Empowering User Participation Through Technological Mediation

Rethinking Citizen Agency in the Quayside Public Realm

by
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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Keywords: Public Space, User Participation, Mediating Technologies, Kit of Parts, Interactive Architecture

The idea of public space has moved from a critique to an orthodoxy, embraced by most stakeholders as an important part of urban development. In the last few decades there is an increase in a particular landscape of projects, that engages with a set of urban tools coupled with digital and information technology that expands, augments and alters the public and social interactions in the urban space. As a result of which, information and matter, code and space collapse into a new system, and mediated spaces have become an architectural problem.

Expanding on this line of inquiry, the thesis looks at the role of urban tools devised as a set of assemblage rather than objects or installations, as more relevant to the experience of the public realm. They function independently or collectively and through mediated technologies foster relationships between the urban environment and the user, by empowering them to participate in the constant shaping of it.

Contrary to the current trends in techno-centric visions for smart city proposals, the research sheds light on other participatory forms of smart city initiatives that makes optimal use of ICT and digital technologies to produce collective urban experiences. In doing so, the research critiques the participatory visions promised in the Sidewalk Labs owned Quayside project in Toronto, based on the analysis of a 1960s historic precedence, by Cedric Price. And then traces its contemporary relevance by re-interpreting the key concepts of agency and participation into the Quayside fabric in a more decentralized setting to intensify the project's empowering visions.

To strengthen the argument, the research builds a theoretical framework of three fundamental concepts involving public realm, user participation and technological mediation that provides two productive viewpoints for the design explorations. The first one is a critical lens to evaluate the design of high agency participatory systems. The second one theorizes philosophies of technology that provides insights to the design of interactive architectural assemblies.

As technologies become more pervasive, they question the role of the material city in fostering new modes of interactions between the citizens and the public space to represent a collective experience. The intent of the technologically mediated design interventions is to promote participatory conditions that opens up possibilities to render varied social settings relevant to the cultural context of the contemporary society, which otherwise would be impossible.

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To My Family

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Introduction

The rapid rise of urbanization has, in recent years, coincided with a massive growth in connected devices or things that talk to the internet. Cisco predicts 50 billion connected devices to exist by 2020. With this steady expansion of the Internet of Things (IoT),[1] along with the kick off of Infrastructure Canada's Smart Cities Challenge, there is significant opportunity for Canadian municipalities to empower their communities through Information and Communications Technology (ICT) and connectivity.[2]

The huge shift in technology for the smart city movement means leveraging data to achieve a constantly adapting, connected, intelligent, healthier and more efficient human habitat. Considering the diversity of integrated solutions tackled by these proposals, it is almost difficult to fully comprehend smart city projects at first glance. Because of which, distorted views and critiques around these projects proliferate the internet that combines disparate solutions like self-driving cars and waste management systems into the same conversation.

Architecture and technology historian Antoine Picon clarifies this ambiguity in his book *Smart Cities: A Spatialised Intelligence* where he broadly categorises smart urban developments into two. The first one is a techno-centric vision that primarily focuses on the economic values and technology to optimize the city's infrastructure and functional aspects. And such an orientation follows technocratic drifting where concerns around data mining, ethics on digital privacy spur debates about its detrimental effects on the social realm of the urban publics. As Dr. Mark Dean mentions 'We are witnessing the shaping of cities with an increased technocratic and administrative focus in what can be understood as a heightened level of risk aversion which significantly narrows down the scope for public participation, that involves social inclusion and democratic use of public space.[3]

In response to the current concerns on social inclusion and participation, the research further explores on Picon's second category of the smart city initiatives, that has a more techno-optimistic vision which involves the co-operation between individuals than just co-ordination driven from above. And the such a city, in its maturity is characterised 'by an increase in the creative potential of the human individuals and groups who inhabit it.'[4]

As technologies become more pervasive, they question the role of the material city in fostering

1 "Smart Planning For Smart Cities." Canadian Urban Institute. Accessed September 1, 2019. https://www.canurb.org/smart-cities.

2 Ibid

3 Tactical Urbanism: Strategies of Community Engagement. Accessed August 20, 2019 https://www.bangthetable.com/blog/strategies-of-community-engagement-tactical-urbanism/

4 Antoine Picon, Smart Cities: A Spatialized Intelligence (Chichester, West Sussex: Wiley, 2015), 11.

new modes of interactions between the citizens and the public space to represent a collective experience. And is the reason why, over the last few decades, we are witnessing an increase in a particular landscape of urban projects that engage with digital and information technologies to expand, augment and alter the public and social interactions in the urban space. In this technology embedded urban typology, information and matter, code and space collapse into a new system and mediated spaces have become a new architectural problem.[5] We have the responsibility and potentials to co-create a responsive city-scape with physical and digital platforms that entrust communities with greater ownership over their public spaces. In this line of inquiry, the thesis sets two primary agenda for further explorations:

- The role of urban tools devised as a set of assemblage rather than objects, as being more relevant in experiencing the public realm.
- The significance of user engagement, and the role of technological mediation in empowering them to participate in the continuous re-shaping of the public realm.

To navigate through this agenda, the research is segmented into four folds:

- First part identifies three key ideas that were significant in the 1960s-70s and are very relevant in today's context. They form the theoretical framework of the thesis and are pivotal to understand contemporary urban conditions as they promote productive relations between human, technology and the city. The viewpoints articulated in this section forms the basis to critically evaluate, analyze and design participatory systems that prioritizes citizen agency and engagement.

- The second part undertakes a comprehensive study on Cedric Price's unbuilt Fun palace project of the 1960s. The study is subdivided into two sections, the first one understands architecture as a complex system of various kit of parts, that collectively represents the functioning of a whole. The second section is an extensive analysis of the implications of a cybernetically mediated user engagement with the kit of parts, that questions the capacity of architecture to response to the changing user needs. The key findings of the analysis outlines a set of principles that addresses contemporary issues in design and functioning of technologically mediated participatory systems.

- The third part traces its relevance in today's technology focussed urban developments by introducing Toronto's Quayside smart city proposal, and delves into reasoning out on the shortcomings of its participatory visions. In doing so, the research frames a

5 Signore, M.D., and G. Riether. Urban Machines: Public Space in a Digital Culture. List, 2018, 5.

new perspective looking through which, the Quayside project can be decoded in terms of its kit of parts components similar to the Fun Palace. The result of the mapping, provides clarity to identify a set of components the thesis aims to re-imagine.

- Following that, the last part of the thesis features a set of design explorations, that questions the theories and ideas discussed in the previous chapters through the design of high agency architectural entities. These entities are imagined based on the concepts derived from technological mediation, that enables them to become interactive and responsive to changing social and environmental conditions. Each of the proposal adopts different participatory methods that questions new ways of creatively mobilising citizen engagement in the public realm, where they become the main actors in the production of it.

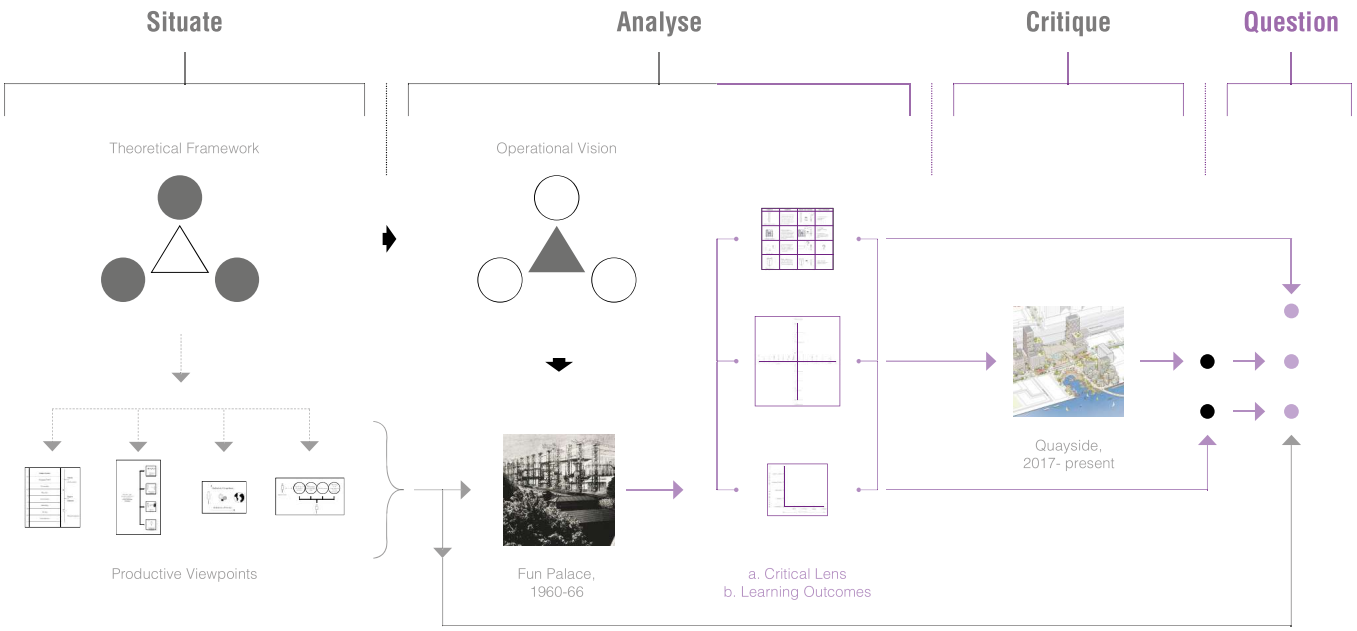


Fig. 0.1 Research Framework and Methodology (by Author)

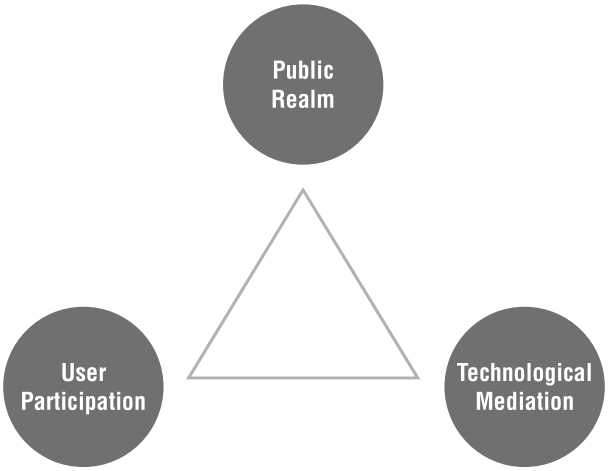


Fig. 1.1 Theoretical Framework (by Author)

01

1.1 Introduction to Public Realm

1.2 Concept of User Participation

1.3 Theorizing Technological Mediation

01

Theoretical Framework

Cities were first developed to support basic human activities, but have gradually transformed into complex, evolving, living laboratories, where socio-environmental relations are constantly being redefined. With over half of the world's population now living in urban areas, it is evident that there can be no single solution to environmental, social or economic challenges. The multi-layered contemporary experiences demands a more holistic approach to think about cities beyond the static layer of physical environment (infrastructures, buildings, etc.) and economic aspects in order to reinforce the dynamism of social qualities in urban life- its processes, relationships, patterns, links, and interactions. The following chapter discusses the significance of three keys concepts that gained prominence in the early 1960s and are very relevant in today's contemporary context as they provide valuable insights on the relation between human, city and technology.

1.1 Introduction to Public Realm

"Public space is a space where many activities overlap: rich confusion, commerce, seduction, and filth. Public space works not as a designed element, but it is instead carved out by wheeling and dealing, crossroads, and the chance at freedom, where a person emerges from shadows into light that grows into the ever-extending space of public gathering and demonstration and seeps into every open pore of the city."
- Aaron Betsky[6]

Addressing the needs to endorse alternative modes of transport other than just vehicular traffic has been climbing up the agenda for many years with the desire to not only accommodate other road users' needs, such as pedestrians and cyclists, but to also create a sense of place and a pleasant environment to be in. Although this is all relative to the function of the street, some locations simply have a high traffic function that needs to be accommodated, whilst others are predominantly led by pedestrian demand for public realm desires.

The public realm in any city abounds with streets, lanes, parks and public squares, but also public facilities such as the public lobbies and spaces that anyone from the public are able to legally access, view and experience. As the design and infrastructure of our urban public spaces are undergoing significant transformation, broadband wireless Internet access is becoming as important and pervasive as the provision of other public amenities on streets and in public squares and parks such as sidewalks, cycle paths, benches, and water fountains. Activities related to Internet use has become an everyday activity in public spaces and is no longer limited to private spaces in the home, workplace or library. Tourists, local workers and residents use the public realm to experience the social diversity that urban spaces offer.

The Situationists' Ideals

This notion of the public space, brings us back to works of the late 1950s Situationists' idea of the public realm as a psycho-geographical condition[7], that is characterised beyond the physical space, into its autonomy and manifestation of the social realm where the citizens becomes the actors in the production of it. The avant garde alternative to the functionalist planning articulated the public realm as a set of shared, common, sentient and networked condition, where the assemblage of different urban components generates a "functioning whole"[8] like a connected system, that intrinsically relates to the agencies that have potentials fro actions to be played out in the physical dimension of the public realm.
The idea of the mobile spatial forms was to provide an adaptable architecture, that could be transformed in harmony with the changing desires of its inhabitants. And so the city was

6 Betsky, Aaron. "Nothing but Flowers: Against Public Space," Slow Space. Ed. Michael Bell and Sze Tsung Leong. New York: Monacelli Press, 1998. 458.

7 Sadler, Simon. The Situationist City Cambridge Ma: MIT Press, 1998., 4.

8 Signore, M.D., and G. Riether. Urban Machines: Public Space in a Digital Culture. List, 2018, 5.

Situationist International

Psycho- Geographical Condition

Physical Space

Social Realm

Shared, Common, Sentient & Networked

Mobile Spatial Forms

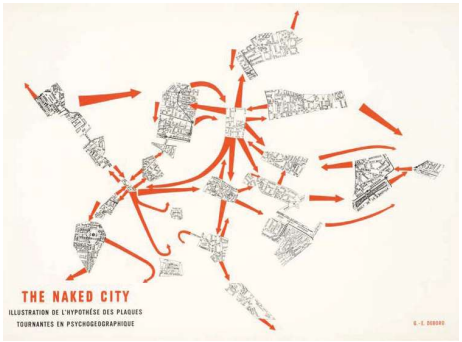


Fig. 1.2 Naked City, Guy Debord, 1957

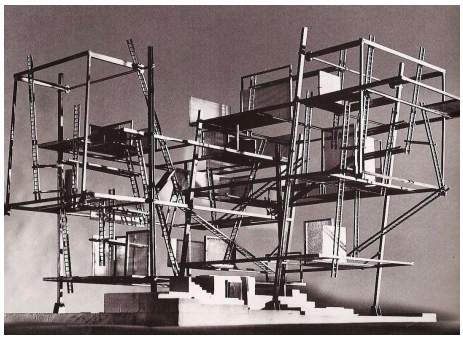
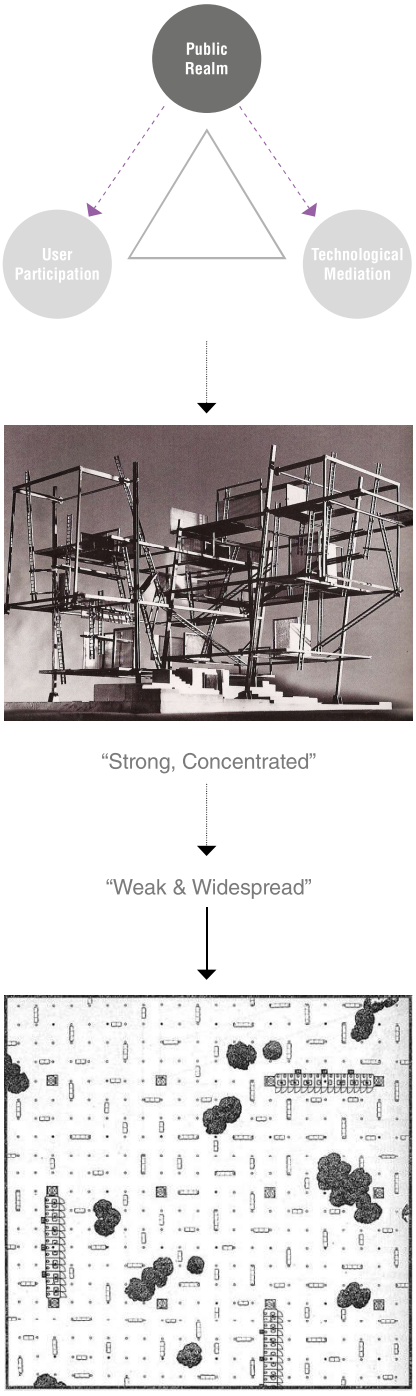


Fig. 1.3 New Babylon, Constant, 1959-74

no longer perceived as a static, planned and controlled object, but rather a spatial experience of social and political activities linked with the context of its surroundings and whose main purpose was to create 'situations'[9] and 'scenarios', that can be explored using a map that is not the traditional one, but the one like Debord's Naked City or Constant's New babylon.

The concept of the mobile spatial forms marked an key era in the architecture discourse as they redefined the potentials of architecture and spatial thinking. Technological understanding of the machines provided a framework to promote relations between city, technology and human scale, that is still very relevant to the contemporary context. Because 'their spatial parameters merge with information, networks, devices, media and users to create public spaces that were more responsive, participatory and collective.'[10]

With this as a hinge point, the thesis tries to understand the fundamental concepts of User Participation & Technological mediation to trace its contemporary relevance by re-imagining it in a more decentralized setting; Borrowing Andrea Branzi's suggestion of the passage from the "strong, concentrated"[11] modernity to the "weak and widespread type", dwelling on the



9 Sadler, Simon. The Situationist City Cambridge Ma: MIT Press, 1998., 11.

10 Signore, M.D., and G. Riether. Urban Machines: Public Space in a Digital Culture. List, 2018, 6.

11 Branzi, Andrea. 2006. Weak and diffuse modernity: the world of projects at the beginning of the 21st century. Milan, Italy: Skira, 132

importance of devising reversible, temporary, imperfect and incomplete projects, that can continuously reprocess its social and territorial situations by casting off old and reassigning new functions to the city.

Archizoom's 1969 No-Stop city project motivated the loss of architecture, as architect and historian Kenneth Frampton calls it the "brutalisation of local space"[12]; Coupled with the rise of modular urban components and by the repetitive multiplication of which, new spatialities were defined.

In this line of inquiry, the public realm is viewed as an 'open sourced space'[13], where the citizens engage with the architectural assemblies to form mutable environments and situations. An important fact emerges out of this condition, as that of the relations and interactions that occur between people, and between people and objects, and with the environment as a whole, that opens up the idea of agency and citizen participation discussed in detail in the following chapter.

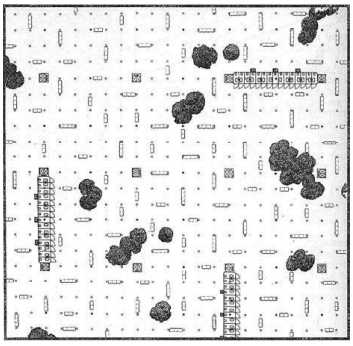


Fig. 1.4 No-Stop City, Archizoom

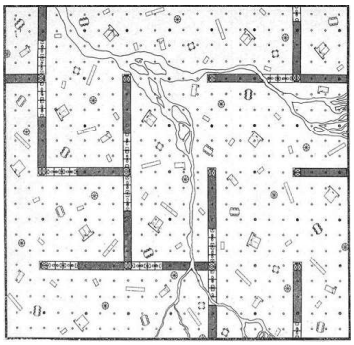


Fig. 1.5 No-Stop City, Archizoom

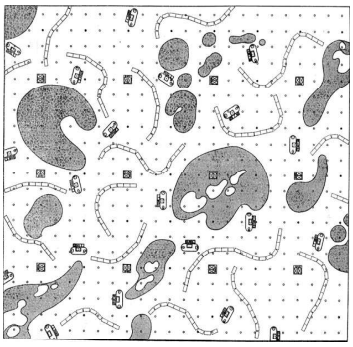


Fig. 1.6 No-Stop City, Archizoom

Loss of Architecture Aesthetics

\+

Rise of Modular Components

12 Ballantyne, Andrew. "Archigram: Architecture without Architecture." Journal of Architectural Education 59, no. 3 (February 1, 2006): 88–89. https://doi.org/10.1111/j.1531-314X.2006.00038.x., 137.

13 Bradley, Karin. (2015). Open-Source Urbanism: Creating, Multiplying and Managing Urban Commons. Footprint. 9. 91-108. 10.7480/footprint.9.1.901.

1.2 Concept of User Participation

1.2.1 History & Developments

A number of terms like citizen engagement, participatory democracy and budgeting, social and citizen-driven innovation, etc. are multiplying to capture the emerging and significant shift towards a more balanced approach to actively engaging with citizens to define the issues we face, to identify the solutions, and manage their delivery together.[14] Movements such as placemaking and tactical urbanism have identified the importance of our public spaces to maximise human encounters, prioritise community driven outcomes, and provide spatial flexibility. This approach towards participation started becoming mainstream during the post war 1960's where emphasis on considering user opinions in major decision making started hitting the limelight.

A brief history

The term 'user participation' represents a user centred development approach in which the needs and desires of the future end users play an important role.[15] Central to this pursuit, were the core ideals of democracy that were rooted in the early Scandinavian research projects in the 1960s-70s, that involved workers fighting for their rights to participate in the development of technology at their workplaces. So as to increase individual engagement among employees, which in turn would increase the efficiency of the technologies in development.

