT Press, 1986), 18.

[177] Ibid., 13. Emphasis added.

determinate and indeterminate elements in order to produce a total system. The main grid is the condition for order, without which the combination of programmatically and geometrically different elements would result in chaos. This binary grid system in Frankfurt-Römerberg determines the infrastructure of Web, nevertheless it leaves the door open for the changes that cannot be anticipated by the architect during the design process. From this aspect, the grid system in Frankfurt-Römerberg re-defines the role of the architect from a "designer" to a "strategist." As a mediator between "the ideal" and "the seen,"[178] grid acts as a physical and conceptual tool used by CJW in the architectural manifestation of Web.

- **Circulation Network**

Another determinate element of Web is the circulation network composed of elevated circulation decks (*tracés*) and vertical circulation cores. (Figure 3.20) The circulation decks in Frankfurt-Römerberg are not only means of access; they also serve for the distribution of the mechanical services that are collected in the underground service-level:

> As a sectional model exemplifies, in this project the *tracés* are conceived as true streets. They are not only pathways, but define –just as the traditional street pattern- *a grid of technical supplies and services* for the project. As in the traditional urban fabric, private buildings can be positioned along the street and connected to these supplies.[179]

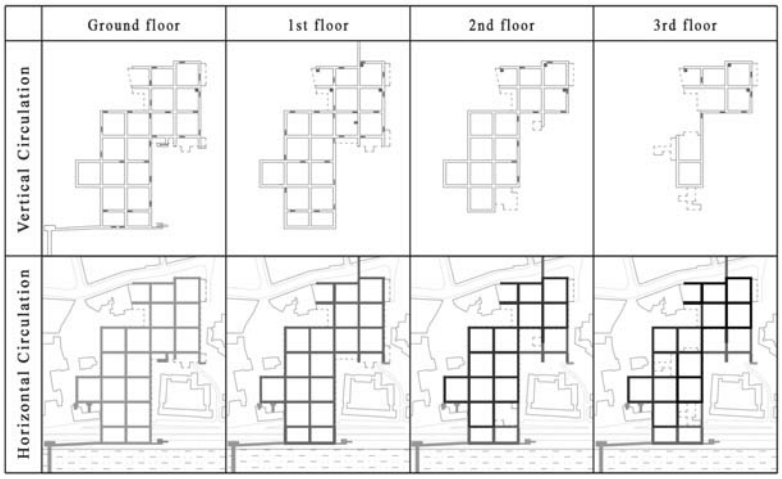

Figure 3.20 Components of the multi-level circulation network. Produced by the author.

[178] Ibid., 18.

[179] Avermaete, *Another Modern*, 314. Emphasis added.

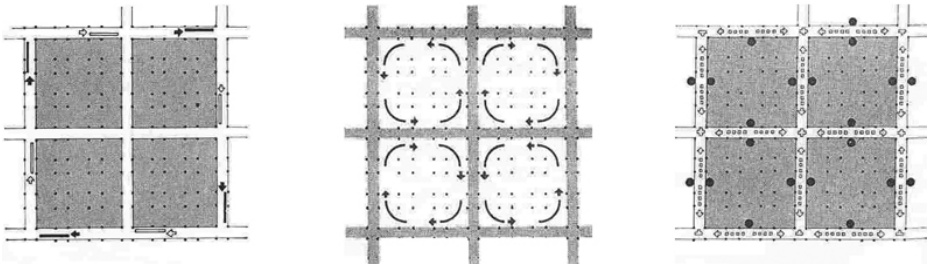

Figure 3.21 Squared stems. Source: Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 206.

As a determinate element of Web, the circulation network is guided by the main (distribution) grid. (Figure 3.20) This network is produced by linkage of squared stems with equal sizes. The circulation network of Frankfurt-Römerberg is non-hierarchical in the sense that all of these circulation decks are planned to accommodate equal density of flow. As a result, the system of Web eliminates any kind of pre-determined hierarchies, and renders the architectural organization non-centric and open-ended. If the circulation system of Frankfurt-Römerberg is analyzed, it is seen that the main precedent of the network idea is the Stem.

Figure 3.21 shows that, the circulation system of Frankfurt-Römerberg is composed of stems-squared that are superimposed on the main grid. Similar to Stem organizations, the circulation decks in the network of Frankfurt-Römerberg act as elements of association as they provoke voluntary and involuntary association. They are not only circulation elements, but also spaces where un-planned activities or coincidental events take place. In Frankfurt-Römerberg the circulation decks are also attributed another function: they are utilized as extensions of exhibition spaces. In this sense, it can be said that the circulation decks serve for more than one function: they are utilized as elements of access, distributors of mechanical services, spaces for unplanned activities, and as extensions of certain functions.

Grid-like linkage of squared stems forms a horizontal circulation network on each floor plan. It is possible to say that the idea of horizontal networking is already inherent in Web concept; however, what is remarkable in CJW's Web is that horizontal network on each floor is connected with each other by inclined ways and vertical circulation cores in a way to establish a multi-level circulation network. The multi-level network binds different activities as well as different levels in the multi-functional entity. In other words, the circulation network of Frankfurt-Römerberg is a linking element that associates a variety of functions. (Figure 3.22)

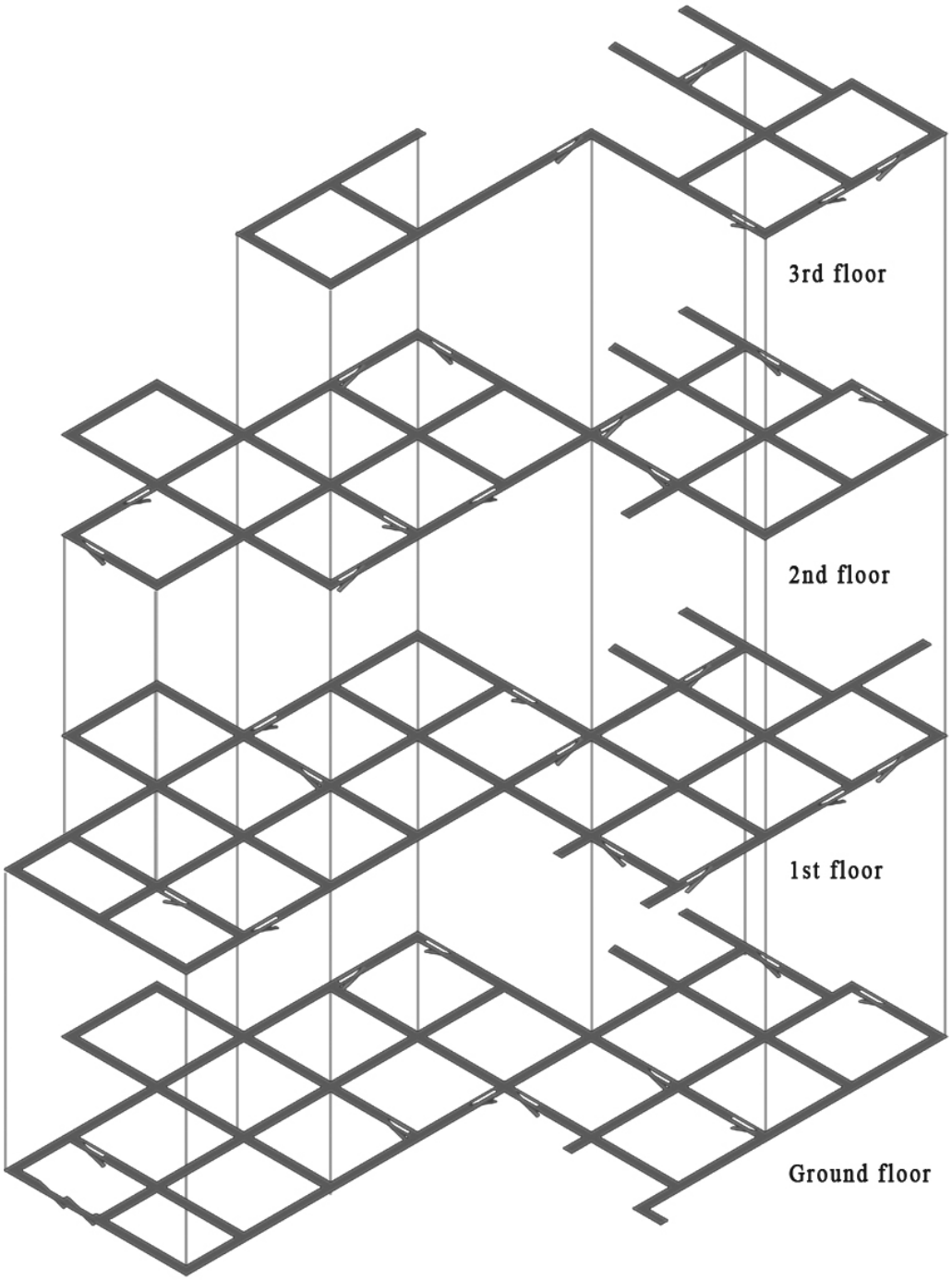

Figure 3.22 Multi-level circulation network of Frankfurt-Römerberg Project. Produced by the author.

Mark Wigley argues that one of the aspects that distinguish Team 10 from CIAM is their understanding of the term "network".[180] According to Wigley, while "modern architects like Le Corbusier only used the word 'network' to describe the old street pattern and the new ones that they proposed", the members of Team 10 attributed it many other meanings:

> [Their] different attitude toward the network - both in terms of physical form, social structure, communication system, and analytical concept - was precisely what differentiated the young group from CIAM and led to their separation from it and the subsequent dissolution of the old organization.[181]

Wigley states that the key person, who provoked this change in the understanding of network was Alison Smithson, in that she argued for the potential of the street in terms of supporting social structure in communities.[182] According to Smithson, "the street and the network of streets have to be seen as the arena in which social relationships were played out."[28] In their Berlin-Haupstadt Project, Smithsons applied the idea of "a three dimensional (multi-level) network" so as to replace the two-dimensional (horizontal) street network of the contemporary city. Similar to Smithsons, CJW also focused on establishing pedestrian networks; whether it is tree-like (as in the case of Stem) or grid-like (as in the case of Web).[183] As Alan Colquhoun states CJW "developed schemes with circulation networks to which different functional volumes were randomly attached."[184]

What differentiates Frankfurt-Römerberg from Berlin-Haupstadt is its perception as a single organism in addition to its orthogonal geometry. That is to say, while the built volumes in Berlin-Haupstadt appear as independent blocks attached to the non-orthogonal circulation network, the built volumes in Frankfurt-Römerberg appear as space clusters integrated to the circulation network. Despite these differences, both two projects display a circulation network that enables establishment of a system of organization, or what Wigley calls "infrastructural weaves of movement patterns."[185] Such networks provide a variety of circulation routes for the users to choose. From this aspect, these prototypes of circulation networks developed by Smithsons and CJW draw close to the Situationist thought. In this

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[180] Mark Wigley, "Network Fever," *Grey Room* 04 (2001): 105

[181] Ibid., 106.

[182] Ibid.

[183] Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002), 220.

[184] Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002), 220.

[185] Mark Wigley, "Network Fever," *Grey Room* 04 (2001): 105.

sense, the circulation network of Frankfurt-Römerberg acts as "a map of trajectories" rather than pre-determined routes.

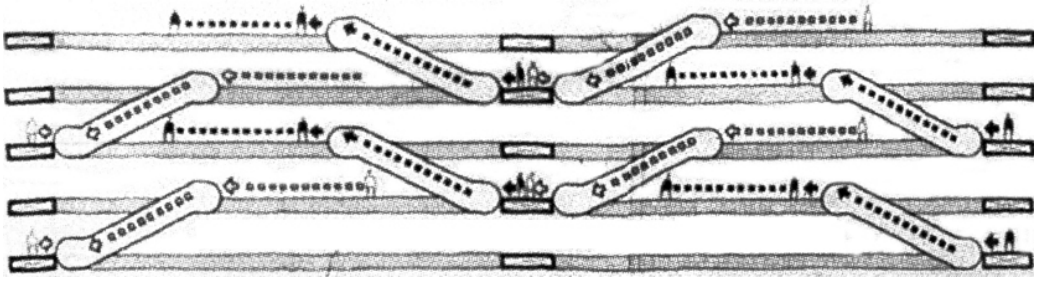

Figure 3.23 Section drawing showing the multi-level and multi-directional circulation network of Frankfurt-Römerberg. Source: Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 206.

