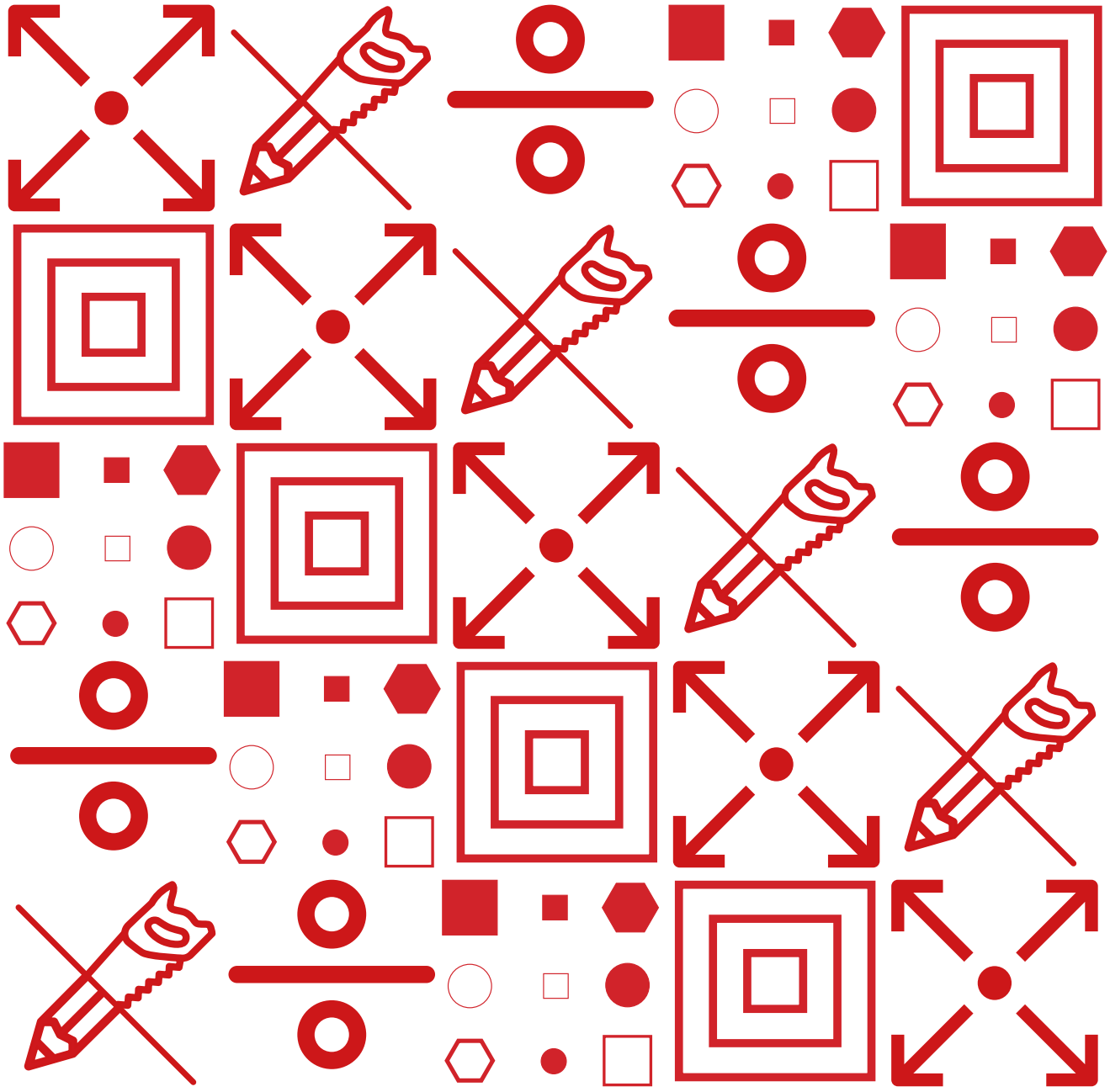
Patterns of Participation

Formulating a Toolkit to aid Architects in Designing Participatory Housing Methodologies in the Global South.



Zhuo-ming Shia

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Cover: Families building their own homes in Mexicali

Christopher Alexander talks about the importance of the human rhythm in construction, and that the process of construction today is only a completion of a task in exchange for money rather than a fundamental human experience of creating your own home.

Credits: Building Living Neighbourhoods.

Author and Graphic Design: Zhuo-ming Shia

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Tutor: Frederique van Andel

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Contents

Acknowledgements

During the course of this research, I was very fortunate to be able to interview many academics and architects, some of whom are leading figures in their respective fields. I would like to acknowledge each of them in chronological order.

Frans van der Werf is a well established architect and one of the key figures in the Dutch Open Building movement. His insights into the practical aspects of support-infill theory were invaluable to me and he was also kind enough to invite me to his home after I reached out to him for the first time. Rachel Keeton, researcher at TU Delft and University of Twente, opened my mind to the field of serious gaming as a participatory method. I would also like to thank Philip Krabbendam for talking to me about his project at Delft Centraal Wonen and even showing me around the housing project, his ideas about co-living are still very inspiring to me. I also had the pleasure of talking to Nabeel Hamdi, a distinguished professor, architect and a pioneer of participatory planning and enablement, whose words strongly reaffirmed my belief in participatory architecture. Nancy Welsh, co-founder of iBuild Global, provided me with interesting insights beyond the field of architecture. Pirouz Nourian, professor and researcher at TU Delft, is also a pioneer in the field of configurational design. Conversations with both of them have expanded my interest in the subject of participation beyond the boundaries of traditional architectural discourse.

However, the most influential figure on me and my research is my tutor, Frederique van Andel, who really opened the door to a new way of thinking about architecture. During our many fruitful conversations about participatory housing and the global south, I could really feel her passion for the topic as she always had a lot of wisdom to share. This is the reason why after every meeting, I would always feel a renewed sense of perspective and a new drive of motivation, especially at times when I needed it most.

Thank you for believing in me every step of the way since the beginning of this two year process.

Preface

Following the urban ideals put forward by the 4th CIAM congress and the publication of the Athens Charter in 1933, many theorists saw the detrimental effects that a simplified, patriarchal design had on previously complex, self-sustaining social fabrics. This brutal interruption of social communities in the name of functionalism, best exemplified by the plan for Brasilia in 1956, triggered a debate among urbanists and activists on ways to open up the city and effectively integrate existing systems of inhabitation. Central to this debate was Jane Jacobs, who advocated a local, small-scale approach to achieving sustainable community integration, contrasted by Lewis Mumford, who believed the only way to combat Corbusian planning was to suggest an alternative, large scale, centralised plan; such as the Garden City approach.[1]

Parallel with this debate between bottom up and top down planning was the question of user participation, an essential part of a humanist urban and architectural strategy. Interestingly, the questions raised in the Jacobs-Mumford debate are also relevant when applied to user participation. At first, participation may seem exclusively a concern of the grassroots bottom up movement, however,as Richard Sennett correctly identifies, the bottom up position has no idea how to scale up from the local to the urban[2]. Consequently, as will be shown in the research, individual grassroots attempts at integrating user participation have often fallen short of becoming more than pilot projects. How can architects implement a participatory housing process that is scalable to accommodate the masses while retaining a humanistic sensitivity at a small scale? Perhaps the best approach is a hybrid of a local, bottom up effort and an organised, top down design.

This research aims to bring us closer to answering this question by distilling ideas from key case studies, learning from the rich treasure trove of experimental housing projects around the world. My research rests on stable foundations built by contemporary enablers of common people who have interrogated the subject of user participation head on. Theorists such as Nabeel Hamdi, who sees the role of the architect as having the oversight of the large scale but operating incrementally at a small scale; John Habraken, who allowed variation at a small scale through the design of a large scale support; and architect Frans van der Werf who put Habraken's ideas into practice.

1. Introduction

Why Participate?

Before the existence of the architectural profession, design of the dwelling was firmly under the control of its users. The process was spontaneous and incremental, each development was born from a specific need at a specific time. Since the popularisation of the architect, there has been a resurgence in the need to re-involve the user, particularly in a typology as intimate as dwelling. Participation as a phenomenon is set against a background of leftist ideology, civil rights and equality, flourishing in the west during the 1950s to 1960s following events such as the passing of post-war housing acts in Britain and the American civil rights movement[3]. Historically, participation can be interpreted as a reaction against centralised control and the exploitation of the poor. As demonstrated by the American example, "participation meant black power. Getting People to participate by protesting urban renewal was the environmental policy strategy."[4] Today, participation means a greater understanding of the specific needs of users and more opportunities to reduce costs, empower communities and design better living environments. "Architecture should not be the private act of a coterie of architects but rather the act of the people – their own expression of their own way of life."[5] Above all, participation should be seen as a fundamental human right, not a way of achieving added value.

It is time for architects to engage in processes that enables users to form their own narratives as vigorously as architects engage in their own. Perhaps Habraken puts it best when he reflects on the role of the architectural profession: "Indeed, it is us who must participate".[6]

Figure 1. Self-built mountain dwellings in Imlil, Morocco.

Research Question

User participation in design should not be seen as a requirement that will automatically be fulfilled if the architect follows a set of prescribed instructions. No such instructions exist as user participation is not the result of the actions of the architect but of the users themselves; but that is not to say that architects do not have a role to play. Whilst user participation is never guaranteed and its success can depend on many contextual variables, it should be the role of the architect to create the most suitable conditions for user participation to occur. The purpose of this research is to help to architect fulfil this role.

A series of key words in addition to participation clarifies the aims of this research, each of which will be elaborated on below:

Prototypical

- It is counter-productive to search for an all-encompassing participatory method which all architects can use in any context. Such a prescriptive methodology does not allow for flexibility and appropriation to local contexts, which are important aspects of a successful participatory process. Instead, it is more useful to find overarching principles that can point the architect in the correct direction. For this reason, the metaphor of 'ingredients' is used in the research question which suggests the architect is analogous with a chef, who should understand the properties of each of ingredient and interpret a selection of them to create an intended dish.

Masses

- Whilst the general problem that the research addresses is a lack of user participation in design decision making, the specific problem is that current methods of facilitating user participation in housing design only function at the small scale. Even when the intention of the project is for it to be implemented on a large scale, the final outcome rarely exceeds the extent of its pilot project or rarely escapes its status as an 'experimental' housing project; participatory processes have not yet penetrated into the mainstream of building production. That being said, this research seeks to target the socially significant topic of mass housing.

Global South

- This research has the intention of addressing the production of houses in the global south because of the disproportionate need to create more houses in these areas due to the increased rate of rural to urban migration. By doing so, the research denies that user participation in housing can only be achieved as an added feature in contexts with a relatively developed and stable housing sector. This topic will be expanded upon in the next sub-chapter, The Global South as an Opportunity for Participation.

The theoretical framework on which this research builds on will span over eight case studies and include theorists central to the participation movement in Europe during the sixties and seventies. This will be elaborated upon in the case studies chapter.

At the center of this research question is how users can participate in the determination of their build environment..

There is no single method that can be applied to all housing contexts. Therefore, a prototypical stance is adopted acting as the first step in formulating a specific participatory methodology.

What are some of the ingredients required in the formulation of a *prototypical* **participatory** housing methodology for the masses in the **global south**?

There is a need to focus on poorer regions of the world as here, participation is more easily overlooked. Unfortunately, these places are also often where user participation can provide the most benefits.

Method should offer a scalable solution to affordable housing.

Figure 2. Research Question

The Global South as an Opportunity for Participation

It is almost unimaginable for a dweller in a developed city to design their own house without the input of a qualified architect, let alone build it themselves without first gaining planning permission and the knowledge of all the technical requirements to achieve a so-called level of comfort; a level of comfort for who? The way building performance is evaluated is drifting further away from being based on what is suitable for people who will inhabit the building towards a threshold model, where something like a BREEAM certificate provides all the necessary justification that the building is well designed.[7] Through industry standardisation and strict regulation, individual expression and thus participation is starved.

Efforts to overturn the status quo of the production of dwellings have been futile and at best unreproducible. Nabeel Hamdi described his attempts at Adelaide Road to implement a flexible infill system within a British context, whereby families were thoroughly reliant on local councils, as "a stepping stone to a greater participation"[8]. Perhaps a better context is required to sow the seeds of this greater participation.

Edgar Pieterse highlights the distorted lens through which urbanists throughout history have viewed the global south and in particular, Africa. He advocates that the same version of development, progress and modernity should not be superimposed on every context on the globe. Instead, " the very structure of the field of urban studies ... needs to be deconstructed and remade by rendering all cities equal harbingers of (diverse) modernities and in need of transformation to achieve more socially just patterns of life and aspiration."[9] In the same way scholars and practitioners need to redefine urbanity in contexts of the global south, the contemporary notion of participation also needs to be broken down, interrogated and reconfigured. Reinforced by the strong initiative and self-help mechanisms demonstrated in its informal settlements, this paper takes the position that the global south provides a more fertile experimentation ground for a designed participatory architecture.

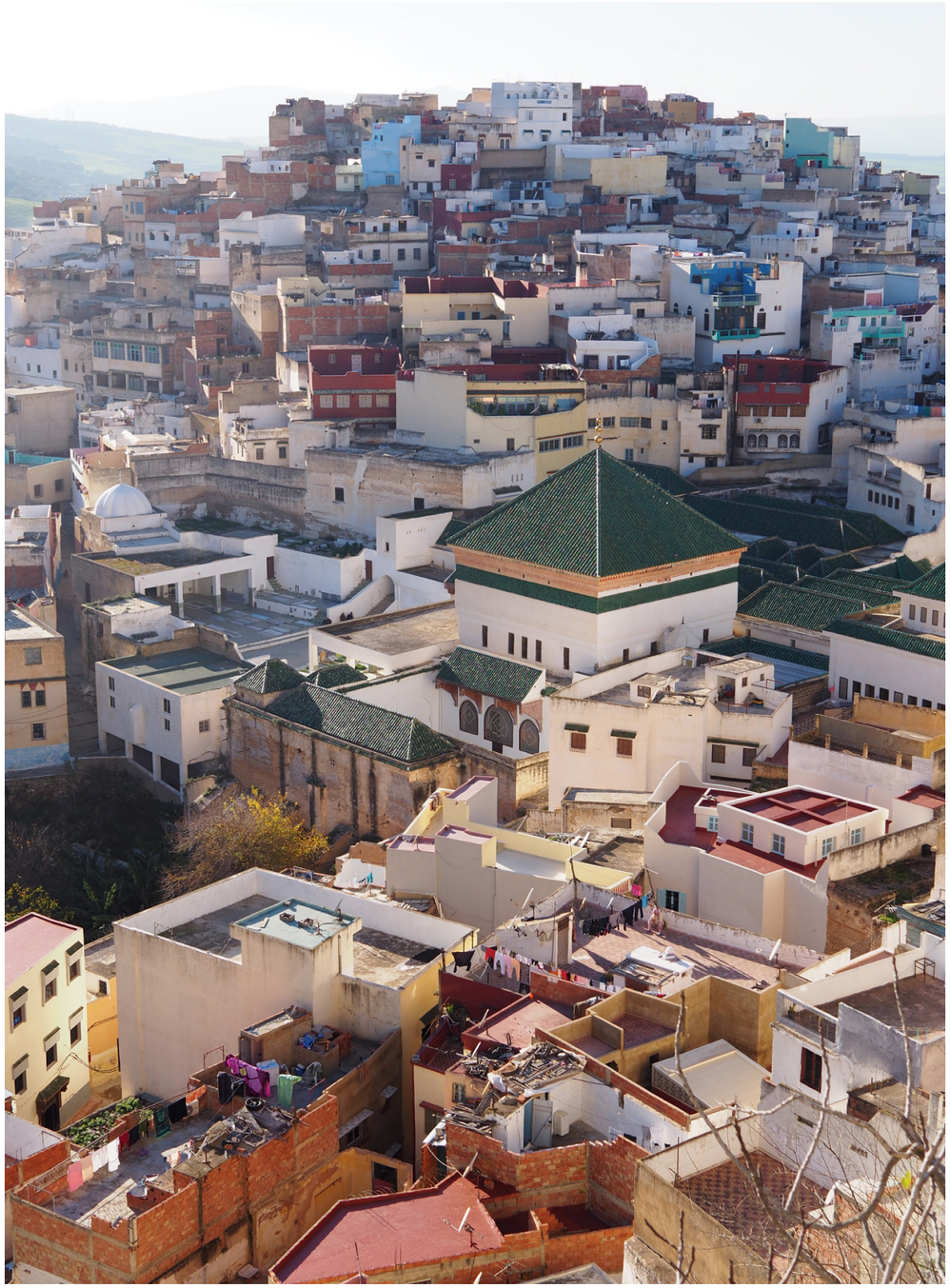


Figure 3. View of Moulay Idriss Zerhoun, Morocco.
I made my way through the multi-colored universe of dwellings with a feeling that bordered euphoria, intense admiration and awe, an effect that can only be achieved when design goes through the hands of the masses.

Levels of Participation

When a design is said to include user participation, it can imply many things as the edges of what defines participation are blurred. What does a user need to do to have "participated" in the design of their built environment?

Starting from one end of the spectrum, users might have complete control over the design, construction and management of their dwelling, as is the case in vernacular architecture. Users are completely left to their own devices and rely on collaboration with neighbours. The next level down introduces an external party, usually a government authority advised by a design consultant, who assigns plots of land and connects them with essential infrastructure known as "sites and services" projects. Unfortunately, these often become inhabited with slums. Alternatively, these can take the form of aided self-help processes whereby a professional provides the skills necessary to empower users.

As is more often the case, construction is carried out by experienced contractors, not the users themselves, who's role becomes focused on decision making. This relationship can be seen in smaller interventions such as house extensions or in places where an architect cannot be afforded. Next, the introduction of the architect to the design process, who offers professional expertise and acts in agency to the user, poses, through no fault of his own, the first threat to the user's role as main decision-maker. The amount of freedom users have under this new power balance can vary dramatically and often depends on the users themselves. They can be very engaged with the architect, for example in private commissions, or equally not engaged at all. This changes when more than one client is involved and the power that decides how much participation users can have shifts towards the architect. The power distribution becomes further fragmented through the introduction of the project manager, which can often obstruct direct dialogue between the architect and the client. Furthermore, we see the user losing influence over large scale elements such as structure and being confined to decisions at the small scale, such as infills. Going further still, the user may lose decision-making powers altogether and only be consulted, or even only informed, about a design. These processes often pretend to be participatory processes but, in reality, are often ways of seeking approval for a pre-determined design. Finally, the other end of the spectrum displays a total disconnection between user and built environment, the design of which has been determined long before the user has even been chosen; the user can customise the internal furnishings at best.

Within the context of planning, Sherry R. Arnstein sets out a similar hierarchy of participation levels, expressing them as different degrees of citizen power, tokenism and non-participation[10]. Within architecture, the boundaries of these levels are not as defined. Therefore, I have redrawn this diagram as a spectrum in figure 5. Architectural participatory processes are not as formalised and can easily exist in-between two categories. Take a typical private residential project for example, not all design decisions are made as a result of consultation with the user, it is inevitable that the architect takes some independent decisions which he/she then informs the client about. The relationship between architect and client is therefore somewhere in-between consultation

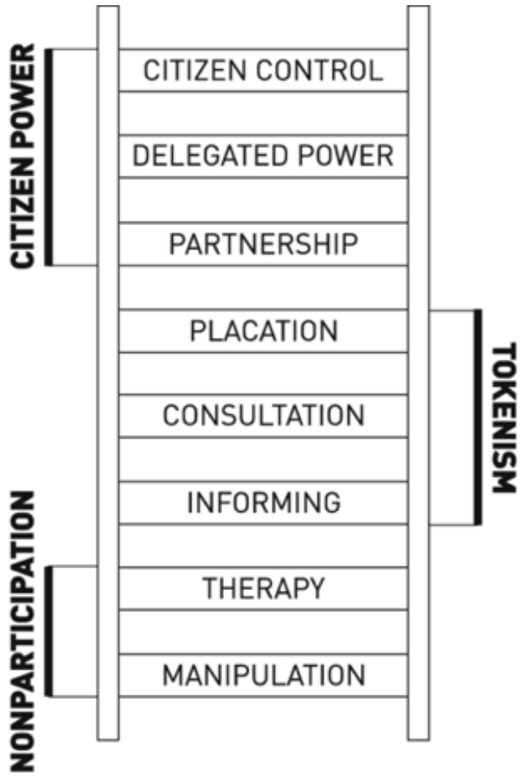


Figure 4. A Ladder of Citizen Participation

and informing. Next to this spectrum of processes, the scope of some participatory methods with respect to the amount of control given to the user is shown. As well as a spectrum of control, participatory processes can also be distributed over a spectrum of scale. This is shown in figure 6.

At this point it is important to state the distinction between a participatory process and a participatory method. The processes, shown on the y axis of figure 5, are an overall strategy that describe the entirety of the project. It is very rare for a project to use more than one process. A method, on the other hand, is a specific event which is part of the overarching process. A single process often utilises a combination of different methods.

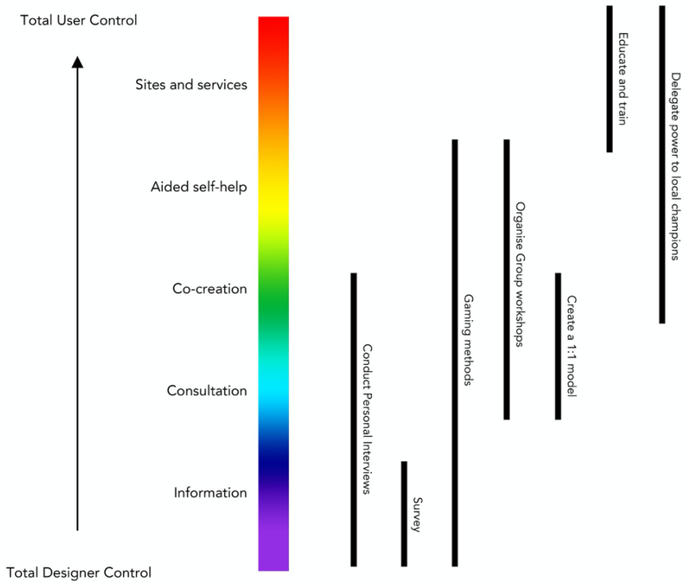


Figure 5. Participatory method distribution over spectrum of control

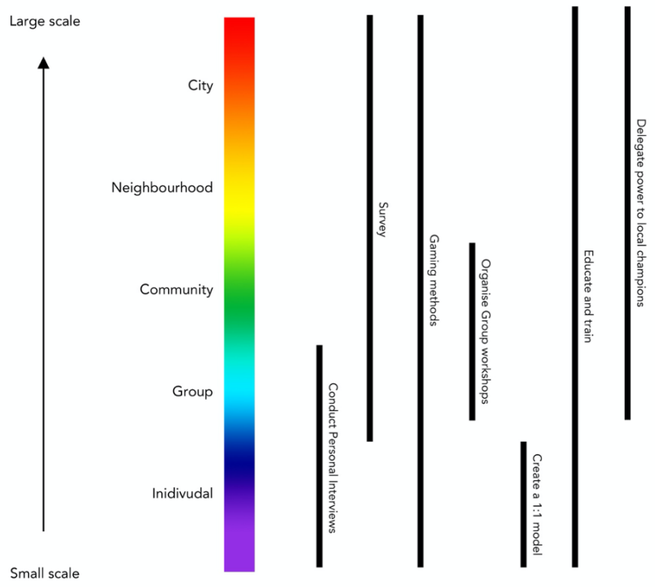


Figure 6. Participatory method distribution over spectrum of scale

Methodology

The participatory methods shown in the diagrams are only a small sample of what has been done before. However, it is not enough only to identify specific, standalone instances of methods that have been used in the past. It is more useful to identify reoccurring *patterns* that participatory methods exhibit. To do this, multiple cases must be compared and their reappearing principles discussed, remembering that a single method may materialise slightly differently in two different contexts.

The methodology is divided into two parts, identification of the pattern and checking the applicability of the pattern. Firstly, to achieve a more objective method, the identification of a pattern will result from a comparative analysis between two case studies. This ensures the pattern has a degree of generality and is not just a one off feature of a single case study. For a comparison between two participatory processes to have any meaning, they must be situated within close proximity on the spectrum of control. Likewise, the pair of case studies should have arisen from similar circumstances. It would not be fair if one project was given much more generous limitations while the other had to operate under strict government regulations; the degree of power belonging to the architect would not have been the same. The social, political, and economic backgrounds should also correspond as comparing a housing project from a wealthy, developed nation with a poor, underdeveloped one would undermine the entire experiment. Furthermore, the research methods of each pair of case studies are kept consistent. In the first comparative study, analysis results mostly from a literature analysis, whereas in the second comparative study, interviews with the architects of each respective project are the main research method.

After identifying the pattern, a mechanism is required to check its validity. To achieve this, the pattern will be analysed in the context of the other case studies. This cross-referencing will result in three different outcomes for the pattern: that its definition is reinforced in the case that the pattern also manifests in the other case studies; that the definition is weakened in the case that the pattern does not apply; or that the definition is broadened in the case that a pattern applies to a particular case study but under a different interpretation.

The end goal is to achieve a collection of, perhaps redefined, participatory patterns which together form a toolkit which could guide the future architect in the formulation of a design process that engages with local users, especially when the context is unfamiliar to the architect.

This pattern approach to formulating recommendations has been attempted by Christopher Alexander in *The Production of Houses* where he describes 7 principles of control[11] in participatory self-help housing. While Alexander's methodology applied more specifically to aided self-help housing processes such as his project in Mexicali, this piece of research aims for a more holistic approach to making sense of how users can participate in design.

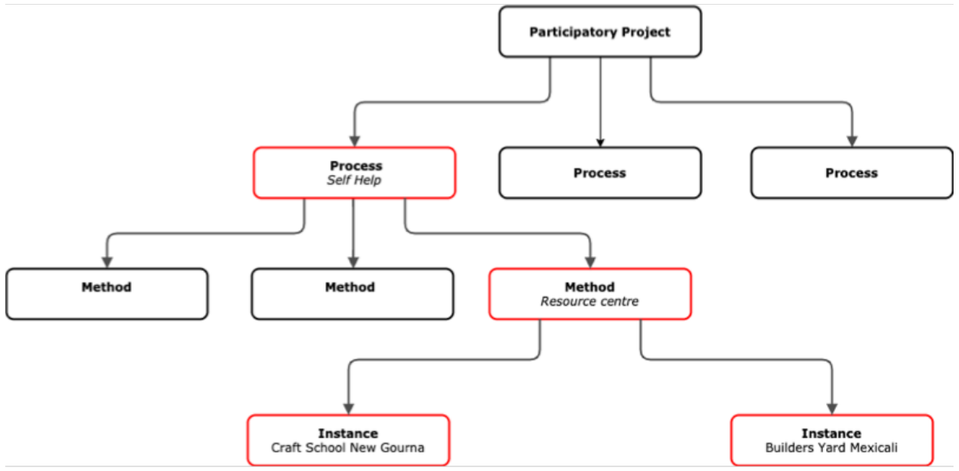


Figure 7. Process method and instance

2. Case Studies

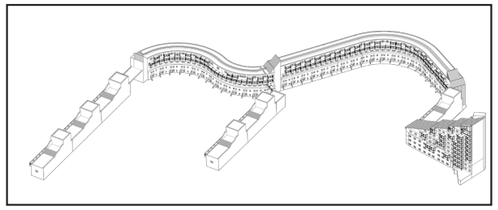
A total of eight case studies are studied in this piece of research, four of which will be involved in a direct comparative analysis and the other four will be used to validate the resulting patterns through cross-referencing. This chapter introduces each case study, mapping them quantitatively using different parameters: location, time and density in terms of FSI and GSI. In the following chapter (3), a qualitative analysis of each case study will compliment this quantitative analysis.

(Isometric depictions of the case studies were produced by the author).

1 New Gourna
2 Mexicali
3 PREVI
4 Oosterwold
5 Molenvliet
6 Adelaide Road
7 Byker
8 Maison Médicale

th and global south. It does not does it wish to show which areas centred around the participation nework. Should this research be expanded in the future, a much more representative list of case studies would be included, notably the fascinating experiments in participatory housing in Asia, such as the work of Charles Correa and Balkrishna Doshi in India and the Next 21 experimental housing in Japan.

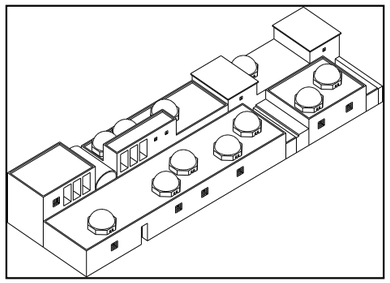
Byker



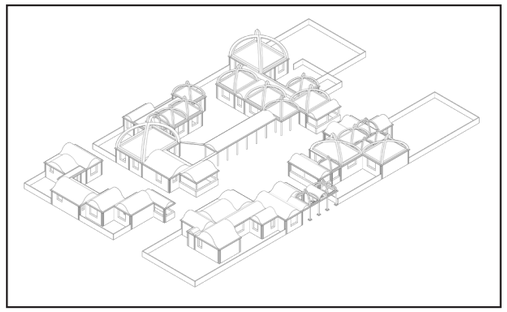
Demolition of Pruitt Igoe in St. Louis Missouri. A symbol for the failures of the modern international style.