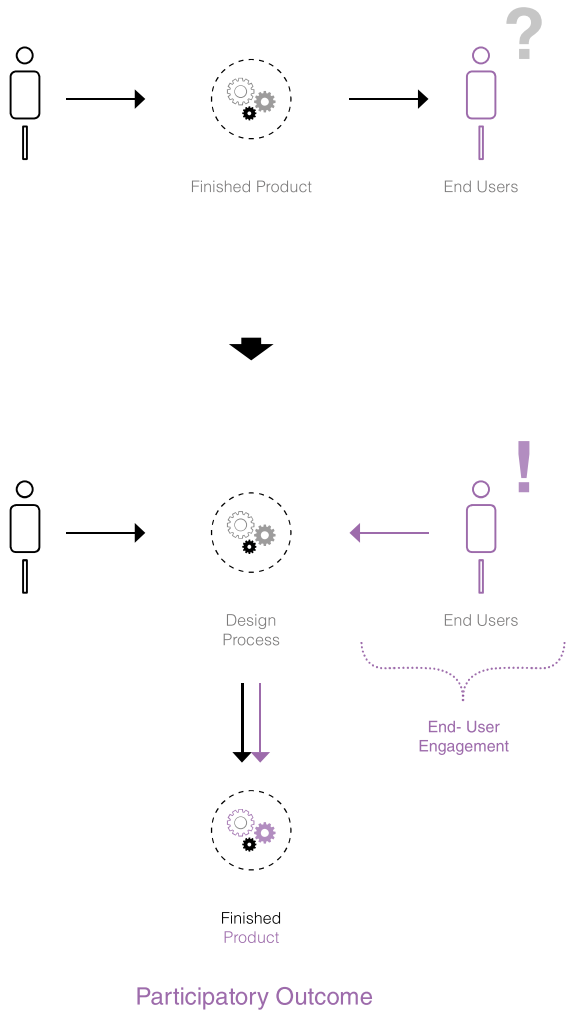


Fig. 1.7 Concept of User Participation (by Author)

14 Extract from REMOURBAN (REgeneration MOdel for accelerating smart URBAN transformation) deliverable 1.16 'Report on Innovative Citizen Engagement Strategies', 3.

15 Holgersson, Jesper & Melin, Ulf & Lindgren, Ida & Axelsson, Karin. (2018). Exploring User Participation Practice in Public E-Service Development-Why, How and in Whose Interest. Journal of E-Government. 16. 72-86.

"The idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you."
-Sherry R. Arnstein[16]

Arnstein's Participation Ladder

The term 'participation' had loose interpretations in various forms and sometimes at a much weaker intensity, or sometimes as am empty ritual to just check off the project's participatory aspect. This diversity of participatory approaches raised several criticisms until social worker Sherry Arnstein clarified this ambiguity in her 1969 article, where she proposed a typology that categorised the types of citizen participation in the form of a ladder.

The ladder is broadly categorised into three parts within which there are eight levels of participation , in which each rung corresponds to the extent of citizens' power in determining the outcome of the end product. The bottom two rungs of non-participation and further moving up the ladder, are the different levels of citizen power where the people can negotiate in trade-offs (partnership) or engage in decision making (delegated power) or operate autonomously (citizen control).

Over the years, several others like Connor (1988) , Pretty (1995), Fung (2006), Ferro and Molinari (2010) proposed ladders and spectrums building off of Arnstein's. But to articulate the critical lens for the thesis, Arnstein's ladder is more relevant as it primarily 'focuses on the redistribution of power as an essential element, with a fundamental point being that participation without redistribution of power is an empty and frustrating process for the powerless.[17] People appreciate having a voice, with the possibility to make a change – with evidence to show a sense of satisfaction in being consulted, even if the final decision is a different one.[18]

Shortcomings of the Ladder

The aforementioned works are aimed at jointly solving problems and preparing decisions, i.e. the typical focus of participation. As Lucke and Grobe (2014) argue, much is written about third party involvement in the first stages of the policy cycle (problem definition, agenda setting, decision making), but the latter stages (implementation, monitoring, and evaluating) are not as prominently discussed by policy makers and scientists.[19] To address the operational and tactical maturity in the delivery and evaluation of citizen engagement , the research examines the participatory models that existed in architecture around the late 1960s, that focussed on the end user engagement.

16 Arnstein, Sherry R.(1969) 'A Ladder Of Citizen Participation', Journal of the American Planning Association, 35: 4, 216 — 224

17 Krabina, Bernhard. (2016). The E-Participation Ladder – Advancing from Unawareness to Impact Participation, 3.

18 Extract from REMOURBAN (REgeneration MOdel for accelerating smart URBAN transformation) deliverable 1.16 'Report on Innovative Citizen Engagement Strategies', 5.

19 Ibid., 4.

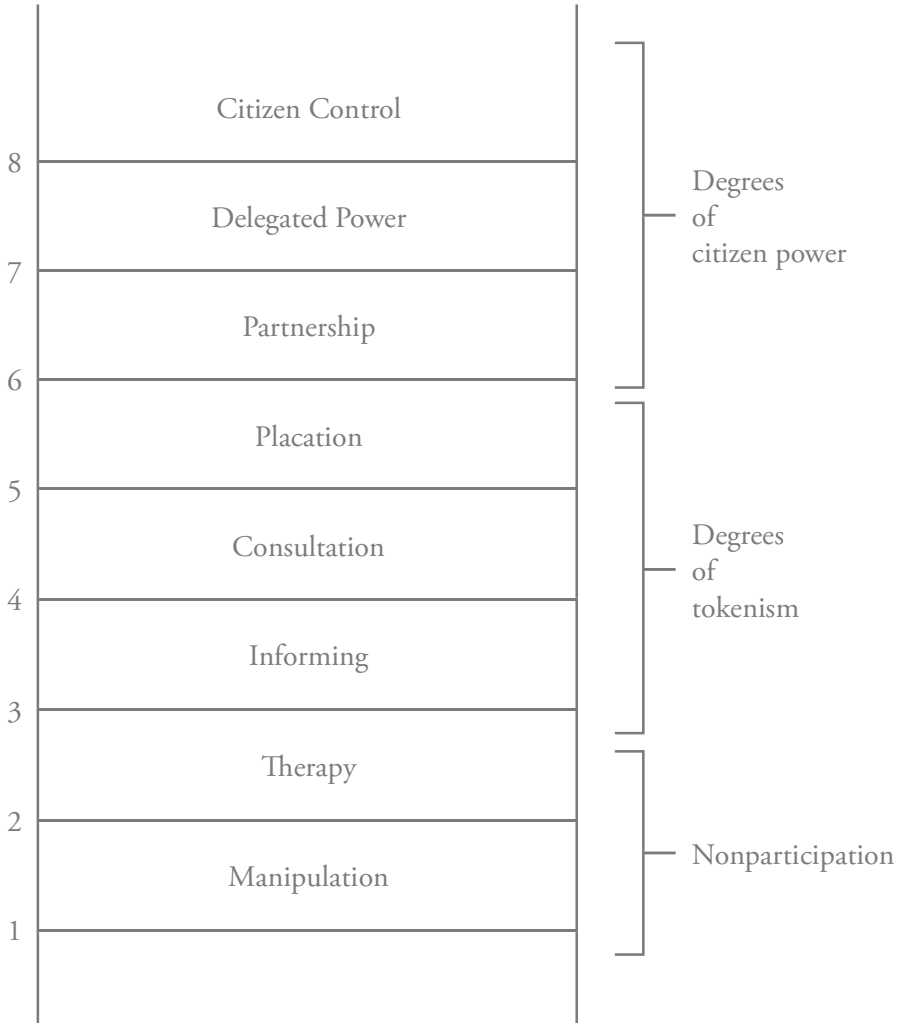


Fig. 1.8 Sherry R. Arnstein: Participation Ladder (Redrawn by Author)

1.2.2 Participatory Models in Architecture

Advocacy for user participation in architecture dates back to the 1960s across Europe and north America.[20] And the major goal of this movement was to encourage user participation and thereby foster communities to be more engaged in the shaping of their neighbourhood.[21]

Many notable architects addressed the different aspects of user inclusion ranging from catering to people's needs and aspirations or providing low cost alternatives to designing prefabricated elements etc. Among which, architects like Yona Friedman, Christopher Alexander, Nicholas Negroponte took a different approach towards engaging with the users. As they proposed models in the form of an overall framework that organizes a sequence of process that guided citizens through the participatory process.

Friedman's Participatory Model

Of the three approaches to participatory models, Hungarian architect Friedman's model remains relevant to the research, as it addresses the fundamental barriers to participation by aspiring to ensure undistorted translation of information between the user's preference and the final outcome.

In his book *Toward a Scientific Architecture,* Friedman diagrams what he calls the 'Information Circuit between the user and the planner'[22] that maps the relations between future end users and the architect. The following diagrams are redrawn versions of the original, that help understand the different conditions that arises through the interaction/ exchange of ideas.

Fig. 1.9 & Fig. 1.10 represents the traditional methods of planning, where the designer/ planner becomes the translator of the user's ideas into a finished final product.

Fig. 1.11 & Fig. 1.12 diagrams the scaled up version of traditional methods of planning, that fails to serve the needs for an increased number of users due to information clutter, resulting in tow bottlenecks in the communication loop; One where the vast inflow of information occurs from the multiple users to the architect and the second one where it hinders the feedback or the inability of the finished product to respond to varying user needs, which Friedman calls the jammed circuit.

As a response to this linear organization of processes, Friedman proposes an alternative system of recursive loop that eliminates the expert intermediary. It begins and ends with the user with no translator or architect in between. So instead of trying to accommodate all the users' need into one rigid outcome, the architect basically structures framework with a '*repertoire of all the possible arrangements (solutions)*'[23] that

20 Wulz, Frederick. "The Concept of Participation." Design Studies 7.3 (1986): 153-162.

21 "Community Technical Aids Centres," Spatial Agency website, accessed March 08, 2019, http://www.spatialagency.net/database/community.technical.aid.centres.

22 Friedman, Yona. Toward a scientific architecture Cambridge, Mass: MIT Press, 1975, 4.

23 Ibid.,8.

Yona Friedman: Information Circuit Diagram

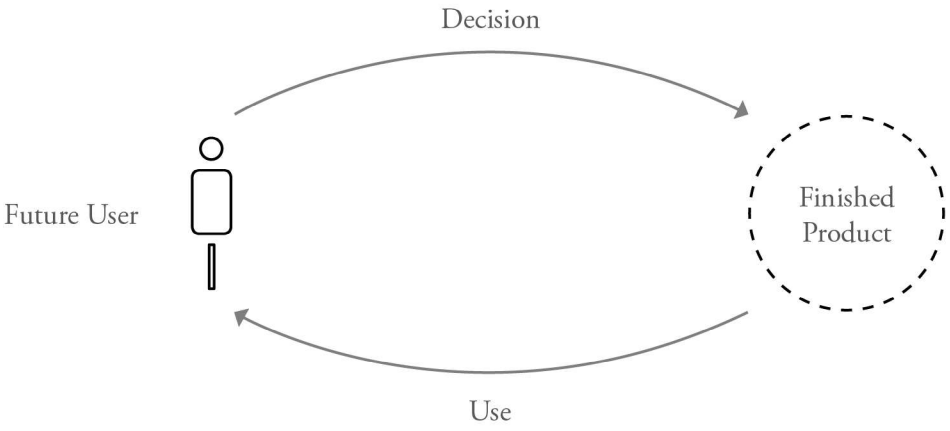


Fig. 1.9 The Basic Process Includes only the User and the Product (Redrawn by Author)

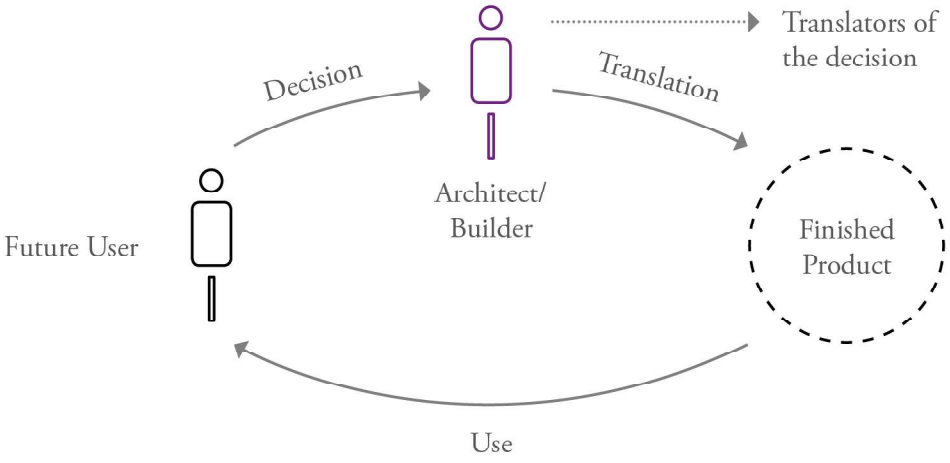


Fig. 1.10 The Translator Enters the Process (Redrawn by Author)

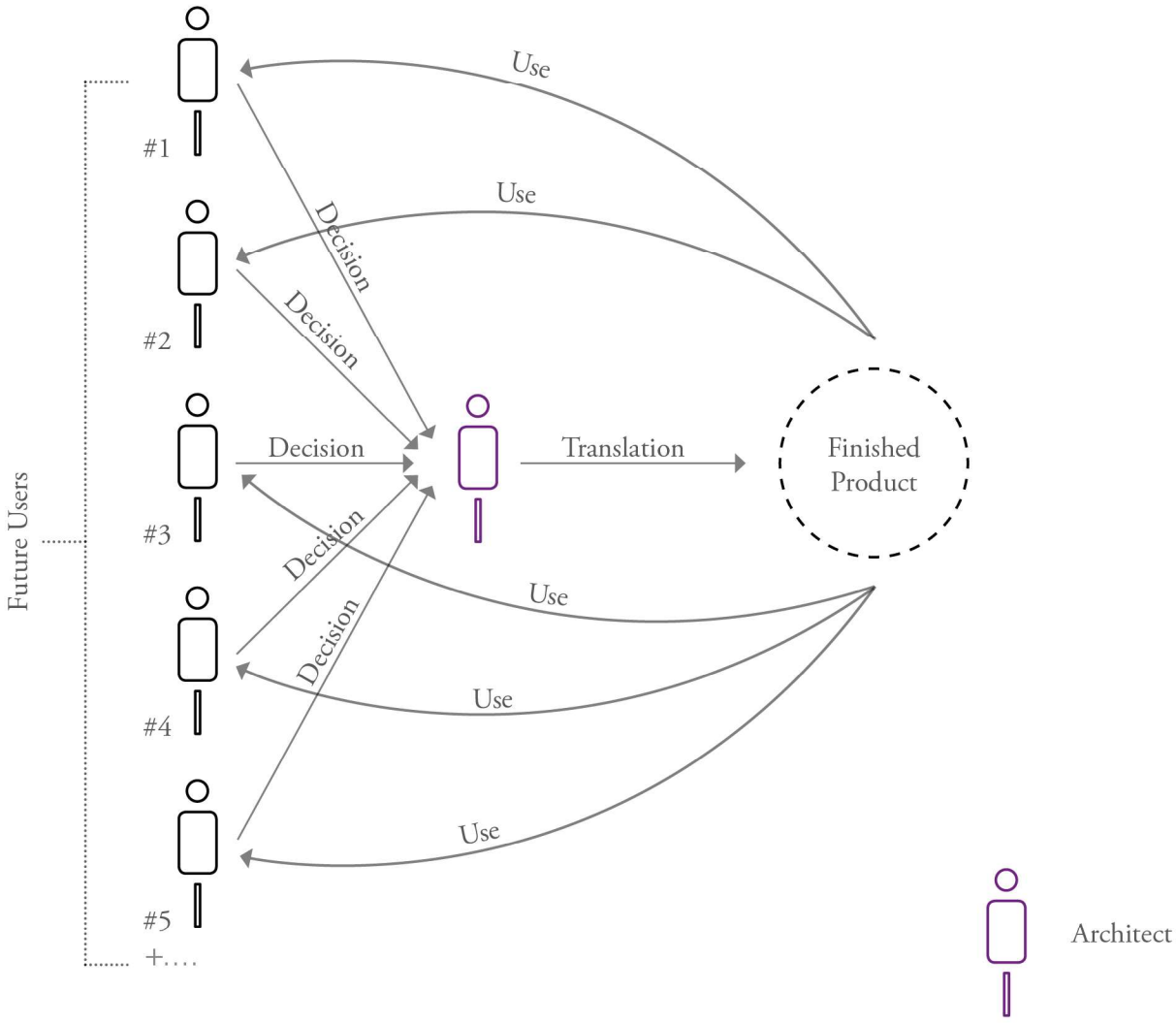


Fig. 1.11 Jammed Circuit (Redrawn by Author)

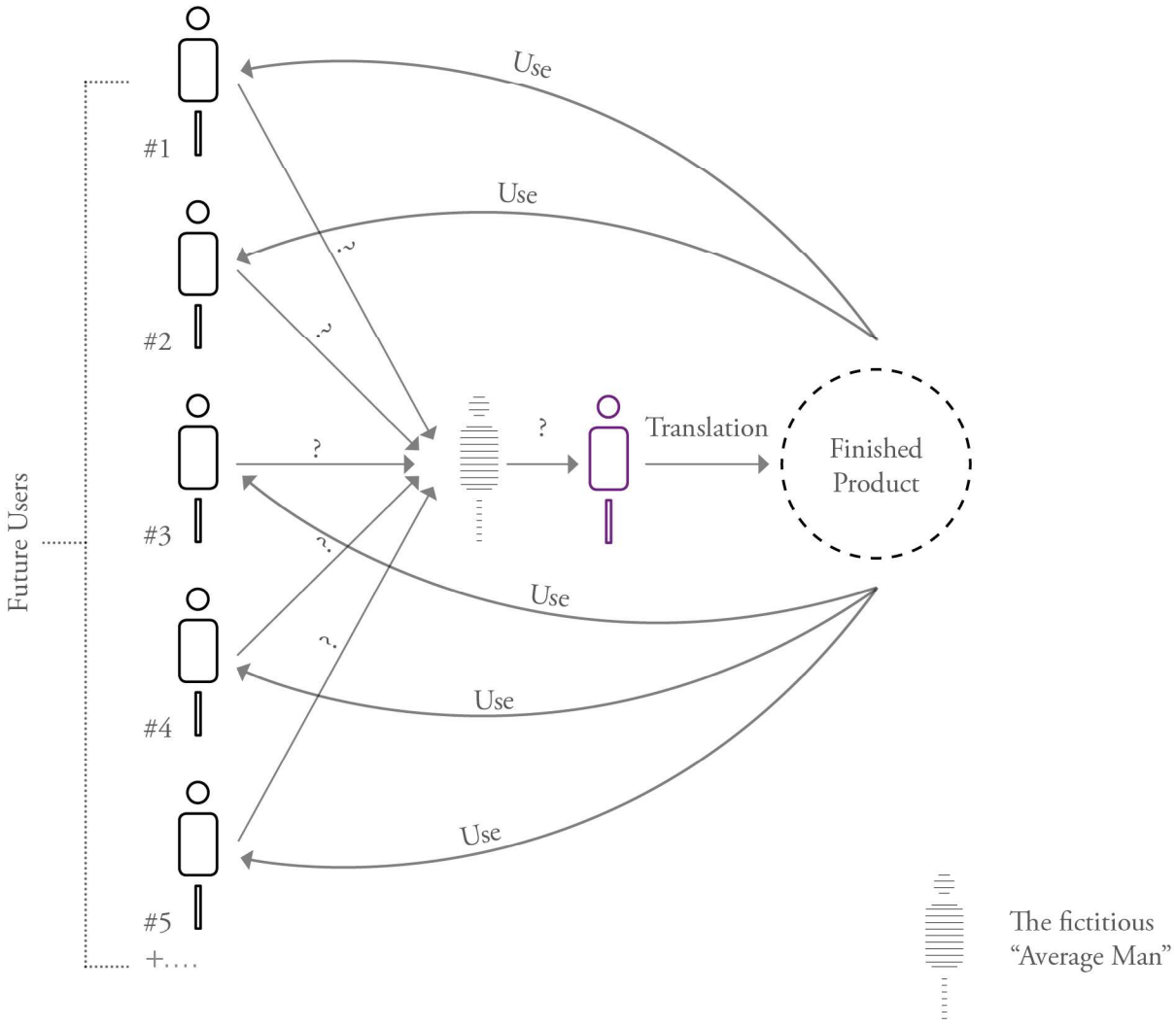


Fig. 1.12 Broken Circuit (Redrawn by Author)

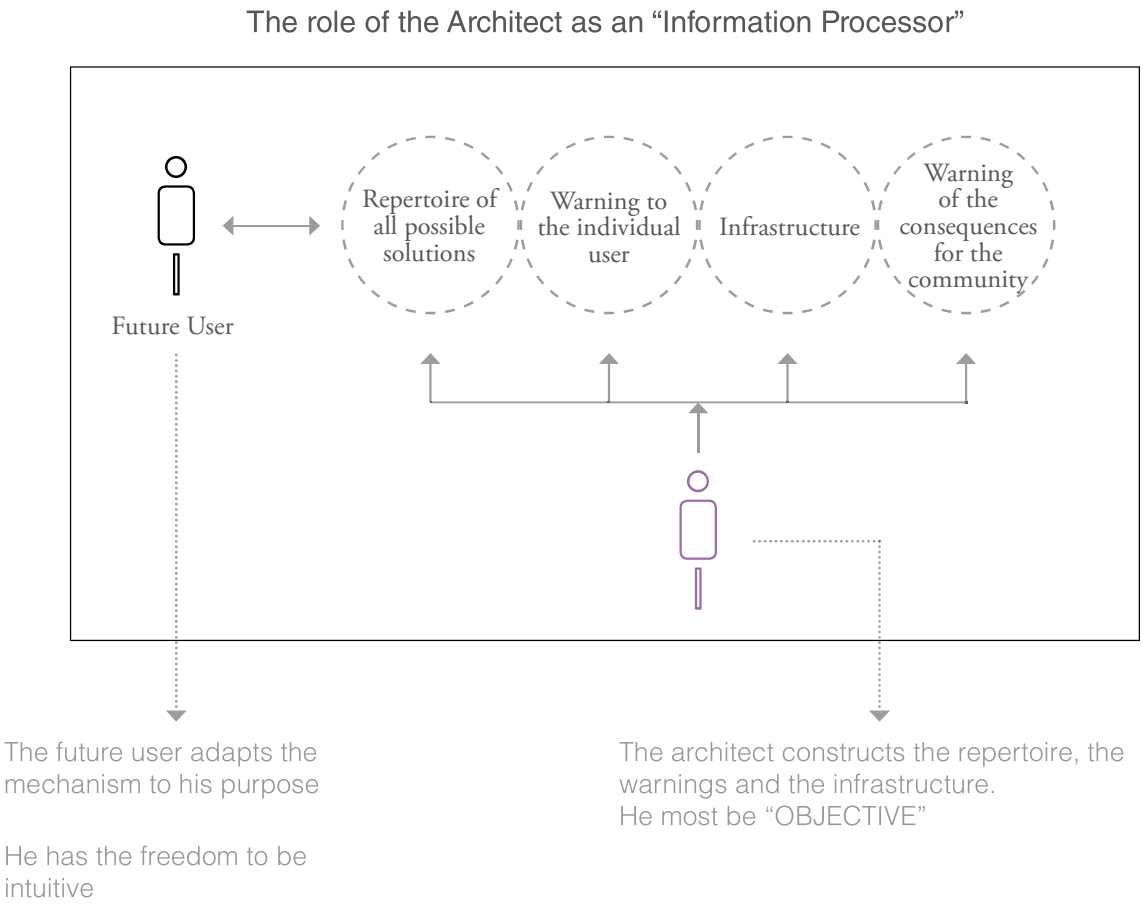


Fig. 1.13 The Feedback System- The Future User is the only Person in the Circuit (Redrawn by Author)

the user engage with and is provided with direct feedback at each stage of the process.