- **Floor Planes**

Looking at the three-dimensional model, it is seen that Frankfurt-Römerberg Project appears as a combination of a horizontal planes rather than a single built-volume. Related with this subject, Avermaete states that Frankfurt-Römerberg Project "presents itself as a dense piece of urban fabric that results from the *juxtaposition of decks*".[186] These floor planes in Frankfurt-Römerberg act as determinate elements of Web. The indeterminate elements of the system, namely the enclosed cells, the courtyards and the incisions are organized on these planes by the help of the secondary grid (modulation system). Avermaete designates these planes as "structural decks" capable of housing a variety of functions.[187]

In the case of Frankfurt-Römerberg, plan organization means arrangement of functional cells and clusters (built volumes) on horizontal surfaces. As stated before, these planes, accommodate both general and specific functions, individual and collective activities, and planned and unplanned events. They are planes of association rather than of dissociation. In Web, *each floor plane acts as a ground floor*, on which spaces and activities merge into each other through utilization of in-between spaces (generic spaces). Linkage of these ground planes results in a ground-scraper that provokes mobility, diversity, and association.

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[186] Avermaete, *Another Modern*, 314.

[187] Ibid. Emphasis added.

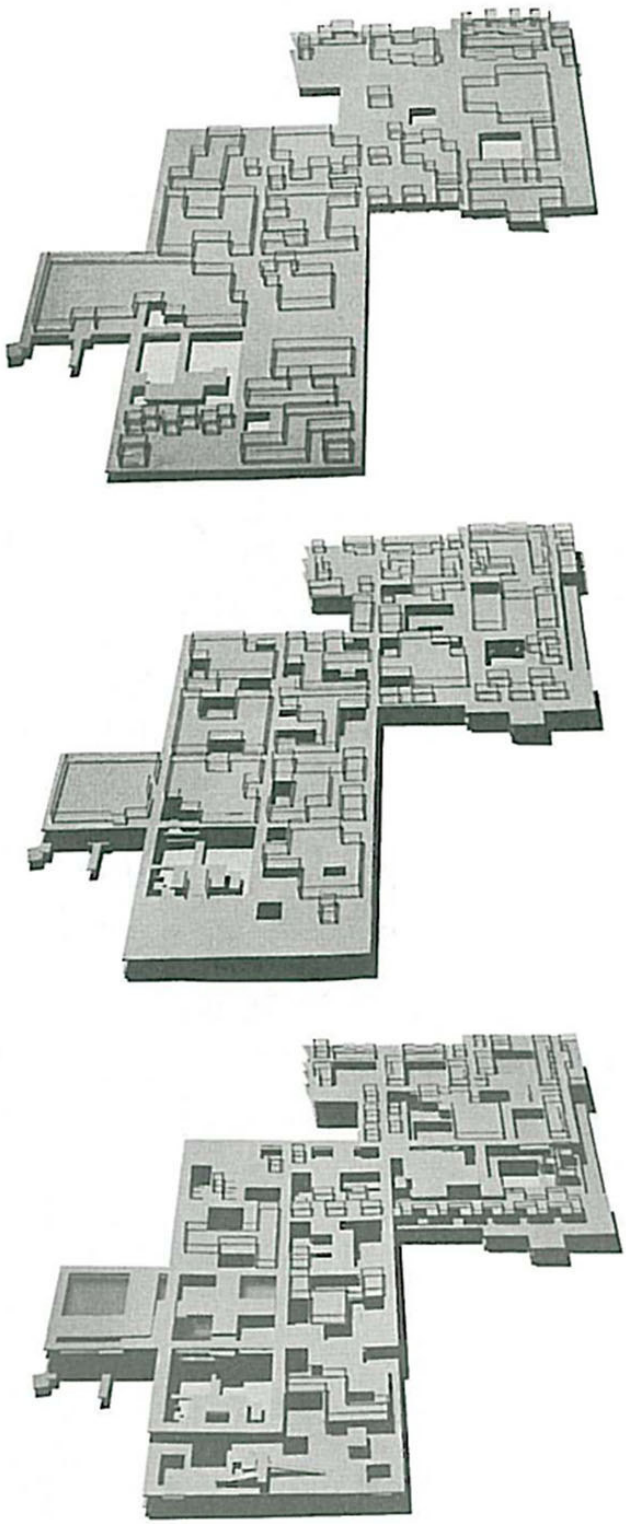

Figure 3.24 Floor planes of Frankfurt-Römerberg Project. From top to bottom: ground floor, first floor, and the second floor. Source: Tom Avermaete, *Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods* (Rotterdam: NAi Publishers, 2005), 311.

Considering the arguments mentioned in the previous chapter, it is possible to say that the initial use of *the plane idea* is observed in *habitat évolutif*. In both *habitat évolutif* and Web, CJW utilized *non-narrative surfaces as generators of systems*. In *habitat évolutif* the dwelling planes appear as multi-functional plain surfaces that accommodate everyday activities. Similarly, the planes of Web also appear as multi-functional surfaces yet these surfaces accommodate public functions in addition to dwelling activities. In both cases, the horizontal planes act as multi-functional decks on which indeterminate elements are organized. In *habitat évolutif*, the indeterminate elements denote the temporary partitions, while in Web, they denote the cells and space clusters, as wells as the open spaces and incisions. Superimposition of these indeterminate elements on the horizontal planes produces, in Avermaete's terms "a multi-layered landscape."[188]

- **Contextual Fixes**

Within the case of Frankfurt-Römerberg, the following elements can be considered as contextual fixes: the surrounding public buildings, historical remains, existing streets (*tracés*) and voids, and natural formations (the river)[189]. Such contextual fixes are both the determining and determinate elements of Web. They are determinate in that they are not changeable, and they are determining in that they constitute the input for the design decisions of Web. According to Avermaete "[t]he Frankfurt web was not only meant to accommodate growth and change within its confines, but also to allow a certain adaptation to the context".[190] While Web adapts to its context, the context enables the existence of Web by defining the scale, density, and the nodes of access:

> A comparative drawing of the project site before destruction and of the proposed development demonstrates that the scale, grain and traces of the medieval urban fabric, present before destruction are re-interpreted on the ground-level.[191]

As Avermaete indicates, Frankfurt-Römerberg Project is produced through re-interpretation of the site conditions. There is a reciprocal relationship between Web and its context, hence they cannot be considered independent from each other.

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[188] Ibid.

[189] In this thesis, the term "contextual fix" is used to indicate the contextual elements that influence the formation of Web.

[190] Avermaete, *Another Modern*, 315.

[191] Ibid.

In Frankfurt-Römerberg the main grid and the circulation network are shaped according to the contextual fixes. The points of contact for the elevated decks are also determined by the pre-existing voids and traces on the site. Web connects itself to the urban tissue of Römerberg. According to Avermaete:

> [T]he re-interpretation of the medieval urban fabric within the confines of the grid not only grants a specific scale to the urban spaces, it also creates connections from the Frankfurt web to the neighboring urban tissue. Sometimes these consist of a moderate re-installation of historic pathways between Römer and Dom on the ground-level of the site, at other places the relation to the context is elaborated as a direct connection.[192]

In order to adapt the Frankfurt-Römerberg Project to its context, the circulation network makes extensions and provides passages to the existing public buildings as well as to the riverside. The circulation network associates the existing tissue and the proposed one. In this sense, the project becomes a pattern of association that connects different scales of organization: building and the city.

Another issue related with the contextual fixes is to make an urban infill. The act of making an infill proceeds with reference to the contextual features of the site. In Frankfurt-Römerberg the infill takes the traces and historical remains into account. As it is seen in figure 3.16, a major part of the grid is left as a void in order to protect and re-interpret the historical remains in the site. Such argument recalls the drawings of *habitat évolutif*, in which incisions are opened on floor planes in a way to protect and incorporate the trees in to the system of habitat. In this drawing of *habitat évolutif*, the tree acts as a contextual fix.

3.3.1.2 Indeterminate Elements

- **Volumes: Cells and Clusters**

In Frankfurt-Römerberg the built volumes appear as cells distributed on the floor planes. These cells are made into clusters and placed in the square areas (plots) surrounded by intersecting stems. Avermaete denotes these volumes as “actual buildings”.[193] The cells and clusters act as indeterminate elements, which are guided by the flexible modulation system defined by the secondary grid. The modulation system determines the size and location of

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[192] Ibid.

[193] Avermaete, *Another Modern*, 306- 315.

the built volumes. With reference to the secondary grid, cells are organized on square plots by repetition and addition. Although the secondary grid regulates this process of repetition and addition, it allows for variation and differentiation within the system.

Similar to Web, in stem projects the ancillaries are arranged on bounded plots by addition and repetition. Such actions of repetition, addition, and clustering can also be seen in the sources of Web, namely *bidonville* and casbah. In the *bidonville* examples that CJW analyzed, it is seen that the cells are organized around a courtyard on a dwelling plane (plot). Different from the horizontal organization of *bidonville*, in casbahs, horizontal and vertical stacking of cells produce a three dimensional collective form. In this sense, Frankfurt-Römerberg project drives close to the idea of "organized casbah" (in Van Eyck's definition), in terms of the repetition, addition, and clustering processes. However, it should be noted that Frankfurt-Römerberg displays a far more complex system than an organized casbah with simultaneous use of the main and the secondary grids.

In Frankfurt-Römerberg, the repetition process takes place in the form of repetition of difference rather than repetition of the same. Avermaete compares the repetition/addition processes of Van Eyck's configurative discipline and CJW's Web. According to Avermaete, configurative discipline "structurally assembles similar architectural objects" whereas, Web is a "structured nesting of diverse spatial and social units."[194] For Avermaete the repetition process of Web is "not an addition of isomorphic elements."[195] In Web, what makes the repetition process flexible is the secondary grid (modulation grid). While the main grid assures repetition of identity, the secondary grid generates repetition of difference.

The fact that functional cells and clusters are physically associated by the circulation network renders Frankfurt-Römerberg project a multi-functional entity. If Frankfurt-Römerberg is a "city in microcosm"[196] in Frampton's terms, the stems are the streets, and the cells are the actual buildings. What distinguishes Frankfurt-Römerberg is that the streets and actual buildings repeat in multiple levels. The cells and clusters (built volumes) also contribute to the multi-levelness of the system by providing vertical circulation cores within

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[194] Ibid., 319.

[195] Ibid.

[196] Frampton, *Modern Architecture: A Critical History*, 277.

themselves in addition to the main circulation network of Web. So the built volumes can be accessed from different levels by utilizing the main stems or the inner cores.

When Frankfurt-Römerberg is read as a diagram, it is seen that the built cells act as indeterminate elements of the system. They are indeterminate because it is possible to produce spaces of various sizes utilizing the flexible modulation system in order to respond to the changes in programmatic and dimensional needs that may take place in the future. In BFU such idea of indeterminacy is made concrete with the pre-fabricated elements proposed by the engineer Jean Prouvé.[197] In BFU, the adaptable façade and partition system makes the cells literally indeterminate. However the construction of BFU was realized only partially, so these changeable façade and subdivision system could not be utilized effectively.[198]

- **Voids: Courtyards and Incisions**

In Frankfurt-Römerberg Project, they are not only the volumes that repeat, but also the voids. Like the built volumes, the voids are also guided by the secondary grid, although they look arbitrarily distributed at the first glance. In Web, the courtyards are treated as important elements as the cells. *While the cells and clusters serve for specific functions, the courtyards serve for generic functions*. These *courtyards are programmatically indeterminate* in that they can accommodate a variety of activities such as gathering or waiting; moreover, in that they can work as extensions of interior activities. As generic spaces, the courtyards provoke involuntary association contrary to the cells and clusters, which provoke voluntary association.

Associative potential of the courtyard can also be observed in casbah and *bidonville*. In a casbah house, the courtyard acts as the associative element that supports social relations within the single family. Different from casbah, in *bidonville*, the courtyard provides association between more than one family. In both indigenous settlements courtyard appears as a generic and multi-functional space in which everyday activities take place. It is argued in the thesis that the potential of the courtyard as derived from the analysis of these indigenous settlements is re-interpreted by CJW in their Web approach.

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[197] *Free University, Berlin: Candilis, Josic, Woods, Schiedhelm* (London: Architectural Association, 1999).

[198] Ibid.