John Habraken publishes De Dragers en de Mensen in Dutch

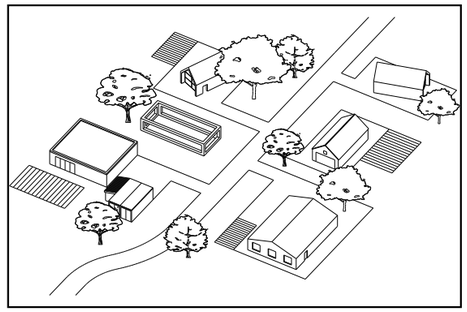
New Gourna



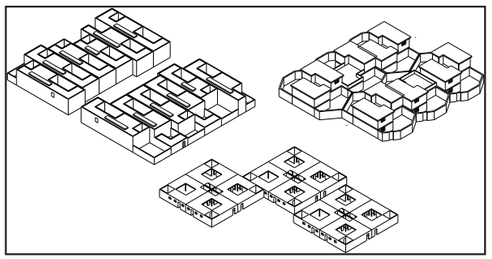
Mexicali



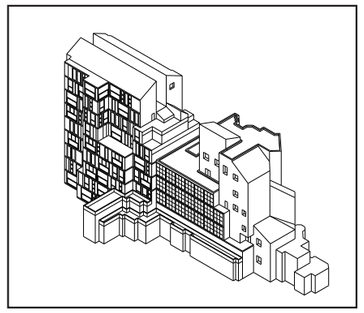
Oosterwold



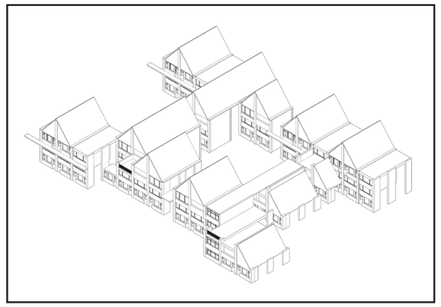
1945 1961 1968 1969 1970 1972 1974 1975 1979 1983 2011 2021



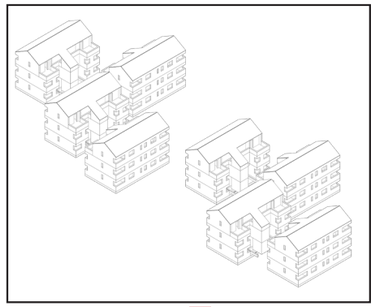
PREVI Lima



La Maison Médicale



Molenvliet



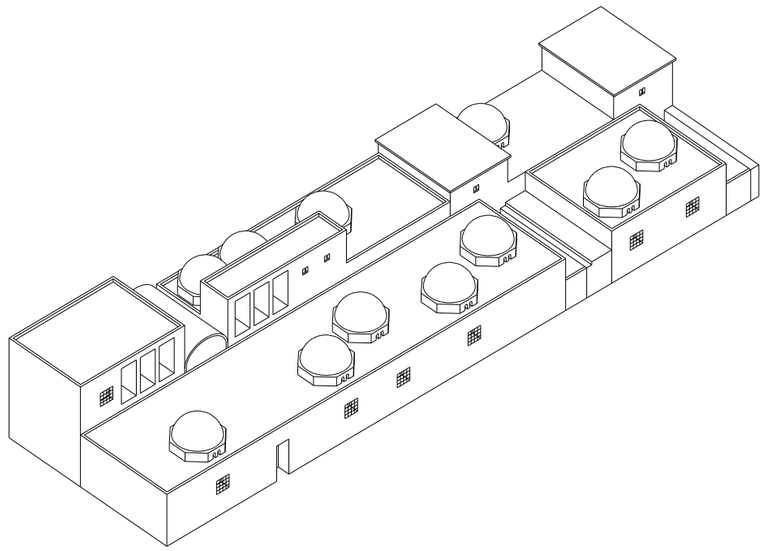
Adelaide Road

Figure 9. The eight case studies are shown here on a time-line spanning over seventy years. The timeline demonstrates that participatory housing processes have a long history. Most of the projects are clustered around the sixties and seventies, coinciding with the rise of left-wing activism around the globe leading to the participation movement. An earlier example of a participatory design process as well as a relatively recent example are also included.

Project Name: **New Gourna**

Architect: Hassan Fathy

Hassan Fathy was a pioneer in using vernacular building methods to create sustainable buildings. He designed a new settlement to rehouse a community known as the Gournii, following plans to relocate them as many in that community had taken up grave robbing in the nearby Luxor tombs. Fathy was met with much opposition, both bureaucratic and directly from the Gournii themselves, which is why his plan was only partially built. Fathy writes about his experience in trying to build a community through architecture in the seminal book, *Architecture for the Poor.*

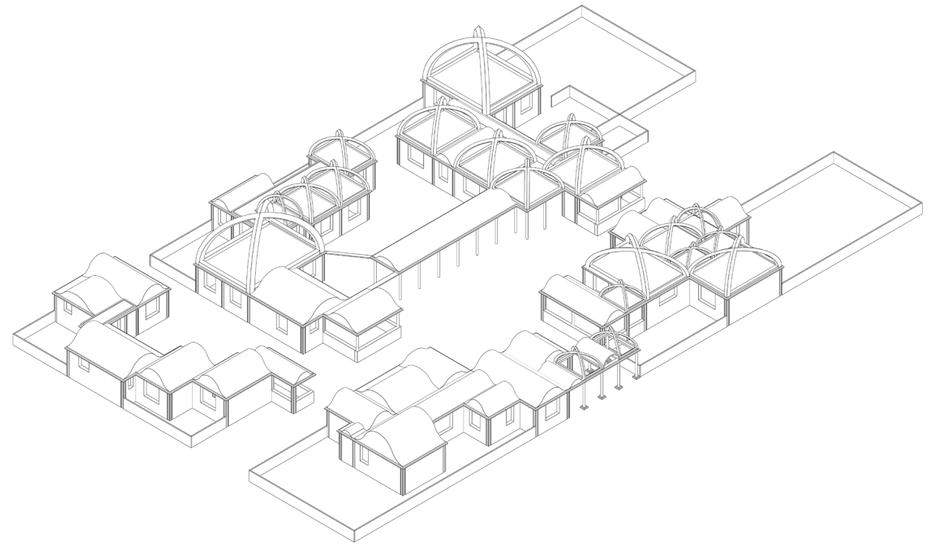


Project Year: 1945	Duration: 3 Years	Project End: 1948
No. Dwellings: 70	Site Area: 17,790m^2	Density: 40 dw/ha
GSI: 0.53	FSI: 0.7	Avg. Dwelling Size: 292 m^2
Nature of Participation: Empowerment		

Project Name: **The Mexicali Project**

Architect: Christopher Alexander

The Mexicali project was an experimental project commissioned by the state of Baja California to co-design 30 houses at the cost of $3500 per house. To bring about this closer relationship between building and people and to achieve an alternative to mass housing, Alexander identified the need for a new system of production which he tried to realise in the Mexicali project. He writes about his experiences in his book, *The Production of Houses.*



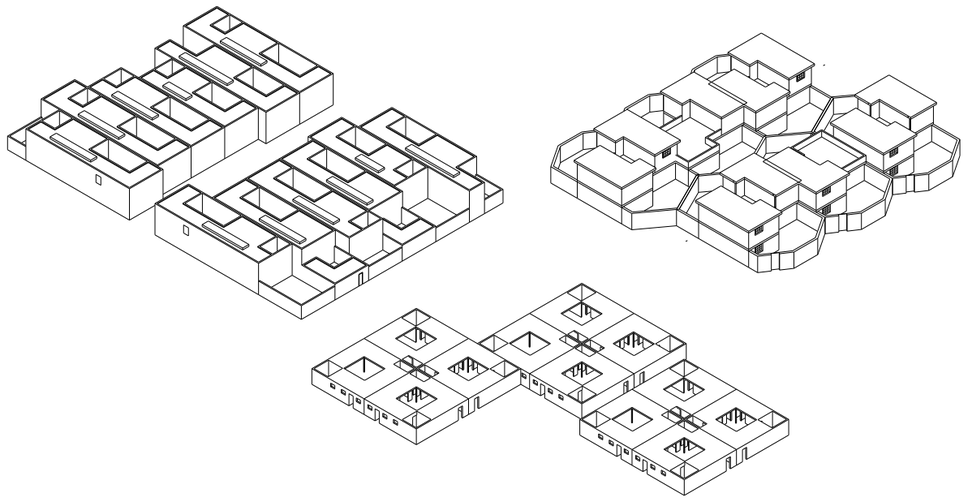
Project Year: 1975	Duration: 1 year	Project End: 1976
No. Dwellings: 5	Site Area*: 1140 m^2	Density: 44 dw/ha
GSI: 0.37	FSI: 0.37	Avg. Dwelling Size: 75 m^2
Nature of Participation: Aided Self-Help		

* The site area of the Mexicali project does not include that of the builders yard. Event though this should be included in the calculation as it acts as a communal space, the builders yard was meant to serve many more dwellings than was eventually realised.

Project Name: **PREVI Lima**

Architect: Various

PREVI Lima is a rare case of a built collection of competition entries curated by professor and architect Peter Land. A star line-up of international architects as well as local Peruvian architects were chosen to participate, including James Sterling, Christopher Alexander, Aldo van Eyck and Charles Correa. Their task was to come up with ways of producing low-cost, low rise housing to combat the rise of informal slums in Peru, with a focus on designing for house expansion and using innovative construction systems. Although, the application of the ideas generated at PREVI was limited, it became recognised as one of the most extensive affordable housing experiments in the global south.



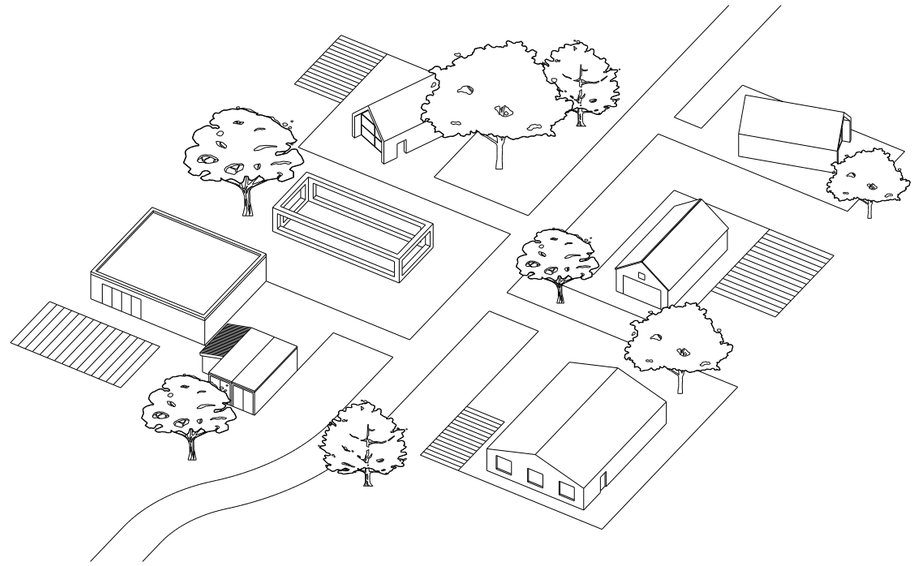
Project Year: 1968	Duration: 7 Years	Project End: 1975
No. Dwellings*: 467	Site Area: 10,5600m^2	Density: 44dw/ha
GSI: 0.42	FSI: 0.84	Avg. Dwelling Size: n/a
Nature of Participation: Appropreation		

* Less than a third of the proposed 1500 dwellings were eventually realised.

Project Name: **Oosterwold, Almere**

Architect: Various

Located a short bike ride away from Almere, the self-build community of Oosterwold stands in stark contrast with the typical Dutch housing development. Here, users are permitted build freely on pre-defined plots following loose parameters relating to site borders and FSI. Even the shared infrastructure such as the secondary roads which come off the main arterial road are managed by homeowners collectively. Oosterwold demonstrates a case where user participation is taken to the extreme causing new managerial roles to become necessary.



Project Year: 2011	Duration: n/a	Project End: n/a
No. Dwellings: 15000*	Site Area: 43km^2	Density: 4dw/ha
GSI: 0.07	FSI: 0.11	Avg. Dwelling Size: 168m^2
Nature of Participation: Self-build		

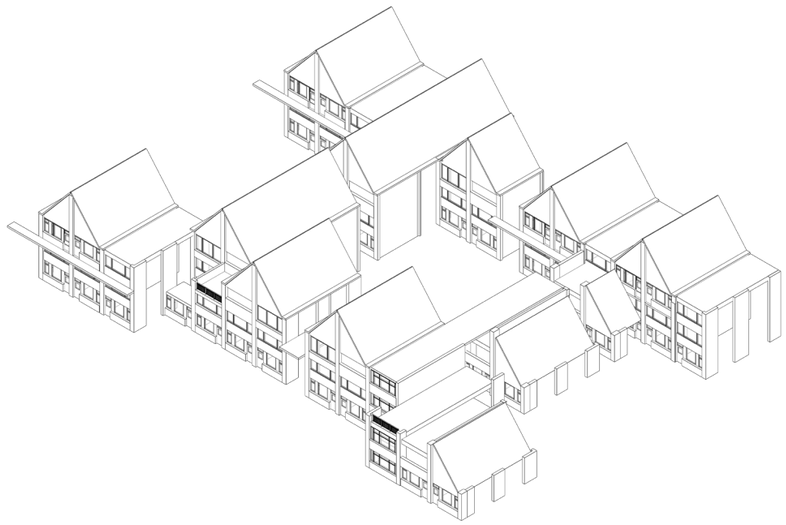
*15,000 dwellings is the extrapolated maximum capacity of the proposed site.

Density, GSI and FSI are taken from a typical neighbourhood cluster

Project Name: **The Molenvliet Project**

Architect: Frans van der Werf

The Molenvliet pilot project represented a feasible and scalable example of support theory which at the time was struggling to find its concrete image. For the architect, it spurred on a whole sequence of support-infill schemes all over the Netherlands where we see the same method being applied to larger and larger schemes, notably the Lunetten and Keyenburg projects.

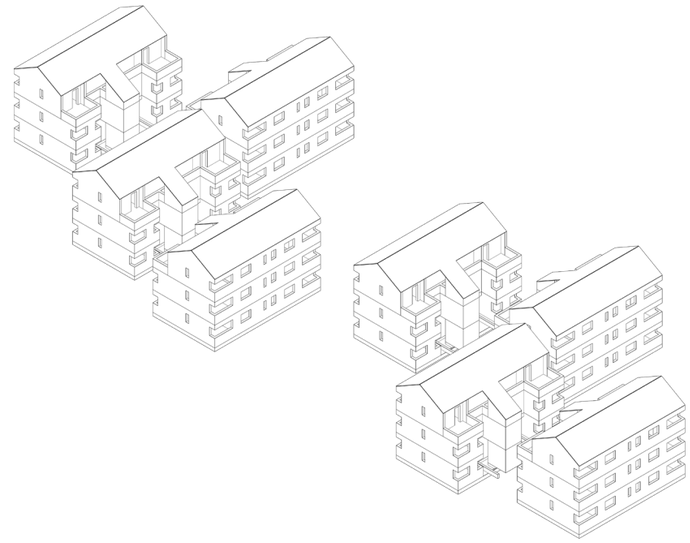


Project Year: 1974	Duration: 4 Years	Project End: 1978
No. Dwellings: 123	Site Area: 8915m^2	Density: 93 dw/ha
GSI: 0.48	FSI: 1.19	Avg. Dwelling Size: 90 m^2
Nature of Participation: Consultation		

Project Name: **Adelaide Road**

Architect: Nabeel Hamdi

The background to the Adelaide Road project in London is in many ways shared with Molenvliet. The first fragments of the Adelaide Road scheme began when Hamdi Nabeel was completing his graduation project at the Architectural Association. During that time, he worked on PSSHAK, Primary Support Structure Housing Action Kit, a version of the Support-infill theory put forward by Habraken. Hamdi even invited Habraken to attend his final presentation and the two were in frequent dialogue during Hamdi's project. PSSHAK, as well as being a system of component fabrication, encompassed an entire participatory methodology that interpreted the infill as a kit of parts.

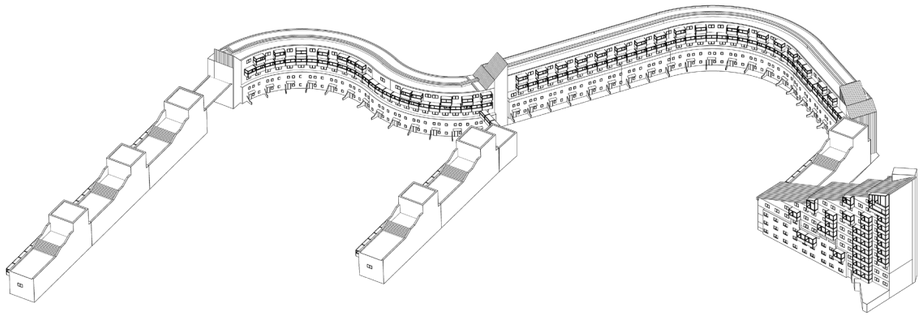


Project Year: 1979	Duration: 1 year	Project End: 1979
No. Dwellings: 45	Site Area: 5650m^2	Density: 80 dw/ha
GSI: 0.23	FSI: 0.7	Avg. Dwelling Size: 89m^2
Nature of Participation: Consultation		

Project Name: **Byker Wall**

Architect: Ralph Erskine

The Byker Wall is an assemblage of multiple buildings: the low rises, perimeter block, point block and the link block in between them. The scheme comprises of a mixture of dwelling types ranging from six-person low rise houses to single person flats. Access to the units in the perimeter block are via circulation cores and exterior galleries.

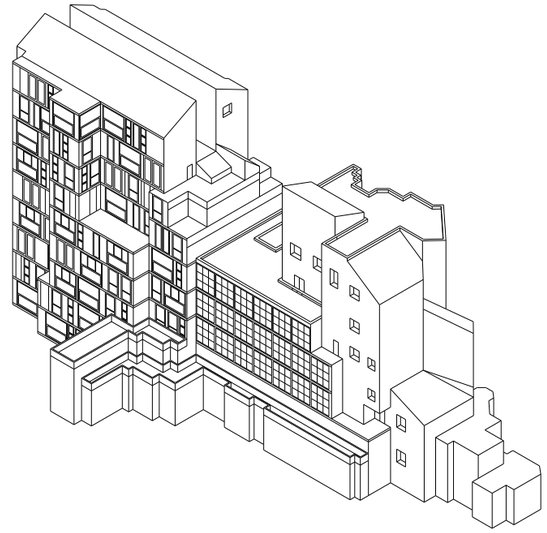


Project Year: 1969	Duration: 1 year	Project End: 1969
No. Dwellings: 259	Site Area: 26,000m^2	Density: 100dw/ha
GSI: 0.32	FSI: 0.97	Avg. Dwelling Size: 61m^2
Nature of Participation: Co-creation		

Project Name: **La Maison Medicale**

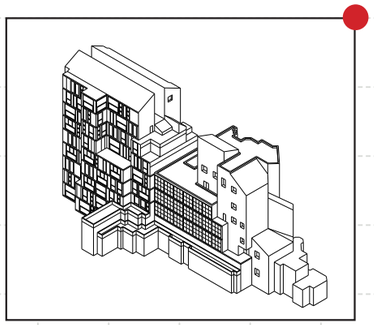
Architect: Lucien Kroll

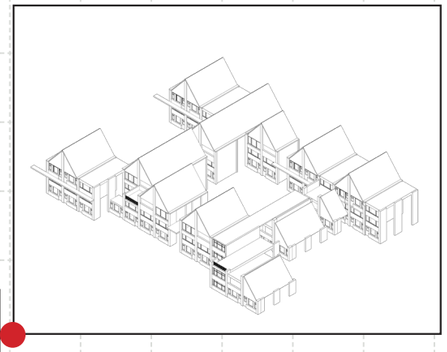
Students approached Kroll for an alternative to the monotonous design proposed by the university and conducted a successful campaign for its adoption. Developed in intense consultation with students and others who would use the building, an evolving physical model became a record of the design process. The resulting building has a fragmented look, as it was split into sections with each part handed over to a separate team of architects within the office. Kroll's adopted method of separating the overall framework of the building, including the structure, from the infill is similar to that of John Habraken, allowing him to create a highly customised architecture.

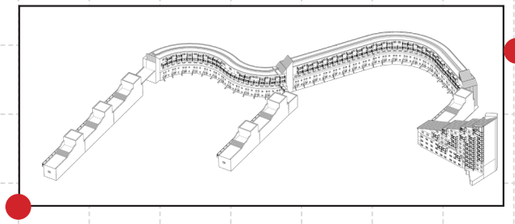


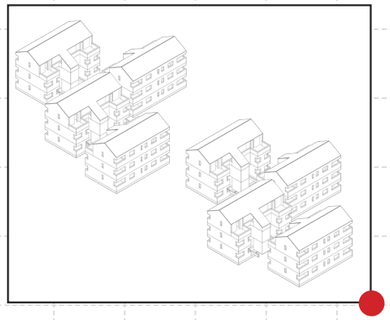
Project Year: 1970	Duration: 7 years	Project End: 1977
No. Dwellings: 123	Site Area: 3980m^2	Density: 309dw/ha
GSI: 0.23	FSI: 2.3	Avg. Dwelling Size: 18m^2
Nature of Participation: Consultation		

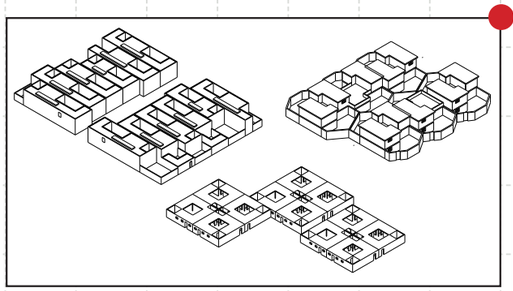
Figure 10. From the graph it can be concluded that all but one of the case studies concerns a low rise-high density typology. Compared to other non-participatory housing projects the GSI and FSI are generally very low. This is the result of many semi-public outdoor areas, in most cases courtyards.

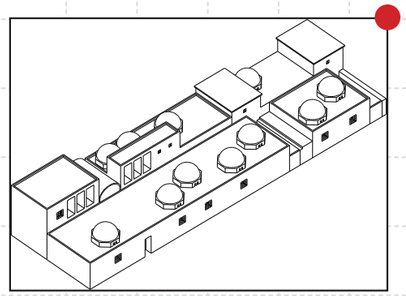


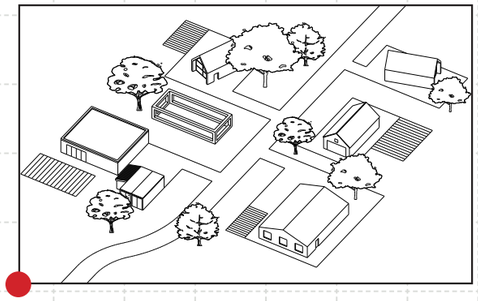


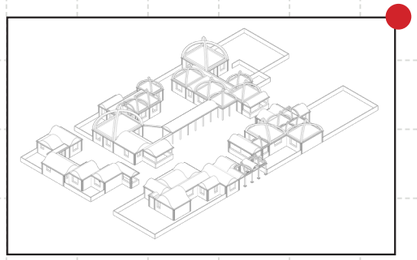












2.0

1.5

1.0

0.5

0

FSI

0 0.1 0.2 0.3 0.4 0.5 0.6

GSI

3 Aided Self-Help

In the next two chapters, eight cases will be studied, with each group beginning with a comparative analysis of two cases followed by two more cases analysed individually. The two groups of case studies are not distinct categories, rather they represent two halves of a continuous spectrum. Aided self-help describes the first chapter and includes cases where the influence of users is generally greater. Users are either the initiators, builders or appropriators of these processes.

New Gourna / Mexicali

The first comparison operates at the level of aided self-help, the extremity of user participation that involves an architect, even though the traditional sense of the role becomes blurred at this level. They are comparable in scale even though the New Gourna was designed to provide more dwellings, as both cases deal with repetitions of a family block. Moreover, New Gourna and Mexicali arose from similar social circumstances, both were aimed at low income rural dwellers.

One main seminal publication for each of the case studies forms the foundation of the research, *Architecture for the Poor* for New Gourna and *The Production of Houses* for Mexicali, each written by the architect of the corresponding scheme.

The background to the Adelaide Road project in London is in many ways shared with Molenvliet. The first fragments of the Adelaide Road scheme began when Nabeel Hamdi was completing his graduation project at the Architectural Association. During that time, he worked on PSSHAK, Primary Support Structure Housing Action Kit, a version of the support-infill theory put forward by Habraken. Hamdi even invited Habraken to attend his final presentation and the two were in frequent dialogue during Hamdi's project. PSSHAK , as well as being a system of component fabrication, encompassed an entire participatory methodology that interpreted the infill as a kit of parts.

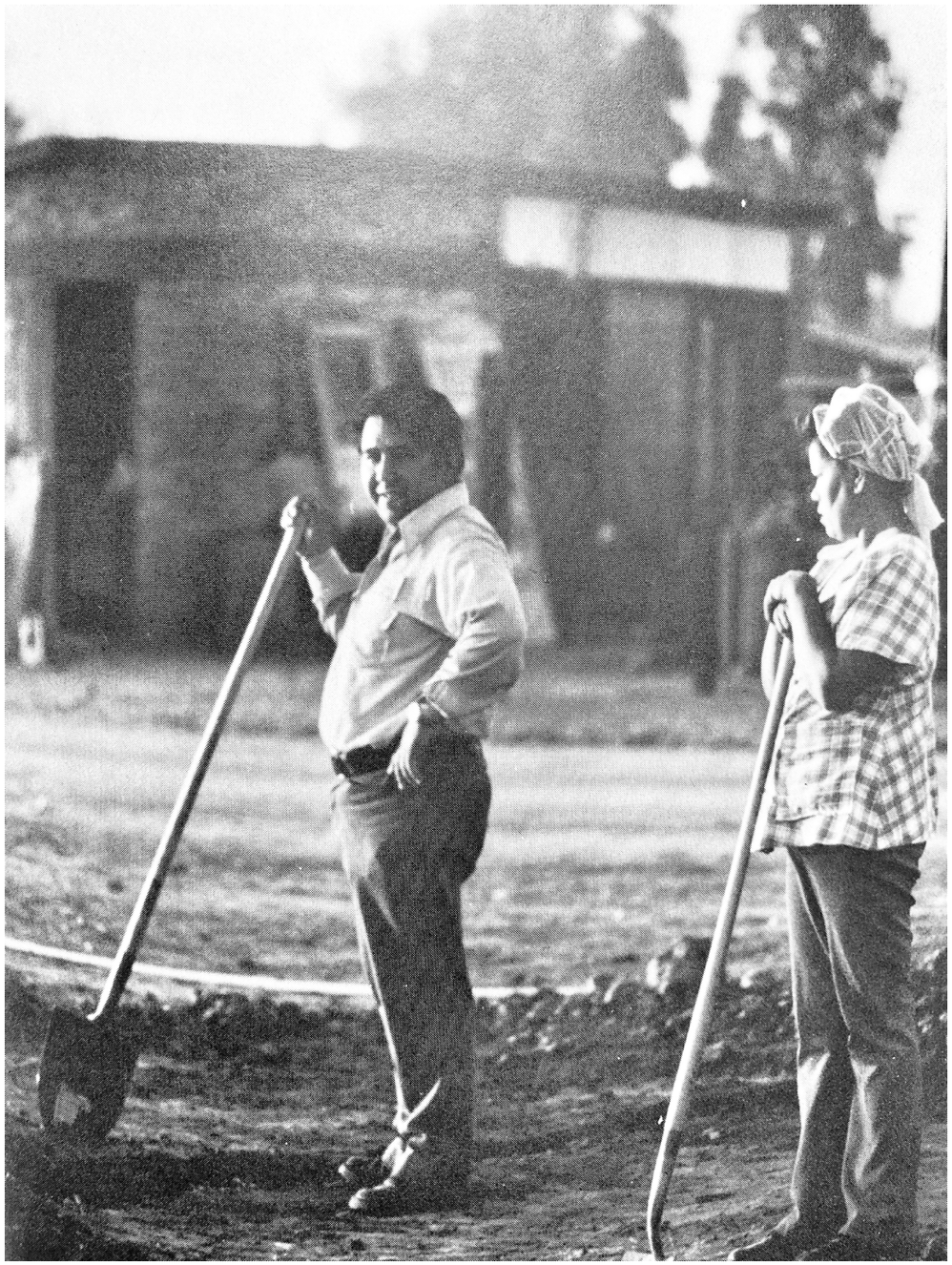
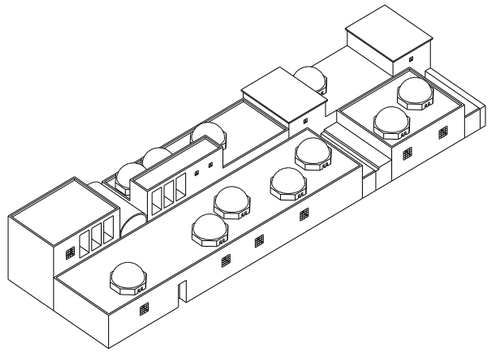


Figure 11. Aided self-help allows users to be involved in the physical construction process.

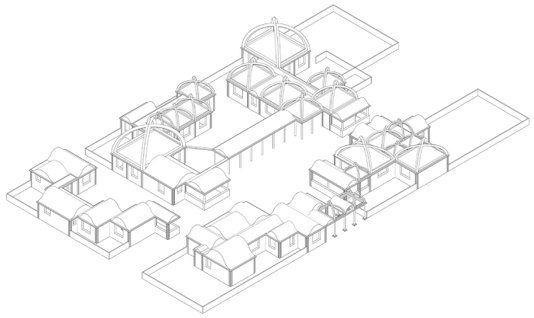


New Gourna by Hassan Fathy

Hassan Fathy was an Egyptian architect, artist and poet who was known for his studies into pre-industrial building methods, technologies and aesthetics. His efforts are a reaction to the takeover of industrial housing methods, a process whereby fashionable European modernism is mistranslated by speculators in big cities of the global south and filters down through the cheap suburbs into the peripheral village where it substitutes tradition[13]. He proposes local, abundant mud brick as the alternative to expensive concrete; local craftsmen instead of imported contractors and decentralised design in the place of mass housing. As well as proposing a more sustainable, efficient technical model, more importantly, Fathy advocates a more socially and culturally coherent housing approach. New Gourna became his pilot project.