Role of the Architect

The architect in this condition, assumes a new role as *'he constructs the repertoire'*,[24] that provides the users a set of tools with feedback mechanisms to guide them throughout the participatory process. And by doing so, makes architecture easily accessible to the hands of the individuals and community so that its form, function or program can be created, modified and altered in endless possible ways.

The discussion on Friedman's participatory model emphasises on this idea of heightening the consistency of user engagement in designing a participatory system, to consider the end users an actor as opposed to a subject. In common participatory conditions, the intensity of end-user engagement in the initial ideation phase of the designs are consistent, and gradually decreases while progressing towards the actual design & implementation phase. This in-turn affects the end user engagement and feedback cycle in the project. From this productive viewpoint, the research tries to articulate a critical lens discussed in the following chapter.

24 Friedman, Yona. Toward a scientific architecture Cambridge, Mass: MIT Press, 1975, 9.

1.2.3 Articulating the Critical Lens

Using the theories discussed so far, the research builds a critical lens to understand and evaluate participatory systems in the forthcoming exercises. To do so, I start by re-interpreting Friedman's information process diagram, that forms one of the defining axis of the 2D graph, to indicate the consistency with which the users engage. Onto which, I overlay Arnstein's participatory ladder, that informs of the intensity of participation.

In order to realise architectural projects with such participatory ambition in the material sense of the word, Friedman proposes the need for an adaptive technology to run this framework for two reasons:

- One that it will give users a chance to make modifications of their choices, even after the final outcome has been realized.
- And the other is to store a history of such changes in a memory to be able to follow it to understand use patterns over time.

Which introduces to the last section of the theoretical framework discussing on the role and imperatives of employing technology to mediate the interactions between the end-users and the architectural framework.

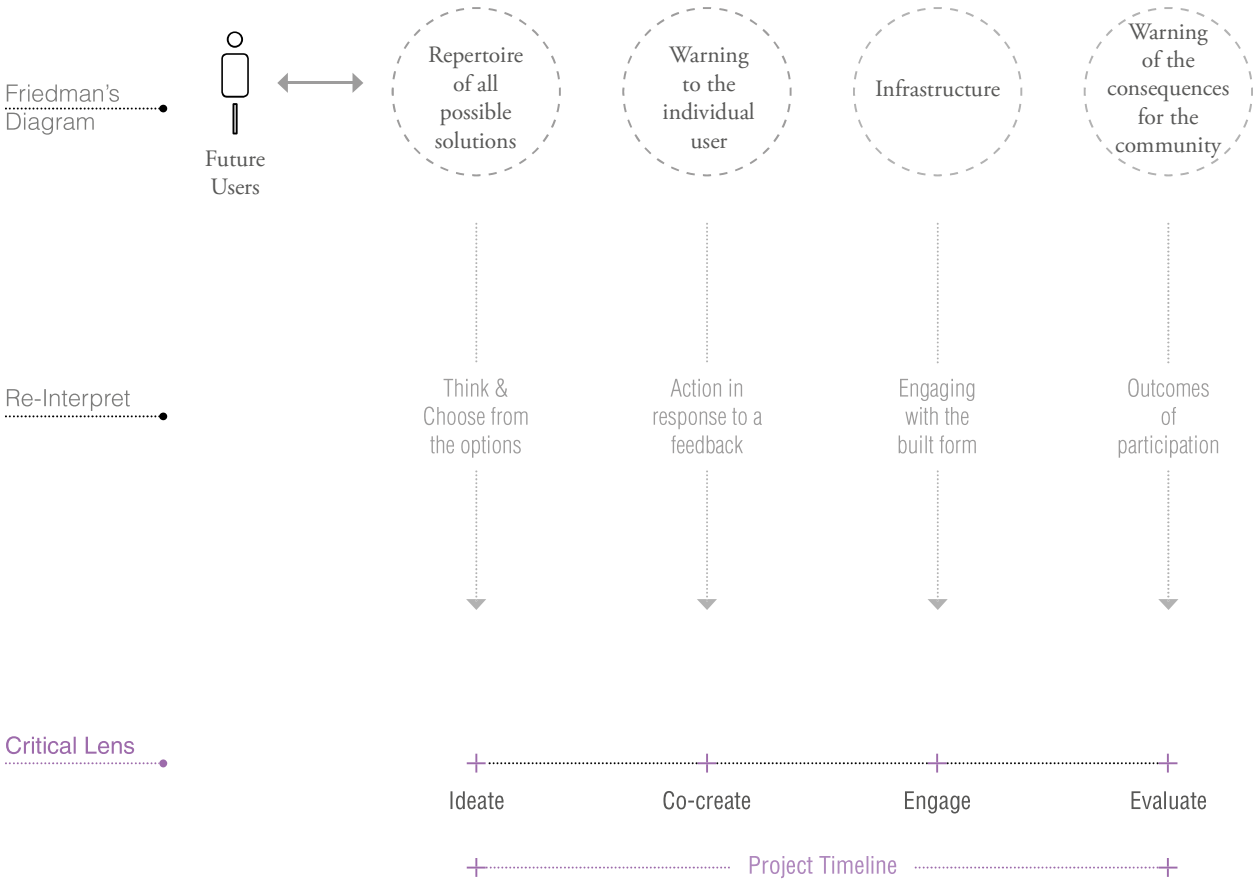


Fig. 1.14 Constructing the Critical Lens: Stage 01 (by Author)

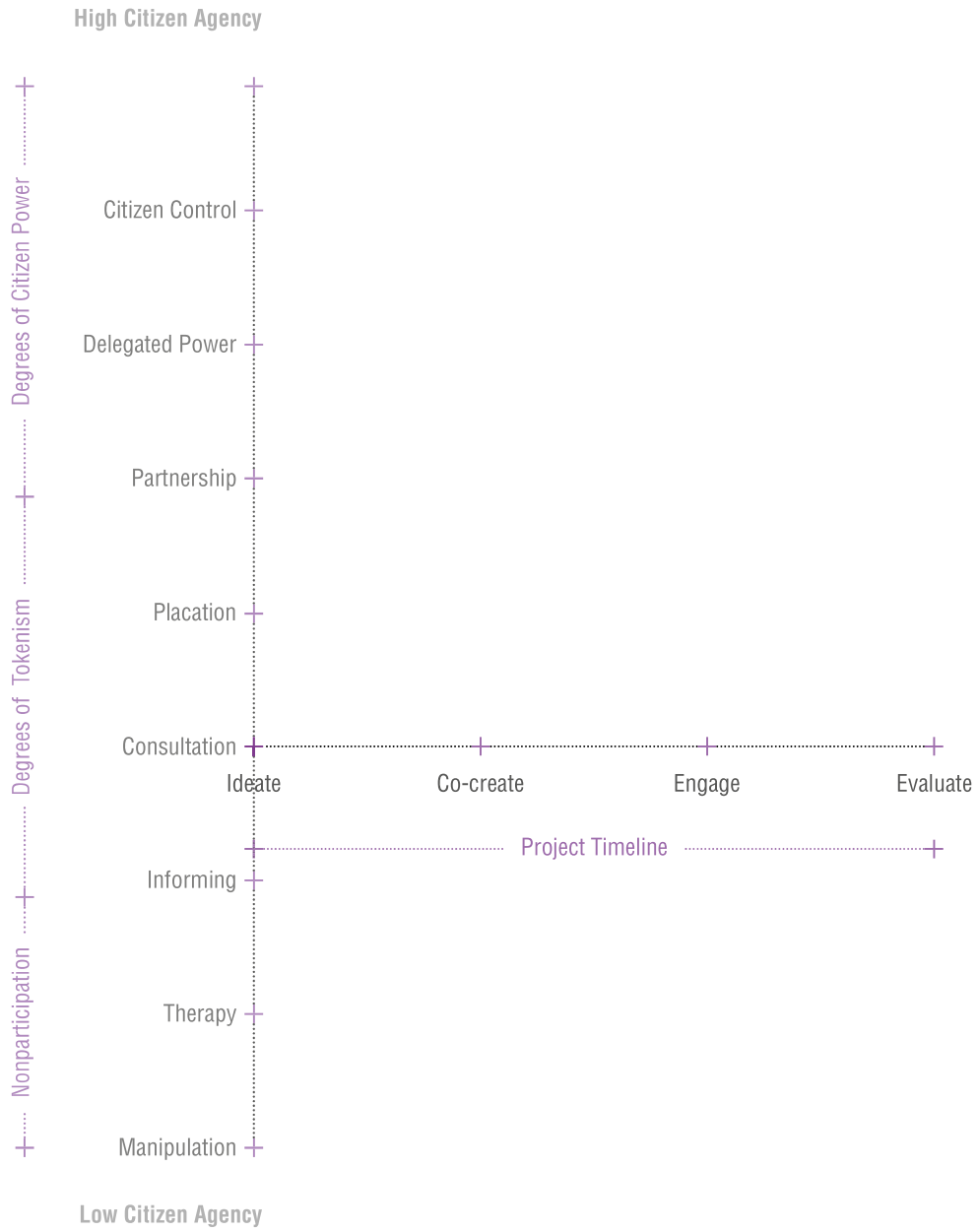


Fig. 1.15 Constructing the Critical Lens: Stage 02 (by Author)

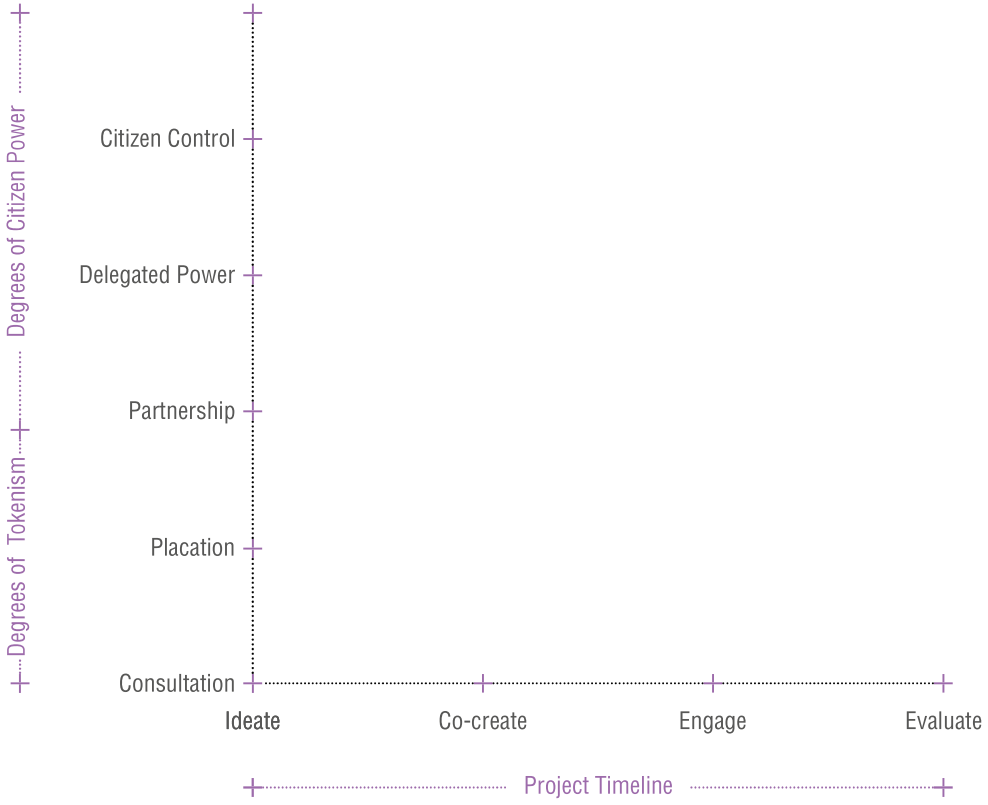


Fig. 1.16 Constructing the Critical Lens: Stage 03 (by Author)

1.3 Theorizing Technological Mediation

Introducing the last part of the theoretical framework, that was present since the late 1960's but started gaining prominence around the 1990's and is very relevant in today's contemporary society, is the concept of technological mediation. This section synopsizes two concepts from the philosophy of technology that offer useful categories for theorizing user- technology associations, will help rid the traditional notions that deem technology either neutral or determining.

Moralizing Technology, Peter-Paul Verbeek, 2011

In his 2011 book Moralizing Technology, Peter-Paul Verbeek sets out to develop a theory of "material morality", that looks at understanding human- technology relations in everyday life, based on the idea that when used, technologies help to shape the relations between human beings and the world.[25]

For instance, a smart phone changes how attentive we are with our discussion partners; And a sonogram helps us to see the fetus as a potential patient. So the outcomes of such mediation is that, on one hand, it helps to shape how the world is meaningful to us; eg. for instance digital technologies change how we understand the world around us by overlaying electronic information.

And on the other, they help to shape our actions and practices; eg. like how cars have made us live further away from our work.

Post-Phenomenological perspectives in Human-Technology Associations, Don Ihde, 1990

Now, Verbeek's study on this idea is a regrouping of North American Philosopher Don Ihde's Taxonomy of human- technological relations in his works on post phenomenology. Rather than approaching technologies as material objects opposed to human subjects, Ihde sees them as mediators of 'human-world relations'[26] and categorizes them into four types ranging from:

- Embodied: we do not look at our glasses but rather through them.
- Read: like the thermometer indicates the temperature by showing a number that we have to interpret.
- Interactive: like how we interact with the ATM to get money.
- Background: like the lighting and heating systems that creates a comfortable environment for us.

Many recent technologies blur these distinction of categories and falls under the spectrum ranging from hybrid beings to merging with the surroundings to create smart & immersive environments.

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25 Verbeek, P-P. (2011). Moralizing Technology: understanding and designing the morality of things. Chicago/London: University of Chicago Press, 1.

26 Verbeek, P. P. C. C. (2001). Don Ihde: The Technological Lifeworld. In H. J. Achterhuis (Ed.), American Philosophy of Technology: The Empirical Turn. (pp. 119-146). (Indiana Series in the Philosophy of Technology). Bloomington (USA): Indiana University Press, 123.

Peter-Paul Verbeek, Moralizing Technology

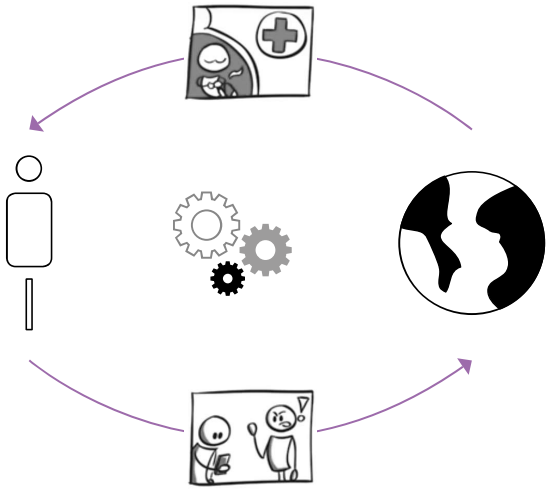

Fig. 1.17 Theorizing Technological Mediation (by Author)

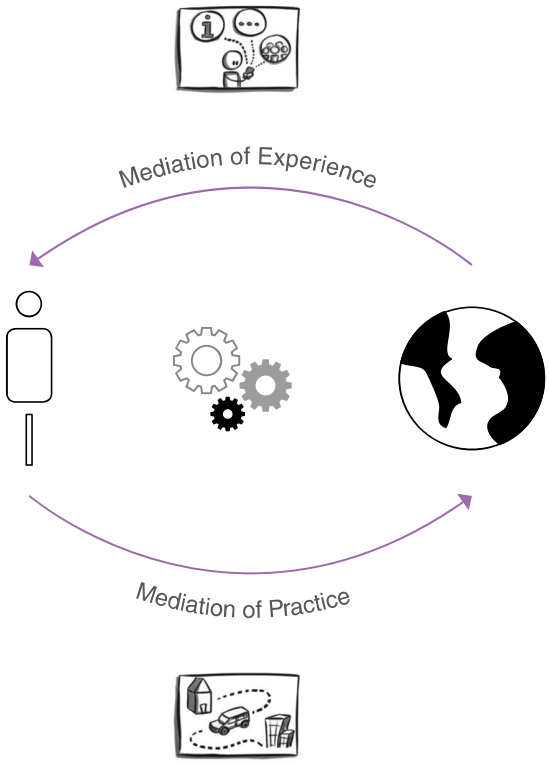

Fig. 1.18 Implications of Technological Mediation (by Author)

Don Ihde's Taxonomy

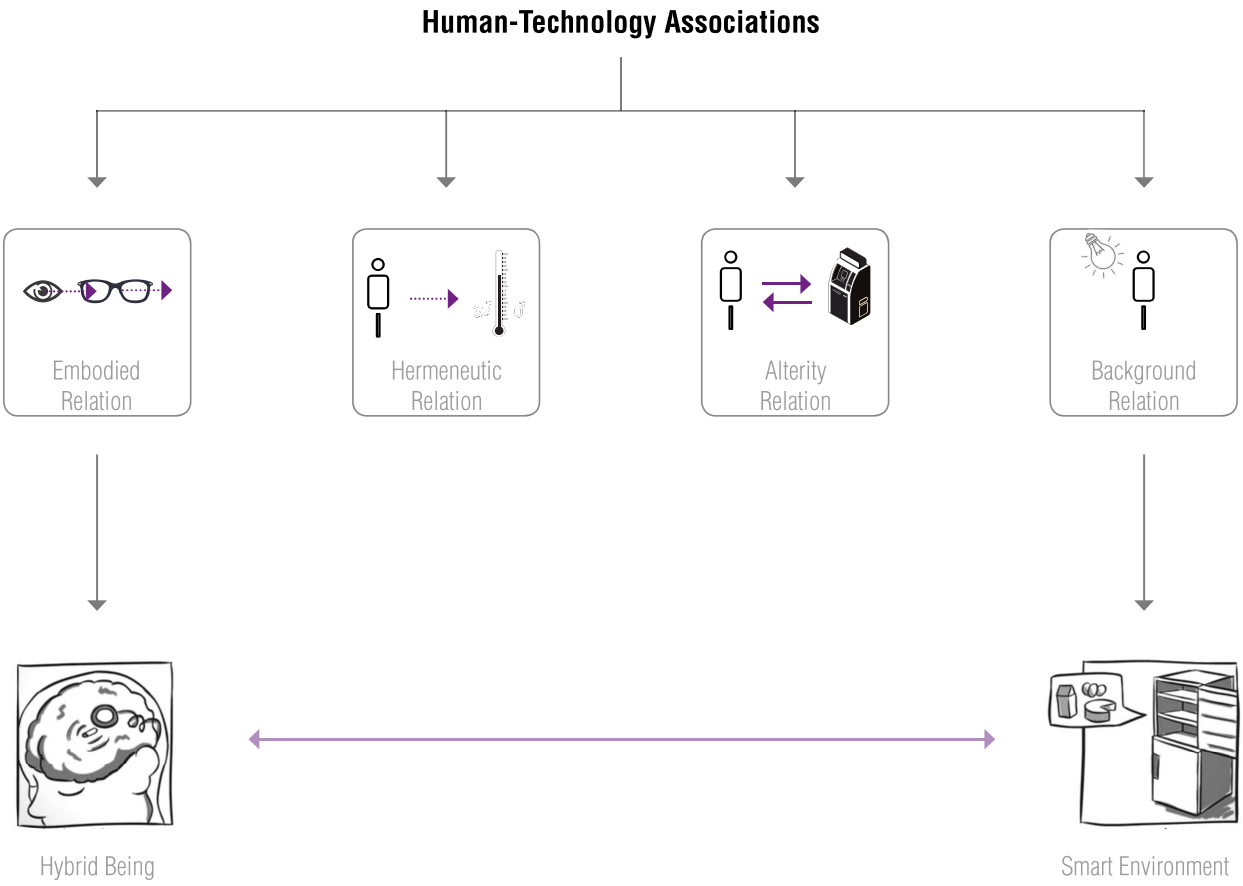

Fig. 1.19 Categorizing Human-Technology Associations (by Author)

1.3.1 Design Participation Conference, 1971

Now, these recent theories, can actually be inquired in the early architectural proposals of the 1971 design participation conference; Where a group of designers, architects and planners proposed new ways of designing, using technological mediation. They presented ideas that would enable "wider sections of society to actively participate in the processes of planning and design"[27] Arnstein's taxonomy was operative and the proposals promoted different levels of participation by employing computation and information technology to remove the professional intermediaries from the design process and give users the agency to shape their settings. In doing so, they proposed a framework for participatory design, consisting of two components, "structure and device".[28]

- One is the device that is programmed to perform a certain task that relates to the cognitive perception of the user.
- The other is the structure, that is a physical entity on which the user acts upon based on his perception. So this framework, has a goal for the participation to happen, in the form of an intention, and makes sure, that the outcomes of the multiple ways in which the user engages with it, are inline with the main goal.