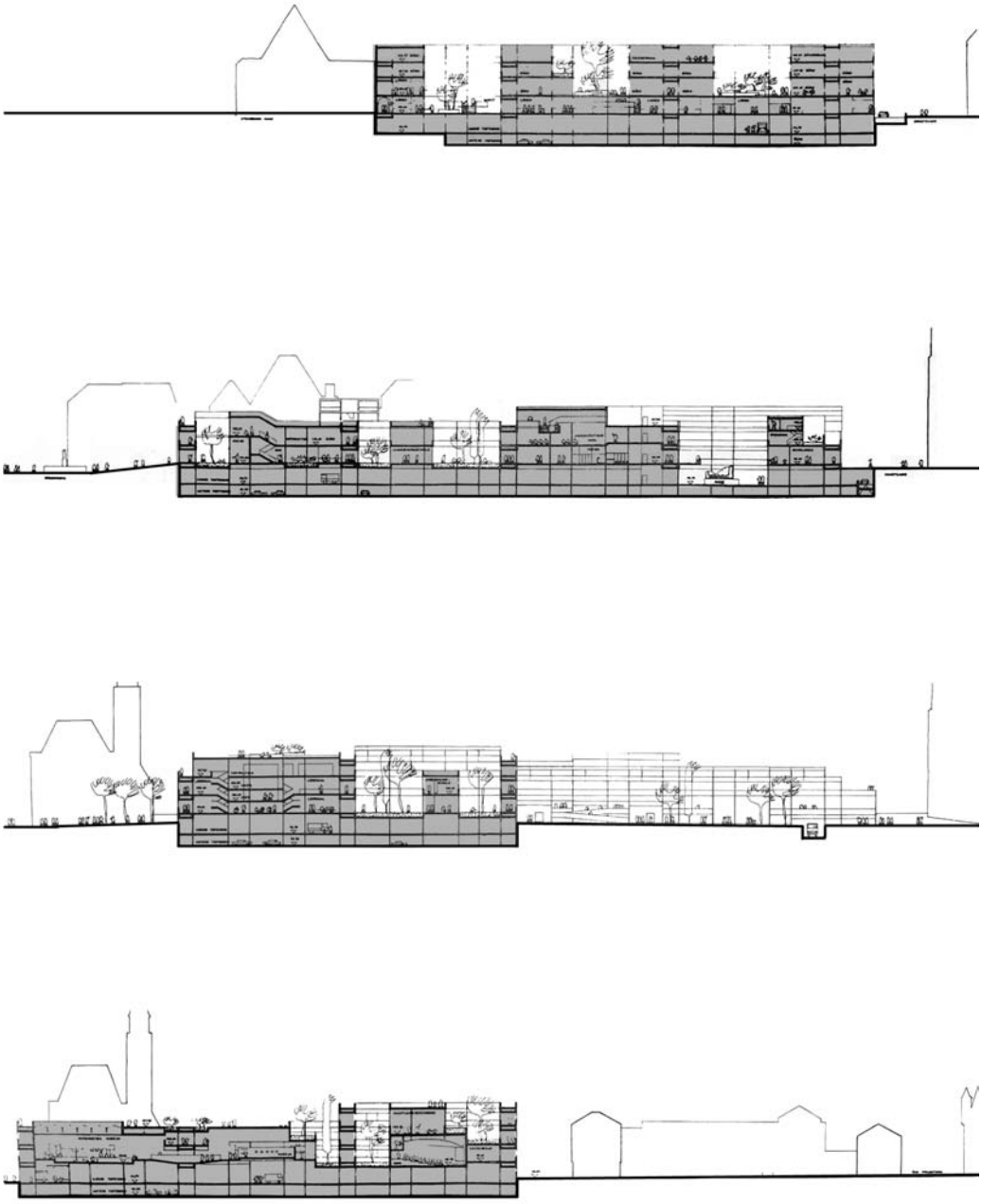

Figure 3.25 Sections of Frankfurt-Römerberg Competition Project showing the solid/void relationship. Source: Jürgen Joedicke, *Candilis-Josic-Woods: A Decade of Architecture and Urban Design* (Bern: Kramer, 1968), 204-207. Edited by the author.

It is seen in Frankfurt-Römerberg that the enclosed cells are clustered around courtyards by addition and repetition. Like the ones in the indigenous settlements, the courtyards provide fresh air and daylight for the whole organization.

Incisions are opened on the floor planes in order to produce courtyards with more than one-story height. These incisions turn the decks into perforated planes. According to Avermaete:

> These incisions create differentiation within the grid. They introduce a certain dimension to the grid and as such are decisive for the position of certain functions at particular places on the decks. Occasionally a whole square of the grid is preserved so that large functions can be located here. At other places the incisions turn the deck into a denticulate foundation that can only accommodate small scale functions such as housing and workshops.[199]

Besides the programmatic requirements, the position and size of the incisions are also determined according to the contextual fixes such as the historical remains on the site. The incisions also contribute to the three-dimensionality of Web by increasing the perception of space. The incisions enable perception of different levels and enhance visual association.

3.3.2 Design Acts: Reading the Process

Having de-composed Web into its basic components, this part of the thesis investigates how these components are operated to transform a diagram into a product. To reveal such process, it is essential to explore the design acts of Web. It is argued that Web as a diagram *suggests* a set of design actions to associate the determinate and indeterminate elements. Here, the aim is to derive these actions, which materialize Frankfurt-Römerberg project. As Manuel Gausa states, a diagram is a "machine of actions", which has structural and organizational potentials.[200]

The following part will try to make a list of design acts that are performed during the realization of Frankfurt-Römerberg. The purpose of producing such a list is to understand how Web operates as a system of organization. It should also be clarified that the terminology used in this list of design acts is formed with reference to the post-war and contemporary debates on "system" as well as with reference to knowledge derived from the

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[199] Avermaete, *Another Modern*, 314.

[200] Gausa, *The Metapolis Dictionary*, 299.

Likewise, Allen defines diagrams as "instructions for action." See Stan Allen, "Diagrams Matter," *Any* 23 (2000): 16.

analysis of the sources (casbah and *bidonville*) and the precedents (*habitat évolutif* and stem). It is argued that, unfolding these design acts will not only assist in understanding how the Web is utilized to produce a system of organization and a pattern of association, but also make it easier to relate Web to its sources and precedents.

Since the design of Web is a non-linear process, it is not possible to make a sequential listing of the design acts. However, the thesis focuses on the design acts that generate the potentials of Web (mentioned in the section 3.2). Thus, it is aimed to reveal how the components of Web are operated in producing a multi-level organization, a ground-scraper, a multi-functional entity, a pattern of association, a non-centric scheme, an urban infill, and an open-ended system. The design acts are: the act of squaring, layering, superposition, division, connecting, framing, modulation, addition, subtraction, and distribution.

3.3.2.1 Squaring

The main design act of Web is *squaring the stems*. Stem was previously invented by CJW as a minimum structuring device to organize complex architectural systems. Different from their previous works, in Frankfurt-Römerberg, a number of stems are intersected perpendicularly in order to form the basic module of a "stem-squared", which the partners call the Web. (Figure 3.26) Repetition of these basic modules results in a system of organization with a higher capacity of mobility and association when compared to that of a single stem. Moreover, continuous linkage of these intersecting stems forms a far more complex circulation network than the previous works of CJW. So, it can be said that the act of squaring is the primordial act of Web.

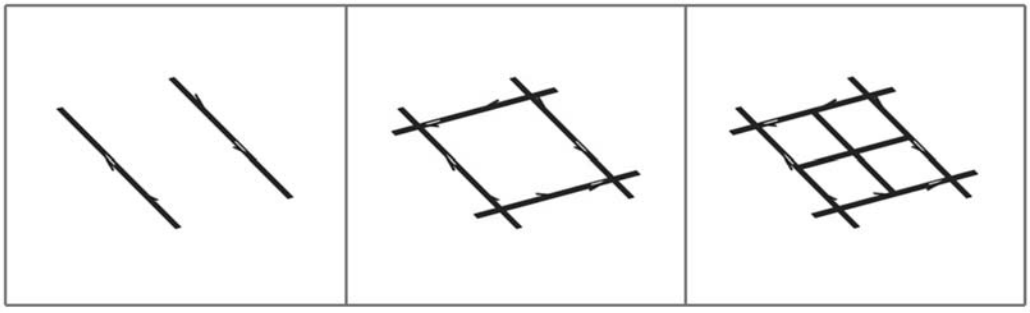

Figure 3.26. Act of squaring. Produced by the Author.

3.3.2.2 Layering

The preliminary act of Web is *layering the components*. The components are categorized as determinate (long-term) elements and indeterminate (short-term) elements according to their life-spans, and these components are treated as different layers. So, the grid system, the circulation network, the planes, and the contextual fixes constitute the *determinate layer* of Web, whereas the volumes and voids constitute the *indeterminate layer*. What is important in the act of layering is that each layer is "governed by its own laws."[201] While the layer of determinate elements is ruled by the main grid -*the act of framing*-, the layer of indeterminate elements is ruled by a secondary grid -*the act of modulating*. The act of layering enables the Web to operate as a *multi-layered system of organization*, in which the layers can work independently. According to Heuvel, these independent layers should be "arranged and combined into a new coherence in such a way as to allow them to develop independently and unhindered by other layers".[202] Heuvel's statement corresponds to the definition of *superposition*. (Figure 3.27)

3.3.2.3 Superposition

The complementary act of layering is superposition. The determinate and indeterminate layers are *superposed* to produce a complex system out of basic elements. According to Allen, *superposition of layers* means more than stacking of layers, and it indicates an interaction between the layers.[203] In Web the interaction between the determinate and indeterminate layer results in what Heuvel calls "a new coherence" and what Woods calls "*a whole that is greater than the sum of its parts*." While the act of layering enables the layers to work independently, the act of superposing enables them to operate together within interaction. So, it is the association and interaction between the acts of layering and superposition, which allows Web to act as a total system. (Figure 3.27)

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[201] Van den Heuvel, "The Diagrams of Team 10," 42.

[202] Ibid.

[203] Stan Allen, "Mat Urbanism: The Thick 2-D," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. by Hashim Sarkis (New York: Prestel, 2001), 125.

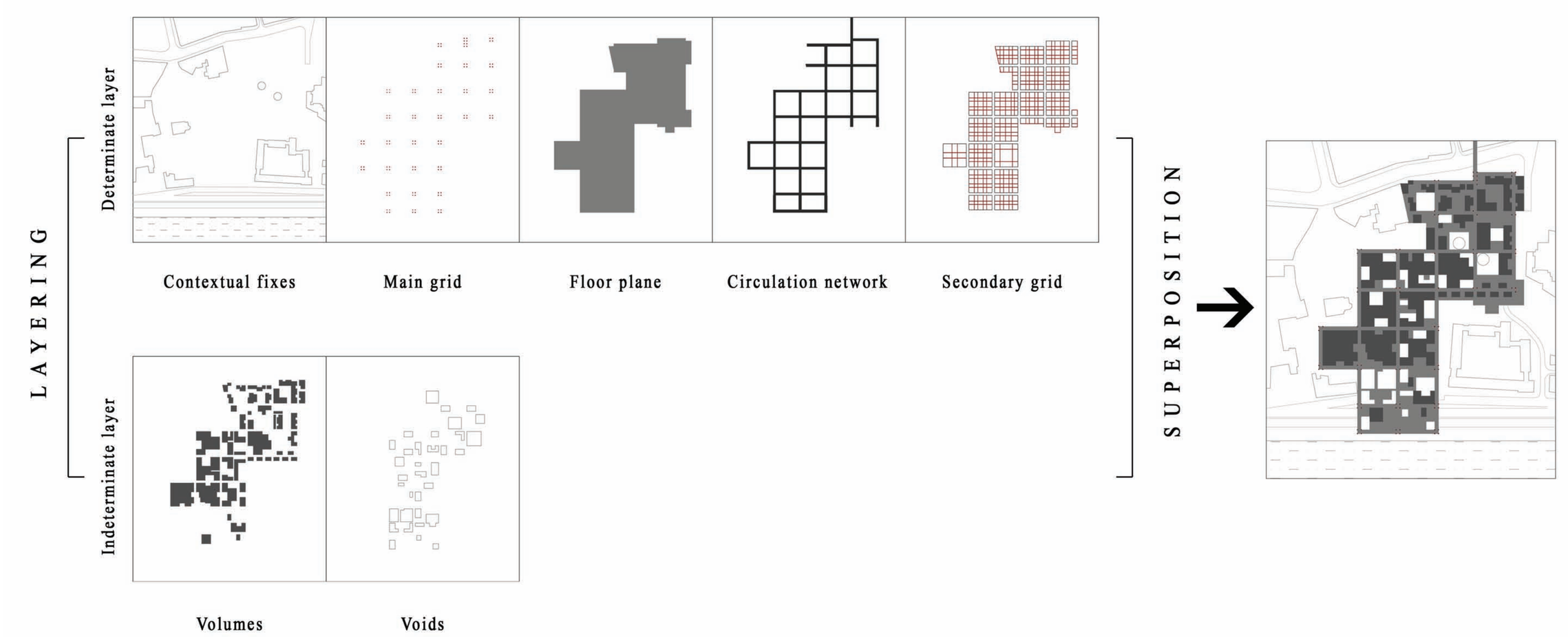

Figure 3.27 Acts of layering and superposition. Produced by the author.

3.3.2.4 Division

In Frankfurt-Römerberg the organization is divided into horizontal floor planes. These floor planes, which are detached from each other, act as multi-functional ground floor planes, accommodating a variety of individual and group activities. (Figure 3.28) They display the versatility of the streets in terms of activity; yet, the difference is that they are ground floors divorced from the ground. The indeterminate elements -namely volumes and voids- are distributed on these planes heterogeneously. In Frankfurt-Römerberg, this act of dividing provides a number of elevated ground floor planes therefore it is the requisite of a *multi-level organization*. However, a complementary act is necessary in order to develop a multi-level system of organization: connecting.