The Gournii are a people situated near the Valley of Kings who are descended from grave robbers and founded the squatter settlement of Old Gourna. The Egyptian Department of Antiquities decided to clear Old Gourna and resettle the 7000 Gournii in a new site of 50 acres. Work began in August 1945[14]. Faced with limited resources and an unsupportive government housing department, Fathy had the option to standardised every unit but instead opted against it in favour for a more empathetic approach that included a full socio-ethnographic survey. He even went so far as to understand the traditional crafts of Gourna such as textiles as well as the processes that facilitated them. This knowledge was to later inspire him to design a crafts school and exhibition hall for New Gourna and also helped him formulate his apprentice system which he used to employ and train craftsmen. Through a sensitive analysis of the context and its people, Fathy could answer the right questions and find the right tools to train and empower the Gouniis, even though this was not what he was paid to do.

Figure 12. Hassan Fathy Drawing of New Gourna



Mexicali by Christopher Alexander

Christopher Alexander is an architect and design theorist who is most known for founding the Pattern Language. Since the first volume in his series of five books, *The Timeless Way of Building*, he has argued for a closer relationship between the conception of a building and its users, that "the human environment can only come to order under circumstances similar to those which have existed in most traditional societies"[15]. His second volume, *A Pattern Language*, not only documents a possible systematic reading of the built environment, but also acts as a tool to allow the user to read the built environment. From this, it is clear that user participation was at the centre of his ideology.

The Mexicali project was an experimental project commissioned by the state of Baja California to co-design thirty houses at the cost of $3500 per house. To bring about this closer relationship between building and people and to achieve an alternative to mass housing, Alexander identified the need for a new system of production which he tried to realise in the Mexicali project. Mass housing has the issue of centralised control, which he thought of as an artificial construct, whereas "a biological system is able to achieve its sensitive and complex adaptations because control over the shape of components is widely distributed at a great many levels throughout the organism"[16]. This organic quality can be seen in his participatory method at Mexicali which is strongly based upon twenty-one entries of the pattern language. He was able to decentralise control through delegating responsibility to his students at Berkelely and educating the five Mexican families on the Pattern Language.

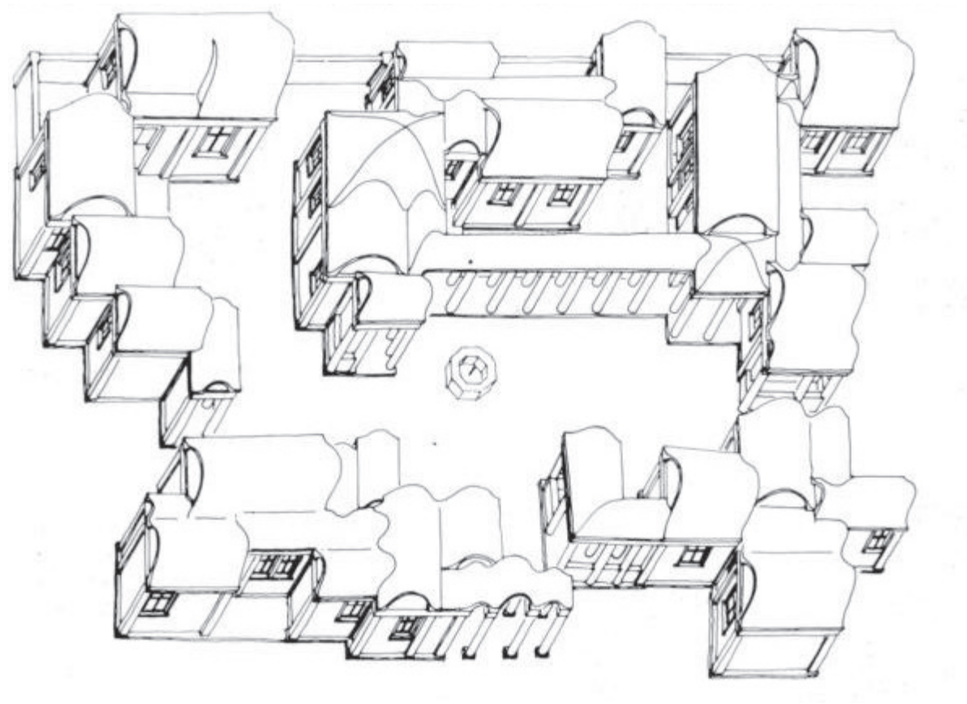


Figure 13. Parallel view of the group of houses in Mexicali, Mexico by Christopher Alexander.

Establish the origin of development: The Source

The first common pattern we discover is the need for a practical, social, educational and spiritual nucleus, a source from which later developments are born. For Alexander, the source of development was the builder's yard.

"For the place that became our builder's yard was, and was built, as a result of a continuous, ongoing series of experiments in construction; it was both the site of our experiments and their outcome, both the construction yard for the construction of the family's houses and the laboratory where we worked out the methods of construction we would use."[17]

- Christopher Alexander

The idea of a builder's yard arose from a physical need. A space was needed for the architects to work together, to experiment with materials and to store them, but also a spiritual need. As the first building to be erected on the site, it embodies the scheme's attitude towards building, its architecture can be read like a reference book of details and building techniques from which the future developments will be based. Moreover, it provides the users and builders of the scheme with a place to meet and contains central public functions such as a water fountain and taco stand.[18]

"As a nation – and even quite a poor one – may invest in a national orchestra, which is a permanent credit to the nation, so it may very well invest in a national team of architects. Even if the country contains three thousand fiddlers playing on street corners, they are not worth nearly so much, artistically, as one permanent orchestra with a hundred musicians, which can cultivate a tradition and devote all its time to improving the standard of its performances. In the same way three thousand architects working each by himself for private clients, through private contractors, cannot be compared with three hundred architects working together consciously to create a national tradition in building."[19]

- Hassan Fathy

Fathy also saw a need for a united central nucleus which would act as the source for future developments. In fact, when making the quote above, Fathy was imagining a source that could create entire new villages around the whole of Egypt. In the New Gourna project, this source manifested in a collection of public buildings consisting of a mosque, village hall, theatre, market and a village crafts exhibition space. Fathy decided to construct these public buildings first, before the dwellings, for two reasons. Firstly, this was done to prevent the government from halting the project as soon as the housing requirement was reached, leaving no funding for public buildings. Secondly, Fathy saw these public buildings as an opportunity to instil the necessary building

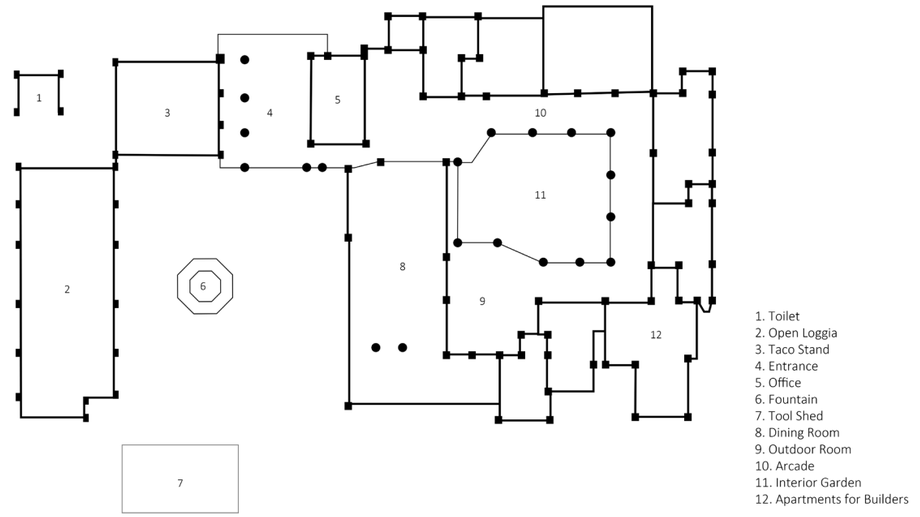


Figure 14. The Builder's Yard in Mexicali

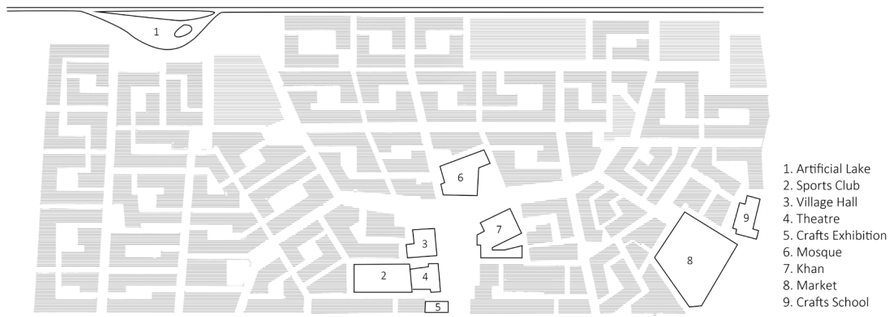


Figure 15. Core public buildings in New Gourna

knowledge and skills into the community so that if government subsidy was to cease, the villagers would still be able to continue to build.[20] Together with the builder's yard, these public buildings represent the process of building as well as its product.

Perhaps an even better comparison can be drawn between the public fountain in Alexander's builder's yard and the artificial lake designed for New Gourna. The idea for an artificial lake was a response to schistosomiasis, a water-borne parasitic disease that effected nearly all peasants in Egypt. Fathy imagined a recreational lake free of disease would bring an end to the symptoms that weaken the peasant work-force and instead strengthen their children by giving them a place to play and exercise[21]. Similarly, the fountain erected in the centre of the builder's yard in Mexicali became a popular meeting spot, as families needed to collect water from it every day. These two examples show that an effective first intervention on the site is not an architectural statement but rather a simple solution to a social problem. The establishment of a social heart allows the users to begin to interact with the site and from this, a new can architecture develop.

As well as curing disease, the Fathy's artificial lake also provided the answer to where he would obtain his materials, as the earth dug up from the ground could be used to manufacture mud bricks. Hence, we see the social centre of the scheme have a close relationship with the construction of the scheme itself. The lake, together with the trucks that carried the mud, the tipping site and the brick yard formed a perpetual system capable of providing the materials to the building site like that of an engine powering a vehicle. In Mexicali, the builders yard also functions as the productive heart, providing "the home base from which the building process can be generated"[22]. As well as a storage for building materials and parts, it also acts as the workshop that provides the specialised tools for construction and maintenance. From this we can deduce that the source of a project is not an end product but a presence that constantly accompanies the construction process and adapts according to the needs of the situation. After the construction phase at Mexicali, the workshop section of the builder's yard subsequently shrunk as its function transitioned from construction to maintenance, and more space was created for day to day social functions. This transient nature of the source of development is what integrates it into a community, so that it is perceived as a gift rather than an imposed system.

Another function of the source of development is to act as an architectural model for the remaining unbuilt buildings and a source of knowledge that the users can refer to. In New Gourna, the construction of the public buildings was a training exercise to educate villagers who would ultimately build their own houses. This also means "the villagers will be assured of architectural harmony and will be spared the sight of a group of buildings proclaiming their officialism and self-assumed superiority in their alien architecture"[23]. Fathy tells us that a vigorous and self-perpetuating tradition of building[24] can only exist if an understandable, cheap method of construction is adequately demonstrated to the users. The builder's yard in Mexicali achieves this on two levels. Architecturally, the builder's yard provides an exemplar model of the building method and details of construction that are a result of an affordable building process. This architectural didactism can be experienced by the user every time they visit the builder's yard for social functions. Intellectually, the builder's yard provides the site for material experiments and an archive documenting the knowledge gained. There was even a small

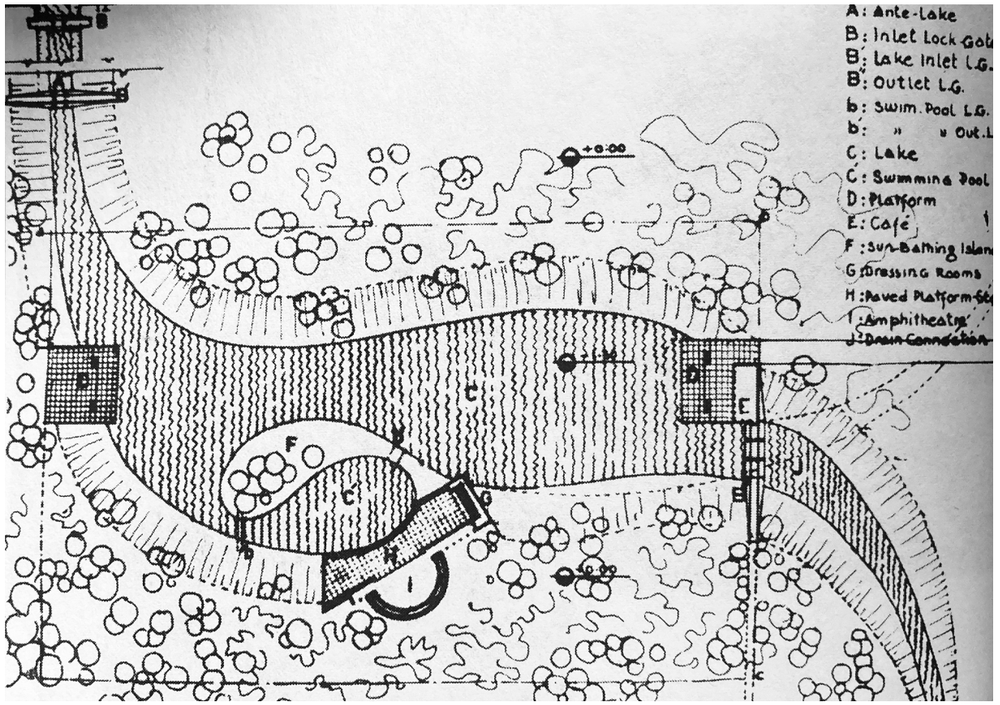


Figure 16. Fathy's plan of artificial lake

library which contained a copy of *A Pattern Language* where users could study and discuss its contents. The setup redefined on-site fabrication; the workshop was fitted out with moulds, pallets and fabrication tools and was accompanied with its own drying and curing yards. "The possibility of creating a system of construction which people who knew nothing about building could follow, could use successfully in their houses, depended essentially on this daily connection which we had to the design and to the building."[25] The didactic role of the source contributes to the decentralisation of knowledge, complementing the decentralisation of building production.

My last point refers to how this source object should be implemented on a project. For this, I refer back to Hassan Fathy's quote about a national team of architects. "We should have a team of architects working at the very highest level of their art, working as a team, continuously advising, criticizing, and revitalising one another's work…"[26]. We learn that central to this source of development should be a community of architects supporting the users around them. This is characterised by the inner courtyard of the builder's yard which houses the architect-builders. During non-working hours, Alexander writes how they play poker in the garden and discuss about difficult details during dinner . This 'investment', as described by both architects, is above all a political choice. Public authorities must see the importance of these sources of development and provide adequate funding for them.[27]

Figure 17. Families taking water from the fountain in the builder's yard. The fountain became a social nucleus.

Marry Design with Construction: The Architect - X

Another common pattern between the two approaches and indeed with all participatory housing approaches, is an intellectual desire to venture beyond the role of an architect and to understand the building process from different perspectives and levels. Fathy calls for a new relationship between three of these perspectives in what he calls, the trinity:

"The intelligent participation of the client is absolutely essential to the harmonious working out of the building-process. Client, architect; and craftsman, each in his province, must make decisions, and if any one of them abdicates his responsibility, the design will suffer and the role of architecture in the cultural growth and development of the whole people will be diminished"[28]

- Hassan Fathy

Fathy's trinity identifies three roles that are in fact fluid and at times overlapping. As in the New Gourna project, the intention to let the local Gournii build their own houses was ultimately unsuccessful, "At Gourna, we were our own designers, supervisors and contractors"[29]. It can be argued that the architect had to take over the role of the client, as the local peasants showed little interest in their new village, as they were dissatisfied with the decision to relocate Old Gourna to begin with.

Alexander argues that in an ideal world, design decisions are made bespoke, house by house. He goes on to say that this is not possible due to the current dynamic between architect and contractor…

"A contractor. Working in the way that contractors work today, does not have the power to make these decisions, since he is working from drawings prepared by someone else. An architect does not have the day-to-day knowledge, nor the time, to make these decisions, since he spends too little time on the site."[30]

- Christopher Alexander

Both architects are dissatisfied with the current role dynamic in the building process and are proposing a change that shortens the distance between the acts of designing and building. This change has different manifestations in each of the case studies.

Hassan Fathy believed in decentralising expertise, for the architect to relinquish some control to local craftsman as those are the people who have the most expertise. This is why he spent a long time familiarising and understanding local crafts. For example, in Architecture for the Poor, he documents the techniques Nubian Masons used to create a vaulted roof without supports or centering (figure 18), providing a simple and cheap solution for roofing mud brick enclosures. Complementary to his belief of the decentralisation of control in the design process, the importance of the vernacular to Fathy shows that he believes the most elegant and

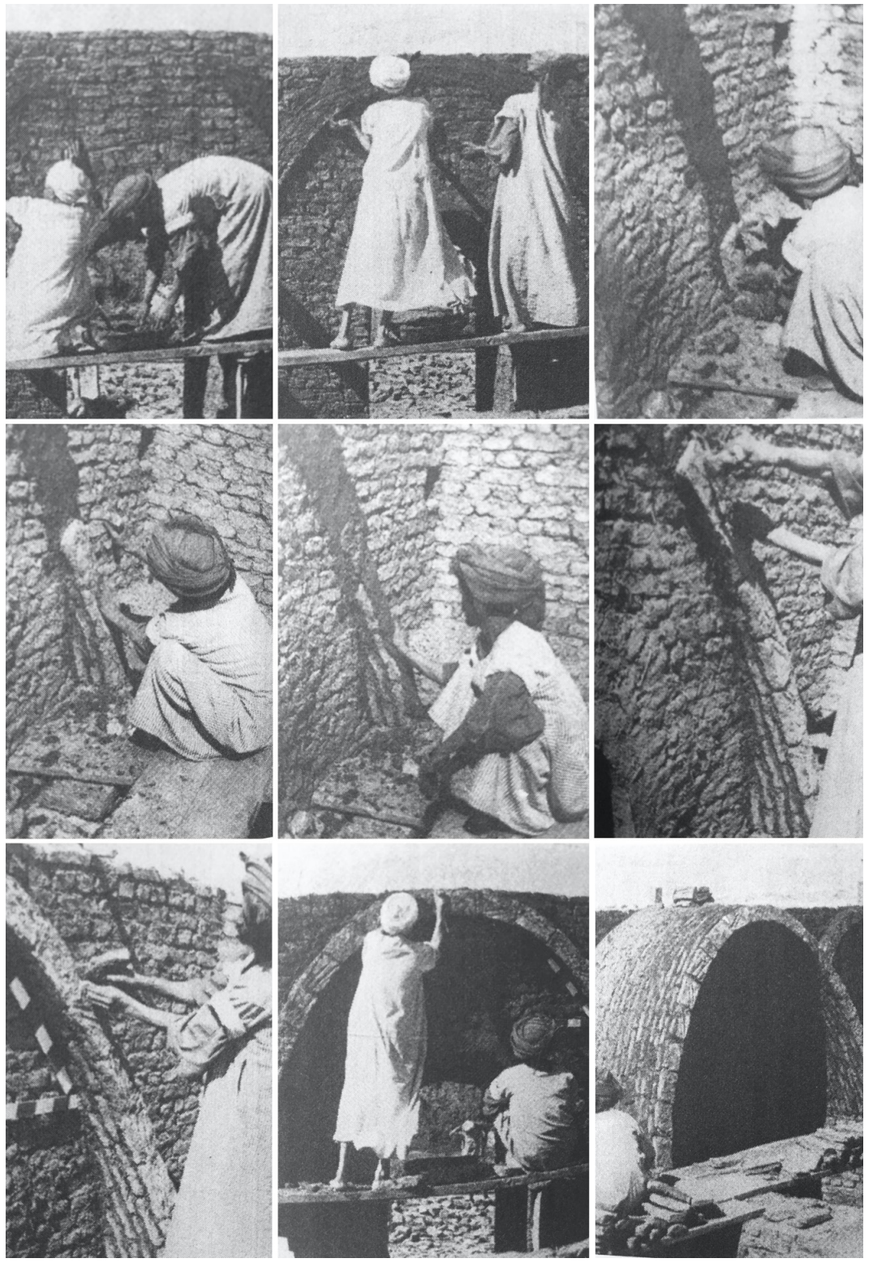


Figure 18. Nubian Craftsmen building a vault

economical solutions to architectural problems are already in existence and it is up to the architect to discover these hidden, local crafts and apply them on a macro level. Therefore, there is a need for the architect to relinquish control.

Alexander sought to reduce the proximity between the design and construction through giving the architect more control, defining a new role, the architect-builder, who would have control over both design and construction[31]. Contrasting to Fathy's approach, Alexander used his pilot project as an opportunity to experiment with new methods of construction which were devised by the architects and tested inside the builder's yard. For the Mexicali project, the use of the vernacular was limited to the choice of material and it was the role of the architect-builder to devise the most optimal and technologically efficient building methods. "We undertook an exhaustive series of experiments to determine the best mix, the best pressure, and the form of pallets which would best receive the blocks from our specially designed mould."[32]

New Gourna and Mexicali represent two contrasting attitudes towards the expertise of the architect - Fathy's trinity against Alexander's ideas of dialogue. Fathy wanted a division of power between the architect and contractor, but a close relationship between them while Alexander wanted to unite these two roles into one.[33] Regardless of their contrasting beliefs on the source of the best construction method, the vernacular (Fathy) or the experimental (Alexander), both projects demonstrate a close relationship between design and construction through an obsessive study on the specific construction techniques. In New Gourna, this was an in-depth study into the vernacular architecture and the crafts of local masters. In Mexicali, it was an iterative, experimental study of local materials and the limits of their capabilities.

How each architect brings together design and construction is also evident in the way they communicate their work to non-architects such as builders or users. Once the architect is able to fully understand the capabilities of the craftsmen, they can begin to trust them with a part of the design. As a result, this reduces the workload for the architect as not everything needs to be pre-drawn and pre-defined. When the architect is forced into redrawing, Fathy explains that the design is then vulnerable to inhumane mass reproduction, "and his (the architect's) presence as a creative artist will not be necessary once the first plan is drawn"[34]. In his drawing for the houses at New Gourna (figure 22), we find a plan void of any detail, and in the place of it, we see Fathy include representations of a multitude of Egypt's local fauna and flora. This conveys the imagery that each house, just like each plant and animal, are made of equal parts but remain unique[35]. Remarking on the level of detail in his drawings, Fathy says, "all I had to draw were the ground plans of the individual houses and, to give them the heights, silhouettes of the family neighbourhood blocks"[36]. It is not meant to be a draconian, instructive drawing but instead a guide for the craftsmen who fill in the blanks with what they already know how to build. Fathy calls for the re-establishment of the traditional role of the craftsman and a redefinition of the role of the architect to accommodate the craftsman's knowledge.

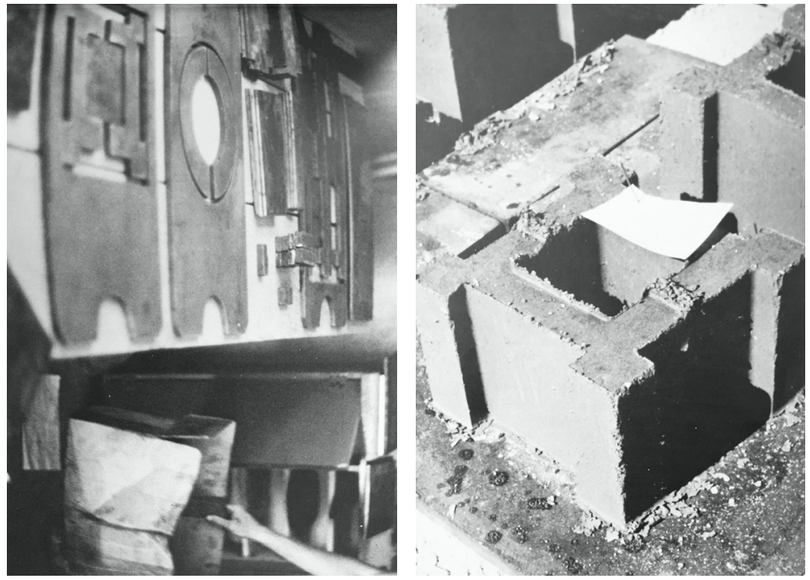


Figure 19-21. Interlocking structural system in Mexicali

The way Alexander negotiates this relationship between the architect and builder is slightly different as, in Mexicali, the traditional role of the builder did not exist as it was taken on by the architects and sometimes the users themselves. Instead of conceiving construction as the assembly of pre-defined components, Alexander proposed a step-by-step guide of building operations "so that detailed control over the building's shape and details passes into the hands of the builder and out of the hands of the designer of components"[37]. As with Fathy's drawings which leaves freedom to the builder, Alexander proposed that the first of these building operations be the setting out of stakes and he was adamant that this was done by the families themselves. After the initial co-design period that produced an approximate layout, each family was told to set out their homes on site with wooden stakes. What is interesting are the adjustments that happened during this process. The families could visualise their homes for the first time and begin the architectural dialogue with neighbours that only previously existed in sketches. Alexander also talks of a "cognitive satisfaction"[38] relating to the psychological achievement of this building operation and how it enables the architecture to come closer to those that construct it.

Through drawing only what is necessary, Fathy teaches us how we can tailor what we draw to the knowledge of the builder who will interpret the drawing. As a result, the builder will see their task as a creative endeavour and not only an execution of the architect's order. Alexander does the same by rejecting construction as a task of putting together in favour of a process based on building operations. Even though the concept of Alexander's architect-builder seems to contradict that of Fathy's trinity, with respect to giving more control to the builder, they have the same goal, regardless of who they believe should be the one responsible for the act of building.

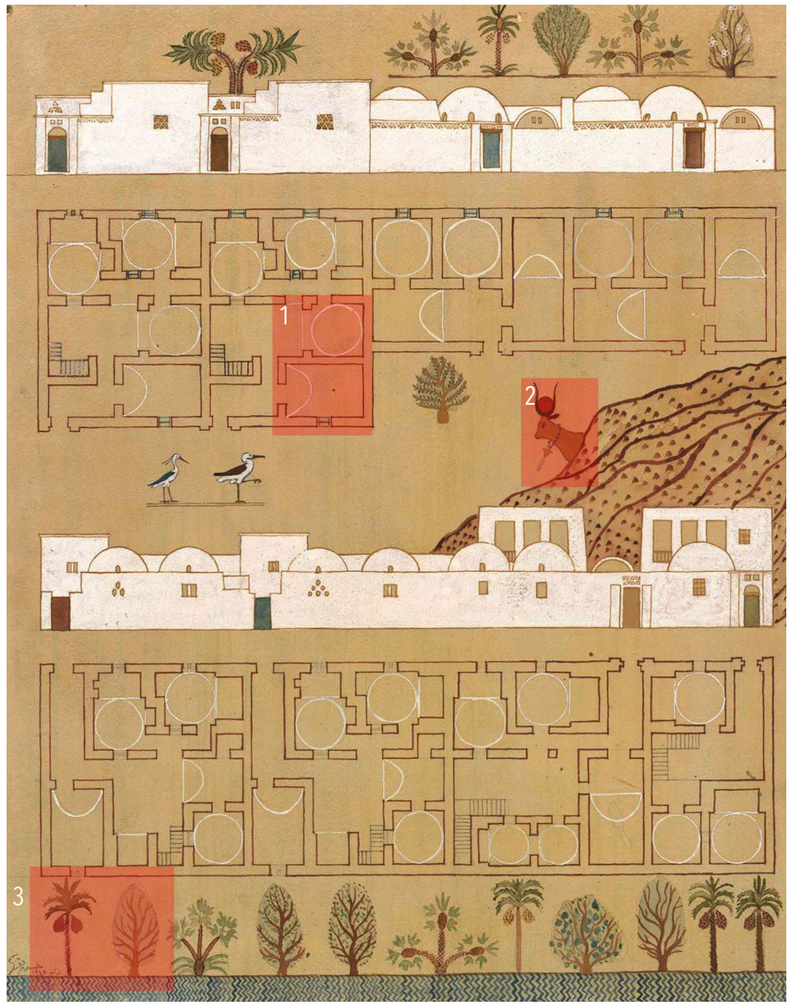


Figure 22. Fathy's study of houses at New Gourna

1. Fathy uses simple 'place-markers' such as the white circle and semicircle to distinguish between single and double vaults. By not-overdrawing, he puts trust on the builder's own knowledge on building a vaulted roof. The drawing becomes less prescriptive and more of a guideline.

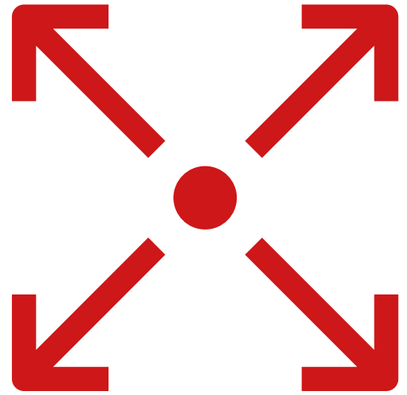
2, 3. Instead of adding details to the drawing of the plans, Fathy creates atmosphere through the flora and fauna he paints around the drawing, expressing the beauty of the land as it is.