But since these proposals were conceived before theories like Idhe's taxanomies, the idea of the mediating entities having a certain intention, was considered very ambiguous, that deemed the proposals determinant in some ways.

So in this line of inquiry, the research views technological intentions as being necessary rather than a determinant that forms constructive associations with its users, to provide agency & facilitate meaningful participation.

To understand the implications of such technologically mediated user participation and its significance in motivating user engagement, the following chapter discusses in detail about Cedric Price's unbuilt Fun Palace project of the 1960s, that bundles up all the three ideas discussed in this theoretical framework as that of the public realm, user participation and the role of technology in mediating it. And through the analysis of which, the research traces its contemporary relevance on the potentials of practicing similar techno- optimistic methods, to enhance participatory design.

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27 Vardouli, Theodora. (2015). Who Designs?. 10.1007/978-3-319-13018-7_2., 13. Originally published in Cross, Nigel. and Design Research Society (Great Britain). Design participation: proceedings of the Design Research Society's conference, Manchester, September 1971; edited by Nigel Cross Academy Editions London 1972

28 Borgmann A (2012a) The collision of plausibility with reality: lifting the veil of the ethical neutrality of technology. Educ Technol 52:40–43

1.3.2 Diagramming the Functioning of Technologically Mediated Entities

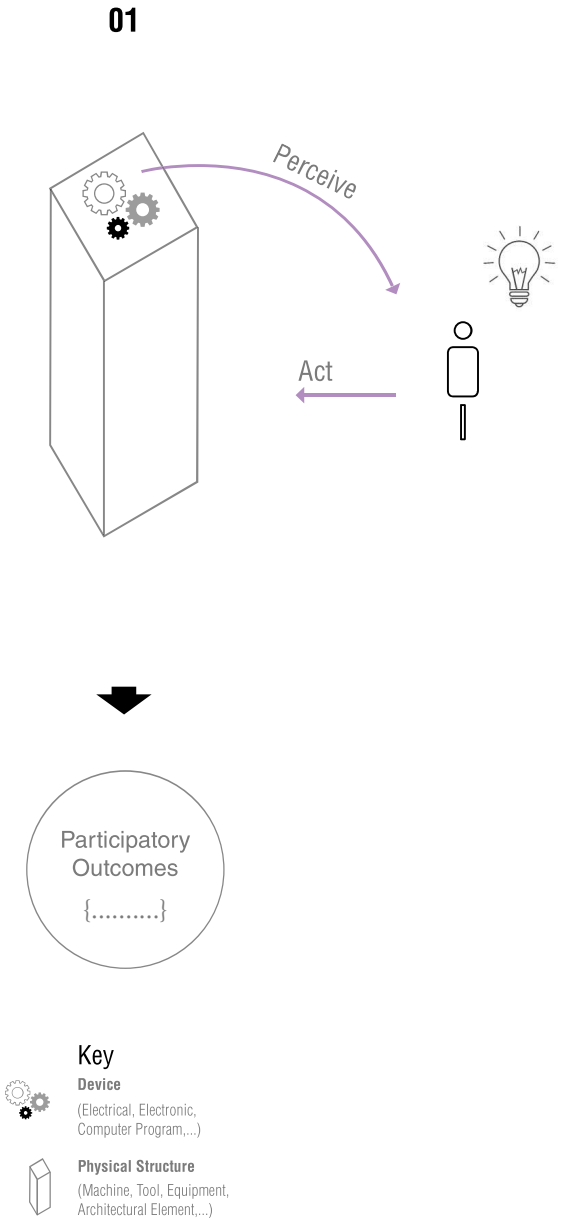


Fig. 1.20 User-Entity Relation (by Author)

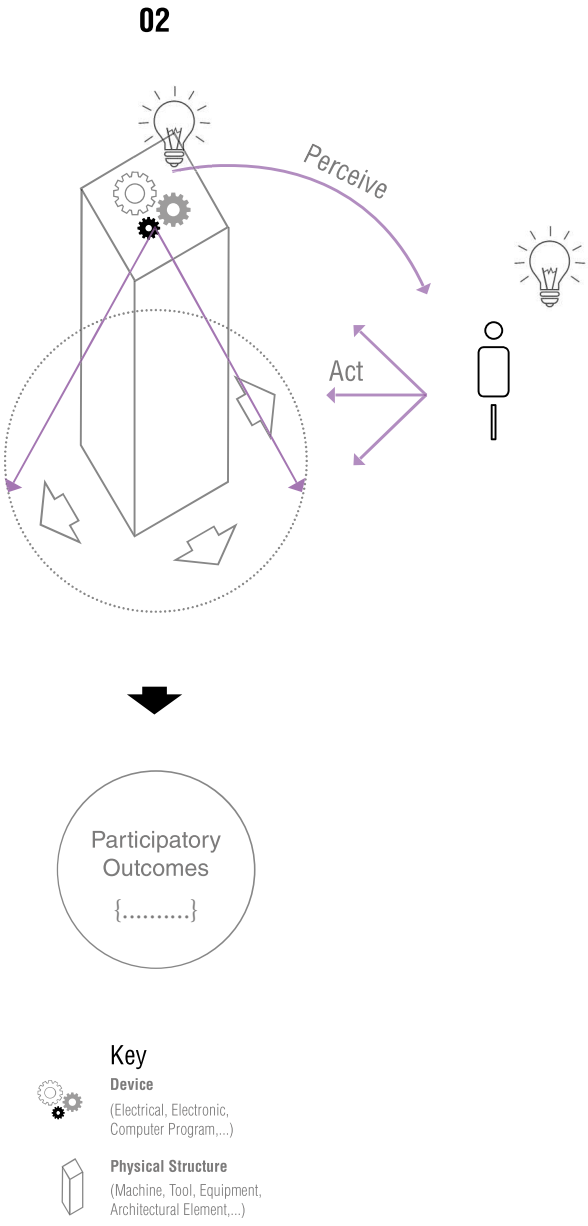
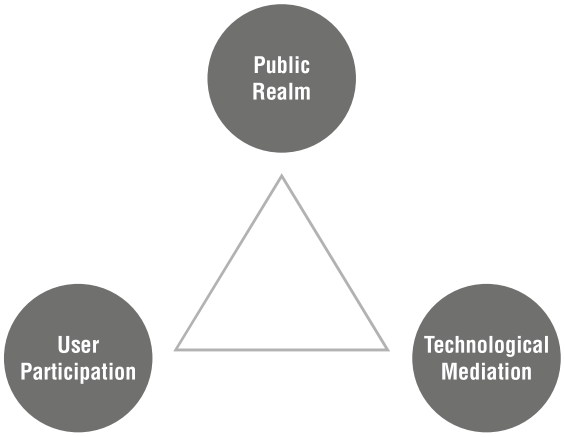
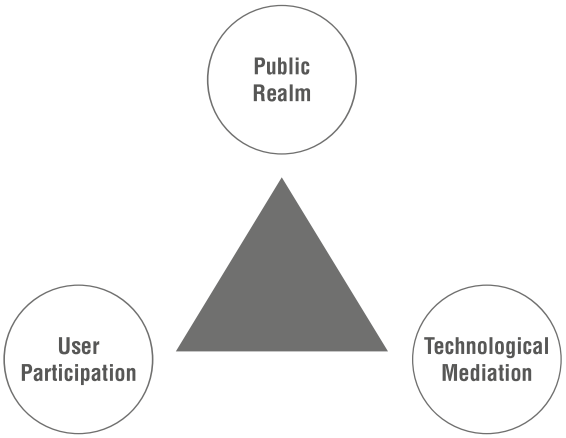


Fig. 1.21 Technological Intentionality (by Author)

Applying Theories into Practice



Theoretical Framework



Combining Three Concepts into an Architectural Vision

Fig. 2.1 Fun Palace: Perspective for the Lea River site on photomontage

02

02

Fun Palace, 1960-66

This chapter is dedicated to the introduction and analysis of Cedric Price's most influential project of the 1960's, Fun Palace. This project is very special to me and has also played a major role in shaping the contemporary architectural discourse of today[29] and is an important part of the thesis, because the ideas of the proposal bundles up all the three ideas discussed in the theoretical framework into an architectural setting from which the thesis design explorations take inspirations from.

29 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 08.

2.1 1960s Social and Architectural Milieu

2.1.1 Postwar Britain

Introduction

Price's education and career practices have always been greatly influenced by significant acquaintances and the much turbulent post war era of Britain. The concepts of time and beneficial change in response to the demands of function, location and users have always been of great strength in Price's architecture.[30] This kind of a social design rose into prominence during the Post War period in the 1960's, that called for unprecedented socio- economic restructuring across the world. This period of the changing world, provoked a new era of radical architectural creativity where politics, pop culture and technology collided.[31]

Leisure & the new society

"Social equality was a goal for politicians and architects alike. Housing, industrial and power buildings, education, factories and supporting services became the focused and central issues."[32]

Britain had a strong influence in globalizing the pop culture and its technology where various groups of architects, artists and critiques held an important role in "creating the environment in which the new society would flourish."[33] There was an increased tension between the pre- war architecture groups like the CIAM (Congrés Internationaux d'Architecture Moderne), MARS (Modern Architecture Research Group) and the post war young generation radical architecture minds who felt modernism was too simple and dull.

As a response to the tensioned society, "The Festival of Britain, 1951" was organized where, 'out of the repertory of pre-war Modernism, a team of architects developed architectural strategies for the exhibition buildings that integrated the work of painters and sculptors, displayed engineering in a playful spirit, using as much bright colour as possible, and creating a general feeling of uplift both literal and metaphysical.'[34] For many, the exhibition was successful and some others viewed it as a threat to the ideas of modern architecture.

As for Price, the exhibition remained relevant to his architectural ideas. Quite specifically Price's imagery of the Fun Palace shares a close resemblance to the Sea Ships Pavillion, installed by Sir Basil Spencer at the Festival of Britain.

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30 Price, Cedric, Samantha Hardingham, and Architectural Association , Issuing Body. Cedric Price Works 1952-2003 : A Forward-minded Retrospective. V.2. London : Montreal: Architectural Association ; Canadian Centre for Architecture, 2016.

31 http://www.adip.tu-berlin.de/wp-content/uploads/2011/03/Interrogating-POP-in-Architecture_Introduction.pdf

32 Dennis Sharp, "The New Architecture in Britain: The Framework of the Welfare State," in Back from Utopia: The Challenge of the Modern Movement, eds. Hubert-Jan Henket & Hilde Heynen (Rotterdam: 010 Publishers, 2002), 118.

33 Clive B. Fenton, "PLAN: A Student Journal of Ambition and Anxiety", Man-Made Future: Planning, Education and Design in Mid-Twentieth-Century Britain, ed. Iain Boyd Whyte, (Routledge: London and New York, 2007), 174.

34 Powers, Britain: Modern Architectures in History, 84.

2.1.2 The Festival of Britain, 1951

Sea & Ships Pavilion, 1951
Sir Basil Spence

Fig. 2.2 Outdoor View

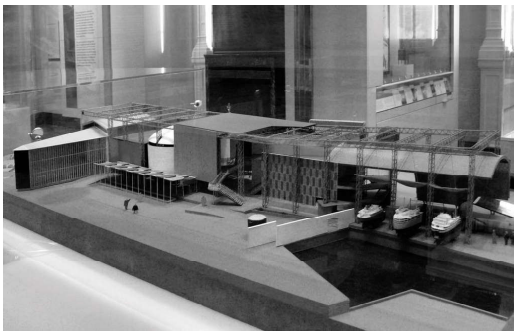

Fig. 2.3 Curated Model of the Pavilion

Fun Palace, 1960-66
Cedric Price

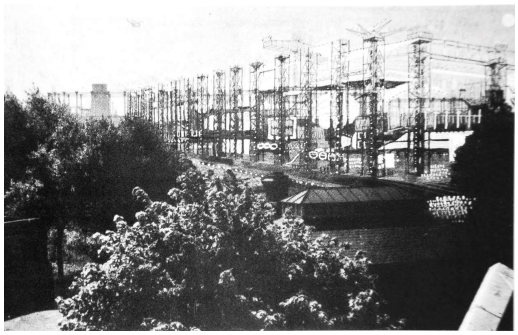

Fig. 2.4 View of the Lea valley Site

Fig. 2.5 Interior Perspective

2.2 Fun Palace: The Beginnings

2.2.1 Introduction

"Theatre? A lot of people facing the same direction watching a foregone conclusion."
- Cedric Price[35]

The Fun Palace started as a collaborative project between architect Cedric Price and Britain's most influential theatre director Joan Littlewood along with Cybernetican Gordon Pask who joined them a little later. It was imagined as a giant theatre in the form of a multi level street setting that captured the more 'spontaneous and unscripted'[36] theatre experiences to share social and political consciousness.

Brecht's Theatrical Inspiration

Central to the idea of Fun Palace included the avant garde theatres of the early twentieth century as developed by Bertolt Brecht's theories, on theatre as a form of social communication[37] through "Fun" and hence it's name 'Fun Palace' that aimed at providing opportunities for learning emerging from play, entertainment, and leisure.[38] So instead of just plays, it showcased the multiple situations and scenarios people were experiencing and constructing through their interactions with each other and with the building components and with the entire system and so on.

"I am not a professional director. I don't know what professional directors are. I haven't sat through a play in my life since I was 15. I spend my time watching the accidents and the courtesies and the hates and the loves and the acting of the people in the streets- because that's where I live."
- Joan Littlewood[39]

Fun Palace Imagery

The building is actually inspired from the shipping yards, it has this large open framework with an overhead gantry crane above that travels along its length to support the physical reorganisation of the activities and objects in the inside. And this structural setting opens up the ideas to start looking at employing technologies of the time to benefit a social setting. And also, it marks the beginnings of imagining the physical re-organization of space as a possible agency to encourage citizens to actively take part in the shaping and programming of the Fun Palace. The following sections of this chapter unpacks the project expanding on this line of inquiry as it kind of becomes the main theme of Fun Palace and the thesis as well.

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35 Price, Cedric, Samantha Hardingham, and Architectural Association , Issuing Body. Cedric Price Works 1952-2003 : A Forward-minded Retrospective. V.1. London : Montreal: Architectural Association ; Canadian Centre for Architecture, 2016, 10.

36 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 62.

37 Goldhagen, Sarah Williams., and Legault, Réjean. Anxious Modernisms : Experimentation in Postwar Architectural Culture Montréal: Canadian Centre for Architecture, 2000., 119.

38 Popov, Lubomir and Gary David. "The Architect as a Social Designer: The Fun Palace Case." Enquiry 12, no. 1 (0, 2015): 9-16. doi:http://dx.doi.org.proxy.lib.uwaterloo.ca/http://www.arcc-journal.org/index.php/arccjournal/article/view/388/322. http://search.proquest.com.proxy.lib.uwaterloo.ca/docview/2015399563?accountid=14906.

39 Price, Cedric, Samantha Hardingham, and Architectural Association , Issuing Body. Cedric Price Works 1952-2003 : A Forward-minded Retrospective. V.1. London : Montreal: Architectural Association ; Canadian Centre for Architecture, 2016, 47.

2.2.1 Key People

Fig. 2.6 Littlewood Directing James Booth in Sparrows Can't Sing. Photograph: Rex Features

Joan Littlewood

Littlewood was one of Britain's most influential theatre director since the 1940s. Since her early days Littlewood had an individual sense of a theatre as a space where knowledge and discoveries are shared. Her innovations in Agit-Prop street theatre methods were deeply inspired by the avant garde works of Bertolt Brecht, which eventually inspired the Fun Palace as well.

Fig. 2.7 Price leads a team of students at the Rice Design Fete, Rice University, Texas, 1967

Cedric Price

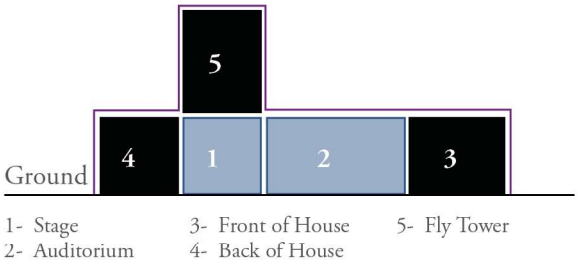
Born Spetember 11, 1934 near Staffordshire, England, Cedric Price developed an early interest towards unorthodox educational methods. Graduated from A.A London, Price's education and career practices have always been greatly influenced by significant acquaintances and the much turbulent post war era of Britain.

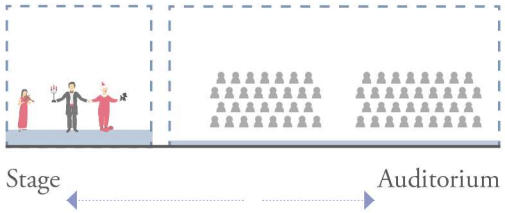
Fig. 2.8 Cybernetician Gordon Pask co-inventor of an electronic brain used as a teaching aid called Eucrates I

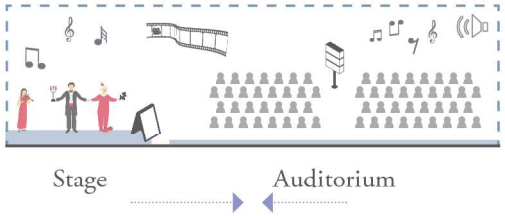
Gordon Pask

Gordon Pask was one of the early proponents and practitioners of Cybernetics. He was pivotal in introducing cybernetic thinking into architecture. His ideas around 'Conversation Theory' investigated the concepts of interaction between the users and the components of the Fun Palace and that experimented on their social outcomes.

2.2.2 Brecht's theatrical inspirations for Fun Palace







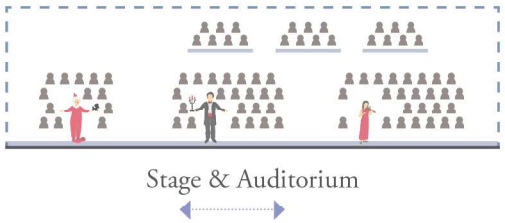


Fig. 2.9 Evolution of Theatre Forms (by Author)

Components of Theatre Building

Theatre Building

Performance Space

Supporting Spaces

Performers

Audience

Conventional Theatre

A pre-written story, enacted by the performers, and the audience becomes a passive listener of the fantasy storyline.

One-way communication

Brechtian Theatre

'Dialecticising' of events: Narrating Real life Social & Political issues with the use of props, Prompting the audience to think critically.

Interactive setting

Littlewood's Vision for Fun Palace

Altering the Spatial Character: Littlewood's purpose was to create a sense of immediacy & to bridge the distance between auditorium & stage.

Participatory environment

2.3 Planning & Design

2.3.1 Lea Valley Re-development

Fig. 2.10 Map of London, showing the Lea Valley Plan, 1964

Site: Mill Meads, London
Site area: 21 acres.
Proposed Area: 7.36 acres

Fun palace was very distinct in its conception & design approach. Unlike the usual where planning & design are site specific, it was the reverse for Fun Palace. The designers, were in search of an ideal site to accommodate the flexible, open nature of the proposal. And the Mill Meads, which was a part of the Lea Valley redevelopment sites, seemed to be the ideal fit to imagine. Mill Meads has multi modal access to the site and instils freedom of movement within the site.[40] Opportunities for social enjoyment seemed promising in the metropolitan riverside site.

40 Hardingham, Samantha. Cedric Price : Opera. Chichester ; Hoboken, NJ: Wiley-Academy, 2003, 14.

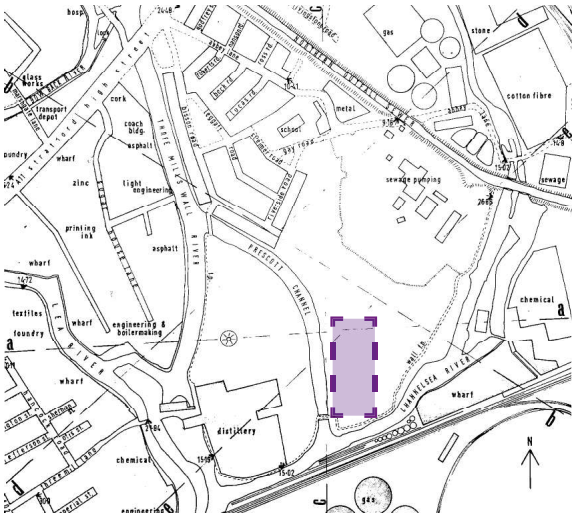
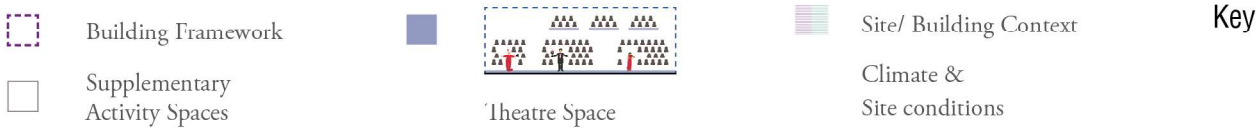
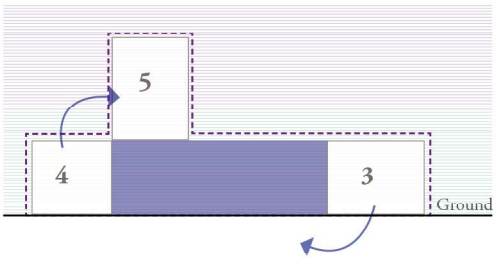


Fig. 2.11 Mill Meads site for Fun Palace

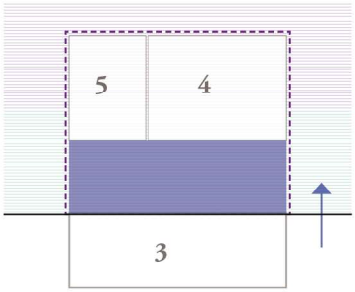
2.3.2 Fun Palace Design Approach





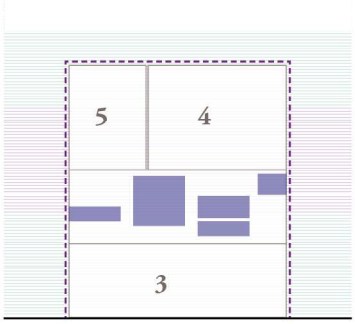
01. Re-Arranging Conventional Theatre Typology

The service spaces (like the front of house and back of house) are re-arranged above and below the main performance space, in order to make it more accessible



02. Shifting Programs Above Ground Level

A vertical organization of zones (as opposed to storeys) is overlaid onto the free and open volume to encourage mutual benefit of all elements both inside and outside the site.