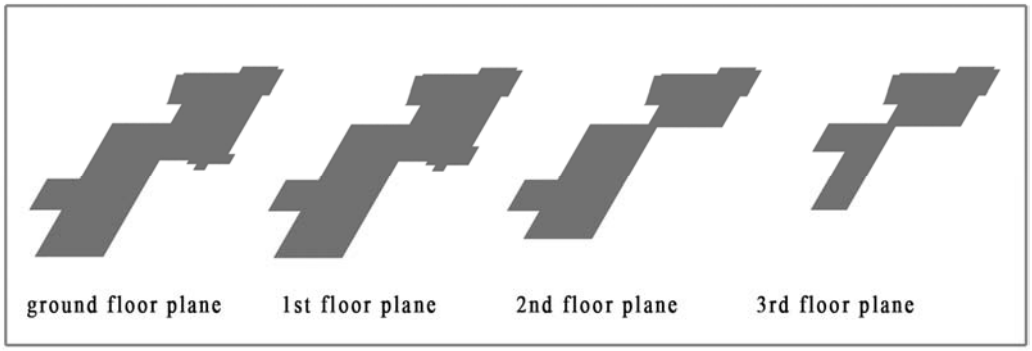

Figure 3.28 Act of division. Produced by the author.

3.3.2.5 Connecting

In Web the separated horizontal planes are connected to each other via the circulation cores and escalators. (Figure 3.29) This act of connecting turns Frankfurt-Römerberg into a *ground-scraper*, and the horizontal planes become planes of association rather than of isolation (dissociation). This act not only connects the detached horizontal planes but also weaves different programmatic elements within the system. Linked by a multi-level circulation network the whole system acts as an assemblage of ground-floors that flow into each other. These floor planes are also attached to the surrounding tissue either by making extensions through the stems or by utilizing supplementary elements such as decks or stairs. The act of connecting is indispensable for a ground-scraper, and at the same time, it is the

complementary act of dividing. Together these two acts of dividing and connecting evoke the potentials of a multi-level organization and a ground-scraper.

The act of connecting is also suggested in CJW's stem organizations. However, in these projects, Stem appears as an independent multi-level element to which building blocks are attached, whereas in Web the whole system appears as a multi-level organization. From this aspect, what differentiates Web from Stem is the implementation of *the act of division*. Similar idea of plane and the acts of dividing/connecting are also seen in the sketches of *habitat évolutif*, so it is why *habitat évolutif* is considered as the precedent of Web in this thesis.

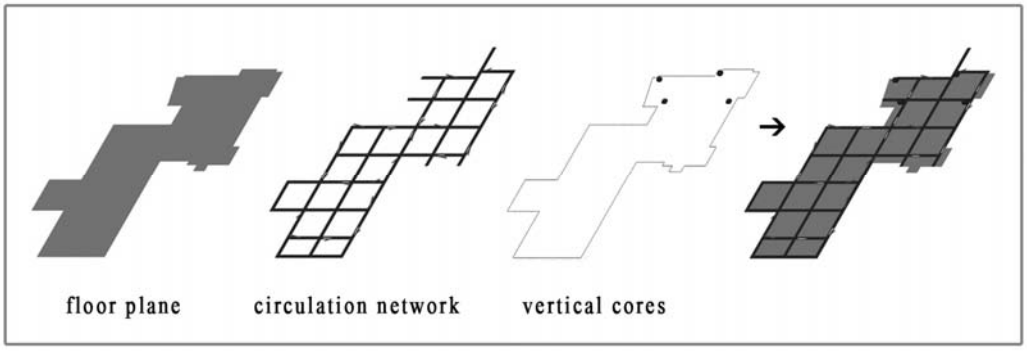

Figure 3.29 Act of connecting. Produced by the author.

3.3.2.6 Framing

Another design act Web suggests is *framing the site* with a determinate grid, structuring the technical and mechanical services as well as the main circulation network. This action is performed via the *main grid*, which has a non-hierarchical geometry with equal intervals. This *act of framing or gridding* leads to a repetitive infrastructure and establishes a framework on which a system of organization and a pattern of association can operate. Repetition of the main grid results in a *non-centric scheme* eliminating pre-determined hierarchies. The act of framing draws the boundaries of the Web, but makes improvisation possible by utilizing a non-narrative grid. (Figure 3.30)

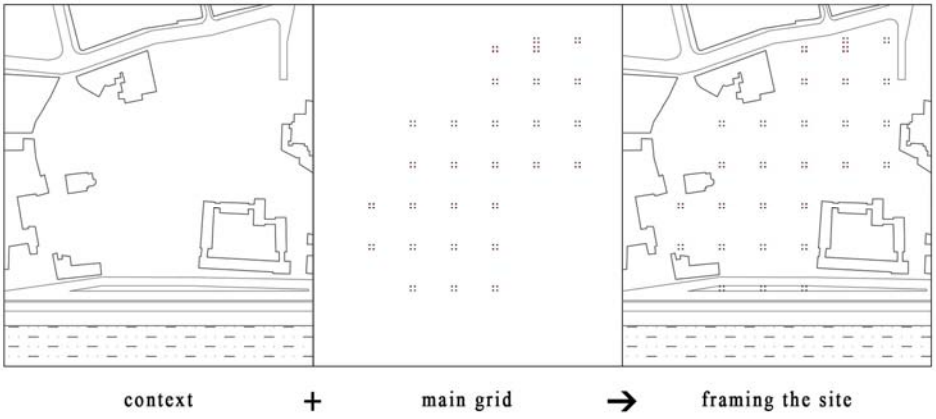

Figure 3.30 Act of framing. Produced by the author.

3.3.2.7 Modulation

Modulation is another design act suggested by Web. The horizontal floor planes introduced by the act of division are modulated with a grid for integration of indeterminate elements. Different from the act of framing, this action is performed by a *secondary grid* (modulation grid). Modulation prepares the ground for the actions of addition of volumes and subtraction of voids. The modulation system of Web is determinate, but the intervals are changeable within the boundaries of the modulator ratio, which in the case of Frankfurt-Römerberg is the golden ratio. The act of modulation allows for repetition and variation, and acts as a tool for an *open-ended system*. (Figure 3.31) *Framing and modulating* are complementary operations; while former brings order to the system, the latter provides flexibility. Co-existence of these two actions engenders a non-centric scheme and an open-ended system.

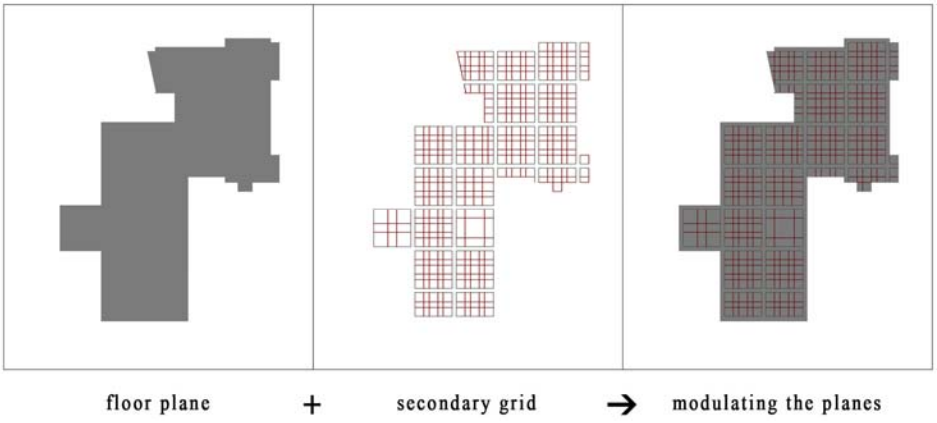

Figure 3.31 Act of modulation. Produced by the author.

3.3.2.8 Addition

In Frankfurt-Römerberg functional *volumes* are added on the floor planes in the form of cells and clusters. (Figure 3.32) The act of addition is also observed in the sources of Web namely casbah and *bidonville*. In *bidonville*, the cells are organized around a courtyard via the act of addition. In casbah, different from *bidonville*, the act of addition proceeds in the form of stacking instead of addition on planes. Adding is also an operation utilized in CJW's Stem organizations in the formation of ancillary clusters. It is seen in Stem organizations that rectangular areas (plots) are allocated for the serving functions so that the capacity of the social, cultural, and educational services can be expanded through addition of cells on these allocated plots. Different from Stem organizations, in Web, the act of addition is utilized as a tool for making *infill*. When the figure-ground diagram of Frankfurt-Römerberg is analyzed it is seen that the volumes are added on the floor planes in a way to fill the site. In Web, the act of adding follows the lines determined by the act of modulation. That is to say the volumes (cells are clusters) are arranged on the horizontal floor planes according to the modulation system brought by *the secondary grid*.

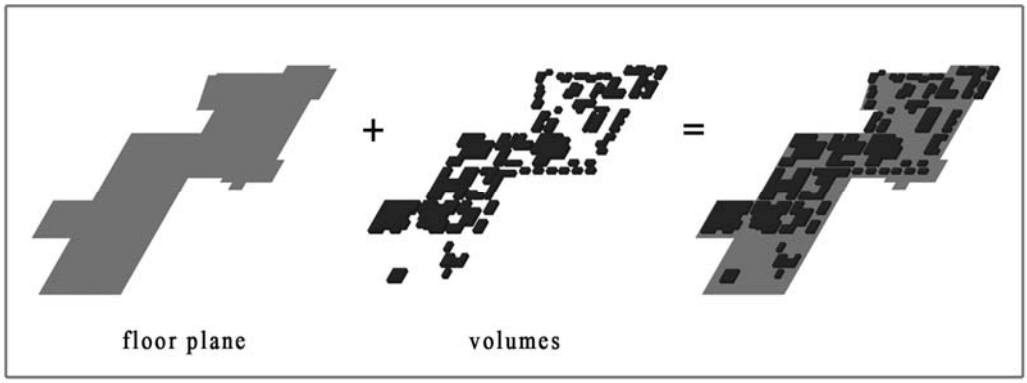

Figure 3.32 Act of addition. Produced by the author.

3.3.2.9 Subtraction

The opposite act of addition is subtraction. *Subtracting the volumes* from the horizontal planes, *generic voids* are produced within the system of Web. (Figure 3.33) These voids act as in-between spaces without specific function, and generate association among groups and individuals. This design act turns the horizontal planes into *perforated decks*, which enable visual and physical contact within the system. The incisions and the courtyards produced via

the act of subtraction function as elements of association in Frankfurt-Römerberg. In this sense, the act of subtraction serves for establishing a *pattern of association*. Similar to the act of addition, the act of subtraction also operates with reference to the *secondary grid*. Therefore it can be concluded that the opposite acts of addition and subtraction are both ruled by the act of modulation.

The act of subtraction is also depicted in the sketches of *habitat évolutif*, in which the dwelling planes are perforated to frame the trees. In this sketch, the tree also acts as a metaphor for the contextual fixes. Similarly, in Frankfurt-Römerberg incisions are opened on the floor planes to preserve the historical remains on the site. From this aspect it can be argued that, besides the act of adding, the act of subtracting is also related with the infill potential of Web.

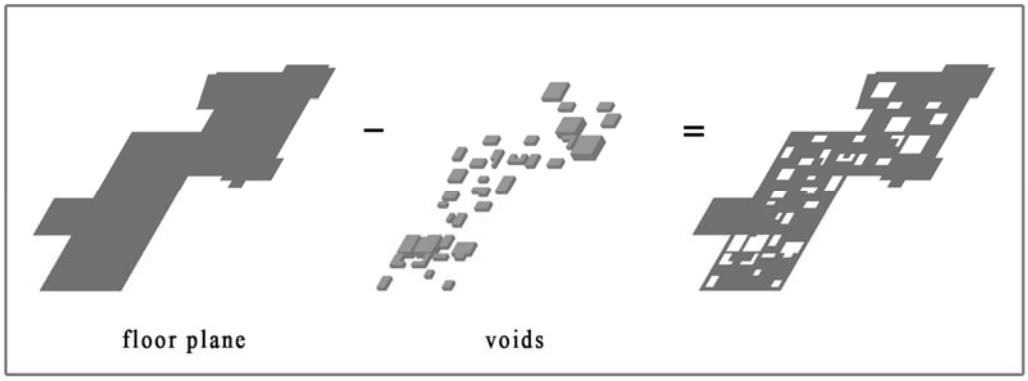

Figure 3.33 Act of subtraction. Produced by the author.