Conclusion

Two patterns of participation are obtained from the comparative study between the New Gourna and Mexicali project. Firstly, it was noted the need to establish a source of development. In some instances this materialised in the physical form of the builders yard, where building experiments were carried out and materials stored; the recreational lake, where children could play and the raw materials for mud brick obtained; and the water fountain, a nucleus of social interaction. In other instances, it materialised in the psychological form of a group of public buildings, representing a didactic role and a source of construction knowledge; and the envisioned team of national architects working together as a union and fostering a national culture of architecture.

Secondly, both cases represented an exercise in rethinking the relationship between architect and builder. Only once the architect has a better understanding of the builder's craft, and vice versa, can opportunities for further design and further user participation appear. In the Mexicali case, the marrying of the architect and the builder is brought to the extreme by proposing a single role that encompasses both disciplines. This fusion should be thought of as an enabler for participation.

The large period of time between the beginning of the New Gourna project and the Mexicali project, more than 30 years, shows, to a small extent, the fundamentality and timelessness of these patterns of participation. Next, two more examples of aided self-help processes will be explored, the PREVi project in Lima and the Oosterwold project in Almere. The inclusion of these projects demonstrates that aided-self help processes and the patterns derived from them are not limited to the small scale and are not exclusive to housing in the global south.



The Source

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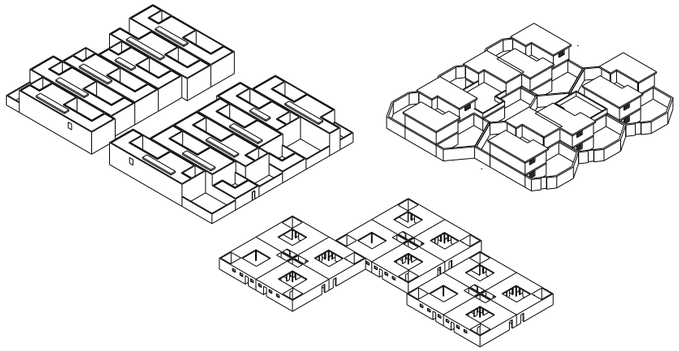


PREVI Lima

The PREVI, Proyecto Experimental de Vivienda (Experimental Housing Project) was a built housing competition[39] launched in Lima in 1968, initiated by the Peruvian government headed by Fernando Belaúnde Terry and sponsored by the United Nations. It was a response to the growing rural to urban migration that resulted in the proliferation of Lima's barridas, as the percentage of squatters in these informal settlements grew from 1% to 25% between 1940 and 1972.[40] This housing experiment was preceded by the work of the national housing commission CRAV who promoted a sites and services approach through their 'elemental houses' concept. John Turner pushed further the value of self-help, contained in Lima's barridas, solidifying the idea of participation as a means of resolving the housing crisis.[41]

Participatory design was realised on two levels in PREVI, firstly at the scale of urban design and secondly at that of the building scale. The PREVI project in a sense was an extensive sites and services scheme which offered a "metropolitan-scale infrastructure and services, and a sophisticated network of public spaces"[42]. The masterplan was a purposely unfinished plan, designed to anticipate the wide variety of cluster forms that would later inhabit it. Furthermore, this enabling urban support structure included the design of schools, kindergartens, shops and parks placed so that pedestrian routes never intersect with vehicular roads. On the building scale, one of the main criterion that participants of the competition had to meet was that each design needed to demonstrate how it can be extended over time to accommodate changes in family size. This rule "prevented the cycle of deterioration that results from when family incomes increase and their houses are unable to respond to their new aspirations, forcing them to move away and ultimately limiting the neighbourhood to low-income families."[43] The designs were to accommodate families of two to six with the potential to expand and accommodate ten people.[44] This aspiration has proved to be successful as many of the houses have been actively appropriated by their users. Thus the masterplan acted as a support for the competition entries and each housing scheme themselves became a support for inhabitant participation.

Figure 23. Aerial View of PREVI

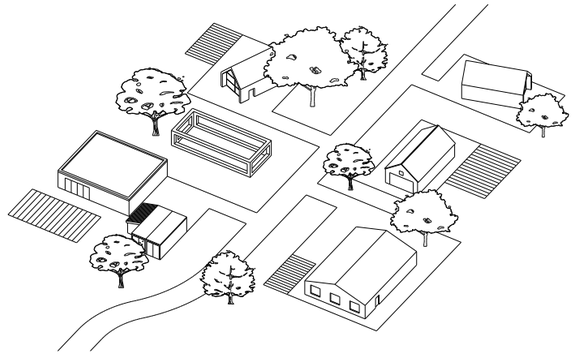
Other enabling devices that the PREVI project demonstrated included the erection of a site workshop that functioned in a similar way to the builder's yard in Mexicali. "Having a workshop and plant to develop the details, prototypes and testing constituted a vital extension for grounding ideas and means."[45] The workshop building itself used an experimental construction method, made up of large U-shaped pre-cast concrete elements, a technology that was later adopted in two of the competition entries.[46]

The military Coup d'etat of 1968 overthrew Belaúnde's government, creating a major setback for the PREVI project. As a result, only one third of the proposed 1500 housing units were ultimately built.[47] The project was subsequently abandoned and the inhabitants had to rely on their own initiative to expand their homes. Their success owes to the flexibility of the designs, not only their ability to expand but in their capacity to incorporate other functions such as income production, in what has been called a 'hyperhouse'[48]

The nature of PREVI, a collection of housing schemes juxtaposed on an urban landscape, gives each project their own character while also bridging the gap between the urban and building level.[49] This creates a hierarchy of collectivity that allows inhabitants to better locate themselves within the masses. The ensemble is a "combination of scales that go from inside the house to the city... from the individual to the collective and from the appearance of varying degrees of intimacy."[50] This strong clustered approach is a repetitive pattern in participatory housing as it fosters a higher sense of collaboration and community, encouraging individuals to take ownership of their defined spaces and clearly assigning responsibilities to collective groups.

PREVI was significant for the development of mass housing technologies as every project entry was given a small site to demonstrate their building methods. Only two projects were not ultimately realised but this was due to their lack of funding. Despite this, it can be argued that the PREVI Lima project failed to expand beyond its pilot project state, it was a collection of many pilot projects. Its influences on later projects were also limited. The products developed by the 'construction laboratory' of PREVI were not taken up by the residential construction industry in Lima, traditional building methods remained. However, Julián Salas concludes that PREVI was significant as it showcased the benefits of rationalised construction and small-scale pre-casting techniques over heavy industrial prefabrication which was popular in Europe at the time. Despite this, Salas also notes the apparent paradox that after being left to their own devises, users opted to expand their homes using traditional construction rather than the new innovative methods developed by world famous architects.[51] This brings up questions as to how well technologically innovative ideas are able to gain a foothold in a societal context which is all too familiar with established methods of producing homes.

Figure 24. Before and after user appropriation, 1978 and 2003. Projects by Aldo Van Eyck (top), Miro-Quesada Williams Nunez (middle), Kurokawa Kikutake Maki (bottom).



Oosterwold

The Oosterwold development in Almere is not the work of a single architect but is an example of an emergent order that derives from the theory of Jane Jacobs. Instead of a development that obeys the formal arrangement of an overall masterplan or zoning plan, as is the case in many sites and services schemes, the experiment at Oosterwold attempted to create a settlement largely reliant on user initiatives and through only proposing a set of framework rules.

Located to the south-east of central Almere and stretching across 43km^2 of greenfield land, Oosterwold provides space for between 15,000 and 18,000 new dwellings.[52] The framework on which Oosterwold grows relies on rules that are created to order development on different scales. On the scale of the site, the entire development is subject to a maximum buildable area of FSI 0.5; the final program arrangement must reach the overall land-use subdivision, which assigns the desired percentage values for buildings (20%), pavements (6.5%), public green spaces (20.5%), water (2%) and spaces for urban agriculture (51%); certain areas are also determined as 'off limits' such as protected landscape areas and spaces for future railway development. On the scale of a plot, four further rules are imposed. Firstly, the maximum density of FSI 0.5 also applies but can be increased to 1.0 if made up for by an adjacent plot. Secondly, each plot must be classified into one of three types: standard, agricultural and landscape, with each type having their own unique program goals. Some programs such as large scale commerce and brothels are banned in Oosterwold. Finally, all plots of land must be self reliant in terms of energy and sanitation, and "internalise all negative external effects" such as the disposal of waste and the obstruction of sunlight.[53] As long as these rules are respected, initiators are free to realise whatever they wish on any vacant plot. The result is a co-creation process that relies on a compromise between top down and bottom up.

This new system of production makes necessary the creation of a new role, the area director, whose primary function is to organise and help initiatives and make sure they obey the overall program rules. They are a type of local planning authority who receives the planning applications of prospective inhabitants. There is a

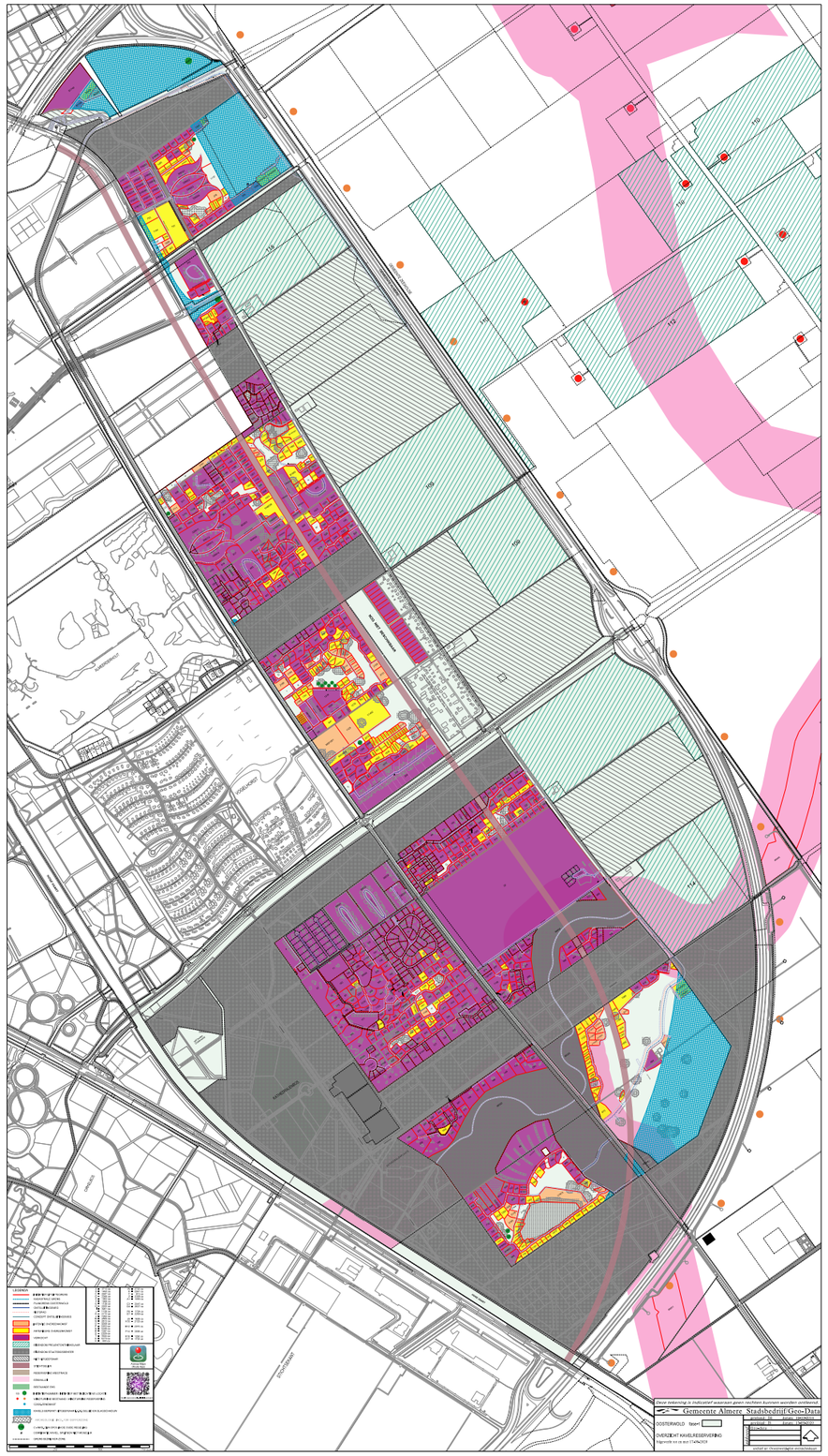


Figure 25. Map of initiative at Oosterwold.

similarity between the role of the area director and that of the architect in projects such as Adelaide Road and New Gourna, they are both responsible for organising the community and using their expertise to enable others. This similarity can even be extended to include that of local community leaders in informal settlements of the global south.

It may seem at first that users are able to have a high degree of freedom and individuality in Oosterwold. This may be true in terms of the freedom of architectural form, but for the remainder of the landscape, much has been indirectly designed. Oosterwold, as a whole, was always designed to have a rural atmosphere. The fact that the farmers originally in the area were not evicted from the site reveals the local government's intent for initiators to share space with farmers. Moreover, the programmatic rule that each plot was to achieve 51% urban farming further consolidated Oosterwold's identity as a rural agricultural community.[54] Total freedom of choice of site is also an illusion as in practice, it is much more economically feasible to choose a site that has an existing road connection. This has caused the emergence of 'road associations', voluntary groups of initiators who share the same road and collectively finance the cost and maintenance of their shared infrastructure. The experiment at Oosterwold has shown that even in the most free of planning frameworks, collective action is inevitable and beneficial[55]. Thus, as one area director explains, the motive of Oosterwold has always been: 'free, but not non-committal'."[56]

While the municipality engaged architecture firm MVRDV to come up with the framework on which Oosterwold functioned, urban game developer Play the City was engaged to test these rules. Created by Ekim Tam, Play the City uses gaming methodology to engage all the stakeholders of a particular project in a dialogue with the aim of uncovering possible issues, agreements, contradictions and opportunities. At Oosterwold, the game 'Play Oosterwold' was tested for more than 50 sessions over a period of three years. Through observing how these games played out, the project stakeholders could 'predict the future' of Oosterwold through identifying repetitive behaviours. During the first simulations of the game, players who chose to situate their initiatives far apart from existing ones ran into the problem of connecting to public infrastructure. A pattern that emerged from this was that new initiators started to organise with each other and cluster their initiatives to minimise the construction of new infrastructure.[57] The game also revealed the issue of self-building public infrastructure, recommending more top-down intervention with respect to public goods, concluding: "a predefining percentage rule doesn't work in this game, and is unlikely to function in the added complexity of reality"[58]. This collectivity issue later arose in reality as the contradiction between individual freedom and collective efficiency was frequently debated. Some noted friction between initiators who refused to be part of collective efforts, whose organic nature conflicted with the desire of utility companies to plan out all infrastructural services before connecting to each individual plot.[59] Nonetheless, the experiment at Oosterwold was successful in demonstrating an alternative housing process, one where top down planning and bottom up initiative are not necessarily mutually exclusive.

Figure 26. Self-build houses in Oosterwold.

4. Co-creation

This next group of cases belongs under the general heading of co-creation. Compared to the first group, the architects in each of these cases play a relatively larger role. In most of these cases, the user is consulted on his/her ideas but the initiative remains firmly with the architect.

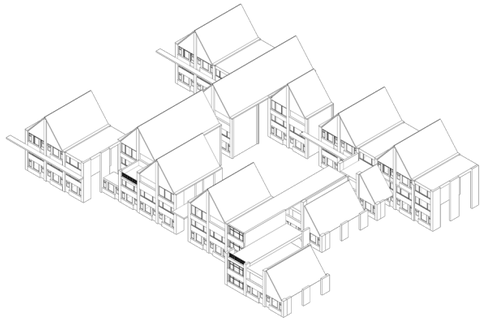
Molenvliet / Adelaide Road

From the level of aided self-help, we move across the spectrum to a region of greater designer control. This is where we find the second comparison, which concerns participation at the level of consultation and co-creation.

These two terms both describe a situation where the designer and the user become two clearly defined entities who produce a design together. The terms differ on the nature of the relationship between the designer and user. Richard Sennett likens this relationship to that of two Greek building typologies, the Pynx, an amphitheatre where lectures and performances occur, and the Agora, an open public space where a variety of different activities could take place. The Pynx, as in consultation, facilitates a patriarchal relationship between the public (user) and the performer (architect), the public has a passive role and can only react on the initiative of the performer. Contrastingly, in the Agora, everyone performs their daily lives synchronously on the same level. This is co-creation, where neither user nor designer plays a dominant role and a design results from the joint effort of both sides.[60]

Two housing projects, each representing a participatory process that takes the step from consultation into co-creation, is presented. Through interviews with the architects and site visits, we will see how each project goes beyond prescribing and towards coordinating a design with their respective users.

Figure 27. Picking out of a hat. This method was used in the participatory process as part of the Keyenburg project designed by Frans van der Werf.



Molenvliet by Frans van der Werf

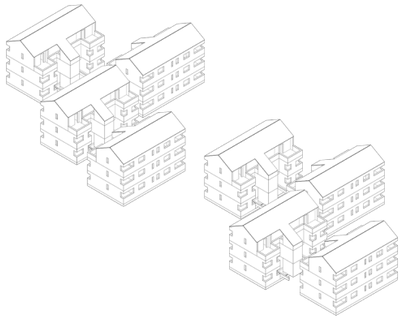
To understand the Molenvliet project, we must first understand the theoretical background from which it arose. In 1961, John Habraken published *De Dragers en de Mensen*, which laid out his manifesto for his theory of supports. Essentially, the support is a structure that creates the necessary conditions for dwellings to be created within it.[61] The support is permanent which contrasts to the infill that can be adapted independently of the support and each other.

Habraken did not design any built manifestations of the theory himself, but he did however have a good number of followers with which he formed the research group, Stichting Architecten Research (SAR), in 1965. Van der Werf was a member of this group and, as a "practical man"[62], realised one of the first full blown support-infill schemes at Molenvliet, Papendrecht, the Netherlands. It provided 80 dwellings for rent and accommodated a range of dwelling sizes. Not only did the theory of supports make possible the flexibility of unit size, more importantly it made possible the conditions for strong participation from the residents. Th architect recognised this and addressed it by engaging in close one on one interviews with the residents early in the design of the infill.

The aspect that Van der Werf built upon Habraken's theory would be his use of patterns, influenced by *The Pattern Language* by Christopher Alexander. He identified his own patterns at two different scales, that of the tissue and the support, and used them as tools that could aid design, a method similar to that of this research.

The Molenvliet pilot project represented a feasible and scalable example of support theory which at the time was struggling to find its concrete image. For the architect, it spurred on a whole sequence of support-infill schemes all over the Netherlands where the same method was applied to larger and larger schemes, notably the Lunetten and Keyenburg projects.

Figure 28. View from Veerweg.



Adelaide Road by Nabeel Hamdi

The background to the Adelaide Road project in London is in many ways shared with Molenvliet. The first fragments of the Adelaide Road scheme began when Hamdi Nabeel was completing his graduation project at the Architectural Association. During that time, he worked on PSSHAK, Primary Support Structure Housing Action Kit, a version of the Support-infill theory put forward by Habraken. Hamdi even invited Habraken to attend his final presentation and the two were in frequent dialogue during Hamdi's project. PSSHAK , as well as being a system of component fabrication, encompassed an entire participatory methodology that interpreted the infill as a kit of parts.

The project consisted of eight three-storey blocks of social housing designed for the Greater London Council. The space between is a mix of private pedestrian paths and parking spaces. A mix of dwelling types is achieved by the different ways the structural shell can be divided. The units currently range from single person accessible flats to eight person houses.[63]

Signs of participation are less visible at Adelaide road than at Molenvliet as the GLC were insistent that the exterior of the housing blocks be kept consistent as it belonged to the public realm. Instead, variation can be seen in the rhythm of window openings and the gardens and terraces which could be personalised. Hamdi worked closely with the chosen users of the scheme from the very beginning, adopting many different methods for user participation to occur. As well as sitting down with individual families on site, each family was given a brochure with instructions on planning their unit. A large model was also created with realistic furniture to allow users to better visualise their own designs.[64]

Figure 29. Adelaide Road view from Eton Road

Divide into Two Parts: Support and Infill

"Support and infill is not a technical problem, but a human problem, it is your attitude towards users"[65]

- Frans van der Werf

Fundamental to the two housing processes is a separation of the project into two parts, the support and the infill. This separation has 3 aspects which we will investigate in this pattern: a separation of attitudes towards housing, a separation of ownership over space and the creation of hierarchy.

There are two attitudes towards the definition of housing. The first is straight forward, it is a space enclosed with walls consisting of a place to sleep, cook, eat, relax etc. Housing is perceived as a noun. John Turner suggests an alternative, to see housing as a verb, "as a means to a human ends, as an activity rather than as a manufactured and packaged product". He goes on to say that decision making power over the activity of housing must be in the hands of users themselves.[66] While the support embodies the noun aspect of housing, it is a static finished product created top down, the infill embodies the verb aspect, it is an undetermined, dynamic manifestation of the users habits and desires. Richard Sennett elaborates on these two contrasting attitudes, which he calls the ville, the physical city and the cite, the innate spirit of the city. He describes how, during the late 19th and 20th centuries, architects and urbanists were unable to find a balance between these two attitudes and how this ultimately resulted in their divorce. As an example, projects such as Haussmann's plan of Paris, consisting of a brutal network of straight roads, prioritised the circulation of vehicles over the creation of space, and consequently diminished the cite in favour of creating an efficient ville.[67] This contrasted with the work of the Chicago school founded in 1890, which, through thinking of the city in purely abstract two-dimensional terms emphasized the cite while neglecting the three-dimensional ville.[68] The work of the SAR and those associated with it, including the projects at Molenvliet and Adelaide road represent a milestone where these two attitudes towards housing, in noun and verb form, of the ville and cite, found an equilibrium.

In both case studies, the support part constitutes an architecture that is shared between all the inhabitants and the infill part representing that which is specific to a particular family or individual. Hence the division of support and infill also represents a division of communal and individual, in other words, a separation of ownership. The Molenvliet project is characterised by long galleries that line the outer facades as well as framing the inner courtyard. In an interview with the architect, Frans van der Werf, it became clear that these galleries were purposely made wider in order to accommodate sitting areas, creating a semi-public space. The design of the courtyards was also such that its size was not too small as to force the user to engage in dialogue with their neighbours and equally not too large as to make it impossible to identify a person on the opposite side. Therefore, in Molenvliet, the common areas and semi-public areas acted as a support in the support-infill sense as well as literally being a space that provided the individual units with circulation. In Adelaide Road, the separation of ownership is literally evident in the fact that the council had complete control over the public realm and the façades visible from it. In an interview with the architect, Nabeel Hamdi expressed his original

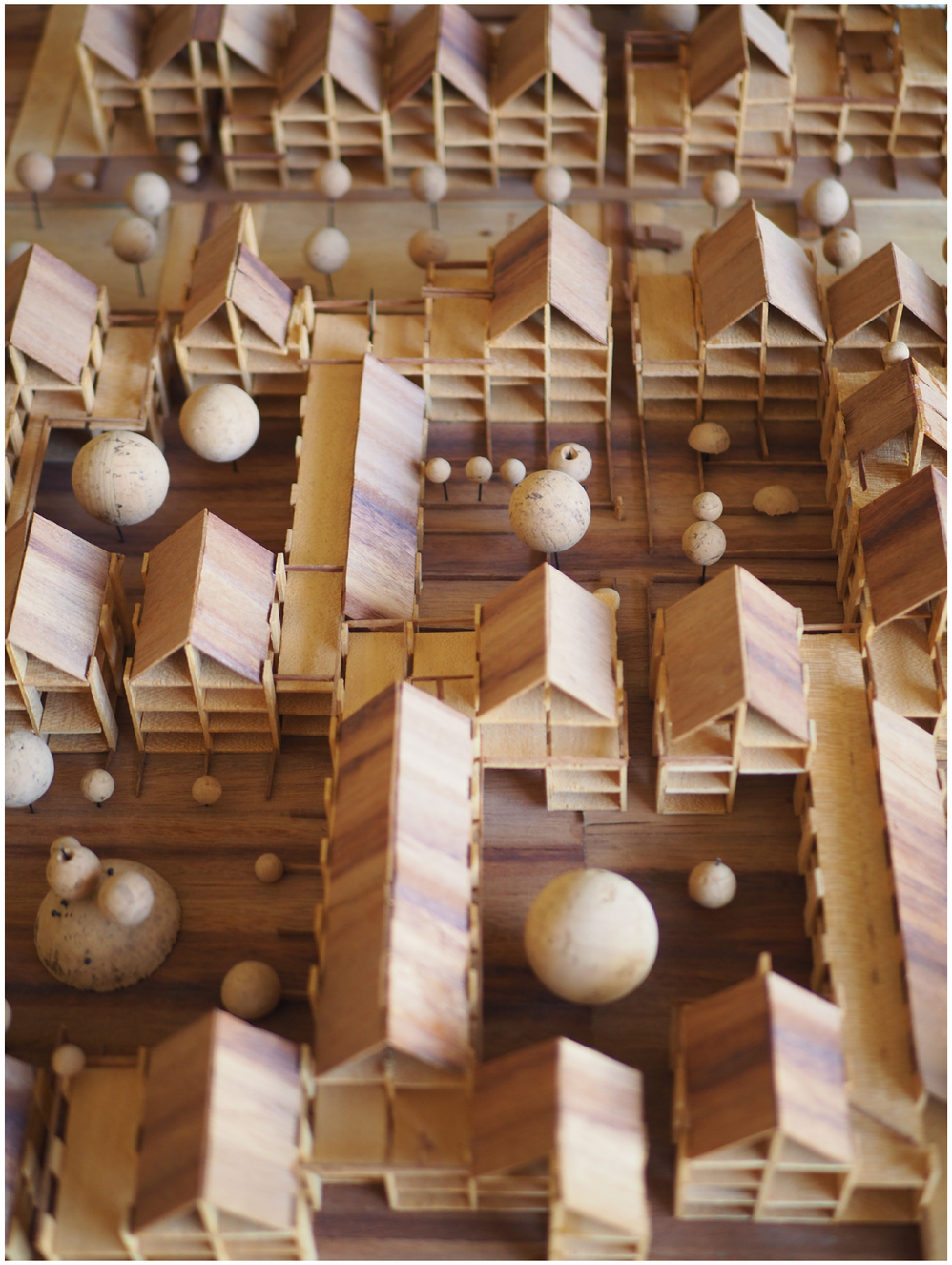


Figure 30. Physical Model of Molenvliet Support Structure

intent for the users to have a degree of control on the design of the façades and public outdoor areas which was ultimately rejected by the Greater London Council.[69] A separation of support and infill not only enables a separation of ownership between users, in terms of public and private space, but also enables different parties such as the housing organisation, local council or the government to have control over a physical part of the housing scheme.

The support-infill relationship can also imply a hierarchy between the parts. Habraken describes this as the law of dominance, a vertical relationship when one power is able to have direct influence over another. The most literal relationship is the vertical relationship between a column and a beam, the former not only supports the latter but is necessary for its existence, the same can be said between that of infrastructure and buildings.[70] The diagram, a translation from a SAR publication[71], expresses four levels in this vertical relationship which links together the scales of the neighbourhood, cluster and building. The support level negotiates an inbetween space between cluster and building (level three) and, according to the SAR methodology, is the level at which the architect should operate. The diagram also reveals the relationship between the levels. Control is exercised through the levels from top to bottom but influence (inspraak) is exercised from the lower level upwards. For example, "the individual has the rights to give their ideas about the support, to a higher level"[72]. This organisational structure brings about an equilibrium between bottom up participation and top down design.

A separation of hierarchy in theory provides a more time and cost-efficient construction and management process as it results in a clear division of responsibilities. It also opens new channels for flexibility as the elements at each level typically have different life-spans, the structure being virtually permanent but the windows are able to be replaced over a few years. One can relate this Stewart Brand's diagram of six layers of building which expands this theory to the separation of a building into six parts: Site, structure, skin, services, space plan and stuff.[73] However, whether a division of responsibility really provides economic benefits as well as social benefits is still debated.

"One of the critiques of the project was whether an assembly kit (infill) was really a desirable way of doing things. Due to the long time scale of the changes made to the infill, it would possibly be more economically viable for it be constructed traditionally."[74]

- Hamdi Nabeel

The division of the production of housing into two parts, the support and infill, brings into play a new attitude towards housing, a separation of control which allows for user participation in design, a creation of a hierarchy of scales and consequently a new role for the architect.