03. Fragmenting the Theatre Space

The central theatre zone is fragmented into a cluster of theatrical spaces to accommodate varied theatre spaces that engages with technology and audience differently.

Fig. 2.12 Process: Fun Palace Spatial Organization (by Author)

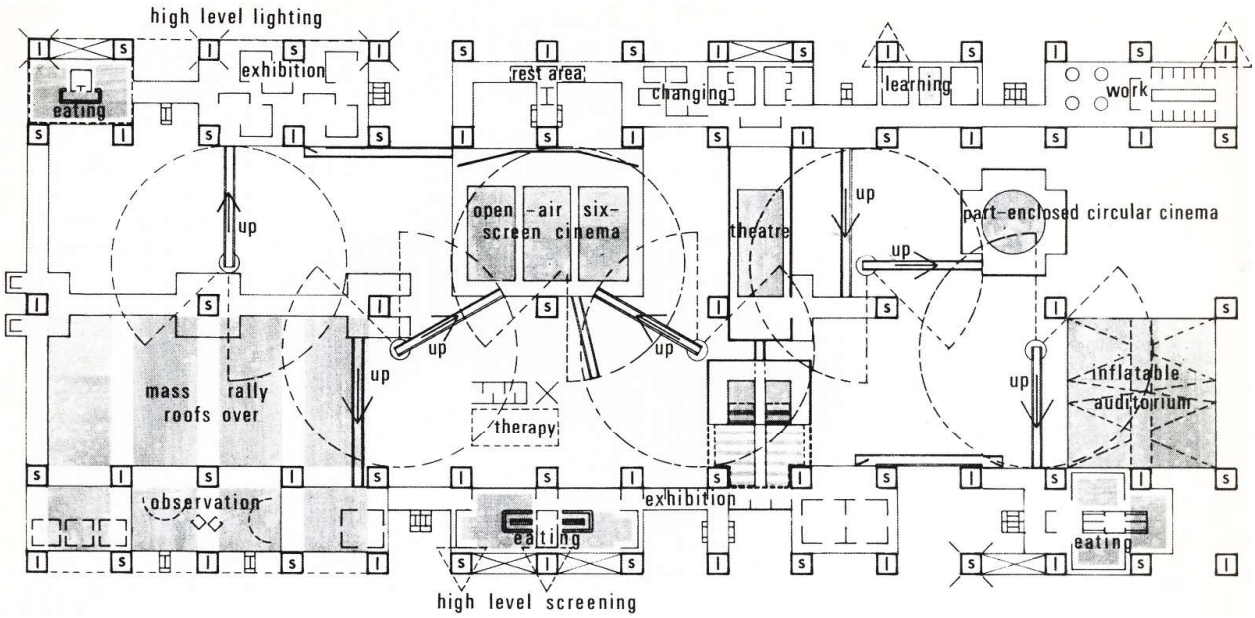


Fig. 2.13 Typical Plan for Fun Palace Complex

2.3.3 Physical & Spatial Organization

Structural Assembly

There was no fixed floor plans for the proposal. Cedric Price and structural engineer Frank Newby designed the outer structure consisting of fourteen parallel rows of service towers, sixty - feet apart, forming two sixty - foot side 'aisles' flanking a 120 - foot wide central bay,[41] arranged in the form of a tartan grid, which supported all of the Fun palace activities in the inside.

The towers housed services like staircase, elevators, Electric Ducts, Plumbing, Heating and Ventilation, along with service lifts to organize goods and freight management that were housed in the basement.[42] The central or the main towers support the overhead gantry crane that travels along the length of the Fun Palace.

The outer skin of the structure is fitted with environment controls and climate responsive systems like 'vapour barriers, operable louvers, optical barriers, warm air curtains, charged-static vapour zones'.[43] And except for this framework, every other part of the Fun Palace, is imagined to be changing.

Spatial Organization

The internal organization of spaces includes a mixture of open spaces, semi-enclosed and a series of fixed enclosed spaces all altering with eachother. Although the relationships between functions and their boundaries changed over the design process, many of them remained similar in the final version of the drawings. The spaces can be can be broadly classified into three categories:

The fixed facilities accommodates activities in them at all times, and acted as catalysts for other unprecedented activities to take place. In order to define a system that would both dictate the evolution of the building and its material quality, the building elements were classified into four categories.

The first category, 'fundamental', contained half of the total programme and included the service grid as well as offices, workshops and theatre among other uses.

A second, 'integrating' category was intended to be the extension of the fundamental functions. These extensions would be decided by local voting participation.

A third, 'mobile' category was to be composed of moveable components that could be placed inside the building but would also have the role of extending the activity beyond its physical boundaries.

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41 Mathews, Stanley. The Fun Palace: Cedric Price's Experiment in Architecture and Technology. Vol. 3, 2005. https://doi.org/10.1386/tear.3.2.73/1, 80.

42 Price, Cedric, and Joan Littlewood. "The Fun Palace." The Drama Review: TDR 12, no. 3 (1968): 127-34. doi:10.2307/1144360., 133.

43 Mathews, Stanley. The Fun Palace: Cedric Price's Experiment in Architecture and Technology. Vol. 3, 2005. https://doi.org/10.1386/tear.3.2.73/1, 81

Isometric Showing the Structural and Operable Elements

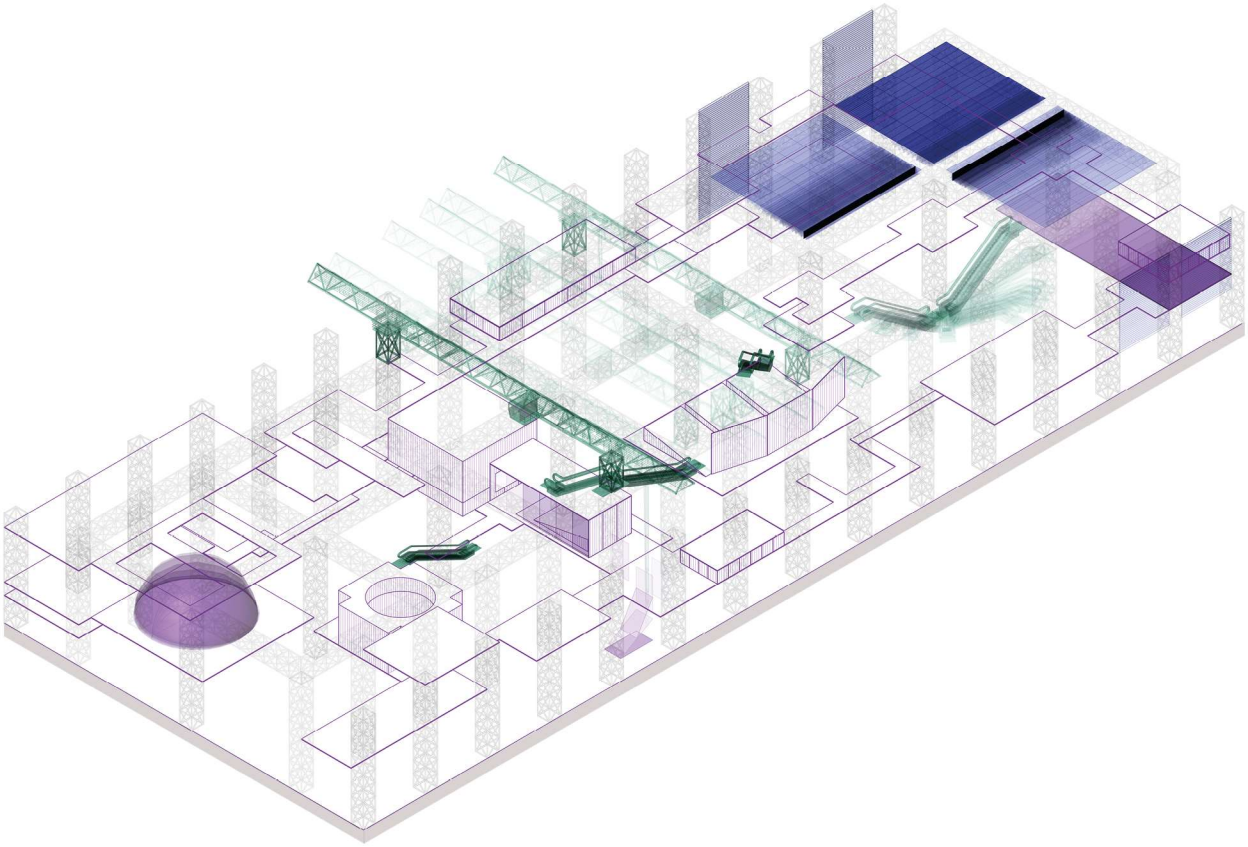


Fig. 2.14 In Motion: Re-configurable and Flexible Systems (by Author)

Key

Climate Responsive Components

01. Skyblinds
02. Louvers
03. HVAC
04. Vapor Barriers
05. Optical Barriers
06. Warm- air Curtains
07. Fog Disposal

Automation & Semi Automation

01. Pivoting Escalators
02. Overhead Gantry Crane
03. Moving Walkways

Basement for HVAC, servicing goods, garbage etc.

Flexible Structures

01.Retractable Floors
02. Inflatable Conference
03.Modular Workshop

Axonometric Detail of the Interior Components

Service Towers

Type 1

Toilets

Staircase

Type 2

Service Lift

Deck

Bulk Waste
Electric Power
Water & Waste Water

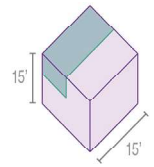
Type 3

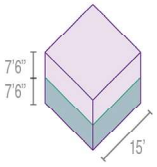
Heating
Ventilation
Pressure power
Vaccum power
Water & Waste Water
Electric Power
Air Conditioning

Fig. 2.15 Service Towers (by Author)

Modular Spaces

The internal structures and elements re made of plastic and aluminium inflatable and standardized modular units which could be positioned and relocated anywhere within the overall structure. Prefabricated walls, platforms, floors,stairs, and ceiling modules enabled users to reconfigure the space.





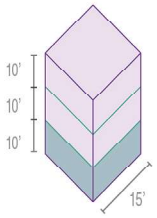


Fig. 2.16 Different Configurations of Spaces (by Author)

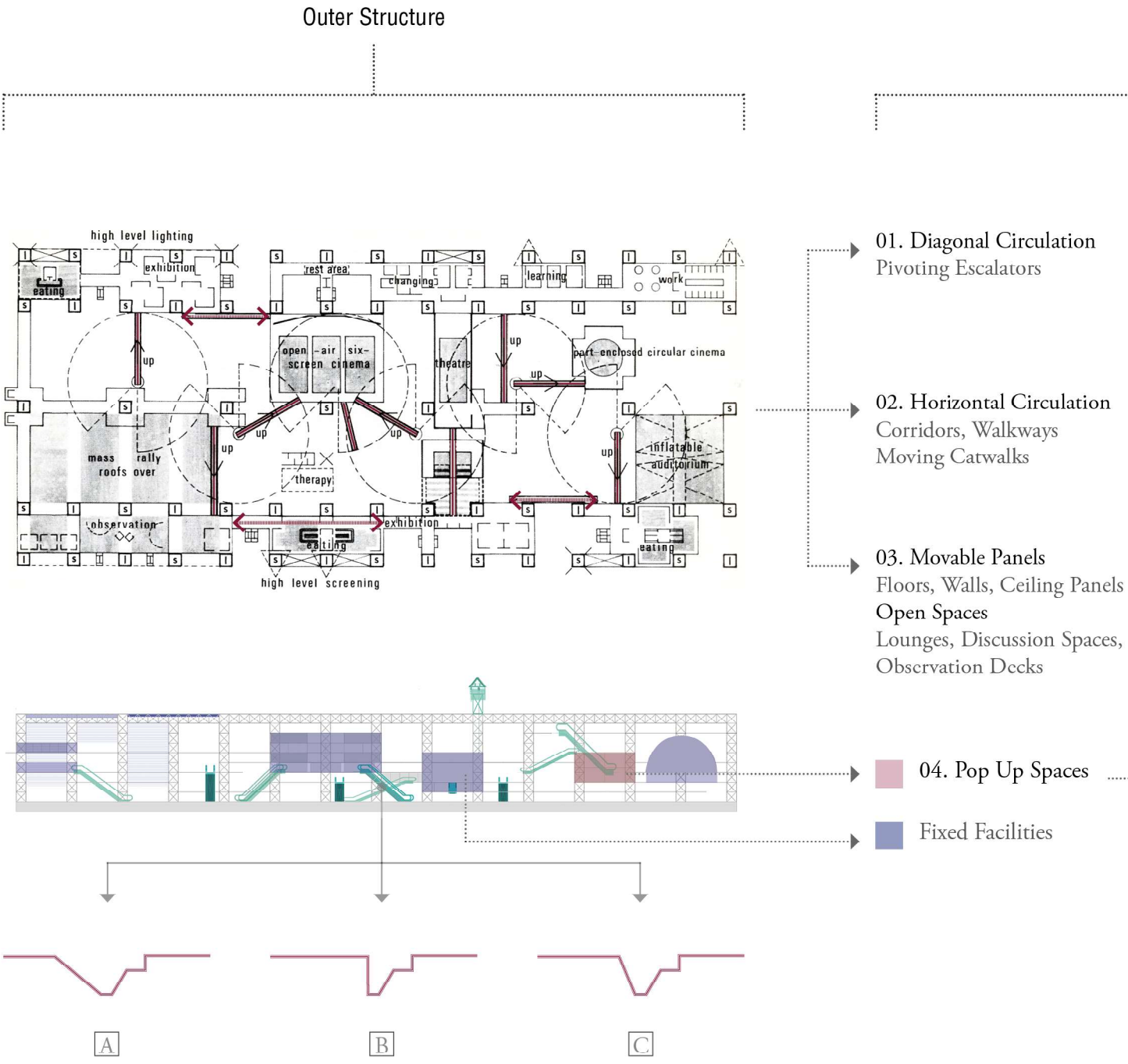
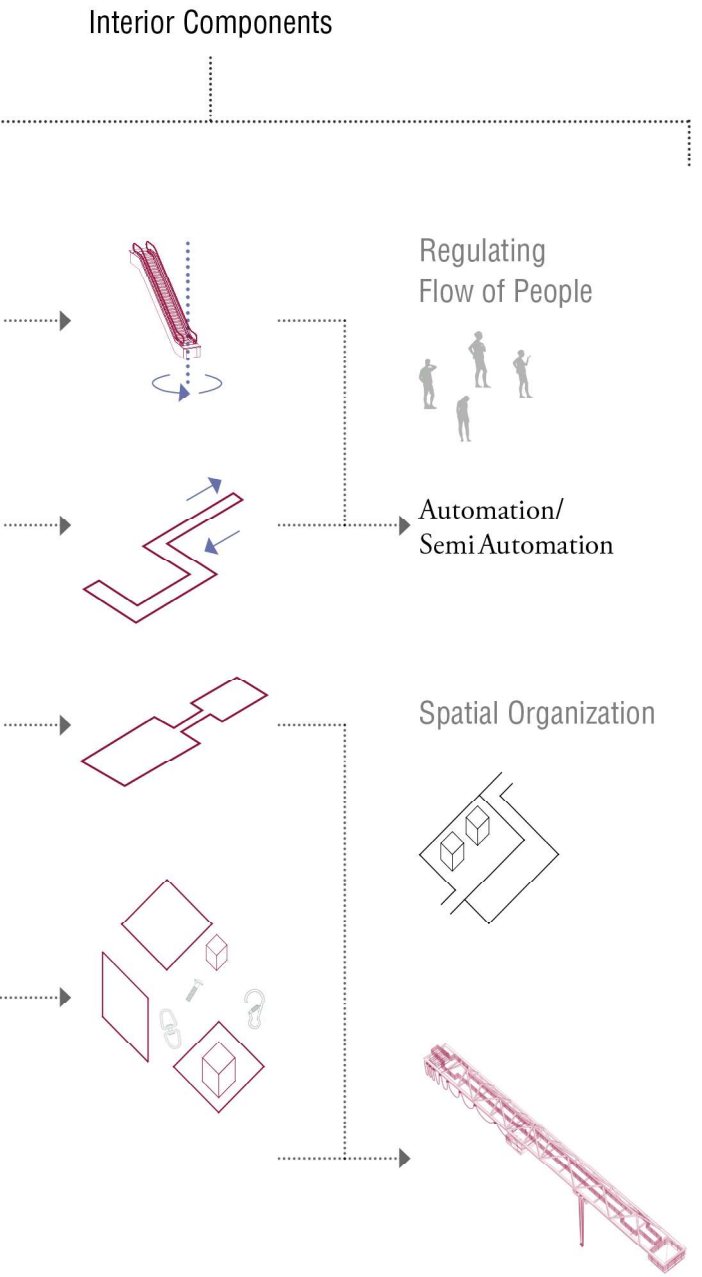


Fig. 2.17 Diagram Showing the Kit of Parts of Re-configurable Public Loop & Organization of fixed and temporary spaces (by Author)



The conception of Fun Palace was a direct response to reinforce the deteriorating social conditions Britain catalysed by Industrialization. It was designed as a space to encourage constructive use of leisure time, achieved by blurring the boundaries between work, education and leisure by employing technology. Imagined as an open framework, flows of people, programming of the activities and culture was its central theme.

The design of temporal spatial conditions became significant than the formal organization of spaces, with a preference for modifying or even dismantling its architecture to suit the relevant social demands. In Banham's words, "the kit of service towers, lifting gantries and building components exists solely to produce the kind of interior environments that are necessary and fitting to whatever is going on."[44] To support such programmatic indeterminacy, the design of elements in the Fun palace employed automation of the time. For Price, the project was a reflection of his beliefs that the architecture of future may not be architecture at all, at least in a recognizable sense.[45]

44 "Architecture, Art and Metabolism | UrbanNext." Accessed October 15, 2019. https://urbannext.net/architecture-art-metabolism/. Originally published in Banham, Reyner, "People's Places", *New Statesman*,. 191-192.

45 Price, Cedric, and Joan Littlewood. "The Fun Palace." The Drama Review: TDR 12, no. 3 (1968): 127-34. doi:10.2307/1144360.

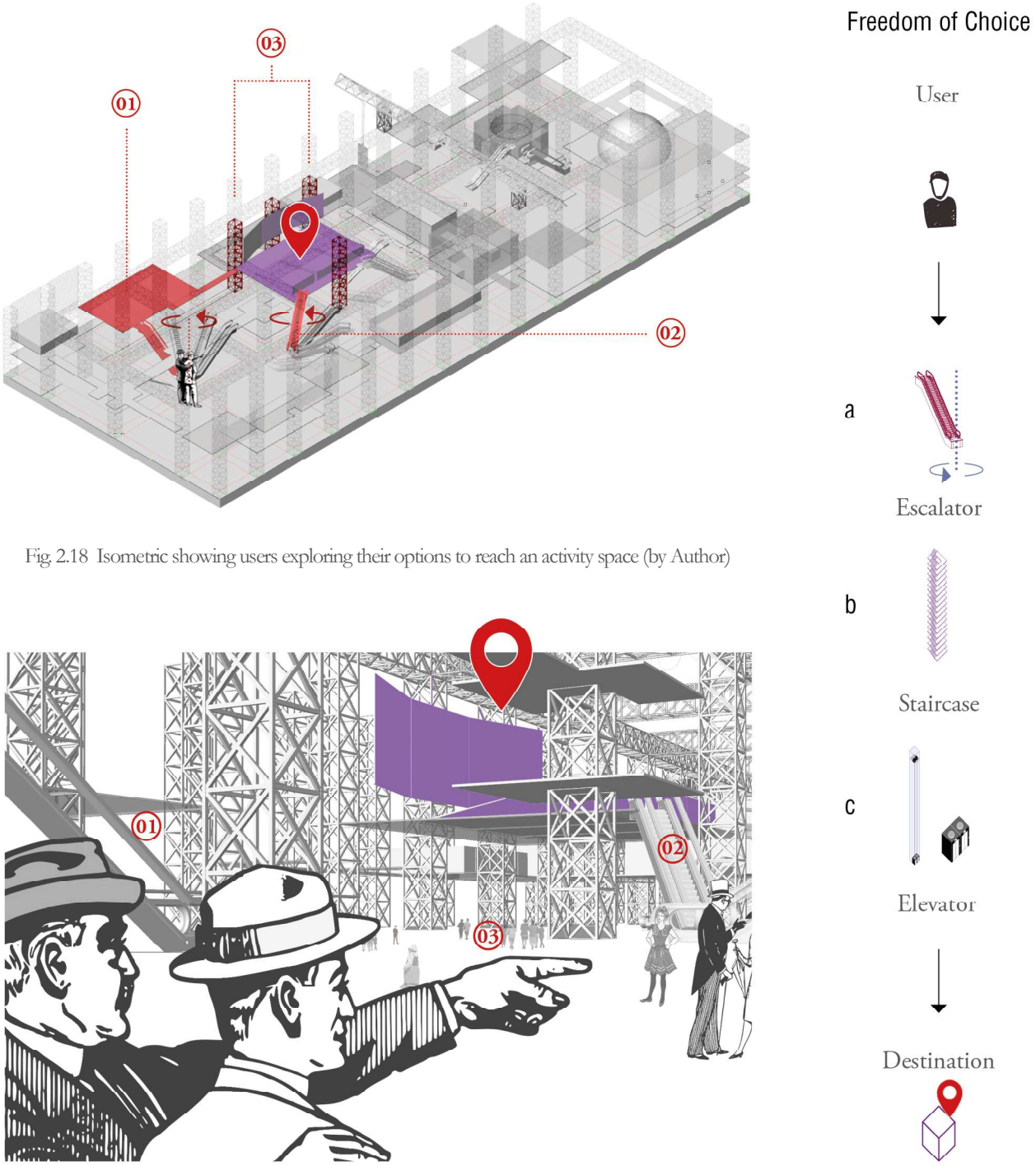


Fig. 2.18 Isometric showing users exploring their options to reach an activity space (by Author)