3.3.2.10 Distribution

Another design act suggested by Web is distribution. In Frankfurt-Römerberg the *elements of the program* are homogenously *distributed* among the floor planes without isolating any function on a single plane in a way to turn each plane into a multi-functional one. (Figure 3.34) Due to the act of distribution, each floor houses a variety of individual and collective functions. The functional volumes are scattered on these planes without concentrating any function on a single plane. So, it is the act of distribution that differentiates these multi-functional planes from the planes of isolation. In this sense, the act of distribution is the tool, which makes Frankfurt-Römerberg a *multi-functional entity*. (Figure 3.35)

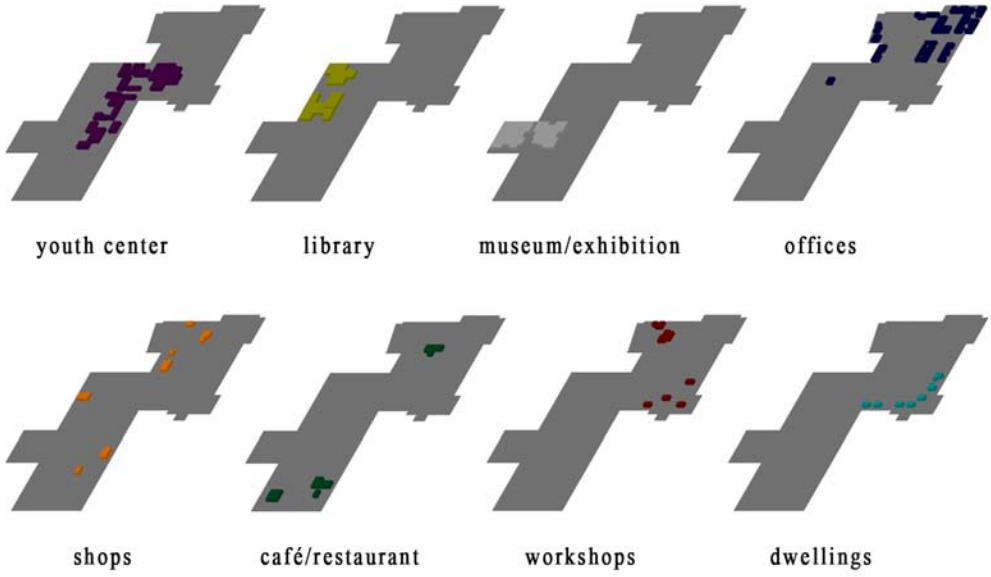

Figure 3.34 Act of distribution: Layering of functions, 1st floor plane. Produced by the author.

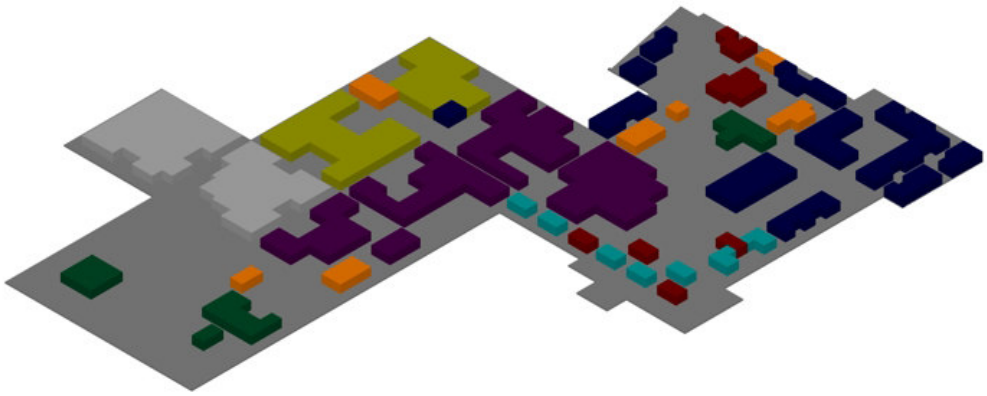

Figure 3.35 Act of distribution: Superposition of functions, 1st floor plane. Produced by the author.

CHAPTER 4

WEB AS A SYSTEM OF ARCHITECTURAL ORGANIZATION

It is previously argued in Chapter 2 that Web should be seen as a part of an experimental process beginning with the partners' participation to ATBAT by means of which they found the opportunity to analyze casbah and *bidonville*, and continuing with the introduction of *habitat évolutif* and Stem. This chapter reveals the relationship between Web and its sources and precedents, and seeks to understand how the idea of *habitat évolutif* evolved into Web. It also examines the relation of the concepts *habitat évolutif*, Stem, and Web to the post-war and contemporary architectural debates. Before examining this relation, the thesis depicts the relevance of the sources; namely casbah and *bidonville* with a diagram. (Figure 4.1)

As seen in figure 4.1 (a1, a2) casbah is a collective form of settlement, which takes its form from its physical context. It has an open-ended settlement pattern capable of growing by making *infill* to the site. In other words, to expand its dimensions, casbah settlement *scrapes the ground*. In this respect it can be argued that such features of Web related to its organic formation is borrowed from the principles derived from the analysis of casbah. Similar to these indigenous settlements, Web infiltrates to the voids of the city with reference to the contextual fixes on the site. As an *urban infill*, Frankfurt Web acts both as an *organized and organic system*.

Another significant characteristic of casbah is its *multi-level organization*. The two main levels of circulation seen in casbah -the streets dominated by men, and the rooftops dominated by women- constitute a unique feature for this settlement. Eliminating the gender issue and considering the use of roof terraces as a ground floor, it can be argued that Web draws parallel to such feature of casbah. The *multi-level and multi-directional circulation* in casbah constitutes a source of inspiration for the complex circulation network that is developed in Web. (Figure 4.1 a3, a5, c2, c3) In both casbah and Web there is a *map of trajectories* provided by the circulation network, however the users are free to draw their own paths according to their own wills. What differentiates Web from casbah is that while the latter has an organic circulation network the former is has an organized one.

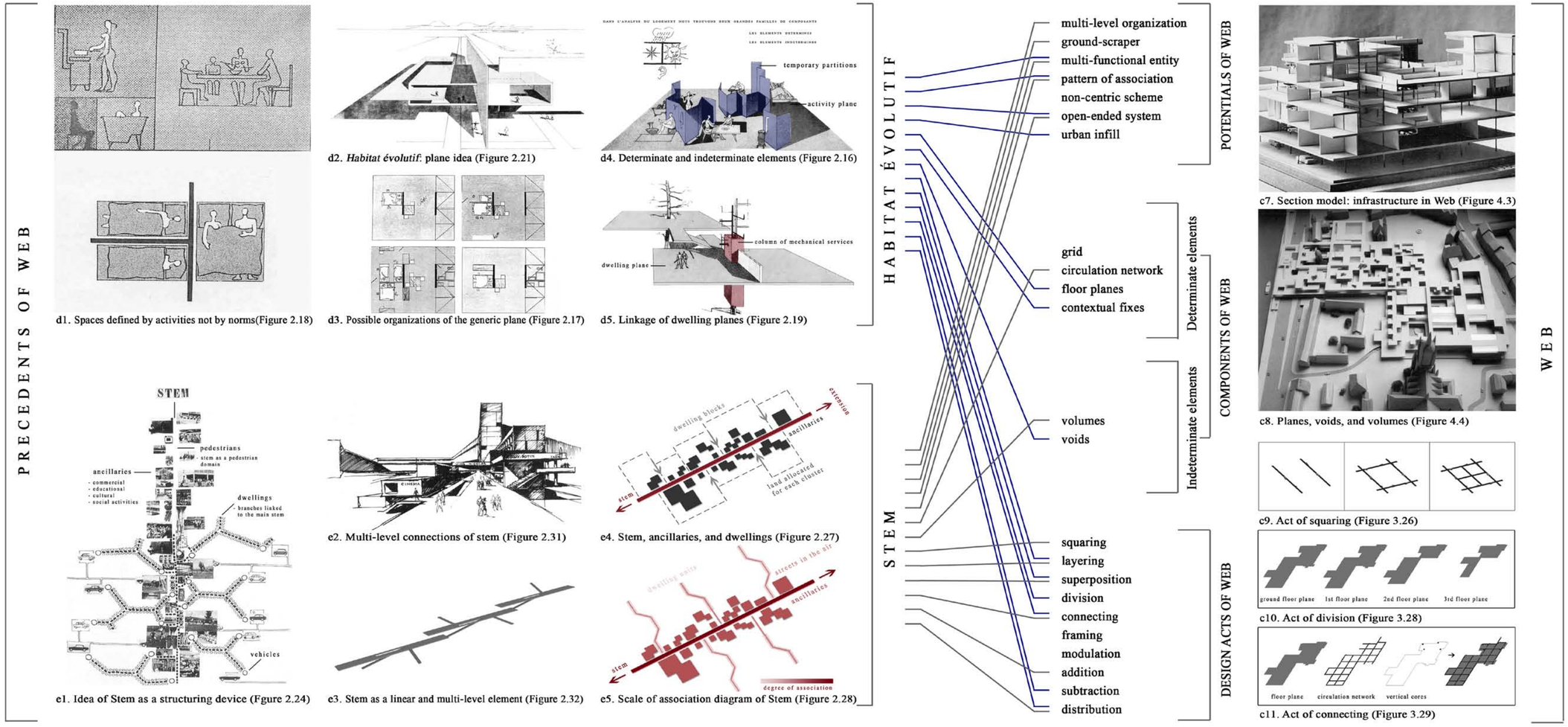

Figure 4.2 Relevance of *habitat évolutif* and Stem. Produced by the author

As a three-dimensional collective form, casbah acts as a *pattern of association*. In casbah the roof terraces, streets, and courtyards are the *elements of association*. While the courtyards appear as the associative elements within the family life, the streets and roof terraces appear as the elements that generate association within the neighborhood. Similarly the voids (courtyards) and the stems are the elements of association within the Web, and they bring together people who have different aims in being there. In this sense they function as spaces that evoke involuntary association, and conduce to coincidental events. So, like casbah, the voids in Web are as important elements as the volumes. The relationship of solid-void relations in Web also draws close to the one of casbah's when the section drawings are examined. (Figure 4.1 a5, c4)

Another feature of casbah settlements that makes them appeal to CJW is the *evolutionary potential* of the casbah house. In figure 4.1 (a4), it is seen how a casbah house is constructed and expanded by its dwellers within a modulation system. This characteristic of casbah is related with the issue of *user participation* and *organic growth*, which is also observed in Web, however in a different way. The difference is that the growth in Web is organized by a pre-determined *infrastructure* while the growth in casbah is definitely organic. From this aspect, it can be claimed that Web draws close to the idea of Van Eyck's organized casbah.

The *bidonville* settlements were also influential to the concepts developed by CJW. Similar to casbah, the *bidonvilles* are *organic patterns of association*. What differentiates the *bidonville* from a casbah house is the use of the courtyard. While the courtyard in casbah is used by a single family, the courtyard in the *bidonville* is used by more than one family. In a *bidonville* house the cells are the volumes, in which the specific activity of sleeping takes place, whereas the courtyards are the voids in which other dwelling activities occur. (Figure 4.1 b3, b5) Similarly, in Web, the cells act as spaces that serve for specific functions and the voids act as spaces for generic functions. In the case of *bidonville*, the dwelling plot appears as a plane on which a number of cells are added to accommodate more than one family. In this respect, the *act of addition* appears as another feature of *bidonville* that is relevant to Web. (Figure 4.1 b4, b6, c5, c6)

In *bidonville*, the rectilinear shacks are the physically *indeterminate elements* of the house. These shacks or cells are short-term elements made out of short-term and fragile materials. They are easily changeable according to the requirements of their inhabitants. In this sense the inhabitants of *bidonville* are architects of their own houses. The issue of *participation* observed in *bidonville* becomes important in terms of Web if it is recalled that CJW sought

for an architecture, which would determine the basic aspects of a system, yet leave it open to *improvisation of users*. In *bidonville*, the courtyard appears as the physically determinate but functionally indeterminate element of the house. The dwelling plot (plane) appears as the less indeterminate element. However, the fact that there is no land-ownership still makes them indeterminate. The dwellers of *bidonvilles* are nomads, and they can construct their shelter wherever they go. It can be argued that this idea of m*obility* and *indeterminacy* seen in this organic form of settlement is re-interpreted in the later works of CJW: firstly in *habitat évolutif* and lastly in Web.

Another feature of these indigenous settlements -both casbah and *bidonville*- that influenced the formation of Web is scale. As opposed to the verticality of the modern cities, Web is very modest in terms of its height. Although it has a multi-level organization, it is a *ground-scraper*, which spreads to the site horizontally. Looking at the relation between the building and human scale, it can be said that the partners took these indigenous settlements as a sources of inspiration for establishing patterns of association, in which the users are in interaction with the built environment.

CJW utilized the knowledge they derived from these organic settlements for developing new habitats. For them habitat did not only indicate dwellings, but any supplementary function that is required to support urban daily activities. According to CJW, new concepts had to be developed in order to establish a system of habitat. The preliminary concepts introduced by CJW prior to the Web are "*habitat évolutif*" and "Stem". Figure 4.2 explains the relevance of these precedential concepts.