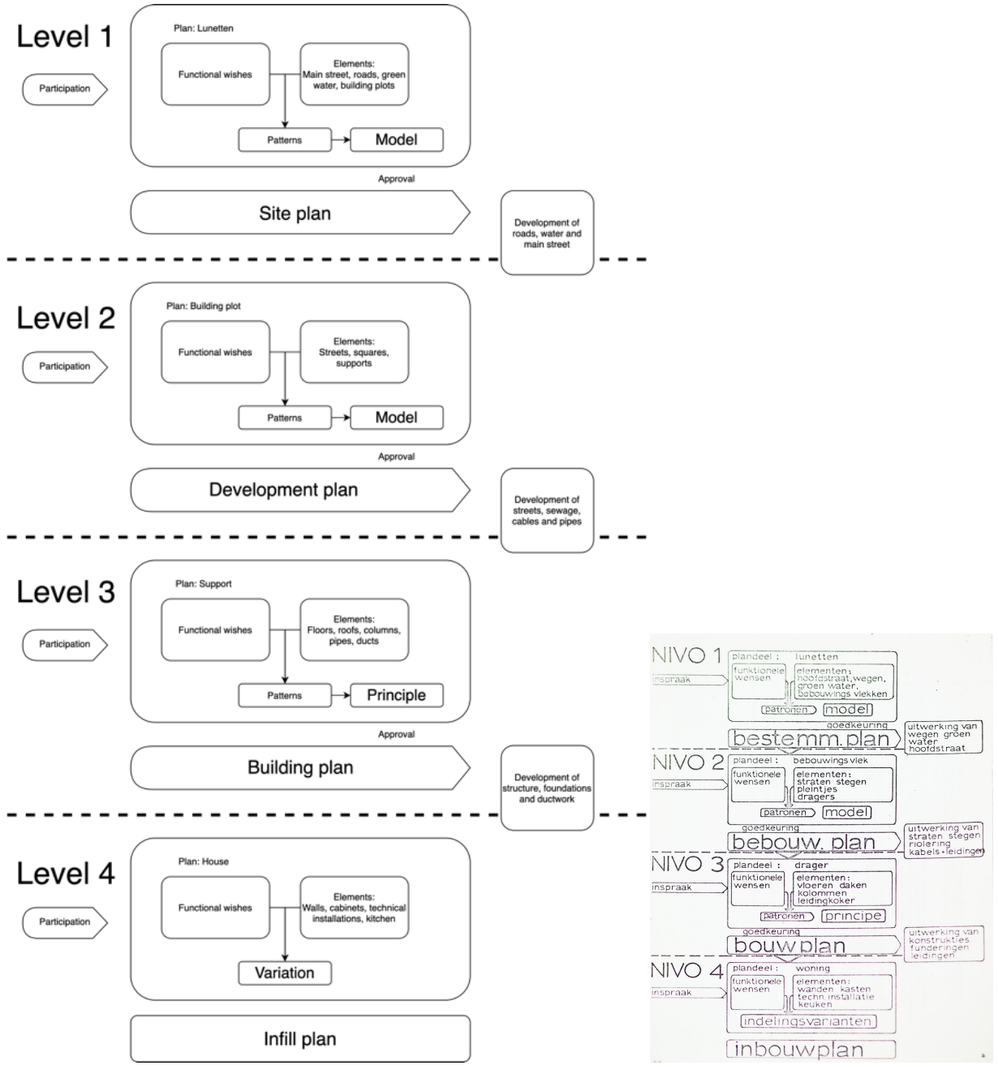


Figure 31. Diagram by SAR showing different levels. Translated version created by author.

Know? the Users: Heterogeneity

At first, the title of this pattern might seem obvious, a knowledge of the client/end-user is an essential part of any project. The difference between a truly participatory user consultation process and a traditional user consultation is the former requires the architect to enter into the conversation with users without pre-conceiving an intent, or simply put by van der Werf, an open mind[75]. Not doing so could result in the architect pre-empting the words of the user and leading them on to confirm pre-determined ideas. In extreme cases, this is user manipulation .

Conversely, it is also wrong to think of consultations as a purely mono-directional transaction, of the architect extracting the ideas and preferences of the user. As Hamdi explains, if the architect was to ask the user "what do you want?", the answer they would get back would most likely be "what can I have?".[76]

Below, both architects recall some of the stories from consultations with their users:

"A mother and a daughter had been on a housing waiting list for about 6 years. While the council was building houses for two people, they all consisted of a double bedroom, whereas this family required two separate single rooms. With our scheme they were able to achieve this. The daughter would also come home later at night so she also wanted her bedroom door to be further away from her mother's so that she wouldn't disturb her. [The participatory process] allows details like that." [77]

- Nabeel Hamdi

This approach directly opposes the classification of users as a monotonous whole and allows specific needs to be addressed, such as different family compositions, the needs of the elderly, disabled as well as personal quirks and preferences. In addition to intensely participatory interviews, Hamdi employed many other methods of engaging his users in design. The complete process involved multiple meetings with all prospective tenants, with some purely for the purpose of getting to know each other. Handbooks were introduced to the tenants including basic instructions for reading a plan and an exercise that allowed the tenants to place furniture and partitions on an empty gridded plan. Afterwards, each family were allocated approximately three hours of individual meeting time where the architect interpreted the tenant's needs through a professional and practical lens.[78]

Van der Werf recalls a more extreme example of his meeting with a young man with mental disabilities. During the meeting, the young man was strongly against the idea of adding any partitions to his allocated unit.

"The young man said he hates spaces. So, what do we do? At that point a thought came into my mind, I asked him do you have a mother and does she come to visit you? He said yes. I proposed to him to have partitions around the toilet so his mother would feel safe. He looked at me and exclaimed, 'that is a good idea! I then

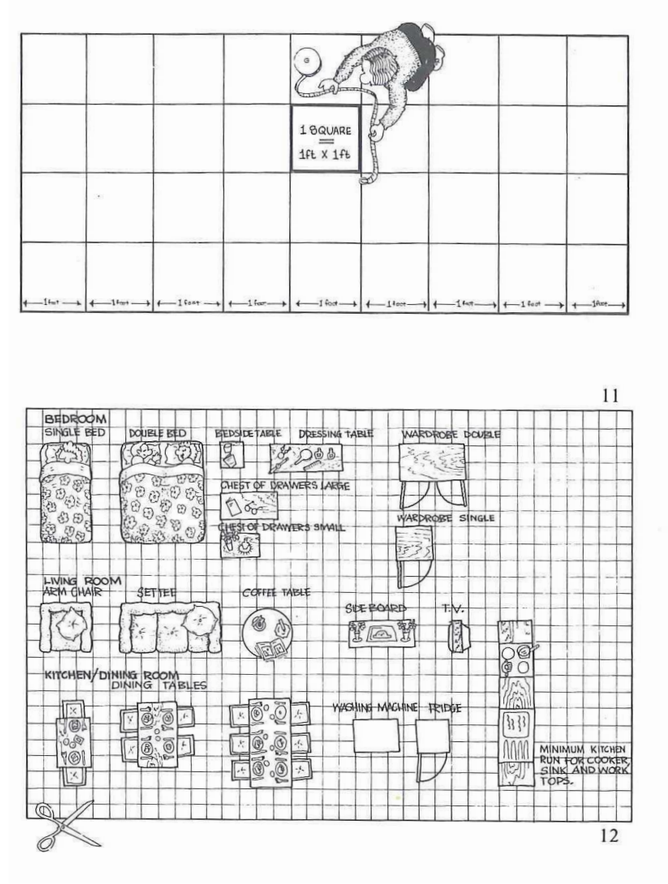


Figure 32. Extracts from self-design handbook developed as part of the participatory process at Adelaide Road

Figure 33. Intense user consultations as part of the Adelaide Road Project

explained to him that the council are offering you a shower which you would need to enclose so that the water is contained. He looked confused so I began to act out how one would clean the floor using a shower. It was a kind of theatre. The young man immediately accused me of adding another space and manipulating him. In the end we came to the compromise of putting the toilet and shower in the same room and leaving everything else open. After some years I visited him and to my surprise he had made his own bedroom with 4 walls right in the middle of his apartment. That is the beauty of open building![79]

- Frans van der Werf

Despite this story representing an extreme case, it nonetheless resonates with the typical dialogues that happen in these intensely participatory meetings. The architect is not a passive listener but instead uses his expertise to help the user find out their most ideal architectural solution, one which the user may not have thought of by themselves. To do this, van der Werf teaches us it is importance to establish "an ambience of privacy and trust", similar to that of a doctor's appointment as the conversations often touch on quite personal and sensitive topics.[80] Not only were the meetings a moment of discovery for the users, the bespoke floor plans that resulted question the standards and conventions of the industry as well. Van der Werf describes another example where an Indonesian family came to the conclusion that they would all like to sleep together in one space. According to Dutch housing regulations, their home would not be considered as a dwelling. Fortunately, the project was able to challenge and change this small piece of regulation before construction. However, as in the Adelaide Road case, the architect had to 'pre-design' all the units for planning approval before undergoing the participatory design process, showing that the building industry still needs to catch up.

The title of the pattern, to 'know' your users, shouldn't be the goal of a user meeting. A superior objective should be to activate users so that they can have a dialogue with the architect following a horizontal relationship, only then can it achieve a bi-directional co-creation process rather than a mono-directional informative process. According to Wakely, this activation of the user can be broken down into empowerment and enablement, where empowerment is the granting of responsibility and enablement is the granting of the tools required in order to fulfil this responsibility.[81] A feature of the participatory processes at Adelaide Road and Molenvliet is that they exercise both of these concepts. They empower the user by creating a framework that gives them a chance of expressing themselves and they enable them by providing them with handbooks, models and sketches that translate their aspirations into architectural form. A large difference between manipulative consultation and co-creative consultation is that the former usually fails to enable the user after it empowers them.

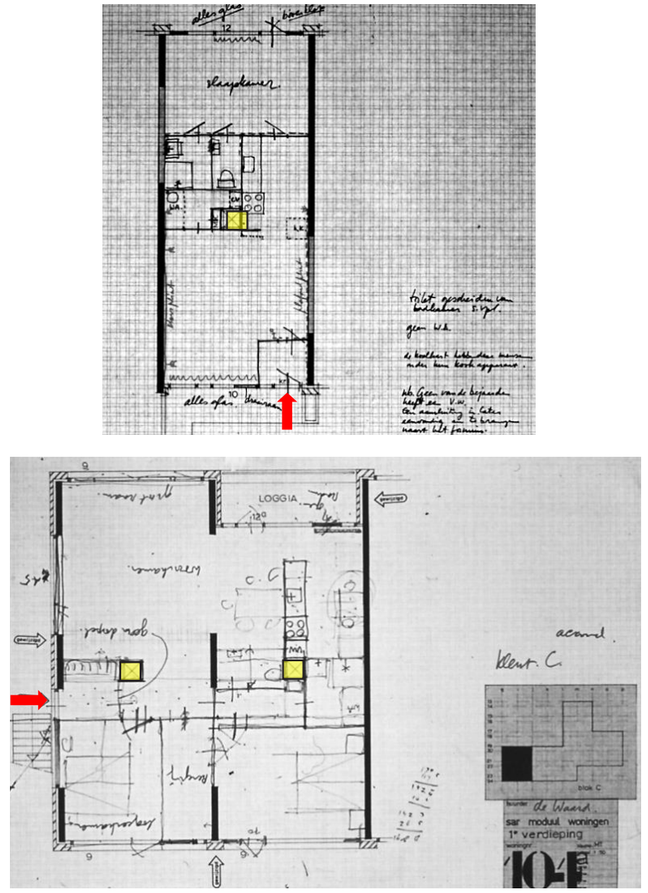


Figure 34. Sketches made at Molenvliet user consultation

Figure 35. Intense user consultations as part of the Molenvliet Project.

Create Levels of Community: Clustering

In contrast with the pristine 'tower in a park' modernist housing ideal, projects that address the social dimension of architecture, especially participatory designs, tend to materialise in a more humble form, often in low rise-high density solutions. Clustering plays a vital role in generating social networks at different levels, both case studies demonstrate this to varying extents.

"Courtyards with looping streets are a key solution for high density, low rise structures, here daily life has a chance."[82]

- Frans van der Werf

Through the Molenvliet project, van der Werf ties together the theory about support and infill with pattern theory. For example, he makes reference to the pattern "*Courtyards which Live",* identified by Christopher Alexander in *A Pattern Language*, which provides instructions on how to design a socially successful communal courtyard: create gaps in the courtyard to connect it with the outside, make a veranda so that the threshold between inside and out is less abrupt.[83] Van der Werf then interprets this pattern further by adding his own observations. He describes the size of the courtyard should not be too large as to make it difficult to make out who is standing on the other side and not too small as to jeopardise privacy. From this it is clear that the use of courtyards in Molenvliet is underlined by a social justification, Van der Werf elaborates on this: "A courtyard also has a positive effect on neighbourhood life. It is uniting and collective, socializing neighbours, family and friends, a shared 'living room', a quiet setting and a safe playground for children. It is concentric and has a centre, the natural place for a tree, a fountain, a statue or a special little garden. It has corners, casting shadows at different hours of the day."[84]

The clustering on the courtyard scale is only one of the many levels of social connection present in Molenvliet. By virtue of each floor being accessed by a continuous external gallery, families who share the same route to arrive at the communal staircase share a closer communality. On a larger scale, the courtyard cluster repeats 4 times, allowing each cluster to have its own unique character as the focal point of each courtyard also varies. The Molenvliet project as a whole has an identity ditinct from the housin developments around it, creating yet another level of social interaction.

Whilst the courtyard typology is ideal to create clusters at different scales, it is not the only method. Nabeel Hamdi also achieves a gradient of social relationships through the careful placing of the housing blocks and the unique way housing blocks are subdivided into units at Adelaide Road. By providing a variety of housing types and thus allowing a mix of family compositions to inhabit the same building, Hamdi creates a more diverse, heterogeneous community.

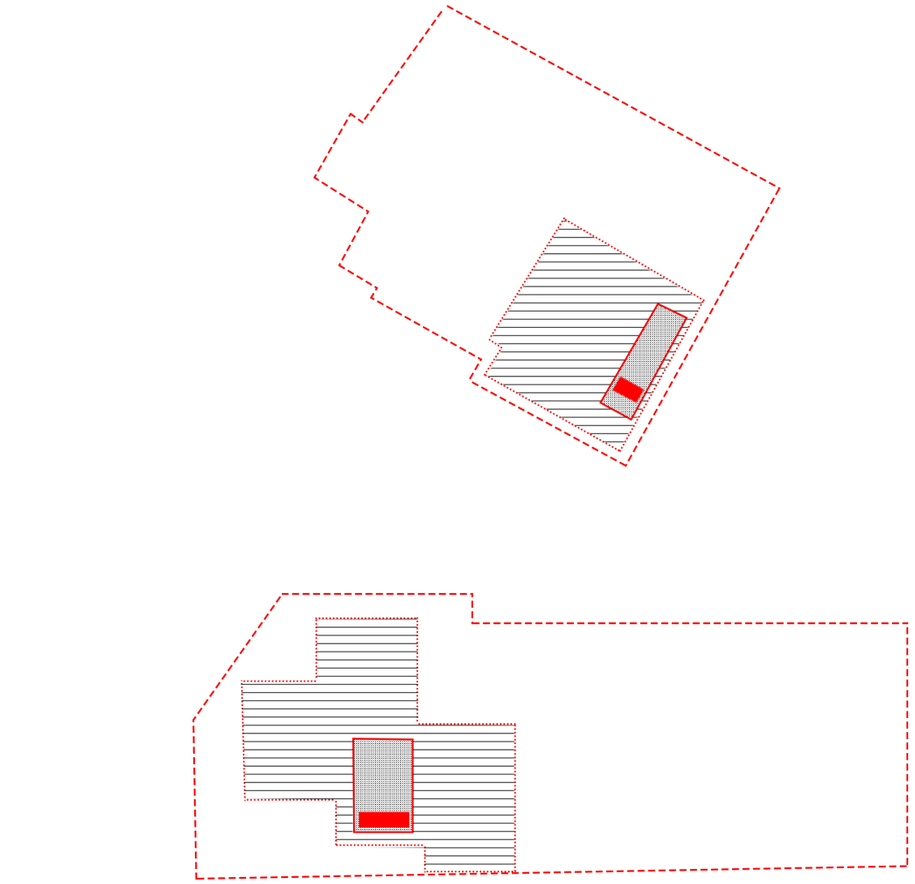


Figure 36. Levels of social interaction represented by levels of physical form (top Molenvliet, bottom Adelaide Road)

"[The objective was] the development of a standard structure which could accommodate a wide variety of dwelling types (from 1 to 8 persons) in which the mix need not be decided until a late stage in the contract, and one which could be adapted simply to meet changing demand."[85]

- Hamdi Nabeel

The Adelaide Road project is organised through eight seemingly identical blocks. Clustering is achieved on the building level by orientating the front entrances so that two blocks look onto each other. These two blocks share the same access routes from the surrounding main roads and so their inhabitants share a close 'neighbourly' relationship. At a higher scale, a group of four blocks share amenities such as parking areas, creating more levels of association and, just as in the Molenvliet project, the entire scheme is clearly articulated as a distinct neighbourhood among the surrounding developments.

The pattern of clustering is indeed a more general pattern that is evident in many low-rise housing cases, regardless of whether the processes behind them are participatory. Even though this pattern is not exclusive to participatory housing projects, it is still relevant as creating a sense of community cohesion at different social levels is key to collaboration, self-help and ultimately, self-determination.

Figure 37. View of courtyard through alley

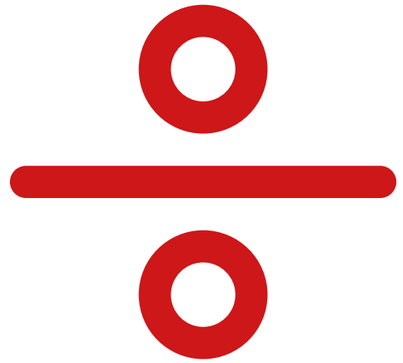
Conclusion

Three patterns of participation were obtained from the comparative study between the Molenvliet and Adelaide Road project. Firstly, both cases were heavily influenced by the support-infill theory of Habraken and this resulted in the clear articulation of both elements in physical form. At Molenvliet, an innovative, flexible fontanelle wall[86] system fulfilled the construction aspect of the support. Large communal courtyards framed with external access galleries acted as a social support which gave rise to the users inhabiting the space with their own furniture, blurring the boundary between private and public realm. At Adelaide Road, the signs of fontanelle walls are less obvious but the essence of a flexible, incomplete composition of load-bearing walls is still present. These are then infilled with elements from Hamdi's housing assembly kit to accommodate a variety of different family compositions and subsequently, ways of living (see figure 53, p120).

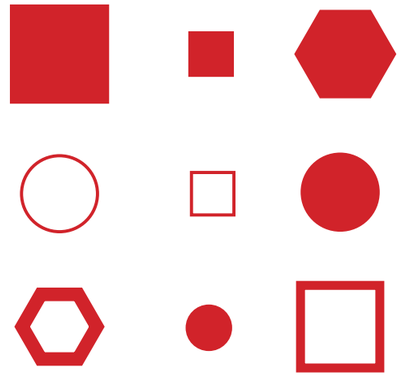
Secondly, both housing processes used creative methods for simplifying the transition between aspirations of the user and built form. While the previous pattern provided the 'space' necessary for participation, this pattern enables the user to fulfil the potential of the undefined area of the project. Through intense but casual interview sessions with families, both architects uncovered details of the design brief which would have been impossible to predict prior to the participatory process. This was made possible because the architects relocated their positions to gain the trust of users, so that their relationship with them changed from a vertical to a horizontal one.

Thirdly, the careful use of clustering at different scales, creating different levels of social interaction is evident in the composition of both projects. While this pattern does not result in user participation directly, it anticipates the participation of users in the future through fostering collaboration. Moments as trivial as meeting a neighbour on the gallery are building blocks for creating a common identity and a mutual feeling of responsibility over shared space. This is a crucial ingredient for the maintenance of participatory space.

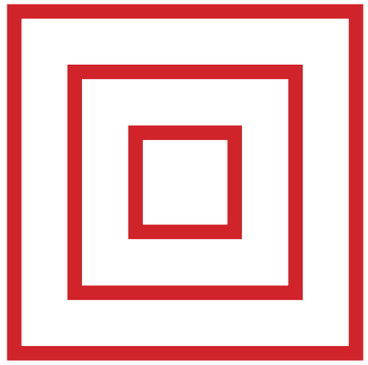
Next, two more pioneering examples of co-creation will be explored, the Byker development by Ralph Erskine and La Maison Médicale by Lucien Kroll.



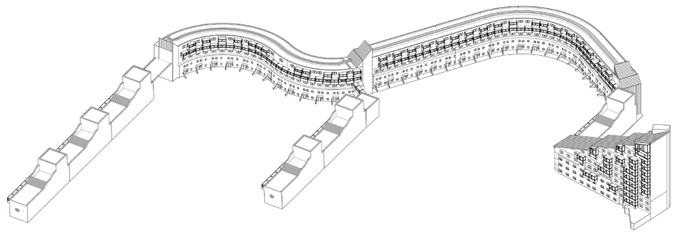
Support and Infill



Heterogeneity



Clustering



Byker

Byker is an area of Newcastle, UK, which was formerly the site of dwellings for mine workers and shipyard workers that fell into disrepair after a surge in its population. In 1968, an independent public-opinion poll found 80% of local participants were in favour of demolishing the entire area and rebuilding. Ralph Erskine was chosen as the architect for his dedication for preserving the intricate social structures inside the Byker community.[87] As one of the founding members of Team Ten, he opposed the traditions of CIAM and instead pursued radical alternatives to traditional modernism, especially interpreting vernacular building forms. Neighbourliness and intimacy became key features of Erskine's work which in the beginning arose from an ecological standpoint as in his project at Resolute bay in the Arctic circle, where he used long wall like forms to protect and nurture a community. This form then later transcended into housing schemes such as Brittgarden where it functioned as a frame for an urban community as well as an environmental barrier.[88]

The Byker redevelopment is valuable to study as a participatory process for two reasons. Firstly, the scheme is important as its authorities were sincere in its goal to engage with Byker's community. Erskine elaborates this point, "...environmental quality can only be common if it becomes an important objective for the community at large and for its politicians and administrators. Left to individual architect's good will, it will remain the occasional 'one-off' phenomenon"[89]. Secondly, Erskine took a very unique position in relation with the inhabitants as on the one hand he was eager to understand and fulfil the needs of the inhabitants while at the same time insisting on certain decisions where he felt he held a greater authority as a trained professional.

From the beginning, Erskine's mission was clear, having a Anglo-Swedish background, he took radical steps to immerse himself in the Byker community. Two of his employees, one of which his daughter, were asked to move into the area as a form of site research a month before accepting the commission.[90] Furthermore, Erskine

Figure 38. The Byker wall from the gallery

set up his own branch office inside the Byker community in a disused funeral parlour. The function of this on-site office was multifaceted. An extract from one of the office day records reveal that inhabitants not only visited the office for technical queries about the building and official tenants meetings but also informal and recreational purposes. At times, the architect felt he also needed to exercise his own intent. As an example, to combat the inhabitants initial dislike for playgrounds, which they felt would be noisy and devalue nearby house prices, Erskine built a fully functioning playground on an empty plot outside the site-office. Over time this place proved to be popular and the inhabitants were successfully convinced of the architect's intent. Another architect-led initiative was the introduction of a wholesale potted plant shop and landscape consultation office which would encourage people to populate the galleries with more greenery. The architect attributes this passivity of Byker's inhabitants with the attitude people have in England towards social housing: "Accounts of Third World self-build housing and blue-prints for tenant takeover may indeed shape our practices tomorrow, but in England now most professionals, whether they like it or not, have to work with an acquiescent population which expects authority to take decisions and which is roused to militancy only when the decisions are appalling."[91]

'The architect on site' was a crucial part of Erskine's participatory methodology. Its success and longevity comes down to the acceptance of the inhabitants. In Byker, the role of the architect on site extended far beyond the architect's traditional responsibilities and hence was able to be more accessible to non-professionals. Thirty years later, a competition to renovate the Byker development used the same method. The five practices took turns to live in the community for a week. An interview with one of the project teams involved revealed that this method achieved similar success to its predecessor. People who came to the office meetings were not only adults but teenagers too. The architects were involved in the community on a personal level too, as an example, a junior architect used to play football with the local boys and the office even celebrated the birthday of one of the children who regularly attended the office's group meetings.[92]

The new Byker development was also designed to accommodate a flexible housing mix, where larger units could be easily combined to form larger units. Erskine also introduced multi-purpose shared spaces, which he called hobby rooms, on ends of terraces adjacent to housing units. This was so that these spaces could be combined with the adjacent housing unit to form a larger housing unit if the communal space proved to be unsuccessful or neglected.

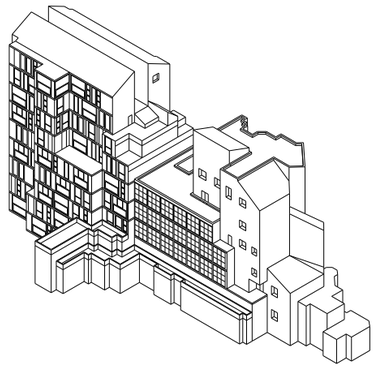
With the support of the authorities the Byker development was able to ensure an early allocation of homes for resettlement. This allowed previous neighbours to be housed together if they so wished. Moreover, it gave people ample time to plan and finance their homes .[93] This prerequisite for user participation coupled with the architect's on site experience and the flexible design of the housing, resulted in a rigorous participatory design process which proved successful through strong sense of community and the continuation of the architect's on-site office long after the completion of construction.

Daybook Record

Time	Name or Description	Reason for Visit	Action	Comment
8:50	Mrs. Smith	Asked for sand from sandbox for grandchildren to play with	Got some	
11:30	Mrs. Spraggon	Reported gas leak at Mrs. Smith's Carville Road	Phoned Gas Board	
12:45	Billy Bucket	Came for matches	Got them	
5:30	Thomas Something	Playing "hide and seek" wanted to hide here	Hit under table	Difficult to throw out
11:20	Man from first handover	Wanted his fence altered as rubbish blows under it	Said we'd think about it	
11:30	Mr. Campbell	To murder Arne because of trowel	Arne was not in unfortunately	
2:45	Mrs. Smith	Lady had fallen in Gordon Road, broken wrist and shock	Called ambulance, came after five minutes	
3:00	Mrs. Rogerson and friend	She wanted some grass seed	Got some in a very nice paper bag	Will come back with bag later
6:10	Eddie	To wash	Washed	
7:10	Mrs. Wann	Upset—kids broke window—news of move too much, broke down	Sherry and a chat	
9:15	Two men (NEEB?)	Said they had a cooker to fix in Shipley Place	Told them Shipley Place not yet built	They left in a confused state
10:00	Ian Muckle, Action Centre	To call meeting about Shipley Rise play area	Roger, Caroline discussed	Arranged for another tenants' meeting
10:10	Tenant, Gordon Road	Collected the key from Action Centre		Very happy man

Figure 39. Extract from daybook record from the on-site office

Figure 40. Site plan



Maison Médicale (la Mémé)

Around the following year of the Byker redevelopment, a new 'zone sociale' was proposed as an extension to the existing hospital owned by the Catholic University of Louvain, Belgium. This new complex was to house accommodation for medical students along with restaurants, shops and an underground station. Due to planning reforms as a result of the 1968 protests[94], the masterplan needed to gain the approval of the students who rejected it and subsequently recommended a new architect, Lucien Kroll, to take over the commission.[95]

Kroll noted two social approaches to housing design. Firstly that of the strict maternal authority, where the architect, justified by his/her professional knowledge, determines the needs of the users. Secondly there is the participatory approach that, through generating enthusiasm, recognises each user as an active part of the design process, as a node in a network where knowledge is exchanged and responsibility is shared.[96] La Maison Médicale (Mémé) was a firm expression of the latter. Through this project, Kroll sought to decouple industrial methods with the former militaristic approach to housing design and instead apply industrial thinking to produce organic architecture; an "industrial architecture without industrialists"[97] The wishes of every student's housing needs is not only granted but expressed in the variety of the facade. Even those who opted out of the participatory process were accommodated in the southern block which consisted of standardised room dimensions. This part of the building was later named "the fascists".

As a result, the site was a "battlefield of ideologies"[98]. Kroll, popular among the students, was fired when the students were away and accused of being an anarchist. The building embodied both approaches to architecture: the geometrical hospital building clashed with the organic medical school. This inherently political element in Kroll's architecture is noted by many authors. Franco goes further to describe la Mémé as the next step after Ralph Erskine's Byker redevelopment, "If the architect in Byker was a craftsman constructing a negotiated utopia, in la Mémé we might say that Kroll was an activist".[99] In plan, one can detect how this new political attitude towards architecture makes the building footprint seem as if it conforms with the landscape onto which it sits. Indeed, Kroll frequently uses the term 'landscape' (paysage) in *The Architecture of Complexity* to

Figure 41. Site plan of La Mémé

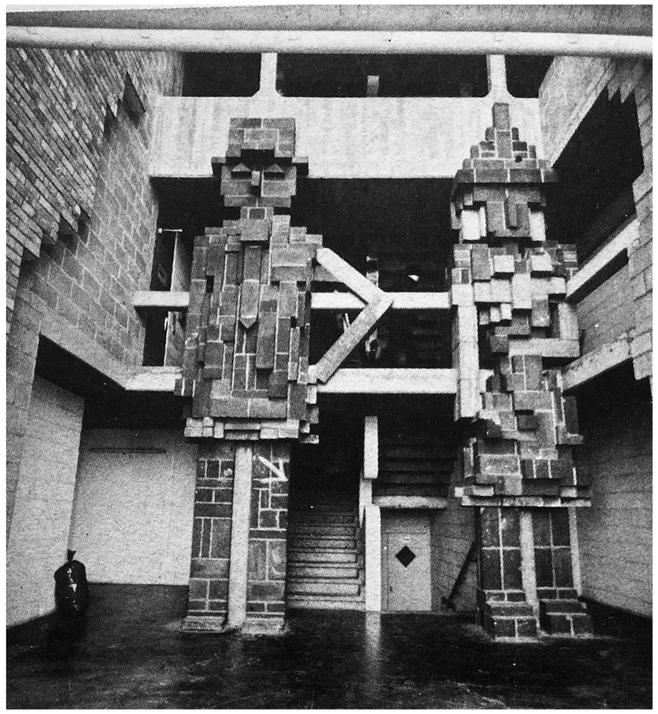
describe the multiplicity of spaces created by people on their surrounding spaces - haphazard, continuous, heterogeneous, instinctive, hidden, convergent, secular, anarchic, in zig-zag, sometimes retrograde, dense, abstruse etc..."[100]. Participation complements the architecture of this type, the facade of the building is already so random that if a student were to change the colour of one of the window frames, it would not seem out of place.[101]

To achieve such a complex composition, Kroll adapted the Tartan grid of 10 and 20cm bands for the coordination of the facade and internal layout. He also adopted the support-infill concept put forward by John Habraken. Habraken once said in an interview, "Lucien Kroll was the first architect to employ this [SAR methodology]... He was himself concerned with similar themes and he recognised us as a support, because we could underpin that methodologically."[102] However, distinct from some of the other projects that derived from SAR theory, the infill did not come from a predetermined 'assembly kit', as in the Adelaide Road project, but could come from a larger variety of sources including any product on the entire market, bespoke products made by artisans and even DIY pieces made by the students themselves. The support was also designed to enable all these possibilities to come together in a finished building. In this sense Kroll's proposal took a more radical step towards an idealised 'open' utopia.