Fig. 2.19 Interior view showing openness and flexibility of the structure (by Author)

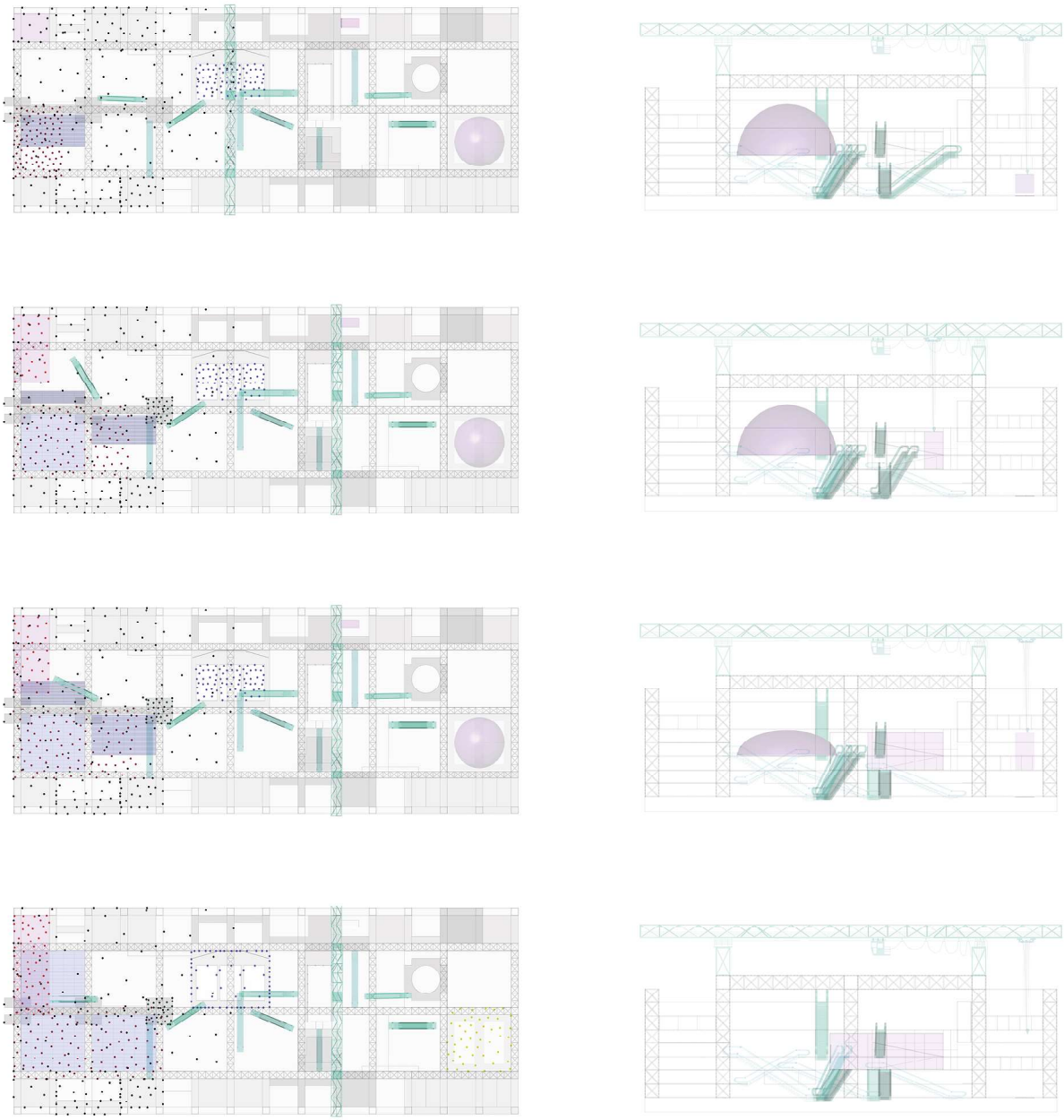
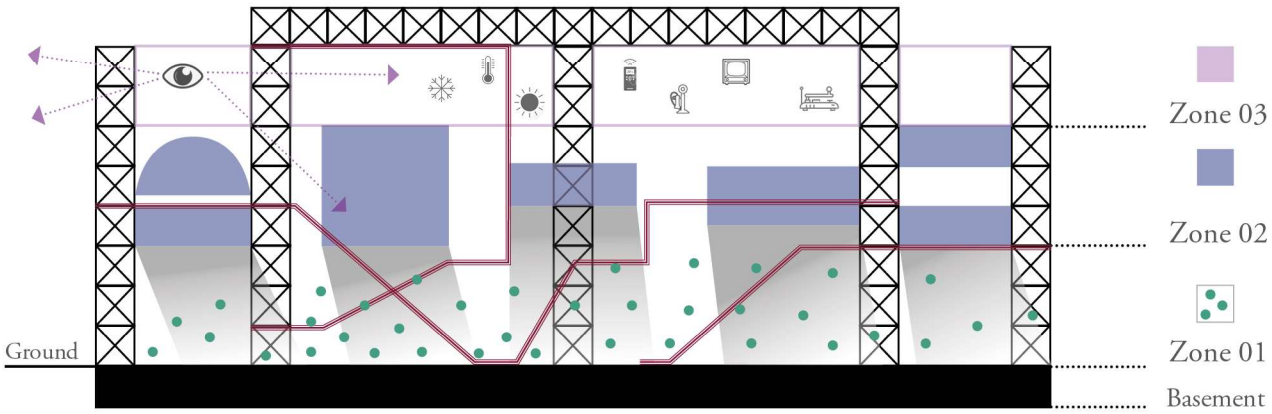


Fig. 2.20 Plan & Section Stimulating Re-configurable Moments (by Author)



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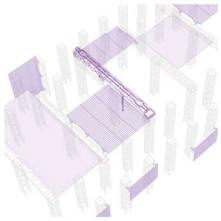
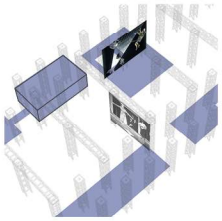


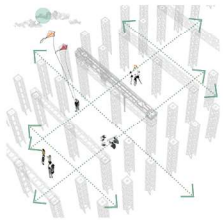
Responsive Zone

02



Enclosed Activity Zone

03



Public Access Zone

Fig. 2.21 Sectional Diagram Showing the Various Activity Zones in the Fun Palace (by Author)

2.3.5 Programmatic Organization

Zoning

Connecting the various spaces in the Fun Palace are the dynamic elements like 'radial escalators, moving walkways[46] that provides internal circulation and forms a public loop system within that can be physically moved, altered and re-configured. Since there is no fixed floor plan, the different activities that take place within the structure are distributed horizontally and vertically based on their character like fixed or flexible, individual or group activity, closed or open, time span, etc.

Vertical Zones

- The lower zone is called the pulsating zone, which is open and has multiple entryways that encourages free flow of people from the inside outside and vice versa
- The middle zone consists of fixed facilities around which the pop up spaces can be plugged in and out and it also provides shelter to the zone below.
- The upper zone is more like the technology zone that supports all non- physical and programmable extensions such as retractable roofs, operable skyblinds for weather control, helipad, telescope and other tools to facilitate long distance viewing, along with digital screens that displays contents from around the world and has a closed circuit television that broadcasts the happenings in the Fun Palace.

Network of People

The programming of Fun palace was imagined to be very spontaneous and ad hoc, and responsive to the changing use patterns and choices. And hence the physical configuration of the space has to be in constant change or altered or modified. As a result of which, to manage the programming and planning of the project Price and Littlewood organised a vast network of people ranging from 'enthusiastic scientists, sociologists, psychologists, cyberneticians and politicians'[47]. who will manage the programming, functioning, maintenance of the structure. Eventually various committees and sub-committees were formed, that worked on the development of each aspect of the project like structure, programming, sociology etc. The committee includes:

- Committee:

1. Cybernetics
2. Sociology
3. Psychology
4. Art
5. Population Statistics
6. Communication

- Sub-Committee:

1. Ideas Group
2. Amenities Group

46 Price, Cedric, and Joan Littlewood. "The Fun Palace." The Drama Review: TDR 12, no. 3 (1968): 127-34. doi:10.2307/1144360., 132.

47 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 75.

Categorizing Activities

The variety of events and activities that would happen in the Fun Palace, were compiled as a list or a database from which the users can choose any event and take part in them. The Cybernetic committee and the Ideas group played a key role in building a repository of programming events & activities that could take place in the Fun Palace and categorized them based on a range of parameters. The list generated takes into consideration a series of responses from the public questionnaires along with the quasi-Situationist scenarios[48] speculated along with the planning of the project. Accordingly, the location and the proximity of the activities were broadly categorized into six different zones:

Zone 1: Teaching Machines
Zone 2: Participation in New Forms of Expression
Zone 3: Films and Lectures
Zone 4: Scientific Experiments
Zone 5: Painting, Sculpture, Etc.
Zone 6: Music[49]

The idea behind the zones is to create an environment where two dissimilar activities co-exist together and through the commingling of which new and unprecedented experiences are produced. To further enhance and heighten the interactions and relevance between them, the cybernetic committee proposed a set of spaces that acted as a bridge between two main activity zones. These spaces were called 'Mixing Regions'[50] which had certain attributes akin to foyers and boulevard cafes that acts as a transitional spaces. Other tactics like audio and visual cues and signals to keep the participants informed about happenings around were outlined.

The result of the collaborative work between the designers, planners, programmers resulted in a proposal that became an amalgam of architecture, theatre, and technology. The following section is an analysis and understanding of the design approach that mediated the key aspect of re-configurability. Everything except for the outer structure was designed to be a variable, and is fragmented into a number of kit of part components that forms the functioning of the whole.

48 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 116.

49 Ibid., 116.

50 Organizational Plan as Programme., Fun Palace Minutes of the Meeting, 1964, Cedric Price Archives, CCA, Montreal.

2.4 Kit of Parts

Introduction

The users of the Fun Palace can change, alter or modify their space by using the "kit-of-parts"[51] components. It consists of a set of 'pre-fabricated walls, platforms, floors, stairs and ceiling modules'.[52] Other elements and structures were made of 'plastic and aluminum inflatable units'[53] that be installed and relocated anywhere using the overhead gantry crane within the Fun Palace system. As a result of this collaborative planning and participation, the spatial conditions of the Fun Palace becomes a variable entity. Further delving into the idea of the kit of parts employed in the proposal, it can be understood that there were different categories of them operating in different scales that the users interact with to produce diverse outcomes.

Cataloguing the Kit of Parts

Based on and extensive reading and understanding of the archival information and drawings produced for the Fun Palace, the kit of part components can be categorized into three types; Two of which were identified in the proposal and the third category is my addition as a result of the learning outcomes from Idhe's & Verbeek's Mediation theory, as these are newer theories that were postulated in the post- fun palace period.

- The first category includes all the lightweight architectural elements that can be easily deployed and constructed anywhere within the structure.
- The second category contains a set of non-physical components that has no spatial quality to it. It is a collection of tools and equipments like speakers, micsets, lights that forms a shared infrastructure, from which relevant components were assigned to the designated activity spaces for a stipulated time to accommodate the chosen activity until its completion.
- The third category is a set of components that embody a technological aspect in them, that are able to foster a certain kind of association with its users. The research further explores the characteristics and functioning of these kit of parts to outline the significance and outcomes of employing a technological entity in motivating user participation and agency. Utilising the theories in technology as guidelines, the following sections are of two parts: The first part identifies and categorises the various technology embedded components proposed in the Fun Palace and the second part conducts a detailed study on the functioning of each component based on the information collected from the archives and catalogues a set of principles as guidelines for designing high agency devices for citizen participation.

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51 Sadler, Simon. Archigram: Architecture without Architecture. Cambridge, Mass: MIT Press, 2005., 107.

52 Mathews, Stanley. The Fun Palace: Cedric Price's Experiment in Architecture and Technology. Vol. 3, 2005. https://doi.org/10.1386/tear.3.2.73/1, 81.

53 Price, Cedric, and Joan Littlewood. "The Fun Palace." The Drama Review: TDR 12, no. 3 (1968): 127-34. doi:10.2307/1144360., 133.

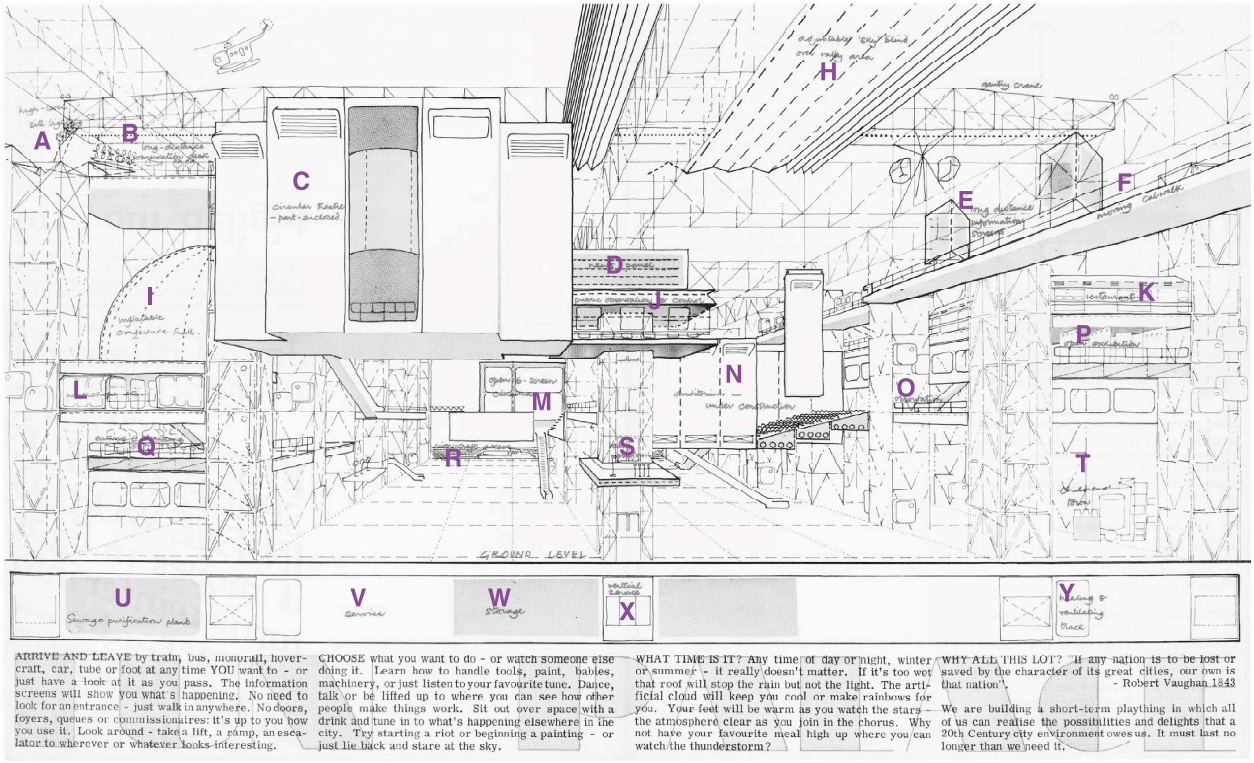
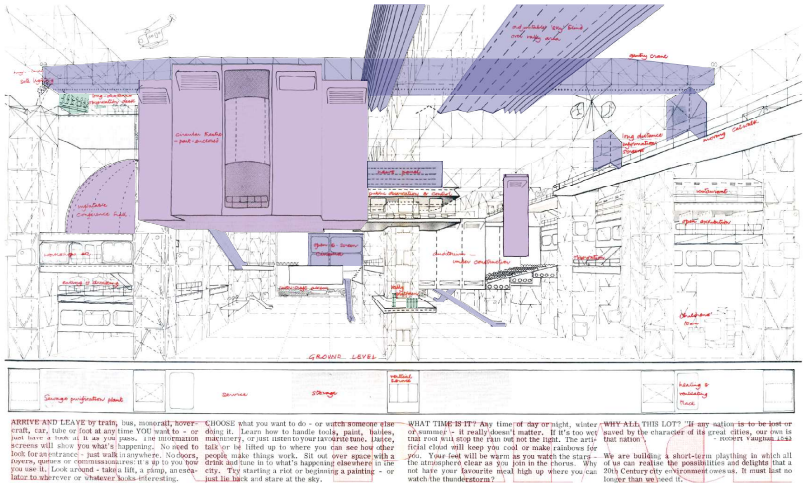


Fig. 2.22 Sectional perspective of interior view

A High-level sight lighting
B Long-distance observation deck
C Circular theatre-part enclosed
D News panel
E Long-distance information screens
F Moving catwalk
G Gantry crane
H Adjustable 'sky' blind over rally area
I Inflatable conference hall
J Public observation and control
K Restaurant
L Workshops, etc.
M Open 6-screen cinema
N Auditorium
O Observation
P Open exhibition
Q Eating and drinking
R River-craft access
S Rally platform
T Children's town
U Sewage purification plant
V Service
W Storage
X Vertical service
Y Heating and ventilating track

2.4.1 Cataloguing the Kit of Parts



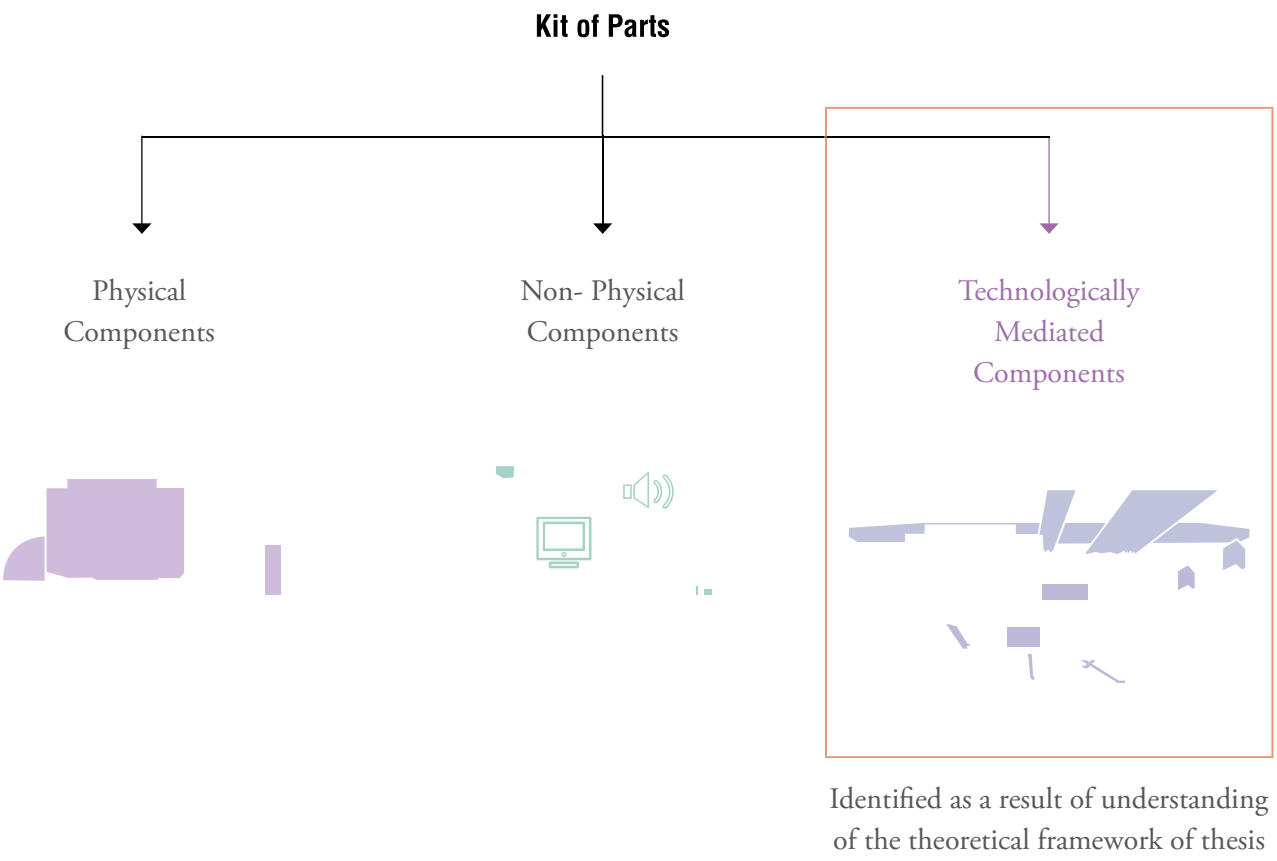
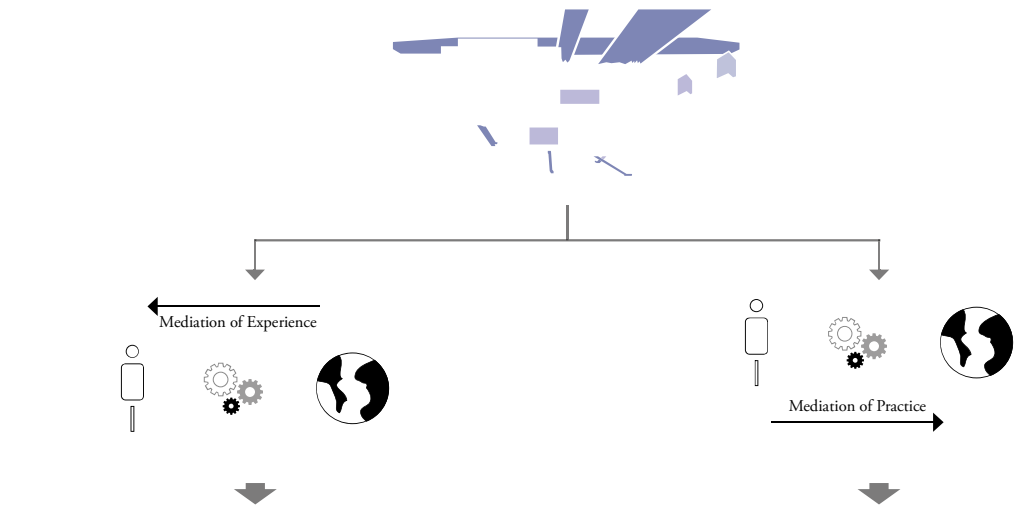
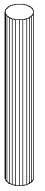