In most of the written sources, Stem is accepted as the main precedent of Web due to the act of squaring performed in the production of Web. However, it could be fair to say that although the squared Stem is the main structuring device of Web, the precedential concept behind the Web appears to be *habitat évolutif*. Since *habitat évoultif* (chapter 2) and Web (chapter 3) are analyzed in detail in the previous chapters, this chapter aims to read them together. Such reading of these two concepts will assist in seeing the parallelisms of the two, and revealing why *habitat évolutif* is accepted as the first effort towards Web in this thesis.

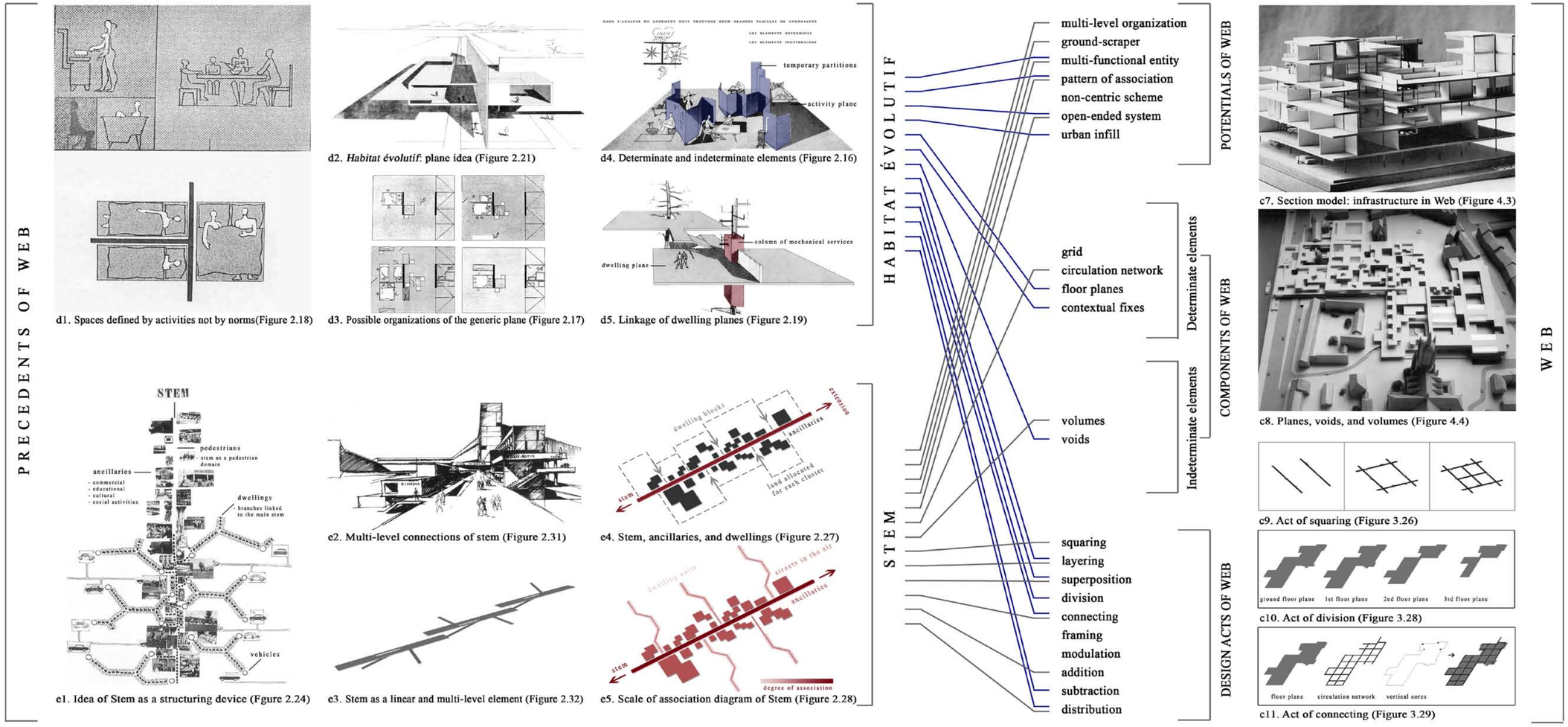

Figure 4.2 Relevance of *habitat évolutif* and Stem. Produced by the author

H*abitat évolutif* is the first concept introduced by CJW that is based on the acts of layering and superposition of components: determinate and indeterminate elements. It is argued in the previous chapter that such layering and superposition are the acts, which render Web an open-ended, flexible, repetitive, and dynamic system rather than a finished and static object. The acts of layering and superposition are also seen in Stem, however in a different way. While the organization of Stem is based on the categorization of ancillaries (serving *spaces*) and dwellings (served *spaces*), the organization of *habitat évolutif* is based on the categorization of determinate (long-term) and indeterminate (short-term) *elements*. Although the categorization of determinate and indeterminate elements can also be interpreted as a categorization of the serving and the served elements, *habitat évolutif* differs from the Stem in that it is not only the spaces that are categorized but all the elements of organization.

Colquhoun calls this act of layering as the "separation of *infrastructure* and *infill*."[204] If this act of layering in *habitat évolutif* and Web are re-read in Colquhoun's terms, the determinate elements become the infrastructure of the system, whereas the indeterminate elements become the infill. It is this separation of determinate and indeterminate elements or the infrastructure and infill, which makes Web both an *organized and organic architectural system*. While the determinate elements constitute the rigid infrastructure on which indeterminate elements operate, the indeterminate elements form the more flexible infill, which is capable of accommodating growth and change. Allen explains the potentials of infrastructure as such:

> Infrastructures are flexible and anticipatory. They work with time and are open to change. By specifying what must be fixed and what is subject to change, they can be precise and indeterminate at the same time.[205]

The non-narrative character of the determinate elements namely the grid, the circulation network and the floor planes, turns Web into an organized but repetitive and variable structure. The determinate elements or the infrastructure draws the limits of the system; however these limits are conceptual and technical rather than physical.

The issue of infrastructure is also depicted in the sketches of *habitat évolutif*. In figure 4.2 (d5) *habitat évolutif* is demonstrated as a linkage of two planes. There is a tree and a column of mechanical services piercing these planes from certain points. There are three different readings of this sketch. Firstly, the depiction of the tree and the incision surrounding it can

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[204] Colquhoun, *Modern Architecture*, 209. Emhasis added.

[205] Allen, *Points and Lines*, 55.

be interpreted as a perforation, which is made to accommodate the existing tree within the new system. In this sense the tree becomes a metaphor for the contextual fixes. Secondly, the tree can be interpreted as a metaphor for the voids whereas the vertical column is a metaphor for the solids. Lastly, the tree can also be interpreted as a metaphor for the vertical column of mechanical services that pierce the floor planes. In such reading the roots of the tree correspond to the underground service level, the stem corresponds to the shafts, and the branches correspond to the pipes.

Such understanding of infrastructure is also seen in Web. As the section model of Frankfurt-Römerberg illustrates, the mechanical and technical services are collected in the underground service level. These services are distributed in the vertical direction by the shafts and in the horizontal direction by the circulation decks. All the shafts are aligned on the circulation network, thus, on the main grid. Figure 4.3 shows how the determinate elements of Web literally act as an infrastructure for the system.

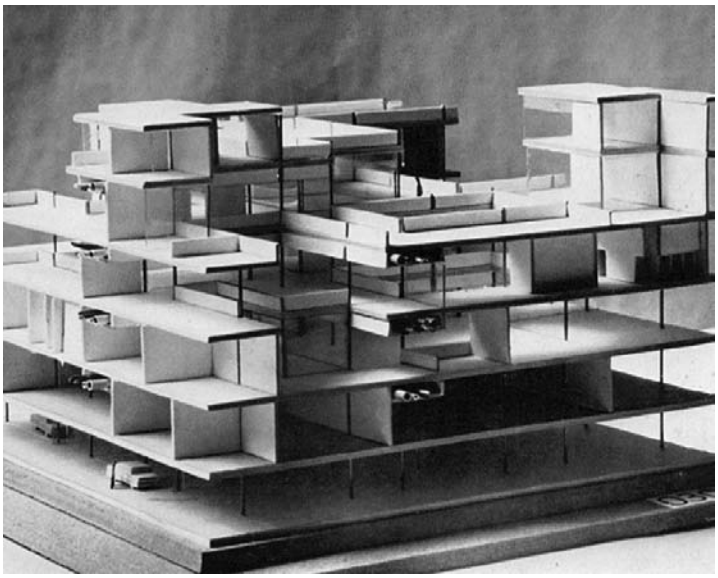

Figure 4.3 Section model of Frankfurt-Römerberg. Source: Source: Tom Avermaete, Another Modern: The Post-war Architecture and Urbanism of Candilis, Josic, Woods (Rotterdam: NAi Publishers, 2005), 311.

One of the elements, which make the infrastructure of Web "flexible and anticipatory", is the main grid. In "The Metapolis Dictionary of Advanced Architecture", Gausa explains the potential of the grid:

> Grids create an effect of operative interconnectivity favored by the interlinked logic of episodes and events themselves. What is interesting in such configurations is their *flexible and infrastructural*, rather than pure and rigidly structural nature. These are not, in fact, monolithic megastructures -totalitarian frameworks- but rather *adaptable and deformable systems*, open to manifold variables and singularities (according to context and use).[206]

Organizing the determinate elements (such as the circulation network and the mechanical cores aligned on it), the main grid mediates between "infrastructure and architecture", moreover, between "outline and network".[207] It also constructs a "field" on which the concepts of "system of organization" and "pattern of association" can operate. In "Points and Lines: Diagrams and Projects for the City," Allen defines all grids as fields,[208] and explains field conditions as such:

> To generalize, a field condition could be any *formal or spatial matrix* capable of unifying diverse elements while respecting the identity of each.[209]

With reference to Allen, *the main grid of the Web can be considered as a field* on which determinate and indeterminate elements are operated in order to produce a matrix: a complex system of organization, which is in Woods' terms "greater than the sum of the parts."

According to Allen, there are certain design acts inherent to the infrastructures:

> Infrastructure prepares the ground for the future building and creates the conditions for future events. Its primary modes of operation are: the division, allocation, and construction of surfaces; the provision of services to support future programs; and the establishment of networks for movement, communication, and exchange. [210]

Here, "the division, allocation, and construction of surfaces" correspond to the *plane idea*, which is initially seen in *habitat évolutif* and then in Web.

In the sketches of *habitat évolutif*, the floor planes appear as the determinate elements of the system (that reminds the dwelling plot of *bidonville*). They are *generic surfaces* capable of

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[206] Gausa, *The Metapolis Dictionary*, 268. Emphasis added.

[207] "Grids are configurations that are resolved in orbit of a possible hybridization between architecture and infrastructure replace, in effect, the idea of outline with that network and that of reticule with that of mesh. This level of internal organization points to a meshed organization, aimed at favoring an elastic topology –a greater capacity for linkage and deformability- in the system."

Ibid.

[208] Allen, *Points and Lines*, 97.

[209] Ibid., 92. Emphasis added.

[210] Ibid., 54.

accommodating a variety of daily activities by adapting the temporary partitions. In this sense, the floor planes of *habitat évolutif* act as multi-functional surfaces on which activities flow into each other. Same idea of the *multi-functional floor surfaces* is also seen in Web. As exemplified by the Frankfurt-Römerberg Project, in Web, the organization is divided into floor planes and a variety of functions are distributed on these planes. As a determinate and infrastructural element, the planes in Web are also operated by the acts of division and distribution. However, it should be noted that, here, division does not mean isolation of certain functions on certain planes, instead, it means distribution of a variety of functions on each plane.

The only infrastructural element of Web that is not defined by *habitat évolutif* is the circulation network. Although access points and circulation elements are designated as the determinate elements of *habitat évolutif*, the development of a circulation network is firstly seen in Stem. As a linear and multi-level element, the single Stem evolves in Web to a Stem-squared composed of intersection of four stems. In Web, stem appears as the tool for a multi-level circulation network, which connects the independent planes and multiple functions. By squaring the Stem the linear-centric scheme of the single Stem also evolves into a non-centric scheme in Web. This non-centric scheme in Web is planned to become a poly-centric scheme through use, which is also the case in *habitat évolutif*. Similar to Web, the non-narrative planes of *habitat évolutif* establish a poly-centric organization, in which the center of activity is expected to shift during the day. The non-narrative infrastructure of *habitat évolutif* and Web allows for continuous change within the system. In this sense both *habitat évolutif* and Web house evolutionary potential:

> [T]he evolutionary is capable of growing and developing, mutating and transforming, altering, varying, deforming and/or being influenced through codes or generic internal basic rules, precise and flexible, *determinate and indeterminate*, and through bits of specific external information, fortuitous and contingent, at once foreseen and unforeseen.[211]

What makes these systems evolutionary is in Colquhoun's terms "the dialectic between the *fixed infrastructure and the random infill*."[212] While the rigid infrastructure constitutes an order, the voids and volumes are repeatable, variable, and changeable. Gausa calls this situation as "determinate indeterminism."[213] So the determinate indeterminism seen in

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[211] Gausa, *The Metapolis Dictionary*, 206. Emhasis added.