At a detail level, Kroll questions the meaningless precision that current industrial methods require, he claims it comes from "a militaristic inability to distinguish between the necessary and the pernicious, which goes hand in hand with the destruction of cultural specificities through colonial conquest, and with the exploitation of national and human resources." He goes on to say that this extremely limiting way of limiting only benefited bureaucrats in streamlining, and at the same time sanitising, the building process.[103] In protest of this, he encouraged the carpenters to sculpt the form-work of the concrete and the bricklayers to experiment through moments of creation (figure 42,43). What was traditionally a mindless task was made into an act of creation. Similarly, Kroll proposed a random composition of columns purposely designed to avoid alignment. Despite this approach creating structural redundancy, Kroll justifies this choice by saying it allows more participation, for a regular column spacing limits the placement of internal walls and thus limits the possibility of internal arrangements, whereas a random arrangement frees the mind and stimulates the imagination.[104]

At the same time, Kroll's obsession with opposing the strict militarism of industrial products, or a "Proto-industrialisation of building[105], meant that plurality and variation were, at times, artificially constructed: sometimes a window was adjusted purely because it lined up too neatly. [106] Met with opposition in the form of bureaucracy, similar to Fathy's experiences in New Gourna, University officials had, over time, changed and their acceptance towards Kroll's participatory approach and the authorities redirected funds to non-participatory parts of the school. Eventually, only half of the proposed 40,000m^2 was built.[107]

Near the end of his book, *An Architecture of Complexity,* Kroll critiques the misuse of computers by architects for design, "it is much more complicated to program a number of moves which are simple but varied than to cope with a few complicated moves which are always repeated". He defines the former as the creation of a



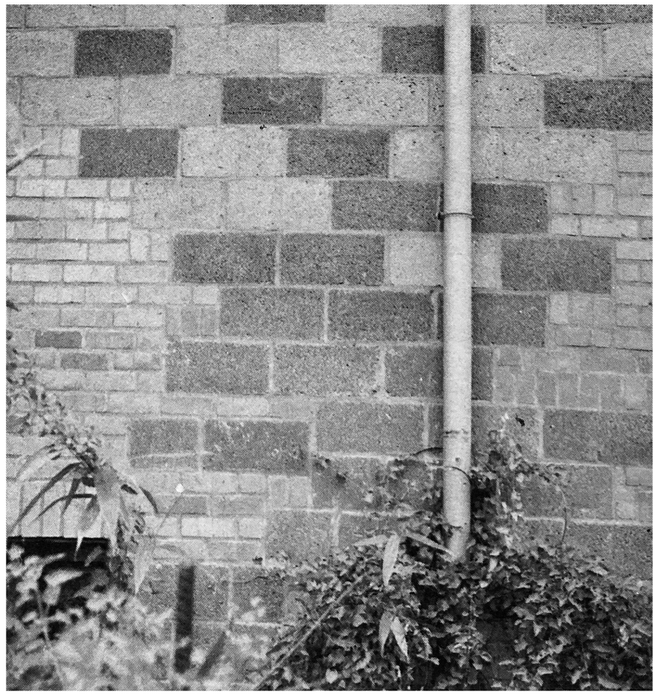


Figure 42-43. Participation of construction workers.

'process', a complex, multi-layered method that benefits architecture, and the latter the creation of a 'mechanism', a complicated mono-dimensional method that benefits modern contractors.[108] This should not be read as a critique of technology itself, as Kroll guides us to utilise the power of technology as a tool to coordinate a wider variety of components. He therefore locates the role of architects as that of architect-operator, an individual that is able to use technology as a part of a process and not be consumed by it, resisting the urge to relinquish full control over to automation.

The implications of technology on participatory architecture will be explored further in the next chapter.

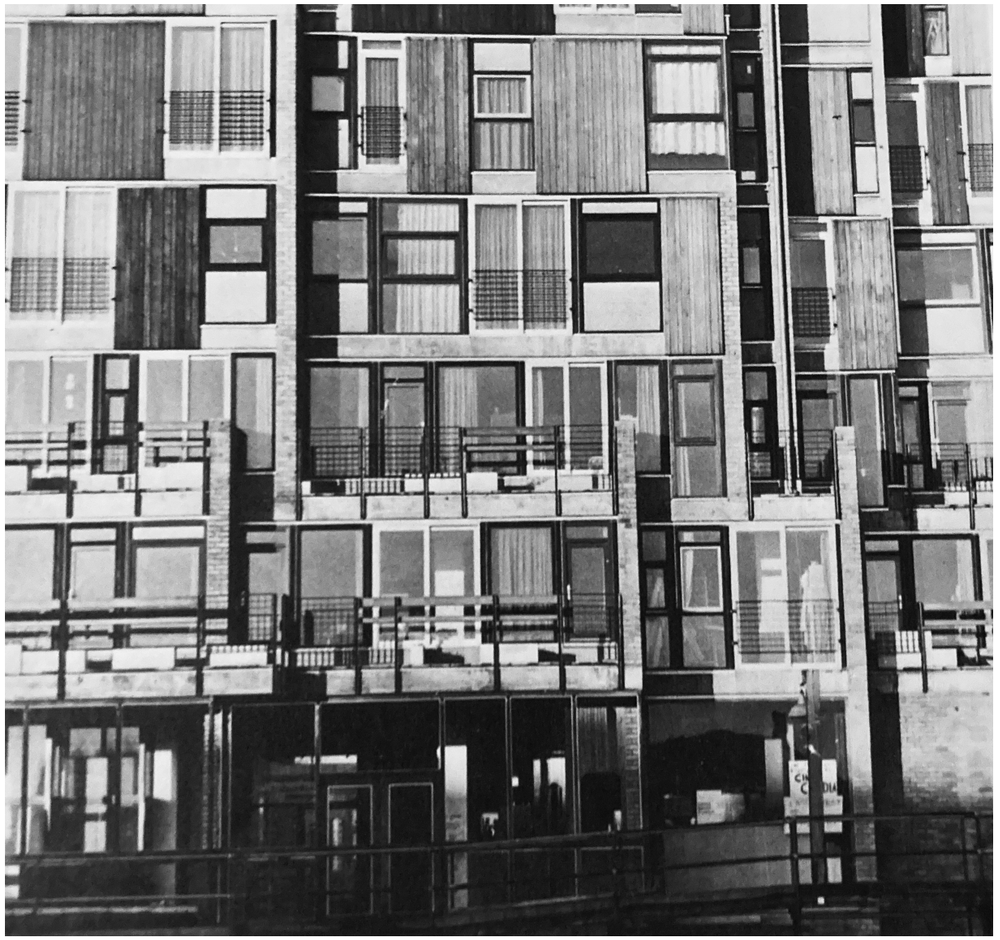


Figure 44. Facade of diversity.

5. Future Technology

Computer aided design tools began to gain popularity as a design medium in the late 80s and early 90s. Before then, the computer's role in architectural design was mostly to produce simulations of reality or as an archive for documenting buildings.[109] Therefore, in almost all of the case studies included in this study, computers were not being used in the design process as the integral, complementary design tools which we regard them as today. Here in the 21st century, we can explore what new opportunities computers offer to participatory design Can new digital methods make previously unimaginable levels of participation possible on a mass scale? This chapter introduces two new participatory precedents that utilise new technologies as an integral part of their methodology. We will explore how each example opens up new possibilities for the future of participatory design.

iBuild Global

iBuild is an initiative co-founded by Lew Schulman and Nancy Welsh to create an app that coordinates and facilitates the construction of buildings. Primarily based in Kenya but now expanding to India, Nigeria, South Africa and Indonesia, iBuild is providing a digital platform that brings together potential clients with suitable contractors, architects and suppliers, formalising and adding transparency to a previously uncoordinated, informal process. It has been marketed as a construction industry version of Airbnb or Uber as it has similar shared economy characteristics.[110] However, in an interview with one of the founders, it was discovered that iBuild offers a lot more than a pairing service as it digitises the entire ecosystem of building, such as managing micro-payments, granting loans and signing off on completed milestones.[111]

The process begins from when a client initiates a project via the app, the scale of which could be anything from a chicken coup to a large public development. The app then asks the client to fill in details of the project, such as what stages of building are required, the program of their building, does the client already have design drawings? Once the project is made public, contractors, architects and suppliers can 'pick up the job' through the app and put in quotes to the client. After the client selects the most suitable people for the job, online transactions are then facilitated following completion of milestones which are agreed by all parties. Proof of completion can be shown through submitting geo-tagged photos of completed building parts, meaning that the client does not even need to be on site.[112]

Although iBuild is fundamentally different to a typical participatory housing process, in that it only creates a climate for participatory architecture to occur, it remains interesting to see how applicable the patterns of participation, concluded above, are.

The first pattern, source, described a centralised location that aided the production of buildings. In iBuild, this source could perhaps be represented by the company's servers. Every user's mobile phone has access to a centralised repository of different contractors, architects and suppliers, each complete with ratings from

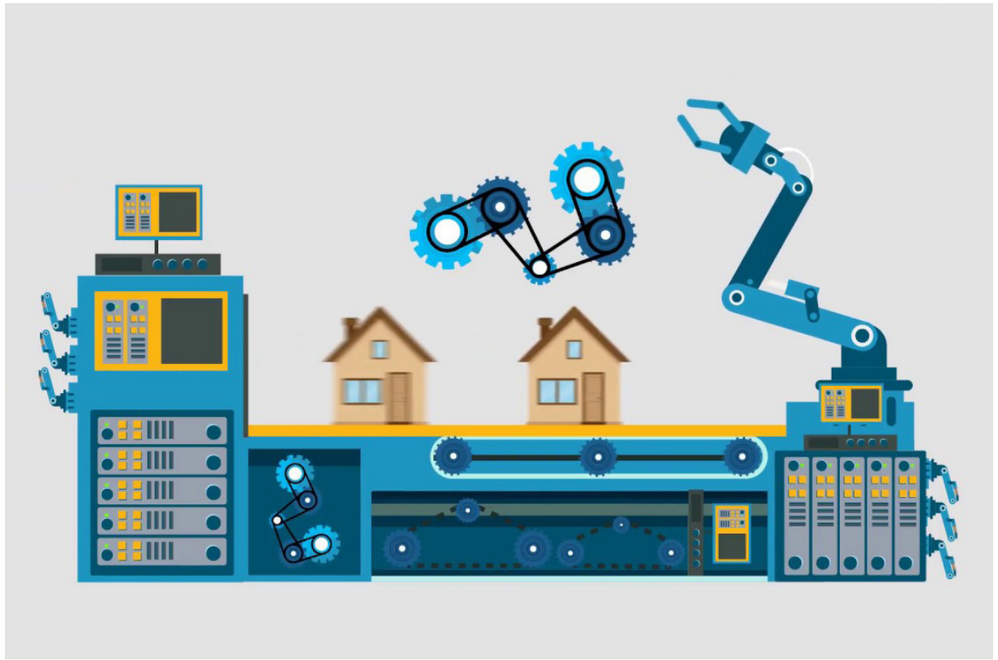


Figure 45. Ibuild is a digital method for the production of houses

previous clients and a complete CV on their previous activities on the app. Whilst the previous case studies have explored the source as a material and knowledge resource centre, this case study expands this definition to include that of a human resource centre. Furthermore, in a similar way to how, for instance, a centralised material distribution centre replaces informal systems for the distribution of building materials, the iBuild app replaces informal hiring mechanisms popular in the global south. Informal labourers can be found loitering around street intersections, looking to pick up informal jobs. As one of the co-founders explains, this exposes that labourer to exploitation and danger as there is no mechanism in place that ensures he is correctly paid or treated.[113] A digital platform is able to offer a fully transparent ecosystem where all parties can be held accountable for their actions.

Although architects play a much smaller role in the iBuild methodology, being limited to the role of a service provider, the developers at iBuild have taken on a unique role that is comparable to that of the architect-community activist. Despite using technological means, the aims of iBuild is still in line with bringing the community together through simplifying the ways clients, suppliers and builders can engage each other. Although iBuild is primarily marketed as a smart-phone app, users can equally participate in the system through cell phones by texting (using USSD). Approximately two thirds of all users on the app communicate in this way.[114] This feature opens up the app to a much larger audience, particularly in the global south while also simplifying the building coordination process. In this sense, the app plays the role of coordinator and simplifier, roles which could become relevant to the architect in the future.

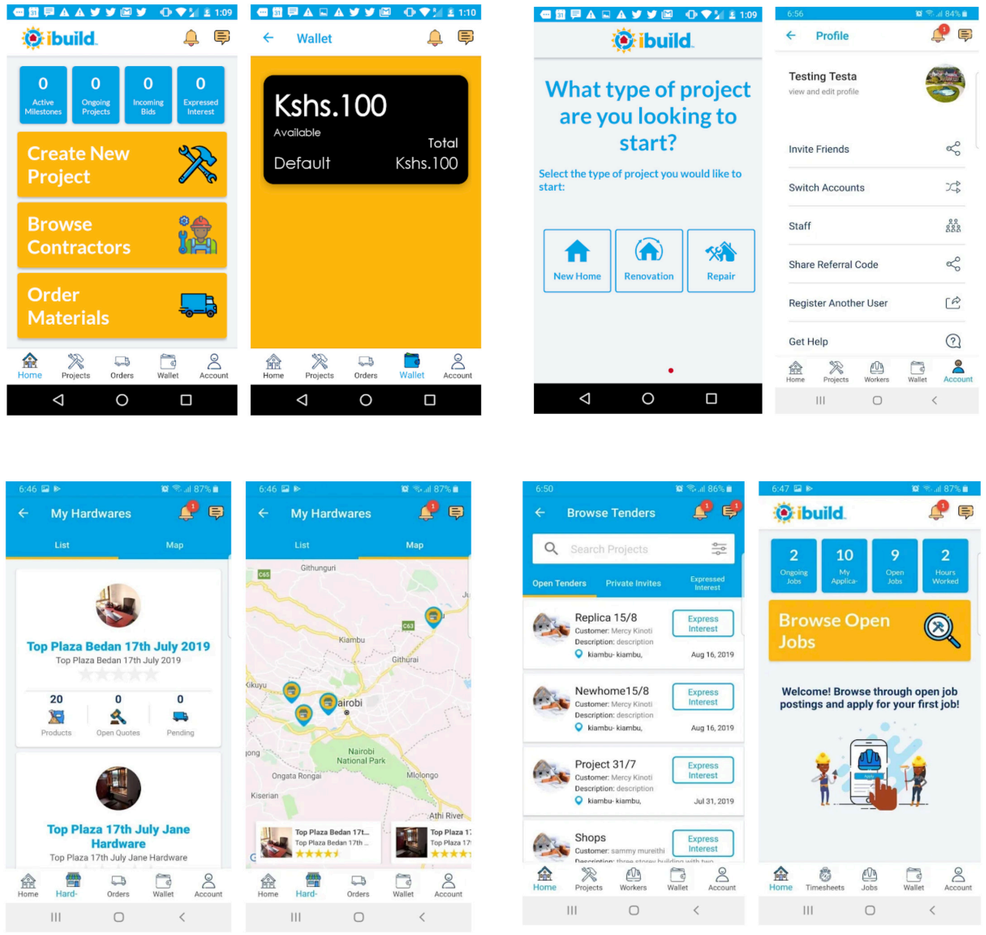


Figure 46.Screenshorts of the iBuild app

Configurative Design

This last example of participatory design included in this research is not a specific project nor a digital platform. It is an area of research that explores the potential for architecture to be produced through computational methods. As Pirouz Nourian, a leading researcher in this field, explains, configurative design differs from parametric design as its focus is on deriving solutions through computational decision making as opposed to generating geometries through computational mechanisms.[115] The fact that it prioritises configuration over form makes it very applicable to participatory housing, which also deals with the process behind how forms are arranged rather than the design of forms themselves.

Configurative design is not a new concept. Since the introduction of computers into architectural practice in the 1980s, the idea that the computer could generate design as well as visualise and document it existed. Even as early as 1971 theorists such as Yona Friedman identified a lack of objectivity in the way spaces were designed for people. While designs for parking garages are strictly guided by quantifiable properties of the movement of vehicles, the same cannot be said for the design of houses for people. Many architects might justify this by expressing that humans are distinct from machines in that their needs cannot be represented by binary choices. Nourian explains that whilst this is true for some aspects of the built environment such as style, comfort and aesthetics, many decisions about the built environment, when concerned with specific details, can be boiled down to a binary question: Does this opening need to be large enough to fit a sofa through it? Does the light need to shine onto this balcony at 5pm in the afternoon? The need to discretise design decisions is crucial in a participatory project as it simplifies the language of architecture to the participant, who is more interested in the implications of design decisions, not the exact definition of the decision itself.

Some qualitative aspects such as comfort, value and sense of identity cannot be represented discretely yet are fundamental to the design of the built environment. They can, however, be measured and evaluated based on very specific criteria. It would make sense for these measurements and evaluations to be carried out by a computer as it is incapable of bias as opposed to a human who's decisions can be effected by external variables. This is a sensitive topic as it brings into question ethical issues as well as worries that automation will replace

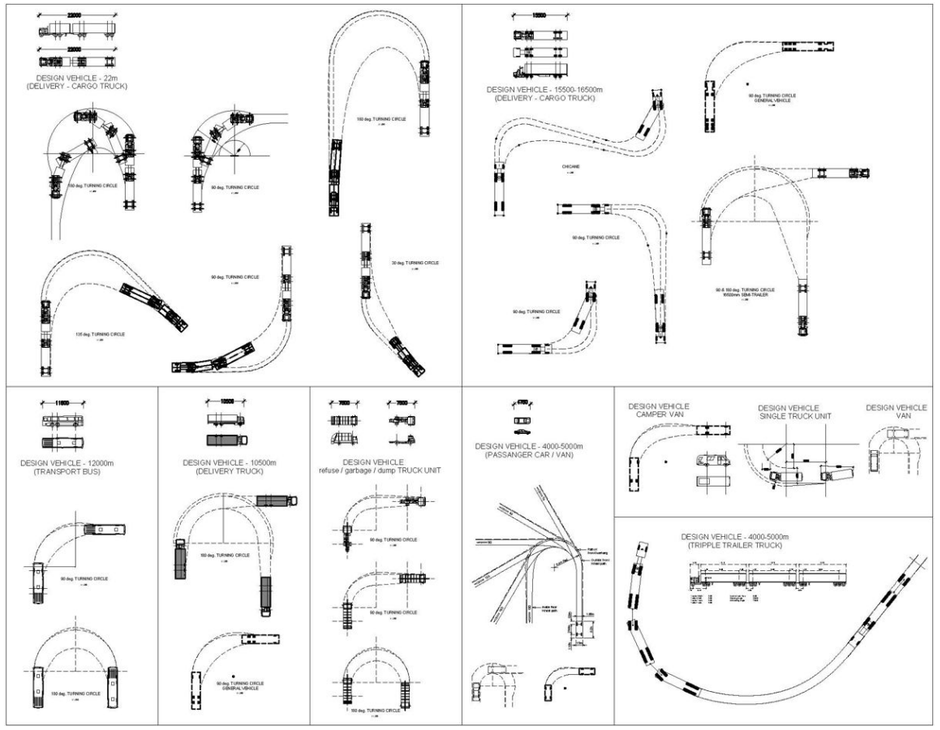


Figure 47. Design is heavy guided by the ergonomics of vehicles.

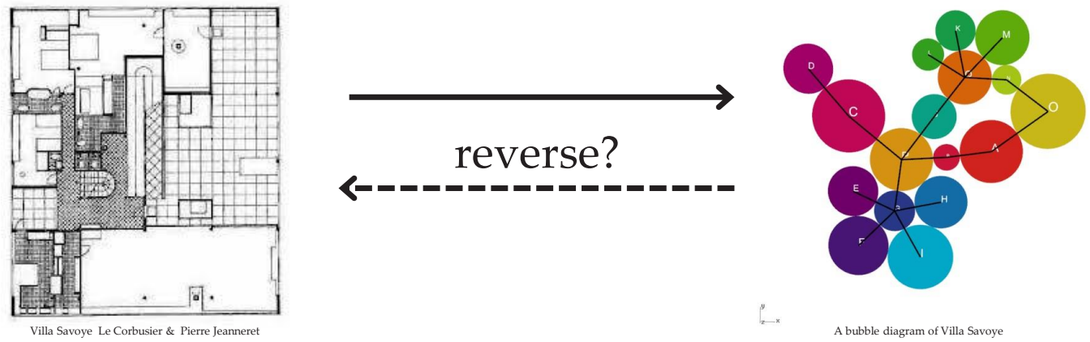


Figure 48. The top arrow shows the basic simplification operation of the computer, its ability to translate architecture into an understandable representation, in this instance, a bubble diagram. It then asks a very provoking question - can this process be reversed?[117]

the role of architects. These worries misunderstand a key point in that evaluation does not equal decision. The computer has no interest in making decisions just as a prefabrication plant has no interest in making all houses look the same. Instead, computational methods can be used as tools to arrive at specific conclusions and help the architect or user make more evidence based decisions.

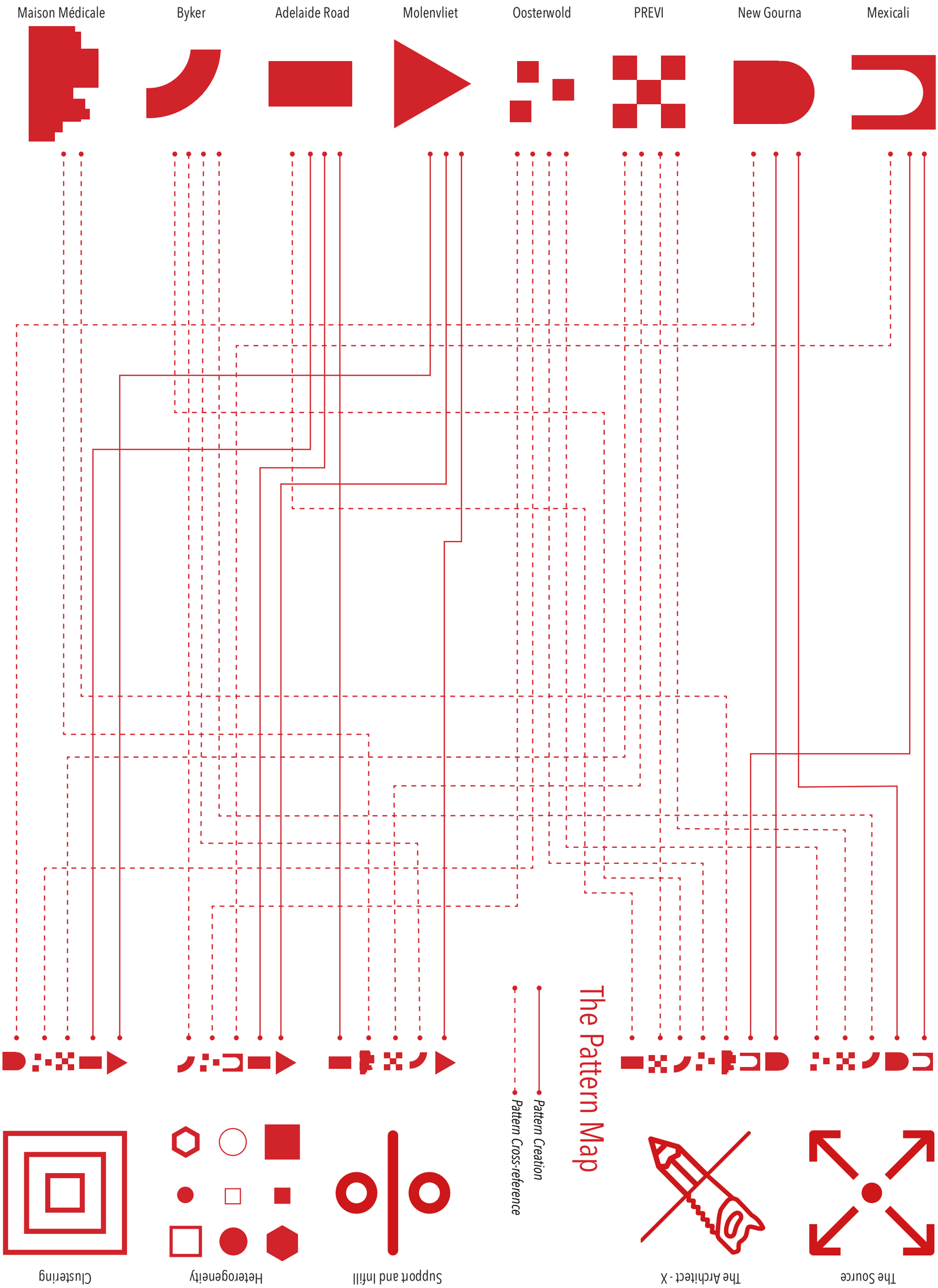
Through simplifying architectural language and providing a means of objectively evaluating the quality of a design, configurative design offers a vehicle for design to be accessible to the non-professional. It empowers them by removing the worries of complexity and enables them through giving them objective evaluations about their decisions, in terms that are of interest to them. A third way configurative design can benefit a participatory process is that it provides transparency. In much the same way that iBuild facilitates a transparent building process for users, contractors and suppliers, configurative design creates a common language that it understandable by all parties, professional and non-professional, who can communicate with each other as equals.

There is a misconception that configurational design relies on the use of computers. This is not the case as the reason computers are used is because they can handle complex calculations. However, a simpler example exists in the case of modular components. Take the design of traditional Tatami mats, due to the fact each mat has already been designed so that they can be combined in a flexible way, the user need not worry about its exact dimensions and whether they will fit. Instead, the user can decide how many mats they need based on their individual necessity. This idea overlaps with Habraken's theory of 'Theme and Variation', that is based on the recognition that "a house type is architecturally determined but not functionally, and that this is done in such a systemic way that variation of interpretation come easily."[116] Through defining a theme, the relatively simple task of variation can be left to the user. This subject will be explored further in the pattern 'Heterogeneity'.

Figure 49. A vernacular example of design that takes into account ergonomics. The Japanese tatami has modular dimensions to fit different sizes of rooms but also to accommodate different activities. One tatami is suitable for sitting on while two is suitable for sleeping.

6. Patterns

After engaging in both quantitative and qualitative analysis, and extracting common patterns from the comparative analyses, each pattern will be re-visited and redefined through cross-referencing them with the other case studies, not involved in the comparative analyses. This next level of comparison will further iterate the process by which patterns are evaluated. The pattern map on the next page will summarise the relationships between patterns and case studies; these relationships will be elaborated in the text that follows. Complimenting each piece of text is a drawing that synthesises the ideas encapsulated by the pattern and aims to provoke its greater exploration. (The solid lines indicate the comparative study which gave rise to the pattern and the dotted lines indicate where a relationship was drawn to another case study in the crossreferencing stage.)