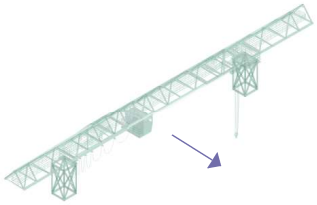
Fig. 2.23 Diagram Identifying the Different Kit of Parts Proposed in the Fun Palace (by Author)



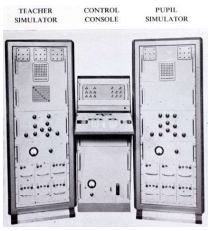


Pillar of Information

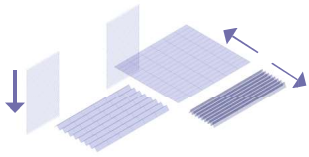
Digital Screen



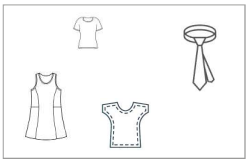
Overhead Gantry Crane



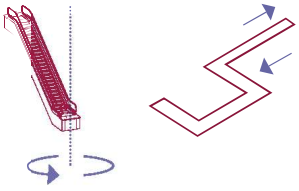
Teaching Machine



Operable Climate Control



Identity Bar



Re-configurable Components

Fig. 2.24 Peter-Paul Verbeek's Mediation Theory as a Heuristic to Classify the Nature of Components (by Author)

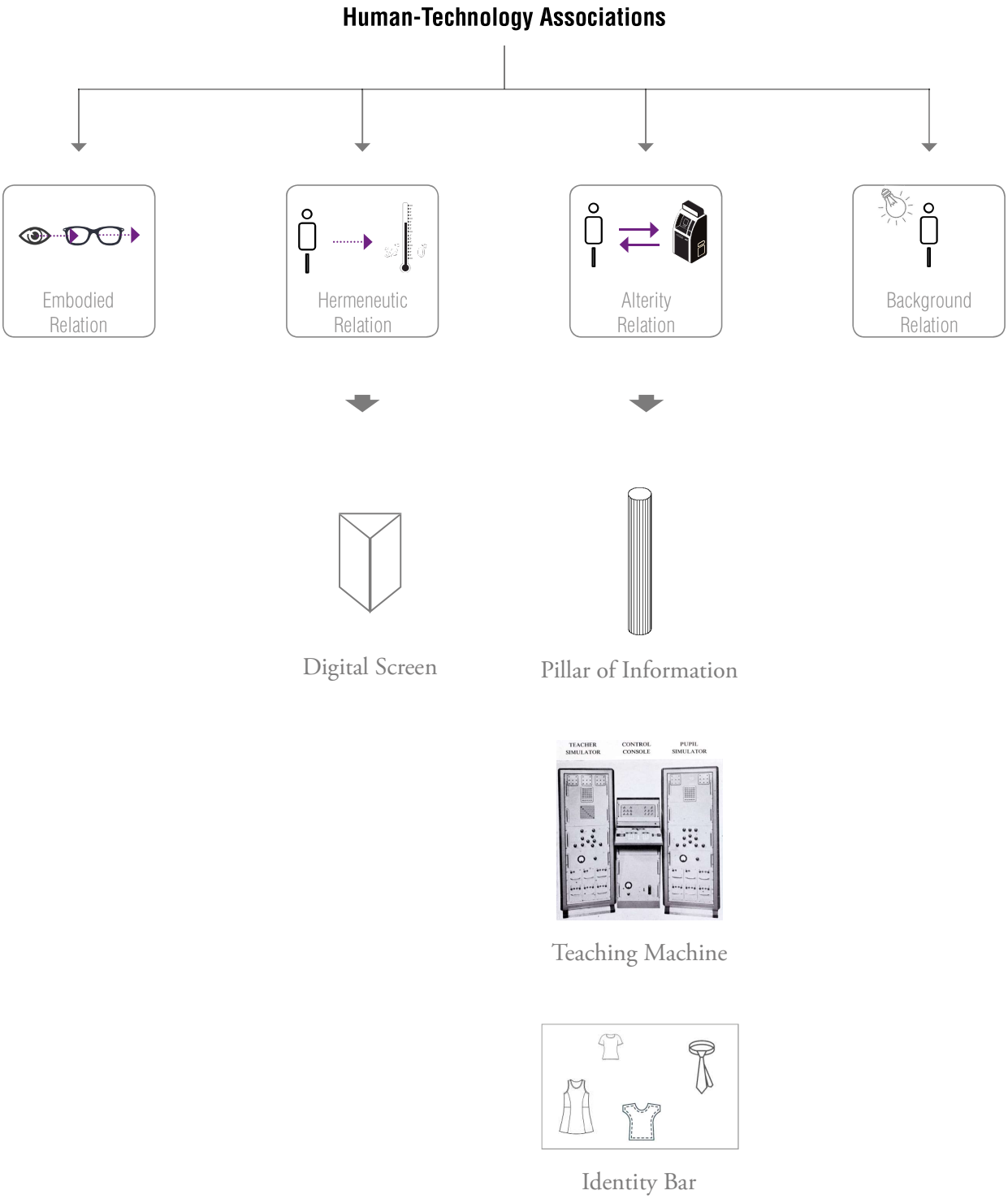


Fig. 2.25 Categorising Relations Between User & Kit of Parts using Don Ihde's Taxonomy (by Author)

2.4.2 Study of Kit of Parts

The cybernetics committee played a pivotal role in proposing and inventing technological components and systems, in the form of a set of electronic kit of parts that motivated the self-regulating environment of the Fun palace. Since the use of computers were at the early stages of becoming mainstream, Roy Ascott made several attempts to democratise its use to the common man. His proposal the 'Information Pillar'[54] was an electronic kiosk that will display a variety of information and is programmed based on the model of the Britannica Encyclopedia.

The kisok embedded early attempts of adaptive machine learning that incorporated a memory system, that stores a repository of inquiries, that allows the users to track use patterns and enables the kisok to prompt relevant information and knowledge suggestions. This idea of information storage and free access to users forms a precursor to the internet and the world wide web we have today.

The second component is the teaching Machines invented by Gordon Pask, that is a cybernetic entity that simulates a pupil-teacher system. Like the machine has a built in intelligence on its own that can be programmed to teach its users any skill. So based on the user's reaction time and pace, the machine adaptively adjusts itself to the teaching process

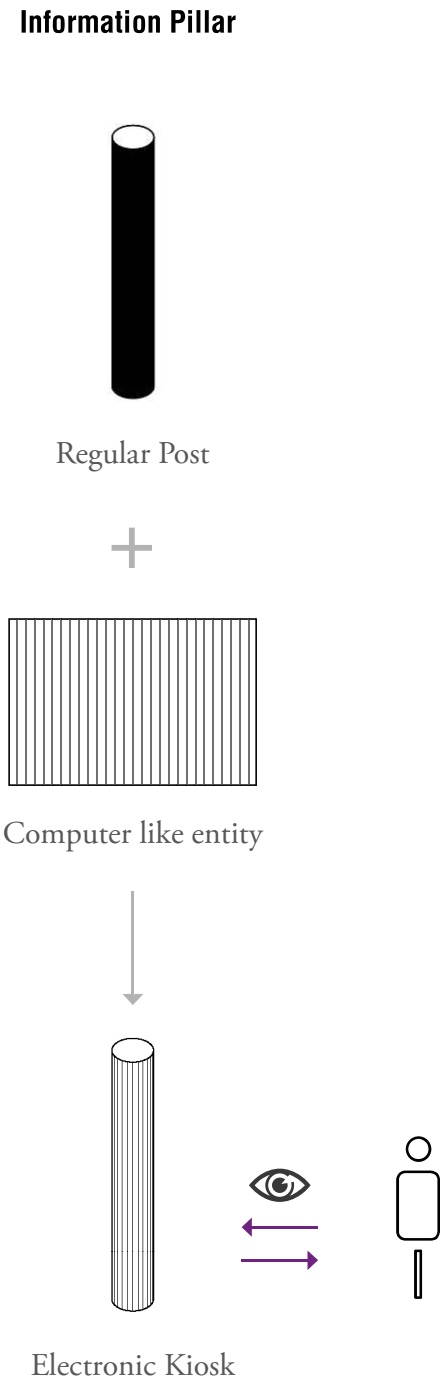


Fig. 2.26 Functioning of 'Information Pillar' (by Author)

54 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 118.

2.4.3 Learning Outcomes

Principles for Designing Tools for Empowerment using Mediated Technologies

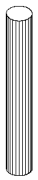
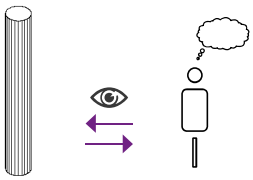
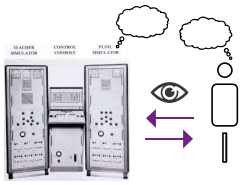
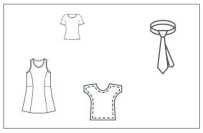
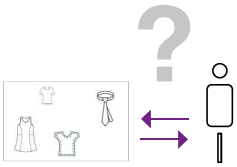
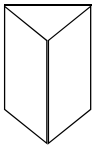
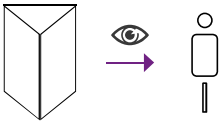
Component	Description	Human-Tech. Association	Value of Participation
 Pillar of Information	A kind of electronic kiosk which could display information of all sorts, based on the model of the Encyclopedia Britannica. One of the earliest proposals for a public access computer, that can store and retrieve information from a vast database.		Access to personalised Knowledge and Information
 Teaching Machines	Solartron Eucrates II, simulating a pupil- teacher system. The machine has a built in intelligence on its own that can be programmed to teach its users any skill, by adaptively adjusting itself according to the user's response.		01. Having an Embedded Learning System 02. Relevance in addressing the prevailing social conditions of the time.
 Identity Bar	The Identity Bar proposed by Roy Ascott would dispense paper clothing, enabling people to try on different and unfamiliar social personae or even gender roles.		?
 Digital Screens	High Level Digital Screens that transmitted long distance information and news feeds, that keep the users informed about the current happenings.		Keeping the people informed and aware of the happenings around.

Fig. 2.27 Tabulating Key Findings of the Study (by Author)

2.4.4 Functioning of a Whole

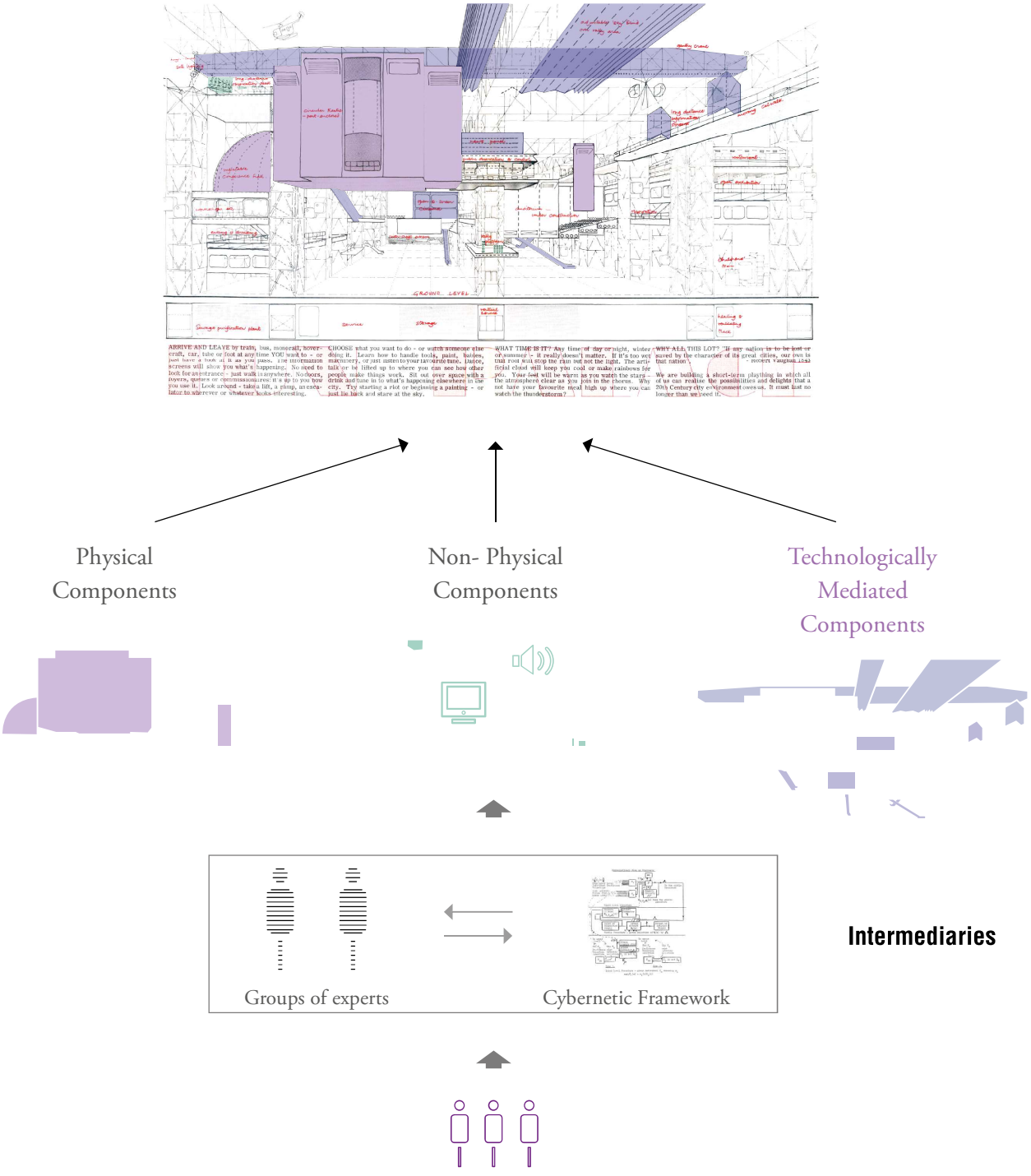


Fig. 2.28 Diagram Showing Intermediate Layer Co-Ordinating the Functioning of Kit of Parts (by Author)

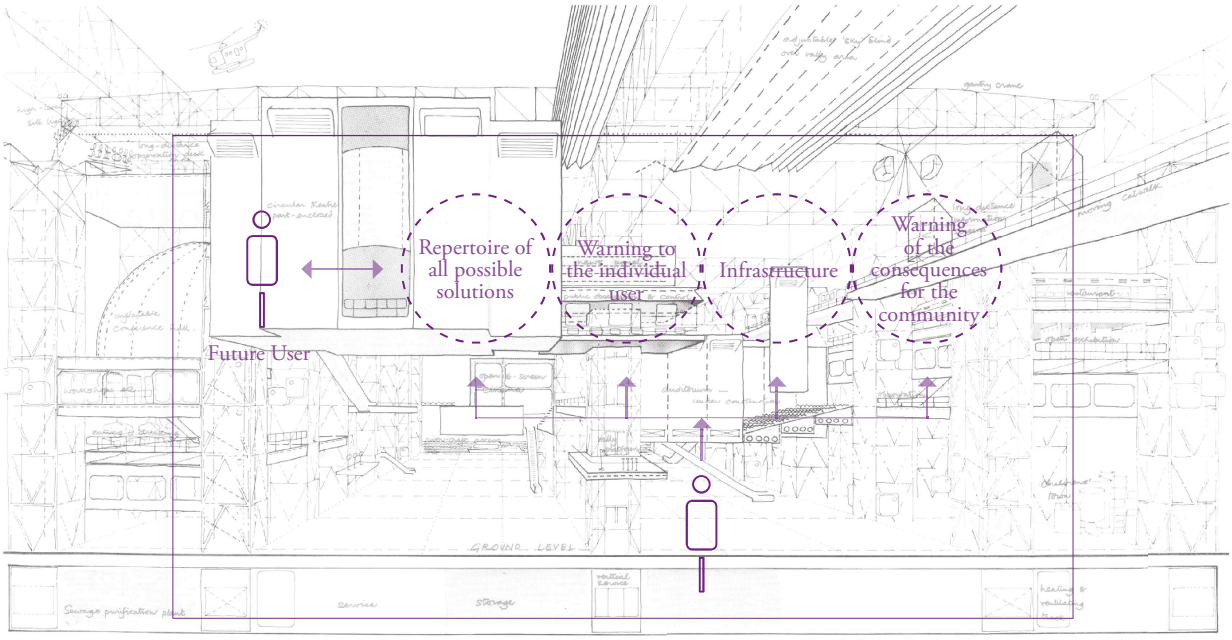
Ascott also proposed the 'Identity Bar'[55] a system that would dispense paper clothing, enabling people to try on different and unfamiliar social personae and gender roles.

The last component is the digital screens, that transmitted news feeds and other information from around the world to keep the users informed about the current happenings. It was a novel idea at that time to integrate it in the design because it made news feeds accessible to everyone.

This section carefully documents and frames the different kinds of associations each of these components have with the users, and the meaningful outcomes of their user engagement. But to understand the functioning of the Fun Palace, it is necessary to understand collective functioning of the kit of parts the as a whole. To do so, the designers of the project employed a set of intermediaries that mediated the functioning of the Fun Palace in relation to its users.

The intermediate layer consists of a cybernetic framework that actively responded to the user inputs and recorded use patterns and managed the Fun palace resources effeciently. To translate and execute the information inputs and outputs from the cybernetic framework, a network of people were responsible to manage the administration of the Fun Palace who also worked collaboratively with the committee and sub-committee. Together the designers devised a vast network of management that was responsive and self-regulatory and the operation of which will be discussed in the following chapter, that analyses the implications of employing such technologically mediated participatory system.

55 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 118.



ARRIVE AND LEAVE by train, bus, monorail, hovercraft, car, tube or foot at any time YOU want to - or just have a look at it as you pass. The information screens will show you what's happening. No need to look for an entrance - just walk in anywhere. No doors, foyers, queues or commissionaires: it's up to you how you use it. Look around - take a lift, a ramp, an escalator to wherever or whatever looks interesting.

CHOOSE what you want to do - or watch someone else doing it. Learn how to handle tools, paint, babies, machinery, or just listen to your favourite tune. Dance, talk or be lifted up to where you can see how other people make things work. Sit out over space with a drink and tune in to what's happening elsewhere in the city. Try starting a riot or beginning a painting - or just lie back and stare at the sky.

WHAT TIME IS IT? Any time of day or night, winter or summer - it really doesn't matter. If it's too wet that roof will stop the rain but not the light. The artificial cloud will keep you cool or make rainbows for you. Your feet will be warm as you watch the stars - the atmosphere clear as you join in the chorus. Why not have your favourite meal high up where you can watch the thunderstorm?

WHY ALL THIS LOT? "If any nation is to be lost or saved by the character of its great cities, our own is that nation".
- Robert Vaughan 1843

We are building a short-term plaything in which all of us can realise the possibilities and delights that a 20th Century city environment owes us. It must last no longer than we need it.

Information Processing

03

03

Role of Cybernetics

This chapter delves in detail on the concept of Cybernetics and its potentials to foster social change at an architectural scale. The introduction of Cybernetics into the Fun palace allows the system to function as an organism to learn over time, anticipate the movements and desires of its visitors, and shift and change in response. The analysis of the cybernetic mediated behaviour of the Fun palace provides valuable learning outcomes that are significant in addressing the pressing issues of contemporary technology focussed urban developments.

3.1 Introduction to Cybernetics

3.1.1 Fundamental Concepts

History

The concept of Cybernetics was first used by Plato in the context of the study of self- governance. Also, in Greek Aristotle uses the word to describe a steersman or helmsman who navigates a boat in a right direction to get to the destination. The modern use of the word was popularized by Norbert Wiener in 1948, in his book Communication and Control in the Animal and the Machine. This introduced the idea of communication between humans and machines and the associations they develop through a series of cyclic process that involves feedback mechanisms that maintains self-regulation.

Gordon Pask

Renowned Cybernetican Pask, is a key figure who published the 'Conversation Theory'[56] that introduced radical concepts of interactive systems between humans and machines. Building up on his theory, Pask invented several machines and systems that engaged with the users for delight, learning and so on. One of his early proposals was the Musicolour[57] in 1953, that was a cybernetic performer that engaged in a feedback loop with a musical performer. The intent of the loop system is to provoke the musician to perform with variety and it augments the sound produced into diverse light visuals. So when the music becomes repetitive or monotonous, the Musicolour stops responding, prompting the musician to change his musical notes and singing. Some of his other sophisticated apparatuses includes the Teaching Machines, Colloqy of Mobiles that focussed on the interactions between the participants and its diverse outcomes. To Pask, Fun Palace was a scaled up vision, where the architectural programme could perform a variety of functions. This questioned the traditional notions of architecture in its capacity to be conceived of as a network of 'complex biological, social or mechanical systems that organize, regulate and reproduce through the evolution and learning from feedback mechanisms'.[58]

Cybernetics & Fun Palace

The cybernetic committee became the most active and influential generator of new ideas. There were several cybernetic proposals like that of a 'cybernetic theatre' where Pask formulated a general goal for the committee to propose 'new forms of environment capable of adapting to meet the possibly changeful needs of a human population and capable also, of encouraging human participation in various activities.'[59] The statistical, sociological aspects of the project were condensed into a single organizational plan based on a number of parameters and conditions that helps maintain the consistent participation and engagement throughout the Fun Palace complex.

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56 Pask, Gordon, "The Architectural Relevance of Cybernetics", Architectural Design, no. 39, September 1969., 76.

57 Pask, Gordon "A Comment, a Case History and a Plan," in Cybernetics, Art, and Ideas, ed. Jasia Reichardt (Greenwich, Conn.,: New York Graphic Society, 1971), 76.