[212] Colquhoun, *Modern* Architecture, 220. Emphasis added.

[213] Gausa, *The Metapolis Dictionary*, 107.

habitat évolutif and Web, results in an open-ended system of organization. Gausa defines open-endedness as such:

> Open is non-closed, non-conclusive, non-confined. Open is *indeterminate*; non-determinate and non-terminated. Open is "incomplete" (and unfinished). Evolutionary. That is, animated. Unsettled. And liberated. Open, then, means non-limited and non-limiting.[214]

So, the non-limited and non-limiting character of Web stems from the acts of *layering* and *superposition* (suggested first by *habitat évolutif*). In this sense, Web is a complex system made of basic elements. Francisco Tolchinsky defines a complex system as such:

> A complex system emerges from the interaction of its components in such a way that the system is not reducible to the sum of its parts".[215]

What is significant in *habitat évolutif* is the layering and superposition of the components as determinate and indeterminate elements. Another design act, which is influential to Web, is division of the organization into horizontal planes. These actions developed in *habitat évolutif* are later used in Web, turning it into a multi-layered and flexible system of organization. Two years later than *habitat évolutif*, the partners introduced the concept Stem, as a tool for connecting the divided planes. With the complementary actions *–division* borrowed from *habitat évolutif* and *connection* borrowed from the Stem-, Web is introduced as a multi-level organization. Most importantly, the acts of layering and superposition has guided CJW to establish open-ended systems of architectural organization rather than finished architectural forms.

The *search for systems* as conducted by CJW was also a great concern for other members of Team 10. The experimental projects realized by the members of Team 10 are depicted by Alison Smithson, in her article "How to Recognise and Read Mat-Building: Mainstream Architecture as It Has Developed Towards the Mat-building" together with some other relevant projects. The projects, which took place in this article, responded to the general concerns of Team 10 such as: association, mobility, flexibility of change and growth, and identity. Frankfurt-Römerberg Competition Project was also included in this article with some other projects of CJW.[216]

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[214] Ibid., 463. Emphasis added.

[215] Francisco Tolchinsky, "Complex System" in *The Metapolis Dictionary of Advanced Architecture: City, Technology and Society in the Information Age* ed. by Manuel Gausa (Barcelona: Actar, 2003), 123.

[216] CJW's other projects, which are included in this article are Toulouse University, Toulouse le Mirail, Fort Lamy, Bochum University, Berlin Free University, Bilbao, Caen, and Toulouse Competition projects and Candilis' typical plan repeats.

In her catalogue like article, Smithson puts emphasis on Stem and Web projects of CJW, and argues that mat-building has become visible by completion of BFU.[217] Smithson defines mat-building as such:

> Mat-building can be said to epitomize the anonymous collective; where the functions come together to enrich the fabric, and the individual gains new freedoms of action through a new and shuffled order, based on *interconnection*, *close-knit patterns of association*, and *possibilities for growth, diminution, and change*.[218]

Considering Smithson's definition of mat-building, it should be recalled that these issues of interconnection, association, growth and change are also significant to the Web concept. According to Timothy Hyde "[i]nstead of defining a distinct object, mat-building weaves itself into the surrounding context, creating a building that performs like a city, or transforming part of the city into a building.[219] (Figure 4.4) Hyde's statement reminds how Frankfurt web acts as an urban infill. Parallel to the arguments on *Web acting as a field*, Allen states that mat-buildings "operate as *field-like assemblages*, condensing and redirecting the patterns of urban life, and establishing extended webs of connectivity both internally and externally.[220]

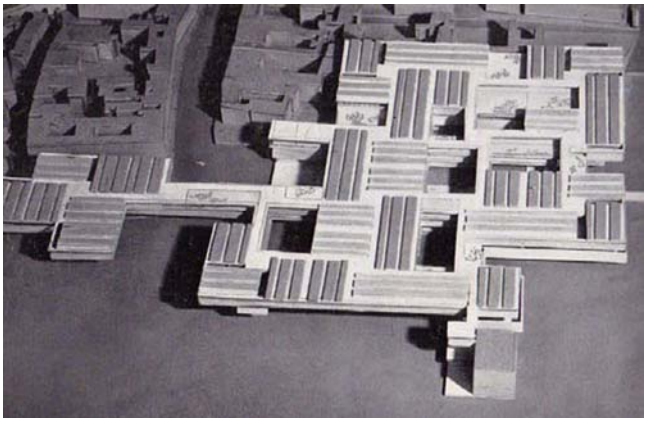

Figure 4.4 Venice Hospital, Le Corbusier, 1964. As a mat-building, the hospital acts as an urban infill. Source: Le Corbusier, *Oéuvre Complete 1957-1965* (New York: G. Wittenborn, 1966), 141.

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[217] Alison Smithson, "How to Recognise and Read Mat-Building," 91.

[218] Ibid. Emphasis added.

[219] Timothy Hyde, "How to Construct an Architectural Genealogy: Mat-Building… Mat-Buildings… Matted-Buildings," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. by Hashim Sarkis (New York: Prestel, 2001), 106.

[220] Allen, "Mats," 421. Emphasis added.

In her article "How to Construct an Architectural Genealogy: Mat-Building… Mat-Buildings… Matted-Buildings", Hyde extends the timeline suggested by Smithson to the present (from 1974 to 1999). In this article, Hyde argues that Smithson's article reduces mat-building into certain characteristics: "a horizontal weave of programmatic and circulatory elements, a play of solids and voids stabilized with a legible geometric order; the exterior conditions are purely contingent, the incidental result of overlaps and interconnections at the interior."[221] He highlights that, in order to extend this timeline and to find the contemporary reflections of mat-building, the mat phenomena should be seen as *an operation rather than an object*.[222]

One of the projects which is depicted in Hyde's article is Kisko Kurokawa's Agricultural City. (Figure 4.5) Kurokawa's project has a lot in common with CJW's Frankfurt-Römerberg. Similar to Frankfurt web, the agricultural city is built upon an *infrastructural grid system*, which establishes the main street network and structures the utility services. Like the Web, in Agricultural City, the utility pipes are carried underneath the main *circulation network*. Both projects exemplify the idea of *organic growth*; Kurokawa's project does it in the city scale, and CJW's in the urban scale. Another difference is that the Agricultural City is composed of a single level network elevated above the ground, whereas Frankfurt web is composed of a multi-level circulation network.

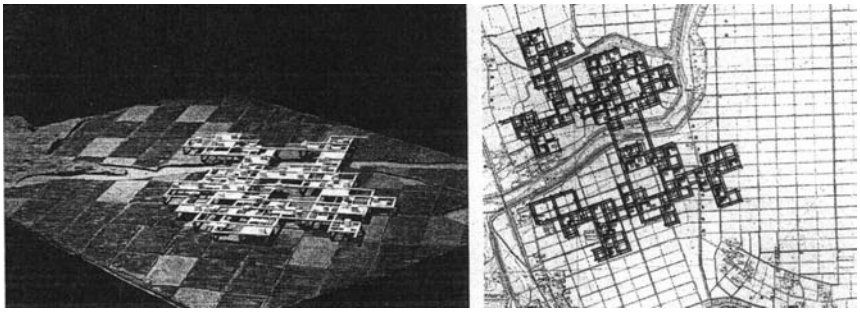

Figure 4.5 Agricultural City, Kisho Kurokawa, 1960. Source Timothy Hyde, "How to Construct an Architectural Genealogy: Mat-Building… Mat-Buildings… Matted-Buildings," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. Hashim Sarkis (New York: Prestel, 2001), 107.

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[221] Hyde, "How to Construct an Architectural Genealogy," 106.

[222] In his article Hyde makes some additions to Alison Smithson's examples of mat-building, starting with the year 1954 (completion date of Tuscolano Housing Complex, Libera). So Hyde's genealogy covers the years 1954-1999.

Ibid., 104-117.

Another project, which can be seen in Hyde's article, is Bernard Tschumi and OMA's *Parc de la Villette* Competition Project. According to Hyde:

> The La Villette competition inspires further mat-building… programs, forms, and surfaces are overlaid and overlapped to create a densely textured landscape… the parts are simultaneously unique and interchangeable.[223]

What makes the project relevant in terms of Web is the superposition of layers. In La Villette *points*, *lines*, and *surfaces* are interpreted as different *layers* and superposed so as to result in a whole in which both the parts and the whole are perceptible. (Figure 4.6) If the columns in Frankfurt web are conceived as points, the circulation network as lines, and the floor planes as surfaces, it can be said that the two projects draw parallel to each other in terms of the acts of *layering* and *superposition*. A difference is that, in La Villette each layer is organized by a different ordering system, whereas in Web, all the determinate elements are organized by the same system: the main grid. *Distribution of the programmatic elements* is another design action shared by the two projects.

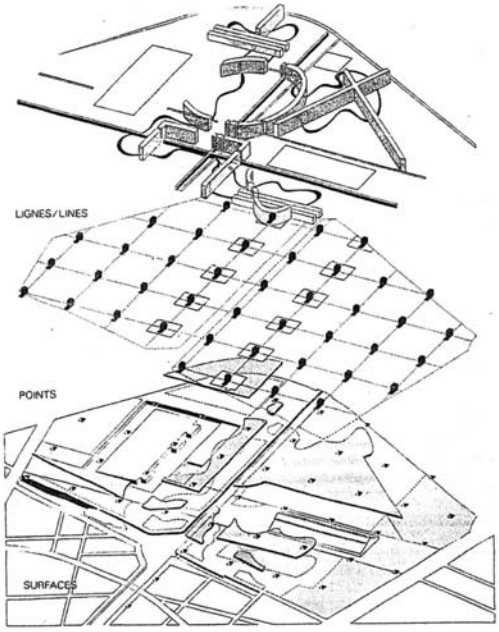

Figure 4.6 Parc de la Villette Competition, Bernard Tschumi and OMA, 1982. Source Timothy Hyde, "How to Construct an Architectural Genealogy: Mat-Building… Mat-Buildings… Matted-Buildings," in *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, ed. Hashim Sarkis (New York: Prestel, 2001), 107.

[223] Ibid., 111.

Mat-buildings, so the search for systems, was evoked by the questions related with the role and responsibility of the architect, or in Allen's terms "the extent of the architect's design control."[224] As already discussed in chapter 1, the members of Team 10 believed that it was not possible for an architect to *anticipate* the long-term or short-term changes that may take place in the physical or cultural environment, therefore they needed to develop solutions which were flexible enough to accommodate change and growth. Putting one-step further Alison and Peter Smithson stated that these systems "must not only be able to *take* change but should imply change."[225] Allen explains that mat-building responds to this concern of anticipation with the voids rather than the volumes:

> The promise of mat-building is of thing happening in the voids, outside of architecture's explicit envelope of control. Mat-building is characterized by active interstitial spaces, where matter shapes and channels the space between things, *leaving room for the unanticipated*.[226]

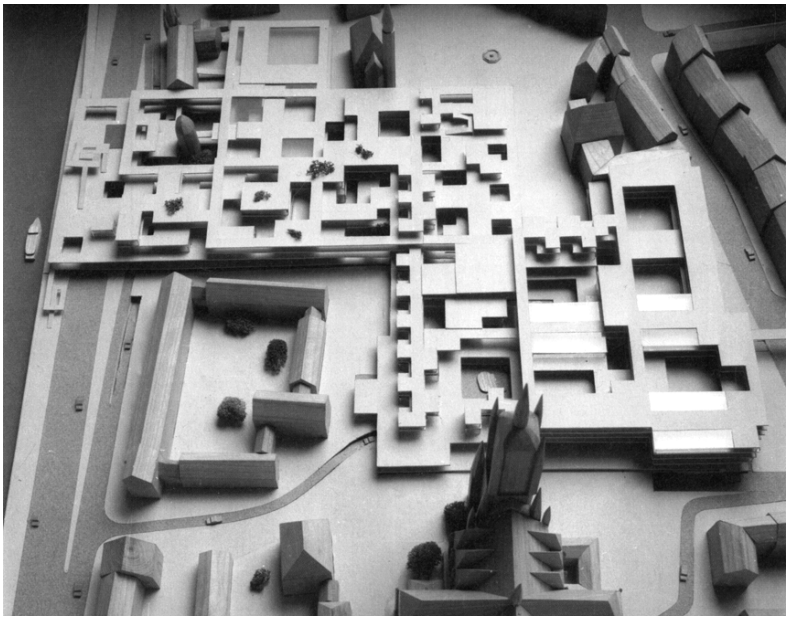

Figure 4.7 Model of Frankfurt-Römerberg Project: Voids as un-programmed generic spaces. Source: Dirk van den Heuvel and Max Risselada eds., *Team 10 1953-81: In Search of a Utopia of the Present*, (Rotterdam: Nai Publishers, 2005), 133.