Maison Médicale
Byker
Adelaide Road
Molenvliet
Oosterwold
PREVI
New Gourna
Mexicali
The Pattern Map
Pattern Creation
Pattern Cross-reference
The Source
The Architect - X
Support and Infill
Heterogeneity
Clustering

The Source

Pattern Definition

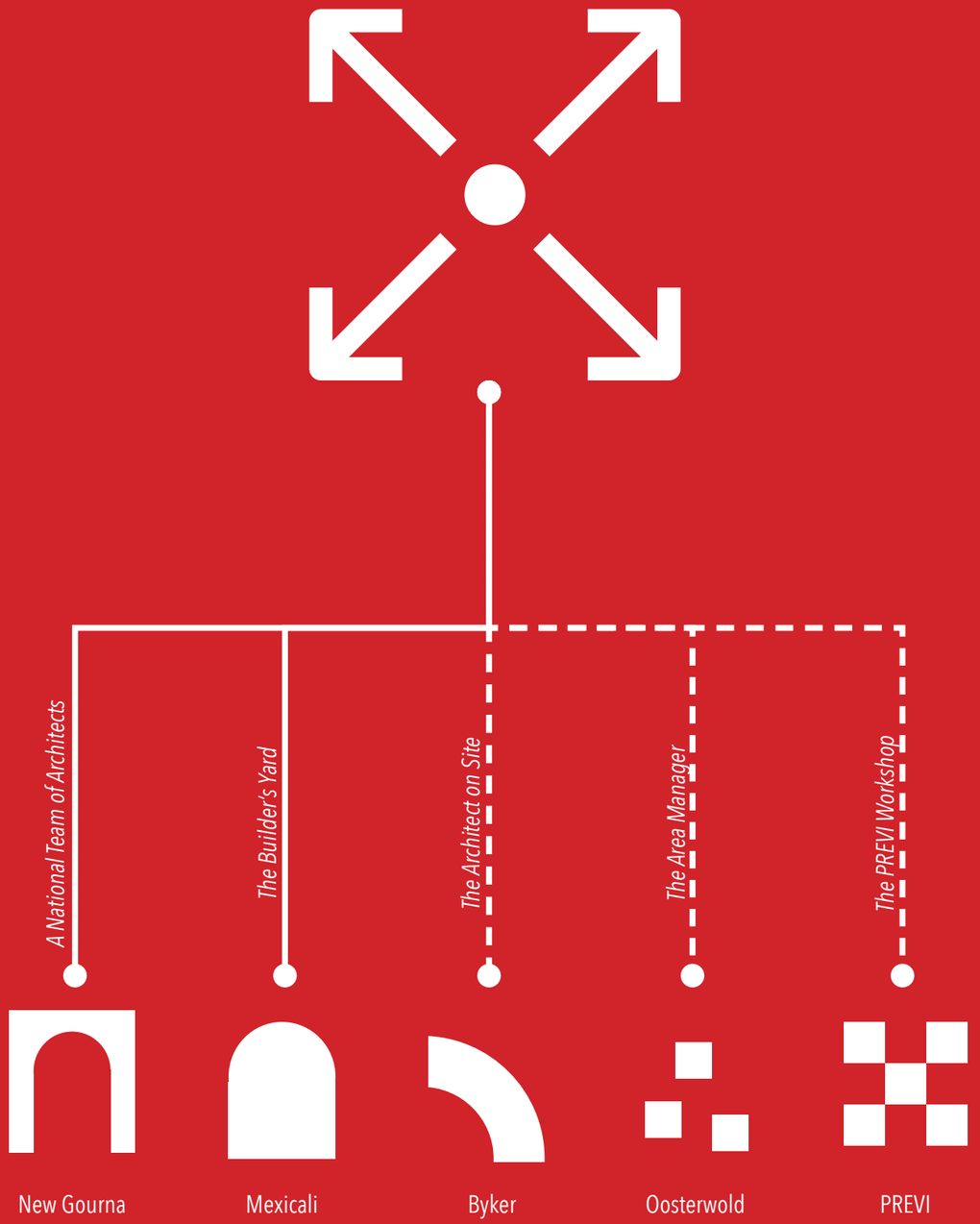
The Source refers to multi-dimensional resource centre that manifests in a building or group of buildings clustered together or spread apart. It acts as a local focal point in a community and fosters the participatory design and construction of new dwellings around it. Its tangible provisions can include a storage for building materials, a site for experimenting with new building technologies, an office that coordinates the participatory process with all concerned parties and a consultation point where users are free to gain access to professional advice. Non-tangible functions of the resource centre include that of a central knowledge base, where information can be shared between professions and with users. It can provide teaching facilities that train new builders in a specific craft or new architects to coordinate the overall process. Lastly, the Source can be combined with new or existing public buildings and give back to the community by providing recreational areas.

Instances of the Pattern

This pattern was founded in the comparative analysis between the Mexicali and New Gourna project, each project having quite a different manifestation of the Source. In Mexicali, the Builder's yard was instrumental in guiding the formation of a new community, it was "a physical anchor point: a source of information, tools, equipment, materials, and guidance"[118]. In New Gourna, Hassan Fathy envisioned the Source as a collection of Public buildings which served the needs of the community while also demonstrating the proposed construction method. The artificial lake can also be seen as a topographic source that marked the beginning of a building process whereby the displaced soil was used to construct dwellings and the resulting lake became a social centre.

Ralph Erskine demonstrated in the Byker project a prime example of the 'architect on site'. His office became a source of building guidance for the residents of Byker and later even solidified into a familiar, trustworthy, local public amenity. A major difference of the Source between the Byker project and the Mexicali project was the that a community had already existed prior to the introduction of the Source in the former, whereas in the latter, the source was the real beginnings of a new community. Nonetheless, they were similar in their aim for the architect to have a closer relationship with users.

The Oosterwold project presents another dimension to that of the resource centre, the role of the 'area manager', a local administrative entity that checks if the overall direction of the participatory community is positive. This



office intervenes on a local level but operates on a macroscopic level.

Finally, in the PREVI Lima project, a workshop was erected as a site for experimenting with different building materials, much the same function as the Builder's Yard in Mexicali. The workshop building itself was composed of an experimental building system which was later used in two other PREVI housing clusters.

Discussion

All 4 of the case studies that concerned aided self-help involved some manifestation of the Source. This is not surprising as the nature of self help requires a higher, in most cases centralized, power to guide its organic development. Whilst not essential to a participatory process, the source acts as a catalyst for an emerging community, efficiently managing material flows, coordinating participation, imparting knowledge, uniting the community and inspiring the creation of bottom-up architecture. The overlapping of these functions benefits their operation: the harvesting of resources from a natural source has benefits to being in close proximity to where these materials are stored, and subsequently to where these materials are used. The lines between certain functions themselves can also be blurred, for example a consultation office can easily also provide other amenities to the community.

The scope of the resource center is broad and may look dramatically different depending on the context. In rural environments, it may have a close relationship with the landscape, perhaps a part of it could incorporate a hydroelectric plant or wind farm and provides a source of energy for its surroundings. In urban contexts, the source might be incorporated within an existing institution, such as a local government building or a factory. In particular, the workshop component of the resource center has a greater responsibility for being a place of imagination, of making and of a symbol for the future of the emerging community. "In its workshop, a material imagination might allow for the discovery of the poetics of substance and serve as a demonstration of linkages between design and construction and, more broadly, members of a community"[119]. Its message to the community is a promise of hope and progress towards better living conditions. In a way, it acts as microcosm for the future community it creates, in a similar way to how a pilot project anticipates its wider application.

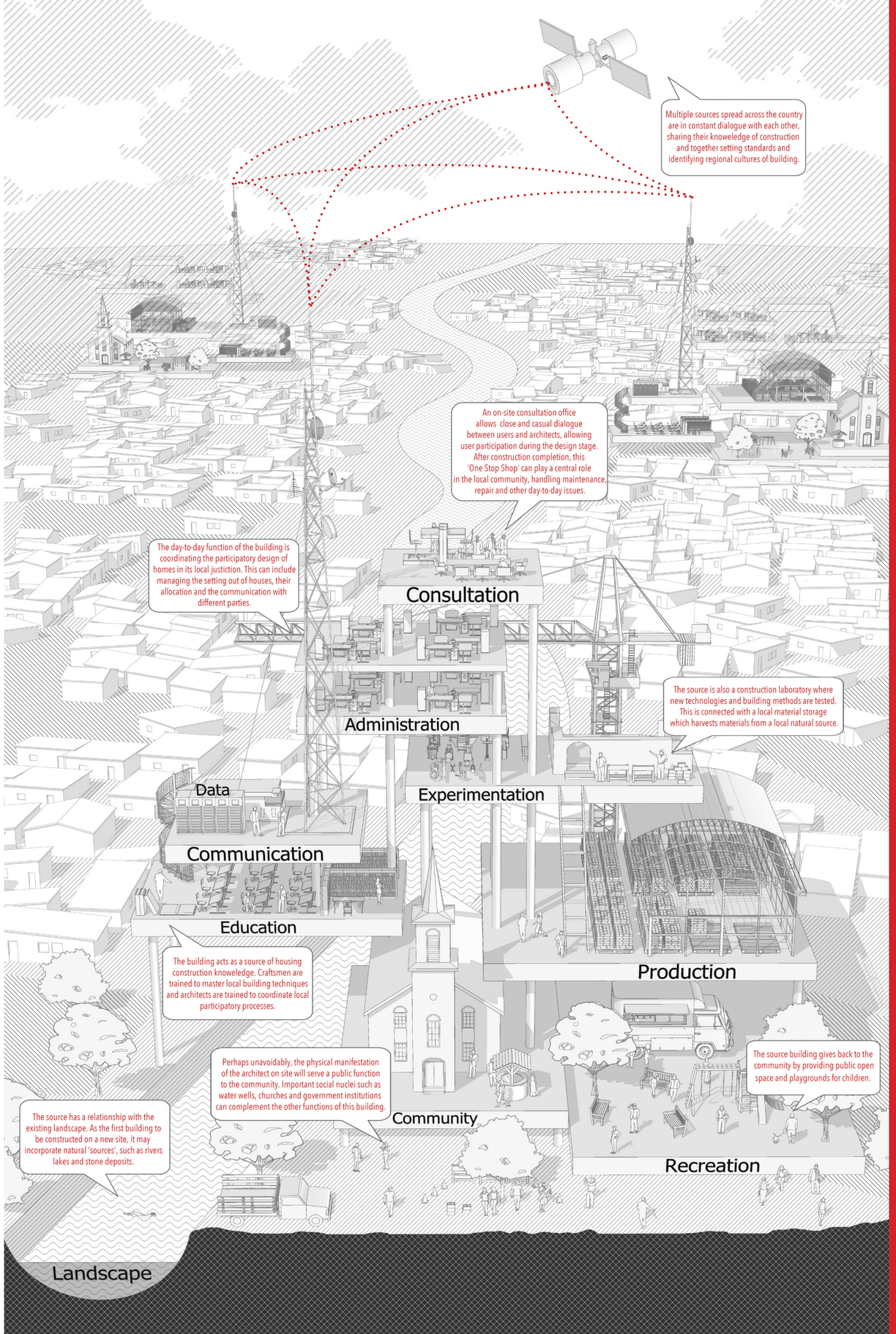


Figure 50. The Ultimate Resource Centre

Here, an 'Ultimate Resource Centre', which combines all the possible dimensions of the Source is expressed in an imaginary scenario. Moreover, it shows how each function overlaps with each other: how production is linked with experimentation, and education creates knowledge that feeds into a collaborative data exchange.

The Architect - X

Pattern Definition

While the previous pattern, 'The Source', represents the different architectural manifestations of the architect on site, 'The Architect - X' provides us with the plurality of different roles that the architect plays out. It is typical in participatory design processes for the architect to perform roles outside of their traditional responsibilities as the designer of space. Contrary to the idea that participation requires less design and therefore less work from the architect, in reality, participation adds more complexity and requires to architect to engage in cross-disciplinary discourses: engineering, building, management, community action, urbanism, technology etc.

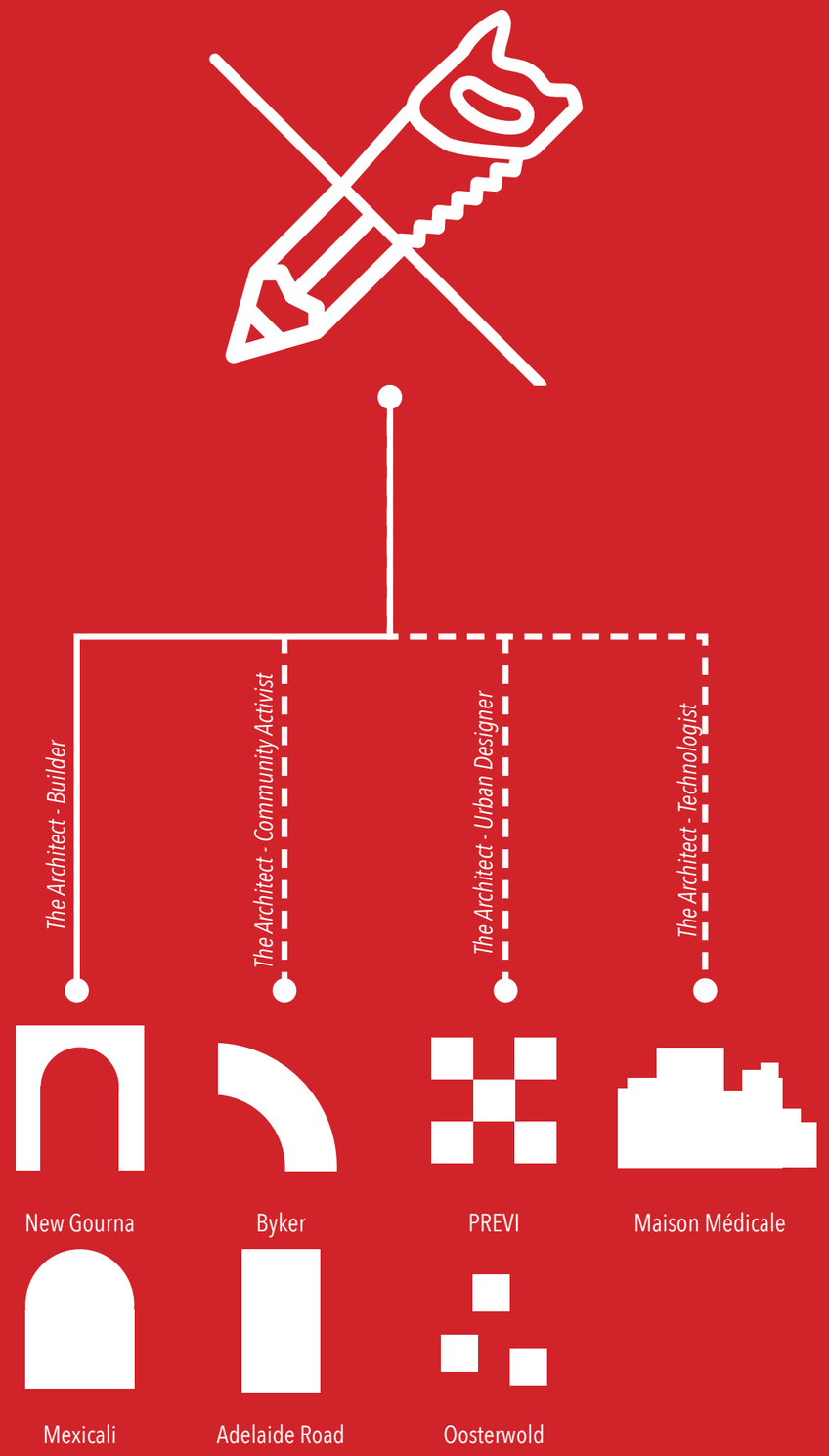
Architect Matthew Frederick quotes: "An engineer knows everything about one thing. An architect knows something about everything."[120] The Architect-X suggests the role of the architect should belong on a higher level, that of an overseer and coordinator rather than a design-specialist. This idea relates to the Gesamtkunstwerk (total work of art) where the architect has total authority over all aspects of a project.

Instances of the Pattern

This pattern is embodied in the case studies analysed before in four different ways: that of the architect-builder in the Mexicali and New Gourna project, the architect-community activist in Byker and Adelaide Road, the architect-urban designer in PREVI and Oosterwold and finally the architect-technologist in La Maison Médicale.

The term architect-builder was used by Christopher Alexander to represent the ideal coming together of designer and builder who is able to combine design expertise with on-site building experience. Only a professional trained in both of these disciplines is able to realise the specificities of user requirements in a participatory design process. Fathy proposed a model where the three roles of client, architect and contractor (what he called the trinity) were in a dynamic state and often overlapping.

The brutal top down nature of the UK's social housing estates resulted in a absence of community interaction and collaboration. Therefore, architects that advocated user participation such as Ralph Erskine and Nabeel Hamdi were required to fill that gap. As well as coordinating a participatory design process, these architects needed to primarily unite the previously fragmented community. Erskine, through his presence on site provided an informal public amenity and organised collective efforts such as the flower pot planting initiative at Byker. Community Action Planning is a methodology devised by Nabeel Hamdi that puts the different



stakeholders in dialogue with each other with the aim of arriving at points of agreement and mutual benefit. To a some extent, the serious gaming methodology, 'Play the City' used in the Oosterwold project devised by Ekim Tan also unites the community through setting them a collective task.

The contributions of the architects involved at Oosterwold (MVRDV) and PREVI (Peter Land) belonged at an urban rather than architectural level. Their role was to facilitate the emergence of architecture rather than directly designing buildings. At Oosterwold, the architect's role leaned towards management, setting up urban rules, setbacks and program percentages, while at PREVI, Peter Land was much more engaged with built form, erecting schools and workshops that behaved as "architecture that facilitated architecture".

Finally, through his reflection on the over-use of technology in architecture, Lucien Kroll advocates the architect as an operator of technology to help him achieve his goals. At la Maison Medicale, Kroll needed to gain knowledge with computing in order to coordinate the complexity of the open components he was proposing. John Habraken work with the SAR can also be read as a technological approach to participatory architecture.

Discussion

Above all, this pattern is a call for all architects to adapt to the current construction environment, one that is in stark contrast that nurtured the 'starchitects' of the modern and post-modern eras. A participatory methodology is a possible route to fulfilling this adaptation because it introduces the architect to different hybrid roles, such as the architect-builder, architect-community activist, architect-urban designer and architect technologist.

Whatever the future of the architect's role will be, Habraken concludes that it will fundamentally different to the traditional notion of what an architect represents "Today the future of architecture will not announce itself by grand statements and manifestos as used to be fashionable with the modernist generation. Nevertheless, there is a profound shift taking place: coming from a quiet but thoughtful and very matter-of-fact re-evaluation by a growing number of individuals who do not shout when they don't like what they see, but just move into more interesting and promising directions, expanding the field."[121] Perhaps the greatest shift of the architect's role which participation will bring about is a shift from prescription to enablement. This requires a pattern of its own...

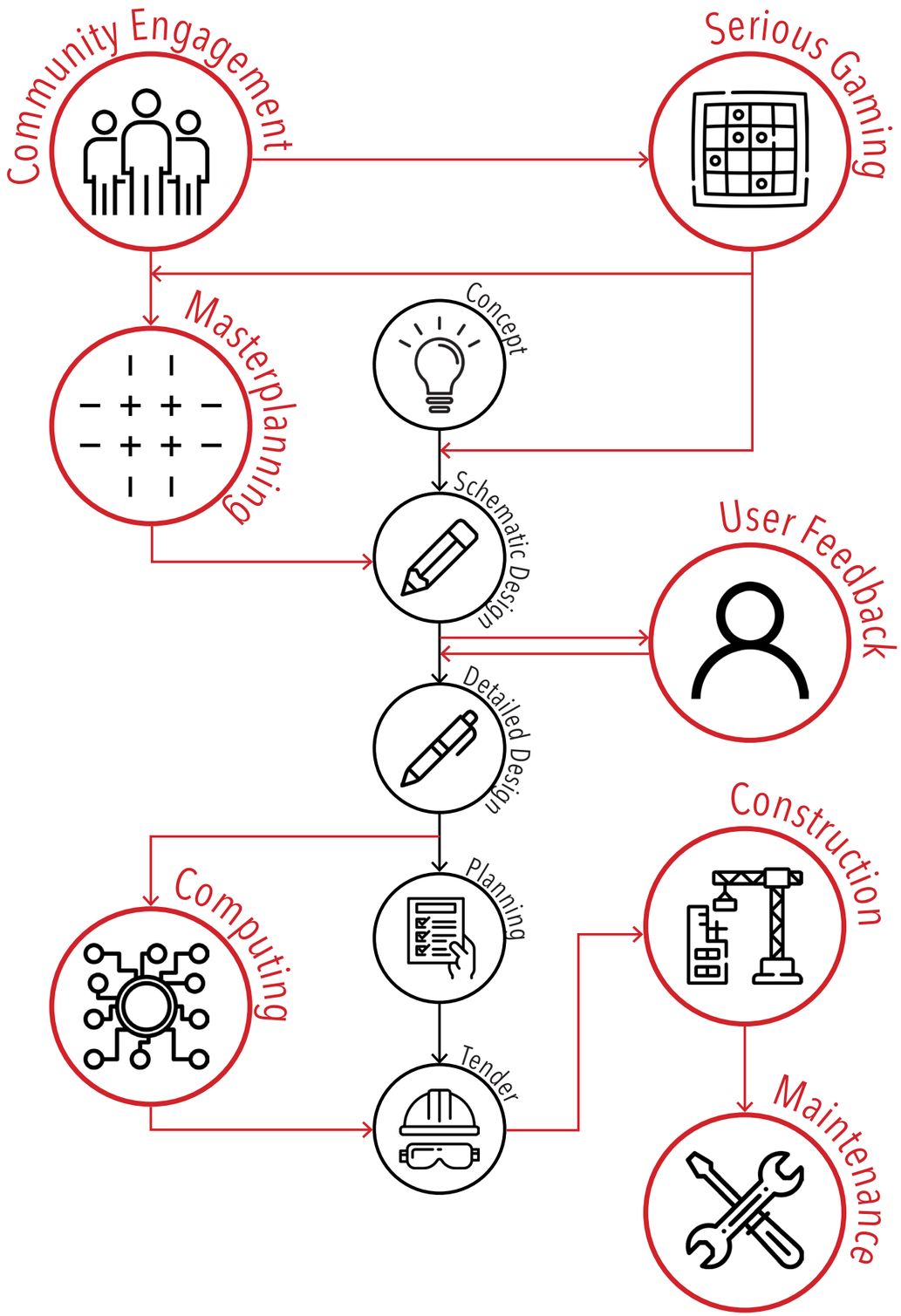


Figure 51. Extended Stages of Architect Involvement

In the contemporary architecture practice, the fundamental roles of the architect are laid out in the stages of design, *briefly outlined in the center of the diagram. Around it, one can imagine the other roles and disciplines that the architect may engage in following a participatory process.*

Support and Infill

Pattern Definition

The topic of support-infill is a very discussed topic with a mature theoretical framework. This dichotomy was coined by John Habraken in "De Dragers en de Mensen" where he described it as a distinction not only on a technical level but that they facilitate different levels of participation. His theory was later practiced and preached by others such as Frans van der Werf and the Open Building group but the physical manifestations of the support remained quite similar: an empty concrete structure. I wish to return to Habraken's more general definition for a support, as primarily an entity which enables and at times empowers[122] the emergence of another entity, the infill. The case studies introduced above will help convey this wider definition.

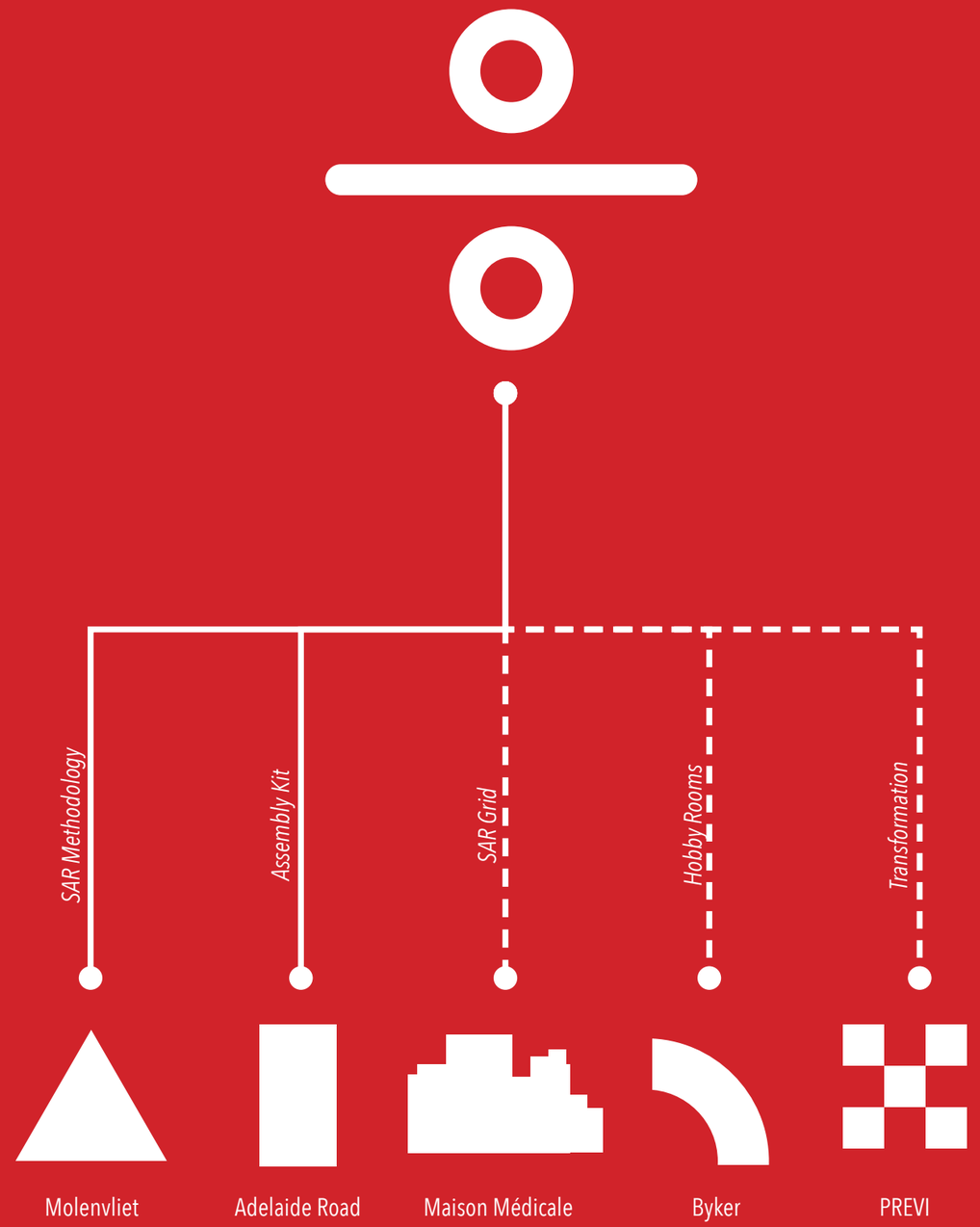
Instances of the Pattern

Molenvliet, Adelaide Road and La Maison Médicale all cite the influence of the work of the SAR, Stichting Architecten Research, headed by John Habraken. In each of these projects, the support included different building elements, in Adelaide Road, the support constituted everything apart from the internal partitions, whereas in Molenvliet and La Maison Médicale, the extent of the support shrinked to that of only the load-bearing structure.

Byker and PREVI convey more abstract representations of the idea of a support and infill. The 'hobby room's at Byker, multi-purpose space located at the ends of terraces, behaved as a programmatic support, which could facilitate a range of public functions, themselves a support-space for the neighborhood. The decision of including these loosely defined spaces rather than filling them in with housing plants a seed with the potential of growing something larger than itself. Similarly, the requirement for the projects entries of the PREVI competition highlighted the transformation aspect, specifying that each project must show a strategy for expanding the dwelling. This built-in flexibility means every housing project at PREVI also functions as a support structure, the extensions later made by the users acting as the infill.

Discussion

Dividing design into two parts, support and infill, is a vehicle for inviting user participation. As Lucien Kroll, architect of La Maison Médicale, explains, "two legal notions about property are associated with these concepts, also two notions about authority and two deciding factors."[123] The support defines the power realm of the



architect in the same way the infill defines the power realm of the user. These can become two processes that can function individually. Support-infill is thus a tool that negotiates the top down with the bottom up, clearly defining the borders of control from the very beginning and preventing the top down from overshadowing the bottom up, as is the case in most contemporary 'participatory' housing processes.

The idea of support-infill has a sixty year history and has received its fair share of criticism. Jaap Bakema once questioned Habraken on the difference between his idea of a support and the structure for Le Corbusier's Domino House, a purely functional, neutral container that is waiting to receive its infill. Habraken replied with two points. Firstly, whilst the Domino skeleton provided a 'blank canvas' onto which appropriations could be added, it does not make it easier for the non-professional user to complete.[124] With this exchange, one can imagine the Domino house as a type of support structure but a very poorly designed one. Secondly, Habraken insists that " a support is not a neutral container but an architectonic design". Imagining the support as an architectural statement as well a purely technical provider is the key ingredient that is missing from built manifestations of supports.

John Turner questions whether support-infill offers a step towards a greater participation. He states, "the purely formal and technological separation of support and infill strengthens the separation of local and central powers"[125]. He argues that a clearly differentiated support and infill already imposes a dominant relationship of those who have power over the support over those who have power over the infill; users turn into a consumer of a support and the final outcome could inhibit more freedom than it provides.[126] Turner's participatory vision is perhaps too radical as it overturns the fundamental process of housing, but it does highlight the need to think of supports beyond their technical and formal manifestations. Nabeel Hamdi, architect of the Adelaide Road project, responds to Turner by referring to the, rather large, gap between theory and what is able to be built within an existing system of housing production. He agrees that the changes that need to take place in order for a higher participation to occur belong on an institutional level and the experiments conducted by himself and his contemporaries represents "the very thin end of a rather large wedge"[127].

Figure 52. Degrees of Support and Infill

Inspired by the collection of small experiments of PREVI, this drawing attempts to broaden the definition of support and infill. As well as typical concrete structure manifestations, the support is also depicted through forms such as a staircase (Usina Ctah) and a core house. Streets, service pipes and public spaces also function as a support but on an urban level. Each example is also assigned a level bar which indicates the relative extent of the support and infill. The drawing demonstrates that a varying degree of user participation results from a spectrum of support extent.

All depictions are based on real designs, only some have been built.

Heterogeneity

Pattern Definition

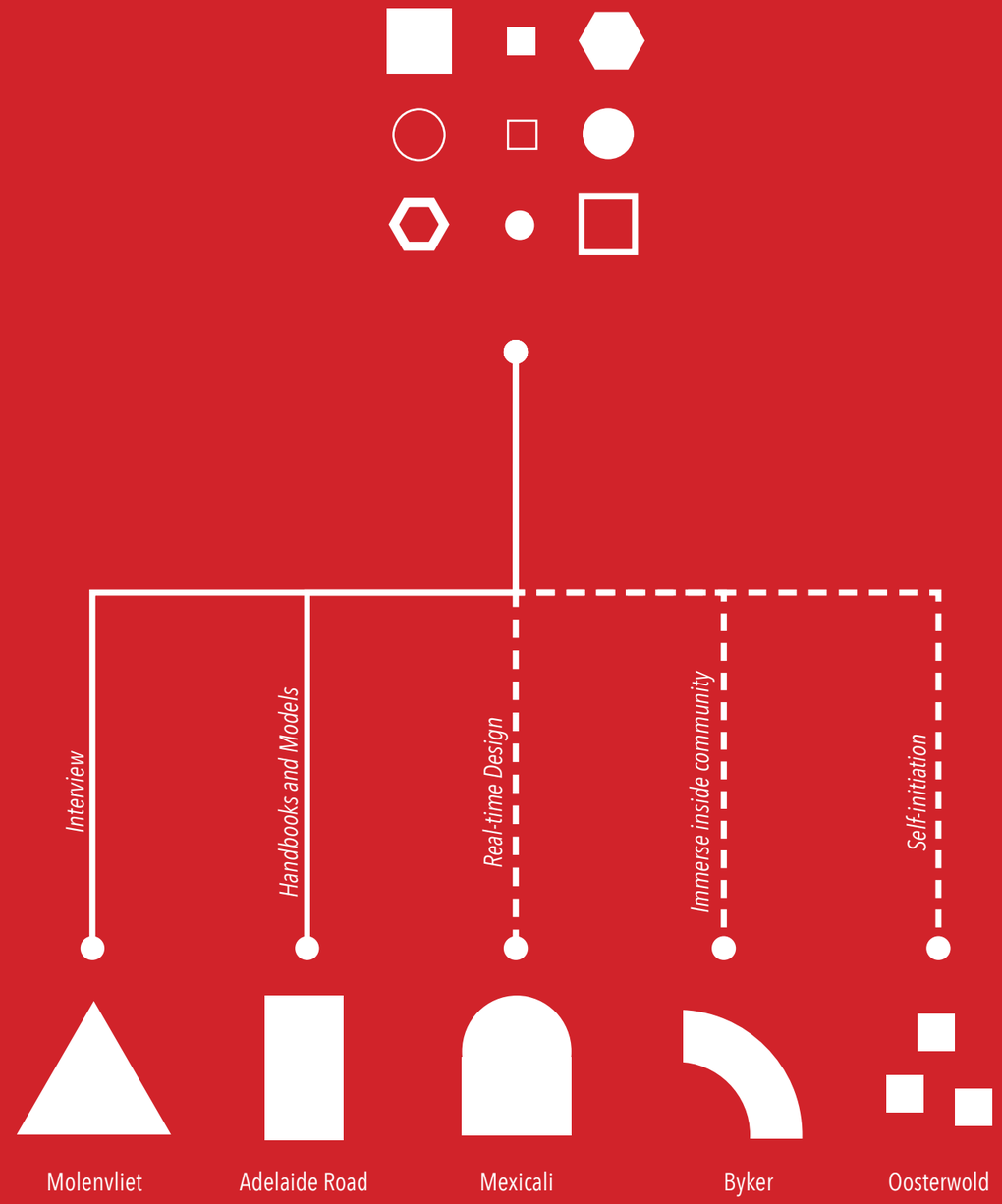
Perhaps the mantra of participation is to create forms, configurations and compositions that were previously un-thought of and un-designed. Heterogeneity is used here as a blanket term to describe the irregularity, variation and specificity of un-designed forms exhibited by participatory architecture. This pattern explores this quality with a focus on the methods, that the architects in each case used, to extract these previously unknown ideas about space. It will be demonstrated how heterogeneity can arise from spontaneous processes, where the distance between designing and building is short, but equally from a carefully considered process of co-creation between the architect and user.

Instances of the Pattern

In the Molenvliet and Adelaide Road project, heterogeneity was unlocked through repeated, one-on-one user consultation meetings. This method seeks to discover new forms and spaces through understanding the specific ways in which people like to live. It captures the ideas of niches and deviants which would otherwise be homogenized in a traditional mass housing process. Hamdi goes a step further at Adelaide Road by creating a series of interactive handbooks and models that aid the user in visualizing and generating architectural representations of their intentions. However, the success of these design aids is unpredictable, as Hamdi recalls in one consultation meeting when a participant mistook a groove in a physical model as a real architectural feature. This experience does however reveal the profession's naivety towards unprofessionals.

A similar process occurred during the Byker project. Through immersing into the community and setting up a site office open to casual drop-in consultations, Ralph Erskine also reduced the distance between the design, the people he was designing for and the product of the design.

The Mexicali project had the advantage of being able to involve user families on site in the actual building process. This allowed users to better visualize their designed houses at 1:1 scale. In addition to tailoring each house design to a specific family, Alexander believed that leaving some aspects of the design undefined until the moment of construction also creates variety, even a source of art and inspiration.[128] For instance, the exact form of the vaulted roofs, made of concrete trowelled over a wooden basket, is not determined until construction, as the shape of the wooden basket, hence the form of the concrete, depends on the shape of the room. Similarly, the infill walls are not defined, but merely depend on the placement of columns. In these examples, form is generated through building operations rather than direct design.[129] In other words, design is happening at



real-time and this creates a natural heterogeneity due to the nature of the construction.

In a way, the Oosterwold project best demonstrates the potential of this pattern as design is completely decentralized and the initiative belongs solely to the user. It is an extreme example of variation through user participation as the form, materials and configuration are all determined by users themselves. Even the rules that guide the urban plan allows for a high level of freedom.

Discussion

The creation of heterogeneity in the case of mass housing relies on two actions, a way of generating variable designs and the creation of a theme which can be adapted, physically changed, to accommodate the variations. Users are crucial to the first process as without them, any variation is only an artificial construct. The concept of theme and variation was proposed by John Habraken in his article "The Control of Complexity" where he states, "Designing in dialogue with form is like improvising on a theme. A system gives us a choice of elements and their allowed relations in space. It emerges when we seek to establish rules... A system always allows variations of form within the rules it imposes."[130] In other words, the rules of the game are defined by the theme and the game is played by the users. Habraken continues by explaining that themes give design a social dimension, playing the game requires collaboration with other members effected by the theme. On the other hand, if users approached the determination of their built environment as individuals, they would prefer a more explicit design in order to overcome the complexity they face; heterogeneity is thus sacrificed.[131]

Heterogeneity does not necessarily mean that the determination of forms must be bespoke, as in the Oosterwold case. In all the other three case studies mentioned in this pattern, the building elements used in construction were industrialised to some extent. Habraken explains, "the factory is not capable of producing entirely finished dwellings, and consequently it does not care whether dwellings are uniform or not."[132] Standardised, industrially produced building components are thoroughly capable, perhaps even preferred, for producing heterogeneity; rather it is the designer who is choosing to standardise the configuration of these building components and in doing so, creating the rows of identical houses which dominates our image of mass housing.

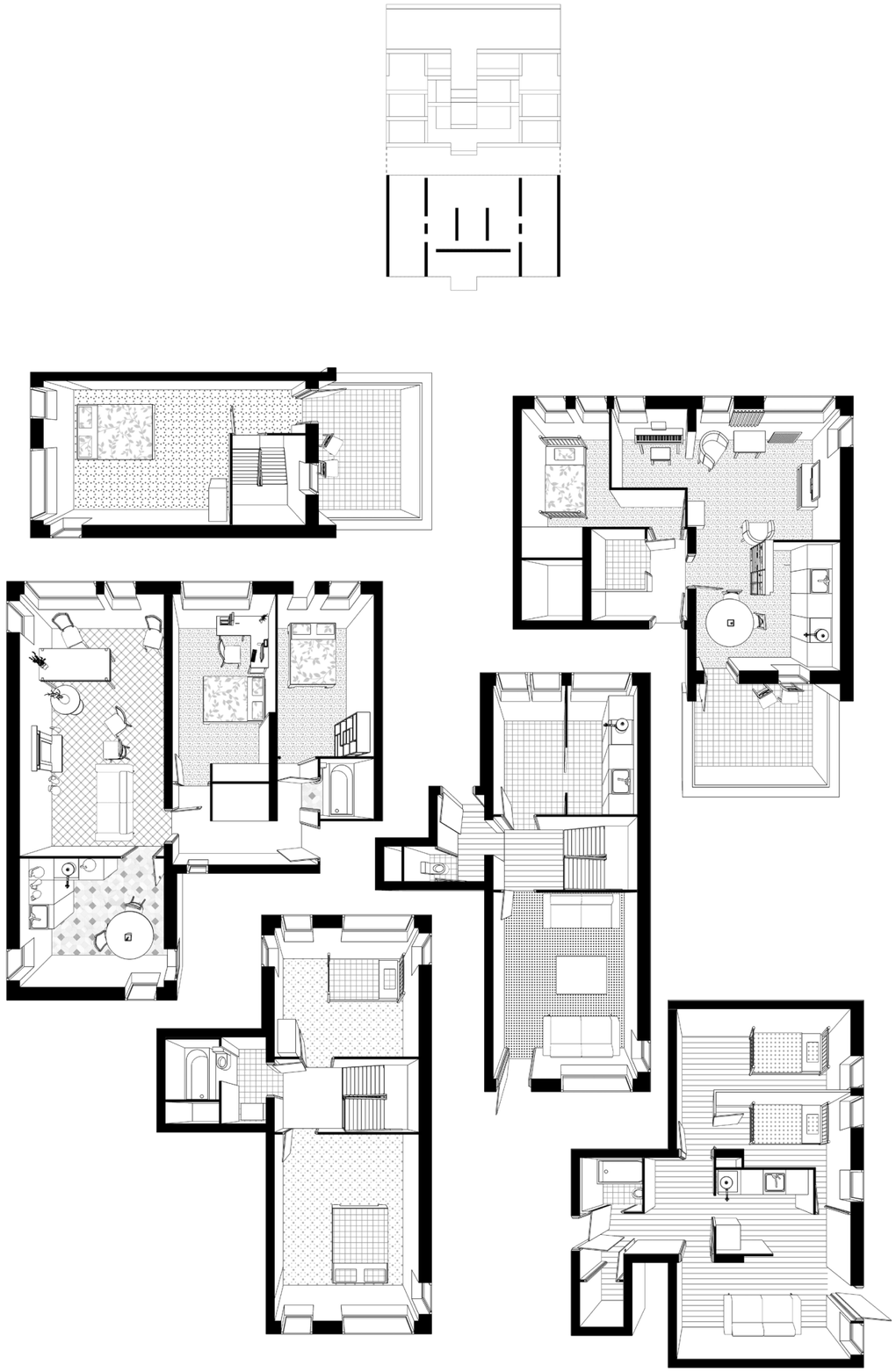


Figure 53. Unit variations in Adelaide Road.

The theme, in this case the support structure (top), can take on a variety of different variations due to its openness. It is expressed here in all the different floor plan variations in one building. This drawing is based on real house plans at Adelaide Road.

Clustering

Pattern Definition

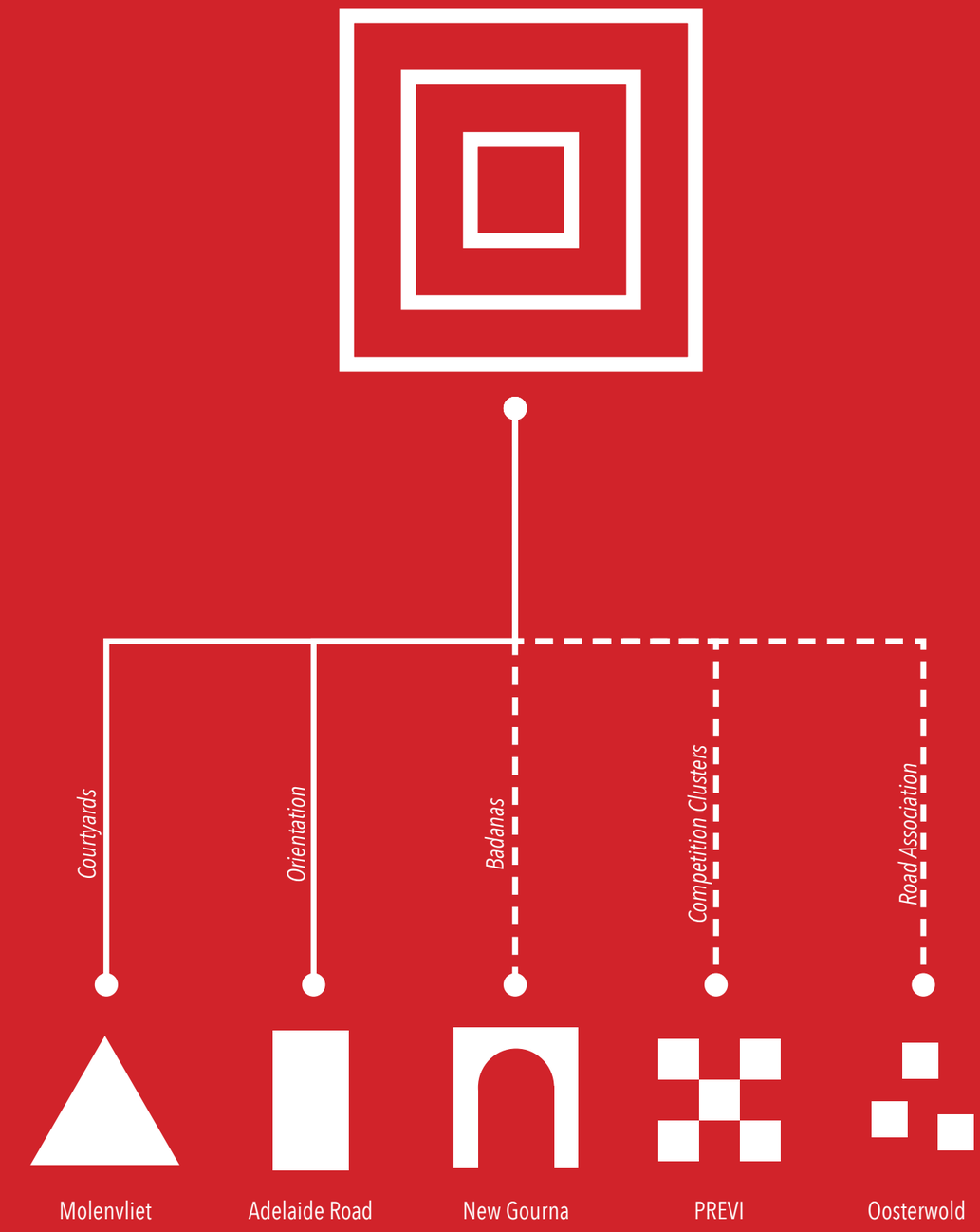
Housing schemes which seek to achieve any level of cohesion, including participatory housing schemes, exhibit a logic of organisation that orders the mass of dwellers into more manageable clusters. The creation of different levels of association through form is important as it complements the natural hierarchy of social relationships. People are naturally closer to those they share a corridor with, as there are more opportunities for interaction. Two neighbouring families will also share more in common than families who live on opposite end of a road. Clustering of form helps users perceive the human scale within a large residential development and aids the creation of relationships and interdependencies between strangers. It is the key to social enablement.

Instances of the Pattern

Earlier in this research, it was found that both the Molenvliet and Adelaide Road projects created more levels of clustering between the building scale and urban scale. In Molenvliet, this was achieved through arranging the blocks into four courtyards and creating a vehicular road that bisected these into two groups of two courtyards. Adelaide Road manipulated the orientation of the buildings to create pairs of blocks that shared the same access from the street. Two of these pairs were also clustered together and shared amenities such as parking spaces.

At New Gourna, Hassan Fathy recognised the prevalence of the badana in the old Gourna village, a local community of about ten to twenty related families who function as one socioeconomic unit. The urban plan can be divided into four distinct units, each represented by a badana.[133] On a larger scale, Fathy's original unrealised plan divided the village into five sections representing five tribes, each having its own unique customs.[134] This allowed the existing social structure of Gourna to be maintained in the new village.

The projects at PREVI demonstrated different ways of ordering the social fabric. Some arranged units in rows served by secondary streets such as in the projects of Christopher Alexander, Atelier 5 and Charles Correa. Others, such as James Stirling, created levels of social interaction through courtyards. In Aldo van Eyck's design, house units enclose open spaces that join onto a main road. The arrangement is similar to the cul-de-sac and road relationship in that it creates two levels of social hierarchy. Furthermore, the collage of different competition entries at PREVI incidentally created a very sophisticated clustering of forms on an urban level. Each plot acts as another level of social interaction, on top of that of the block unit and block cluster.



The Oosterwold project showed that even in a place that is not dictated by a clear masterplan, clustering and the formation of collective agreements exist. The formation of 'road associations', self-organised groups of landowners who share the same access road, organises the otherwise fragmented families of Oosterwold into groups that are capable of collective actions. In fact, the Dutch government have a regulation that dictates homeowners who share a public space that needs to be maintained must form an association and must meet at least once a year to discuss communal affairs.

Discussion

The configuration of a residential scheme, in terms of different levels of clustering, has a large implication on a variety of factors: how its future users will interact with each other, the level of safety in the community, the ability for collective action and continued user participation after construction.

Philip Krabbendam, an architectural theorist and architect of the co-housing scheme, Centraal Wonen Delft, formulated a participatory design method based on creating different levels of social interaction. He explains, “in order to feel like an individual, you need a small group of people around you... a group of individuals also requires a social context to define what kind of group it is"[135] The presence of a higher level thus defines the existence of the lower level. He continues to explain that “different people have different requirements in terms of the levels"[136], indicating that the configuration of housing units on an urban level should also be open to participation.

Alexander agrees with this as he explains, "it is the human effort that must make the formation of the cluster, not a designer at a distance."[137] Participation on an urban scale is conceivable for small residential projects, where the users can be identified prior to the commencement of design. However, as the scale of residential developments increases, the feasibility of using traditional methods of participation, holding meetings and interviews, decreases. Contexts in the global south are met with even greater obstacles to large scale participation. Perhaps the use of applications and widely accessible online platforms can help coordinate participation on the mass scale.

Establishing a clear, well informed hierarchy of clustering ensures that user participation does not stop after the construction of the building. It provides users with the necessary social infrastructure to overcome issues of maintenance, disputes and changing tenancies, preventing over-reliance on top down decision makers that often results in neglected living spaces.

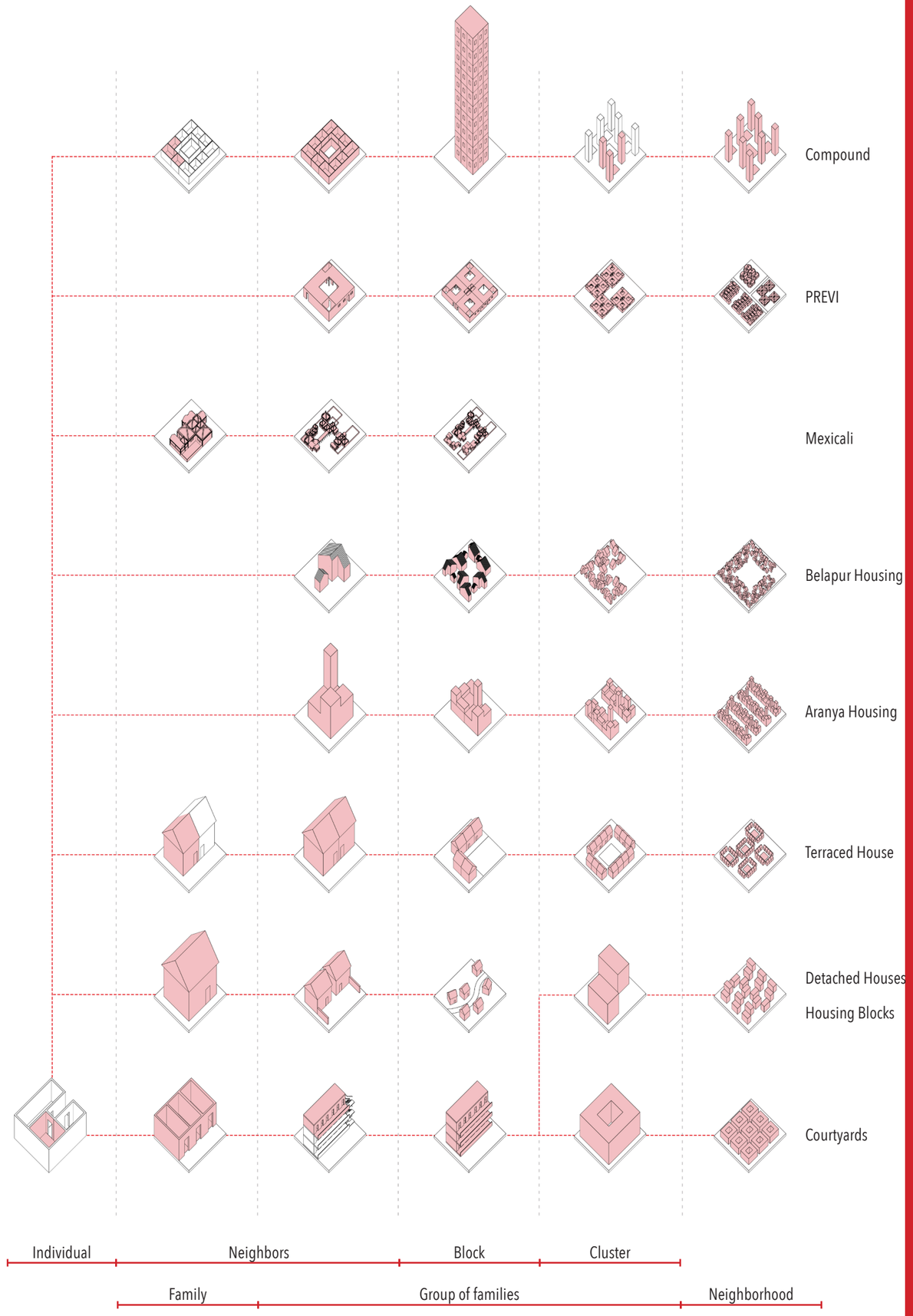


Figure 54. A tree of social/spatial levels
A collection of different residential typologies are ordered in a hierarchy from the room to the urban tissue level. Under it, the ranges of social groups are shown in relation to the forms.

7. Conclusion

Since the decline of the participatory movement during the second half of the 1980s, the role of the architect has shifted back to its more traditional, conservative state. Spurred on by commercial forces, the contemporary 'starchitect' has returned to the foreground of architectural discourse. The decline of experimental participatory architecture is often blamed on reasons external to the architectural profession, the conservatism of bureaucracy, the short-sightedness of politicians, the inflexibility of the construction industry, forces outside the responsibility of the architect. When asked, what can an architect do in order to create more user participation, the answer is often vague and unsatisfactory. This piece of research has attempted to formulate a direct, justified answer to this question, under the belief that this answer is not beyond the realm of architecture.

Through examining a sample of 8 case studies taken around the world and making sense of them by extracting 5 common patterns, this research has provided a small step towards formulating a toolkit for the creation a participatory housing process. These patterns offer a range of ingredients, each of which need to be understood and considered by the architect and ultimately translated to suit a specific project context. Corresponding to each pattern drawing, one can also anticipate another drawing as its counterpart that unites the ideas of a pattern with the specific conditions of a context. In the same way that a typical design for a building needs to consider the aspects of structure, sustainability, materials and spatial configuration, so too does a design for a participatory process need to consider its patterns. Needless to say, the patterns concluded in this research came to be through the specific lens of the author and do not represent universal truth: in the same way Christopher Alexander did not name his most famous publication "The Pattern Language" instead of "A Pattern Language. Another individual may make sense of the same case studies in a different way and consequently conclude with different patterns. Nonetheless, as long as an interpretation of the case studies is rooted in evidence, it is a productive vehicle for design.

One characteristic of the lens through which the patterns were identified is the concern for mass housing as this was an aspect that the research question focussed upon. Mass housing is relevant to all the chosen case studies, even those such as the Mexicali project which only involved a small number of families; its underlying process was designed to be replicable on a large scale. Consequently, the patterns derived also aim at aiding the formation of a large scale housing solution. For example, in the 'Heterogeneity' pattern, the importance of a common theme makes the creation of variations on a mass scale more feasible. Similarly, the pattern of 'Support - Infill' is itself a compromise between the bespoke, intricate design of the bottom up and the efficient, standardised design of the top down.

The Pattern Map (p104) reveals the validity of each of the patterns as it shows how applicable a pattern is to the range of case studies. Four of the patterns were applicable to three other case studies and one pattern applied to five other case studies. Overall, these results show that the patterns have a high degree of validity.

Whilst there is definitely a relationship between the patterns, particular attention was paid to their distinction. 'The Source' proposes a new architectural element dedicated to the coordination and support of a participatory housing process; 'The Architect - X' proposes a new role for the architect; 'Support - Infill' divides the building process into two distinct stages represented by two types of architecture; 'Heterogeneity' provides methods that create variation within the infill level and finally 'Clustering' proposes an ordering system based on creating different levels of social interaction. A proposed sixth pattern titled, 'A Collaborative Network', that highlighted the need for different groups of participants to collaborate on a higher level through shared knowledge, was ultimately combined with the first pattern.

The dynamic nature of the patterns and their tendency to change, combine with one another or split demonstrates the flexibility of the methodology. However this also means that the definition of the patterns is constantly in flux with the addition of more and more case studies. At the same time, the validity of the patterns is directly proportional to the number of case studies considered. This implies that, theoretically, there is no end to this research and it can always be improved upon ad infinitum. Therefore, the sample size of this experiment is the most significant limiting factor. Although an effort was made to include case studies from a variety of social contexts, the sample failed to escape a Eurocentric perspective, partly due to the scope of the theoretical analysis in which the work of John Habraken was especially influential. If this research was to be extended, it is recommended that the sample of case studies is expanded to include a more diverse selection of contexts, particularly those from Asia.

Upon reflecting on the patterns, there is a danger that the pattern definitions become too general, until they are undistinguishable from common sense. This is counterproductive as it will create the illusion that the pattern is highly applicable to a lot of cases. Therefore, it is recommended that a method is formulated that prevents the definition of the patterns from becoming too general, perhaps continuing the synthesis of pictorial representations of the pattern will ensure clarity and prevent patterns from becoming overly theoretical and obscure.

The work in this research concludes with five patterns of participation that will hopefully bring clarity to a subject that is otherwise overlooked. However, a larger part of its value lies in the pattern generating methodology it proposes. This method can be repeated with more precedents - historical as well as contemporary - allowing with each addition and iteration an improvement of the richness and quality of this toolkit. The methodology is the engine for an ever-spinning wheel.

Notes

1 Richard Sennett, *Building and Dwelling* (London, Penguin Books, 2019), 76 - 86.
2 Ibid, 87.
3 Nabeel Hamdi, *Housing Without Houses,* (New York, van Nostrand Reinhold, 1991), 76.
4 Hester Randolph, "Participatory Design and environmental justice: Pas de deux or time to change partners," *Journal of Architectural and Planning Research* 4:4, (1984), 289 – 300, quoted in Nabeel Hamdi, *Housing Without Houses*, (New York, van Nostrand Reinhold, 1991), 78.
5 James Steele. *An Architecture for People: The Complete Works of Hassan Fathy*, (New York, Whitney Library of Design, 1997), 109 – 111.
6 John Habraken, *Towards a New Professional Role*, Design Studies 7, no. 3 (1986),140.
7 Pirouz Nourian, Interviewd by author.
8 Nabeel Hamdi, Interviewed by author.
9 Edgar Pieterse, "Cityness and African Urban Development", *Urban Forum*, 21:3, (2010), 208.
10 Sherry Arnstein, "A Ladder of Citizen Participation," *Journal of the American Planning Association*, 35: 4, (1969), 216 - 224.
11 Alexander, *The Production of Houses* (New York: Oxford University Press, 1985), 62.
12 Ibid.
13 Fathy, *Architecture for the Poor* (Chicago: The University of Chicago Press, 1973), 21.
14 Ibid, 150.
15 Alexander, *The Production of Houses*, 30.
16 Ibid, 34.
17 Ibid, 99.
18 Ibid, 97 – 98.
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Following the urban ideals put forward by the 4th CIAM congress and the publication of the Athens Charter in 1933, many theorists saw the detrimental effects that a simplified, patriarchal design had on previously complex, self-sustaining social fabrics. This brutal interruption of social communities in the name of functionalism, best exemplified by the plan for Brasilia in 1956, triggered a debate among urbanists and activists on ways to open up the city and effectively integrate existing systems of inhabitation. Central to this debate was Jane Jacobs, who advocated a local, small-scale approach to achieving sustainable community integration, contrasted by Lewis Mumford, who believed the only way to combat Corbusian planning was to suggest an alternative, large scale, centralised plan; such as the Garden City approach.

Parallel with this debate between bottom up and top down planning was the question of user participation, an essential part of a humanist urban and architectural strategy. Interestingly, the questions raised in the Jacobs-Mumford debate are also relevant when applied to user participation. At first, participation may seem exclusively a concern of the grassroots bottom up movement, however,as Richard Sennett correctly identifies, the bottom up position has no idea how to scale up from the local to the urban. Consequently, as will be shown in the research, individual grassroots attempts at integrating user participation have often fallen short of becoming more than pilot projects. How can architects implement a participatory housing process that is scalable to accommodate the masses while retaining a humanistic sensitivity at a small scale? Perhaps the best approach is a hybrid of a local, bottom up effort and an organised, top down design.

This research aims to bring us closer to answering this question by distilling ideas from key case studies, learning from the rich treasure trove of experimental housing projects around the world. My research rests on stable foundations built by contemporary enablers of common people who have interrogated the subject of user participation head on. Theorists such as Nabeel Hamdi, who sees the role of the architect as having the oversight of the large scale but operating incrementally at a small scale; John Habraken, who allowed variation at a small scale through the design of a large scale support; and architect Frans van der Werf who put Habraken's ideas into practice.

Patterns of Participation