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[224] Ibid.

[225] Jonathan Hughes, "The Indeterminate Building" in *Non-Plan: Essays on Freedom, Participation, and Change in Modern Architecture and Urbanism* eds. Jonathan Hughes and Simon Sadler (Boston: Architectural Press, 2000), 99. Emphasis original.

[226] Allen, "Mats," 421. Emphasis added.

This argument of Allen reminds the analysis of Frankfurt-Römerberg, in which the voids act as un-programmed generic spaces. In Web, the circulation spaces also act as spaces for un-planned activities or coincidental (unanticipated) events. While the voids respond to the short-term changes in the program, the determinate elements of Web allow long-term changes by providing a repetitive infrastructure. Although the determinate elements are not changeable, they prepare the ground for the unanticipated. By separating the determinate and indeterminate elements, Web becomes a system that allows for participation, and eliminates the formal constraints, which would be imposed by the architects.

Anticipation and the role of the architect was also a significant concern for other post-war architects. In the article "The Indeterminate Building", Jonathan Hughes states that the members of the "Independent Group" developed "the strategy of indeterminacy" as a response to this concern.[227] The keywords of the Independent Group were transience and expendability. Their approach towards the strategy of indeterminacy was influenced by the "uncertainty principle" in quantum physics indicating the impossibility of "determining simultaneously both the position and the velocity of atomic particles."[228] For the architects of the Independent Group, the uncertainty principle corresponded to the idea that an architect could not anticipate the future changes. The uncertainty principle pushed these architects to an approach, which was based on the idea of "conceptual endlessness".[229] According to this idea, the buildings had to be conceptually limitless, and should be open to continuous growth and change according to the needs of their users. Loose-fitting, expansion and flexibility of internal subdivisions were the main principles of this approach.

The idea of "conceptual endlessness" draws close to the idea of *habitat évolutif*, which denotes that an architectural system should be continuously adaptable and re-adaptable. Conceptual endlessness is also parallel to the infrastructure idea of Web, in which the determinate elements can be repeated, and the indeterminate elements can be varied in order to accommodate growth and change. So, it can be said that the strategy of indeterminacy, *habitat évolutif*, and Web has a common feature: *evolutionary potential*, in other words, the potential of being open to continuous growth and change.

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[227] Hughes, "The Indeterminate Building," 90.

[228] Ibid., 96-97.

[229] Ibid.

One of these architects among the Independent Group is Yona Friedman. Friedman's approach draw close to that of CJW's in terms of the act of layering. Friedman also categorizes the architectural components according to their life-spans and changeability. According to Friedman, the "function map" is the most easily changeable (most indeterminate) element of architectural organization, whereas the "envelope" is the relatively easily changeable (less indeterminate) element, and the "supporting structure" is the unchangeable (determinate) element.[230] In this approach, Friedman argues that "the structure and envelope can be separated from each other" in order to increase the capacity for user-participation.[231] (Figure 4.8) He called this approach "mobile architecture", which he defines as "techniques of making the alteration of form and function easy, within a rigid, pre-existing *infrastructure*."[232]

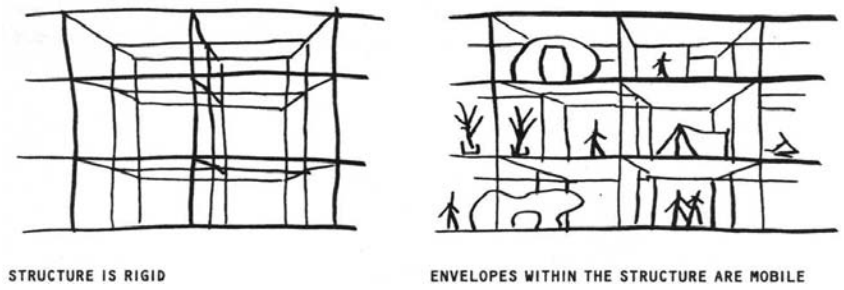

Figure 4.8 Sketch by Yona Friedman, showing the separation between structure and envelope. Source: Yona Friedman, "Function Follows Form" in *Non-Plan: Essays on Freedom, Participation, and Change in Modern Architecture and Urbanism* eds. by Jonathan Hughes and Simon Sadler (Boston: Architectural Press, 2000), 109.

Another similarity between Yona Friedman's approach and *habitat évolutif* can be read from Friedman's sketch. (Figure 4.9) In this sketch, Friedman illustrates that the "architectural space is determined by the equipment specific for that space."[233] This statement recalls *habitat évolutif* in the sense that spaces are not defined by norms of partition but by the activity taking place in that space, supported by the determinate elements such as the

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[230] Friedman, "Function Follows Form,"110.

[231] Ibid., 109.

[232] Ibid., 111. Emphasis original.

[233] Ibid., 104.

services. Both CJW's Web and *habitat évolutif*, and Friedman's approach are characterized by "formlessness" and "multi-functionality". For Friedman, architecture is about decision making, yet it is shaped by the decisions of both the architect and the user. According to Friedman "[t]he process cannot be mastered by the architect, nor by the user."[234]

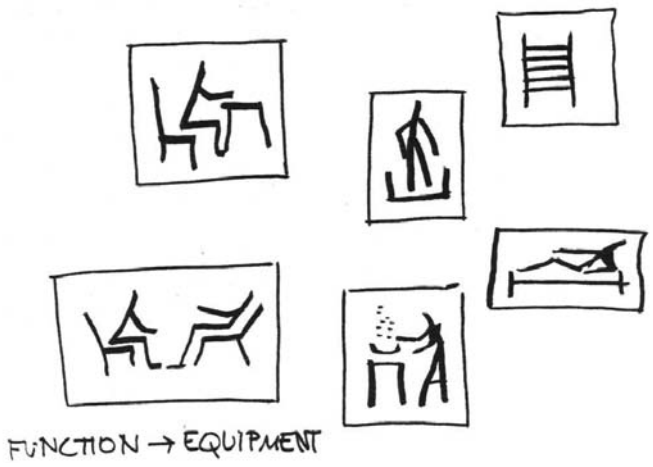

Figure 4.9 Sketch by Yona Friedman, showing how function is defined by the equipment (not by spatial norms of partition). Source: Yona Friedman, "Function Follows Form,"104.

The infrastructural approach in Web, similar to Friedman's, allows for user participation by determining the services and leaving the indeterminate elements open-ended. According to Allen:

> Infrastructural work recognizes the collective nature of the city and allows for the participation of multiple authors. Infrastructures give direction to future work in the city not by the establishment of rules or codes (top-down), but by fixing points of service, access, and structure (bottom-up).[235]

In this sense both *habitat évolutif* and Web can be seen relevant to Allen's infrastructural urbanism.

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[234] Ibid., 111.

[235] Allen, *Points and Lines*, 55.

CHAPTER 5

CONCLUSION

Today, the city is considered more as a continuous and dynamic organism made up of multiple layers than a static and two-dimensional entity composed of independent buildings. The disciplinary boundaries between architecture/urban design/city planning, which have been questioned since 1960s, are being dissolved. In such an era, understanding of architecture as a system of organization rather than an object is more significant than ever. Therefore, this thesis has focused on one of the preliminary concepts emerged in the beginning of 1960s, which aims at establishing systems of architectural organization: the Web. It has been argued that this concept was introduced by Candilis-Josic-Woods as a response to the concerns of mobility, identity, and association. Accepted as the main prototype of Web in this thesis, Frankfurt-Römerberg Competition Project by these partners has been analyzed in order to reveal the potentials of Web in organizing *multi-layered architectural systems*.

In this thesis it is argued that CJW had similar concerns with some other post-war architects in addition to Team 10; it was the mobility of the era. What differentiated CJW and the members of Team 10 from the other architects was their preoccupation with the notion of human association besides the common concerns of freedom of movement, flexibility of growth and change, variability, and participation. CJW argued that new systems of organization should be developed in order to respond to these concerns. It is put forward that during their search for systems, CJW was inspired by certain indigenous settlements in North Africa, namely casbah and *bidonville*. According to CJW, these indigenous settlements featured the capacity to accommodate organic growth and change by repetition and variation. In this sense both casbah and *bidonville* appealed to the partners, as collective forms capable of responding to the time dimension organically by enabling user participation. These settlements also housed an associative potential when compared to the modern cities, which have become cities of isolation due to the principles of functional zoning imposed by the Athens Charter. According to the thesis, the partners derived certain principles from the

analysis of these indigenous settlements, and utilized them in the concepts they introduced: consecutively in *habitat évolutif*, Stem, and Web. Therefore, in this thesis, these indigenous settlements have been accepted as the *source of the system approach* conducted by CJW.

After revealing the sources of Web, the thesis has focused on its precedents: *habitat évolutif* and Stem. It is put forward that the main idea behind Web is the *habitat évolutif* with the categorization of the components as *determinate* and *indeterminate* elements. From the analysis, it is revealed that *habitat évolutif* is the first attempt towards a system of organization, while stem is the main structuring device. According to the thesis with the design acts *layering*, *superposition*, and *division* borrowed from *habitat évolutif*, and *connecting* borrowed from Stem, Web appears as the most mature and complex system of organization developed by CJW. In this sense the thesis accepts *habitat évolutif* and Stem as the *precedents of Web*.

It is highlighted in the thesis that the potential of Web as a system of organization stems from the distinction of design elements as determinate and indeterminate elements. By fixing certain elements and setting the others free, CJW has established *open-ended systems of organization*. This feature of Web is significant in terms of being open to change and growth. In Web the indeterminate elements appear as the elements that respond to the time dimension of design, and the determinate elements appear as the elements, which define the limits of this response. With this categorization of determinate and indeterminate, the infrastructure and infill are separated from each other. This categorization (layering) in Web corresponds to Stan Allen's *infrastructural urbanism* in the sense that it re-defines *the role of the architect* as a *strategist* rather than a designer. This shift in the role and responsibility of the architect also denotes the shift from "designs" to "decisions".

Such idea of "decisions rather than designs"[236] is still a fresh discussion topic within the contemporary architectural field. Architects are more occupied with suggesting strategies and tactics (design acts) rather than producing finished objects. Like Enric Ruiz-Geli states "[t]oday's architects build relationships,"[237] not objects. The responsibility of architects is to provide a framework, which enables *participation*, *growth*, and *change*. In this context, Web constitutes a preliminary example of such an approach by *establishing frameworks* that

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[236] Gausa, *The Metapolis Dictionary*, 152.

[237] Enric Ruiz-Geli, "Matrix" in *The Metapolis Dictionary of Advanced Architecture: City, Technology and Society in the Information Age* ed. by Manuel Gausa (Barcelona: Actar, 2003), 420.

organize physical, spatial, and social relations. Pushing the limits of the architects' design control, Web mediates between two different scales: architecture and urbanism. It establishes a pattern, which associates these two scales. It links itself to the existing pattern of the city by making infill. So, it can be argued that, such feature of Web is closely related to the contemporary debates on *urban architecture*.

Another significance of Web in terms of contemporary debates is the conception of architecture as a multi-layered system. It is argued in the thesis that the *components of Web* are *superimposed as layers* in order to establish a complex system of organization. Such approach draws parallel to the idea, which conceives the contemporary city as a multi-layered structure. This structure is composed of superimposed layers of infrastructures (networks, grids), events, and stages (of evolution). Gausa calls this multi-layered structure as the "Metapolis."[238] So, the Metapolis or the multi-layered city calls for multi-layered systems of architectural organization. As such a system, Web organizes patterns of movement, flow, change, and growth, and treats the city as a *multi-layered field*.

To conclude, our time is a more mobile one than that of the post-war period and the role of architect is more in discussion than any other time in the past. Therefore, such effort of CJW for developing systems of architectural organization rather than architectural objects is still important and relevant in the contemporary architectural theory and practice. Gausa explains the role and responsibility of the architect in the contemporary architectural field:

> Today, the figure of the architect can no longer be seen only in terms of a "producer of objects," but rather as a "strategist of processes." In effect it is no longer a question of designing a shape, local or global (of closing it, finishing it, completing it or embellishing it), but rather of providing the rules of the game. The strategist develops *evolutionary logics for virtually unfinished structures*, in constant -or virtual- transformation: structures- such as that of the contemporary city itself -in constant mutation, recovery, and modernization.[239]

In this sense, *habitat évolutif*, Stem, and Web exemplify how CJW developed "evolutionary logics for virtually unfinished structures."

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[238] Gausa, *The Metapolis Dictionary*, 430.

[239] Ibid., 573. Emphasis added.

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