58 Mathews, J. Stanley. From Agit-prop to Free Space : The Architecture of Cedric Price. London: Black Dog Pub., 2007, 75.

59 Ibid., 114.

Structuring of the system
Data gathered from people being processed, analyzed

Organization of the Physical environment
Assignment of activities in space

Raw Data
People choosing an activity

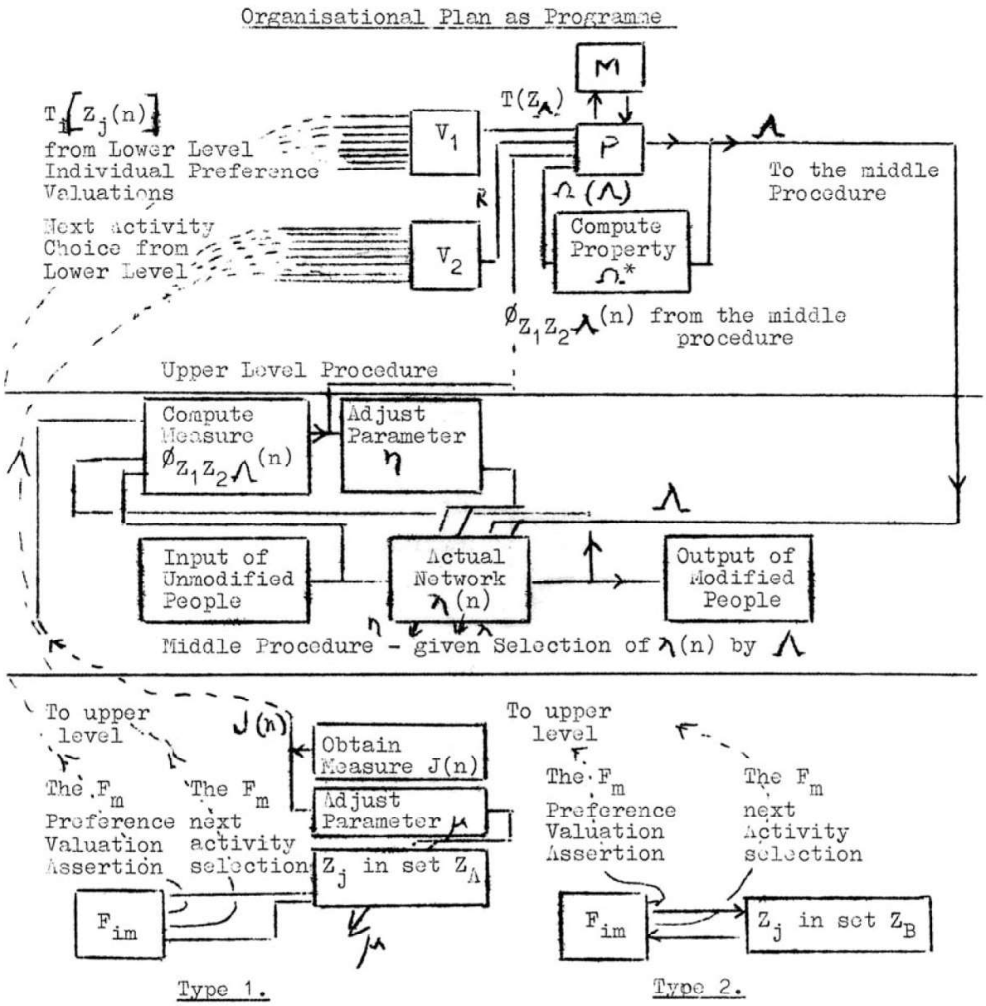


Fig. 3.1 Cybernetic Diagram of Fun palace

3.1.2 Glossary of Key Terms & Symbols

General Set of Components

Z: A collection of spatio temporal units of facilities or resources
R: A set or collection of the possible activities r
R(n): Activities to be ideally accommodated at the nth instant
R(n)= {ri(n)}. The term, R= {r(n)} denotes the sequence of requirements.
Λ= {λ(n)}. A sequence of assignments of activities to quantized units of resources.
λ(n)= {ri(n), zj(n)}

ri(n) chosen activitiy at the nth instant
z_j(n) spatio temporal unit where a chosen activity gets assigned to

A valuation factor: $T(Z_\Lambda)=T_i[Z_j(n)]$
$T_i[Z_j(n)]$ is produced at n^{th} instant, by individuals performing r_i in z_j as assigned by λ(n) which is
λ(n)= {ri(n), zj(n)}

Z= Z_1,Z_2, Z_A, Z_B
Z_1: Subset of "input" or "accepting" facilities (such as Television Studio Facility)
Z_2: Subset of "output" or "transmitting facilities" (viewing screens, loudspeakers and a video tape facility)
Z_A: Adaptively controlled facility units
Z_B: Fixed facility units.
z: is a single activity that can be found in Z_A, Z_B, Z_1, Z_2,Z_Λ

High valued Measure of utilisation $Ø_{z_1z_2\Lambda}(n)$

which is high valued if and only if in the given assigned sequence λ(n)= {ri(n), zj(n)}
the use of z in Z_1 @ nth instant ≈ use of z in Z_2 @ the later $n+m^{th}$ instant

$Ø_{z_1z_2\Lambda}(n)$ is high only if $Z_1 \approx Z_2$ (Input and Output co relate)

which is high valued if and only if in the given assigned sequence λ(n)= {ri(n), zj(n)}
the use of z in Z_1 @ nth instant ≈ use of z in Z_2 @ the later $n+m^{th}$ instant

Mixing Regions rule
Ω(n): Measure of a property $\Omega^*(\Lambda)$
Ω(n) should be high valued
It is high valued only if the fixed activities are separated in a spatio temporal sense by "Mixing Regions" z_o
i.e. only if the assignment Λ= {λ(n)} places some z_o in Z_Λ between any pair z_a in Z_B and z_b in Z_B.

Functioning of Different Levels

Upper Level Procedure

The highest level control procedure has two input feature/pattern recognition devices:
V_1: forms R from a collection of individual "next activity" assertions
V_2: forms $T(Z_\Lambda)$ from the collection of individual "preference valuation"

M+P= Λ
M: Association Memory
P: Assignment Programme (where the activities are assigned to particular spatio temporal units)
Λ maximises $\emptyset_{z_1 z_2 \Lambda}(n)$ and $\Omega(n)$
i.e. $\Lambda = \{\lambda(n)\}$

$\lambda(n) = \{ri(n), zj(n)\}$ is derived/modified by inputs from R and $T(Z_\Lambda)$ and the given Z and the constraints upon z in Z.

Middle Level Procedure

For a given Λ, if P can be specified;
The "straightforward interaction" is adjusted by providing or removing cues that take place in $\lambda(n)$
η = Coupling parameter (is Δ Straightforward interaction i.e the variation)
η is a catalyst that maximises $\emptyset_{z_1 z_2 \Lambda}(n)$ for any value of n.

Lower Level Procedure

F: Individuals or groups of individuals.
Interaction of individual with the facility units
F_m choosing an activity $r_{im}(n)$ and the assignment of the activity into facility $\lambda(n)$. Where $\lambda(n) = \{ri(n), zj(n)\}$.
Fm is of two types:
Type 1: Fm= z where (z is a subset of Z_A)
Type 2: Fm= z where (z is a subset of Z_B)

where, **μ: Adaptively Controlled parameter** that works towards the objective of maintaining interest and attention by providing sufficient relevant variety. (Still remains unclear)

J(n): Information or Variety Measure
Maintains the environment of the individual varied or novel enough to sustain his interest and attention but not so varied that it is unintelligible.
A standard value of J(n) is then plugged into $\emptyset_{z_1 z_2 \Lambda}(n)$ to compute the measure of utilisation.

3.2 Analysis of Cybernetic Functioning

3.2.1 Constructing the Fun Palace Operational Framework

The functioning of the proposed organizational diagram eventually became the central focus of the Fun Palace. The aim of the following sections is to understand 'how the artificial machine-driven can fit into building spatial conditions that can be constantly modified and adjusted.'[60] The analysis is conducted in two stages. The first stage involves the appropriation of the participatory sequences in the Fun Palace. To identify those, the study uses Yon Friedman's information circuit diagram and re-contextualises it to make it more it more relevant to the Fun palace project.

In doing so, a framework to organize the operational network is derived based on which, the second stage of the analysis begins. A detailed diagram of the network is extrapolated drawing information and interpretations from the archives. The human network consists of six main committee groups along with the sub-committees. Additionally, there is a whole another network of administrative people who manage the functioning of the complex. The designers may come in between to resolve conflicts or any issues that may arise in the system, if nothing, they are just passive, as the whole system is constructed to be a self- regulatory.

In collaboration to this is the cybernetic entity that responds to the input and output processes through informational feedback. The working process is articulated in each stages, as it starts by the user choosing an event from the catalogue of activities. And his choice gets recorded in an electronic punch card system that indicates the details pertaining to the chosen activity like the location, time span, character of the activity etc. This computerised system of data collection avoids programming conflicts to track and allocate resources. Following this, a sequence of responsive systems and feedback mechanisms are activated and set to work that guides the users to participate throughout the process to help accomplish the goals of accommodating the chosen activity. The information diagrams through page 73-84 demonstrates this process sequentially.

Working

The users choice is then recognised by the cybernetic system, and the data is being run through a set of parameters and variables that adaptively computes the input based on the information gathered from the other activities that are taking place in the fun palace at the same instant.

The output data has three kinds of information:

- One that indicates the optimal location in the Fun Palace for the chosen activity to take place.
- A list of kit of part components needed for the activity are assigned.
- Time span of the activity.

60 Pask, Gordon "A Comment, a Case History and a Plan," in Cybernetics, Art, and Ideas, ed. Jasia Reichardt (Greenwich, Conn.,: New York Graphic Society, 1971), 77.

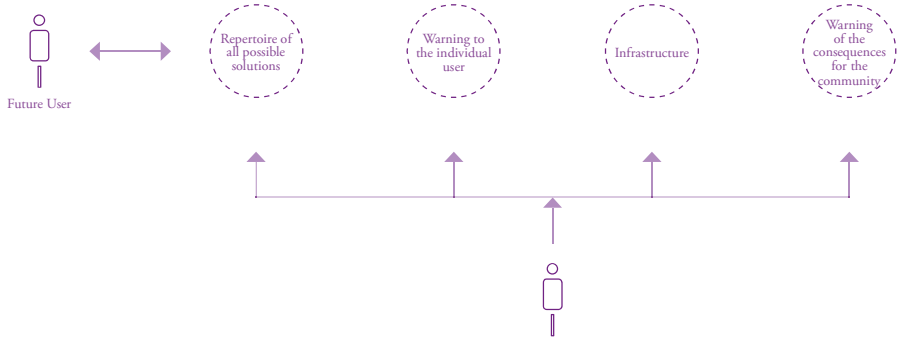
This data is then collated and interpreted by the cybernetic committee, who with the help of the building management team, sets up the kit of parts in the assigned space.

The users indulge in the activity and therefore interacts with the space in multiple ways. These use patterns are then recorded and recognised by the cybernetic system, which evaluates the success of the activity in generating unprecedented social experiences. The evaluations are based on a certain measure of utilisation, that is set to be high valued in order to maintain a consistent energy of dynamism and interactions within the project at any given time.

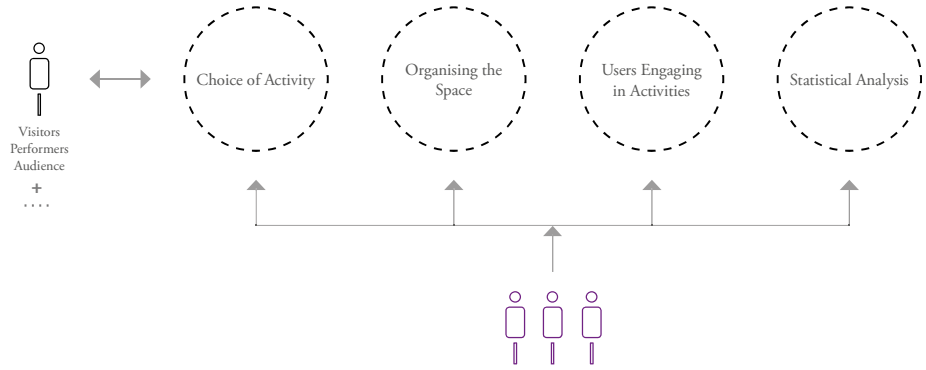
The feedback generated from the evaluations is shared with all the committees and sub-committees, who then publishes statistical analysis of different use cases.

As a response to which, the collection of activities, spatial locations and any other physical variables are altered and modified based on the results of the feedback and is reflected back to the users in the form of an updated catalogue of activities.

Friedman's Diagram



Re-Appropriating to Fun Palace Context



Fun Palace Diagram

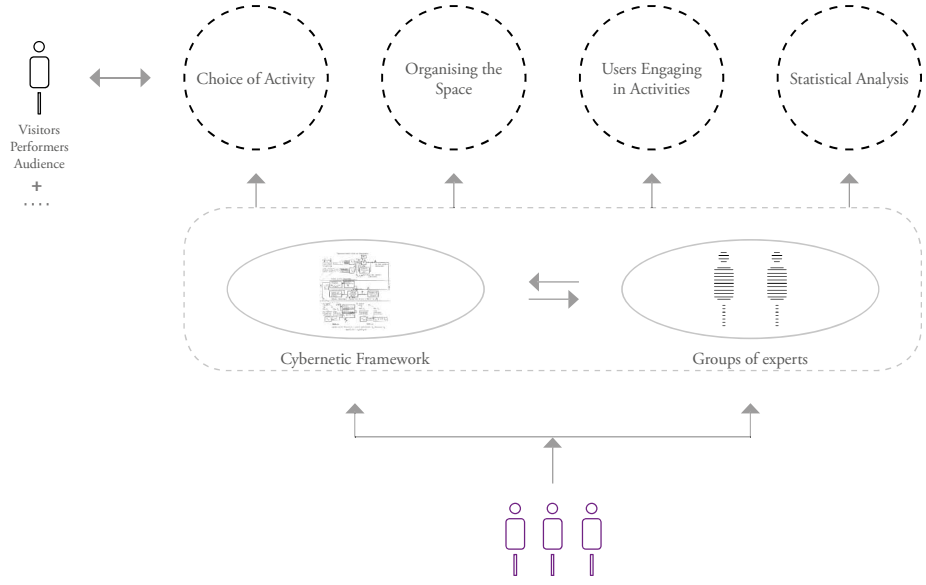
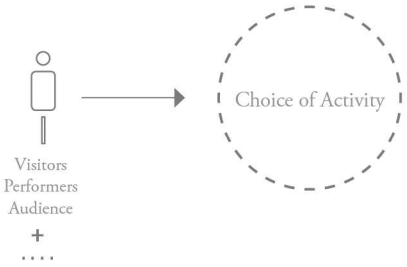
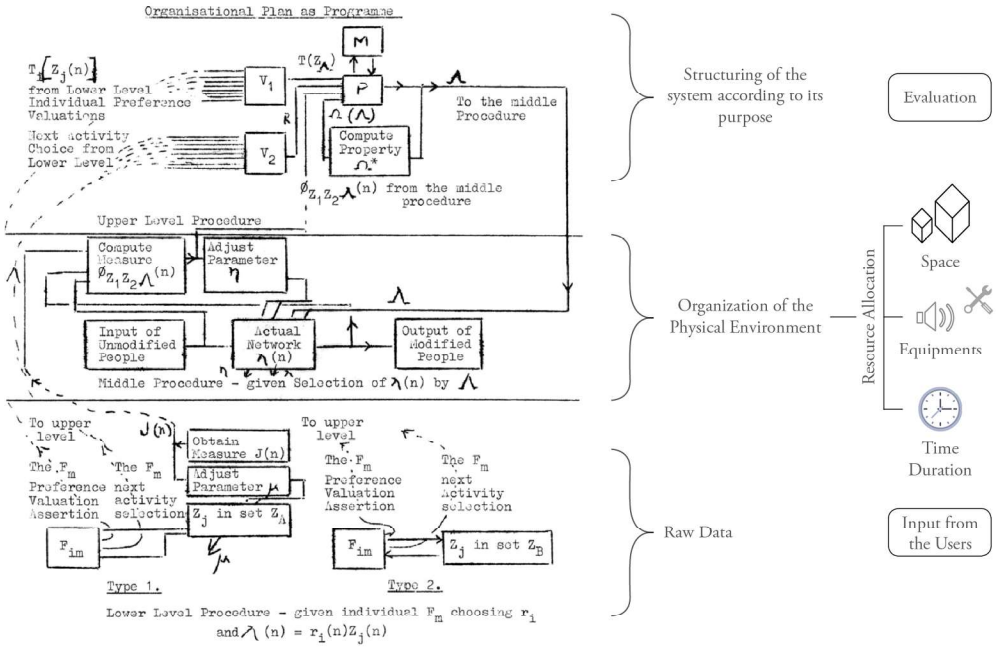


Fig. 3.2 Constructing the Fun Palace Participatory Sequence (by Author)





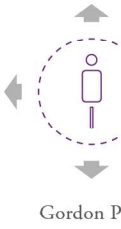
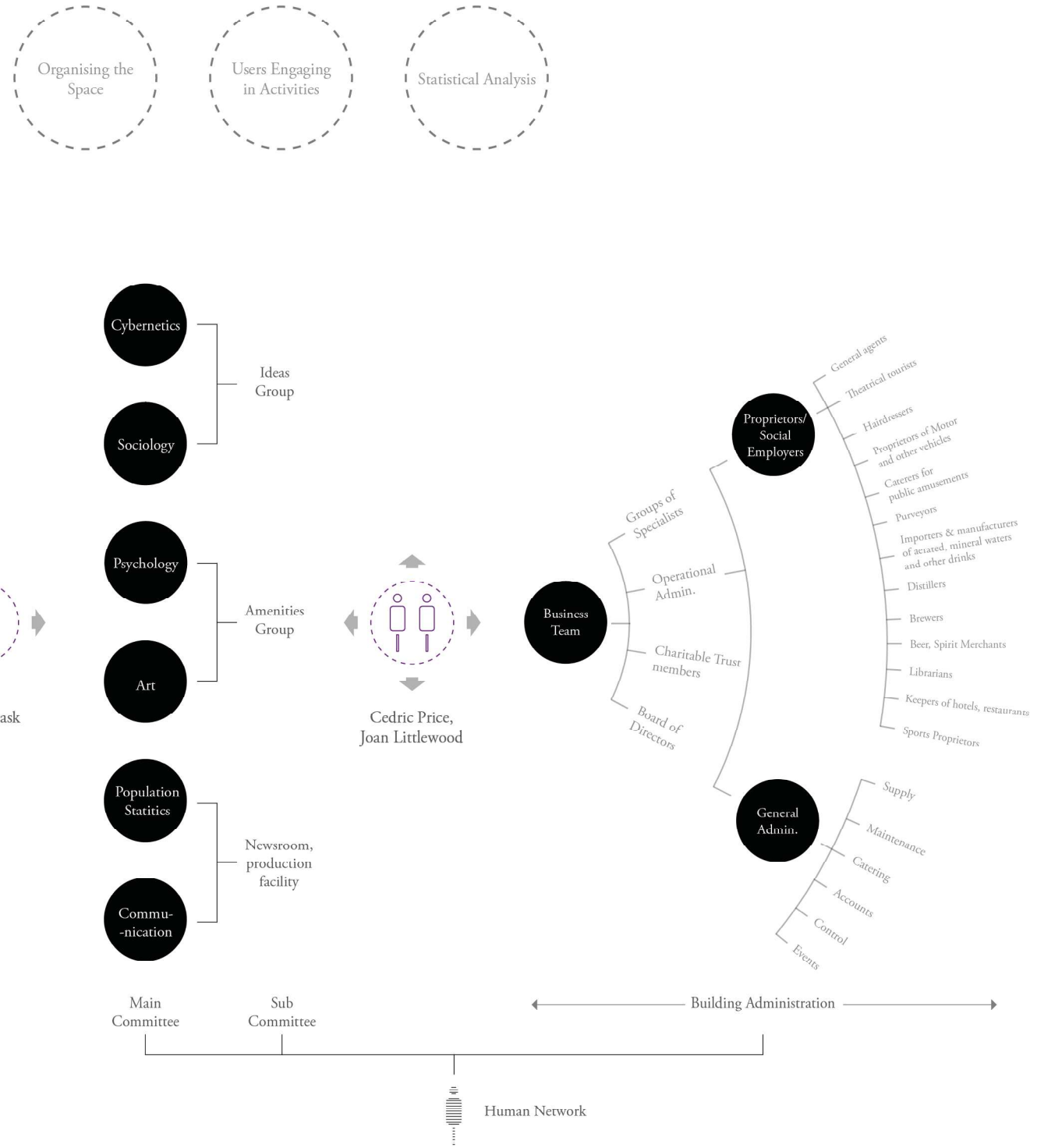


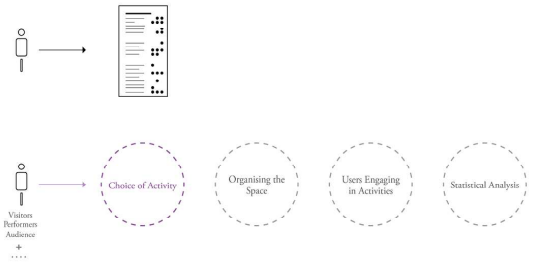
Fig. 3.3 Detailed Diagram Mapping the Fun Palace Parti

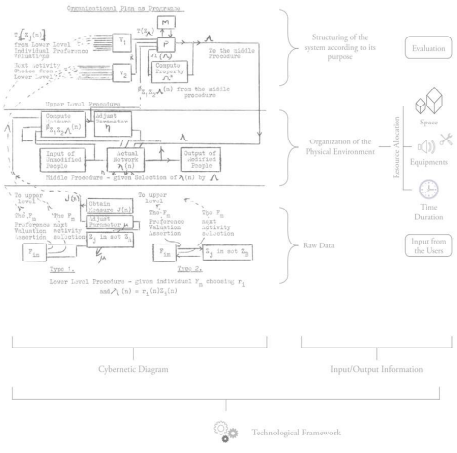
tion Flow & User Participation

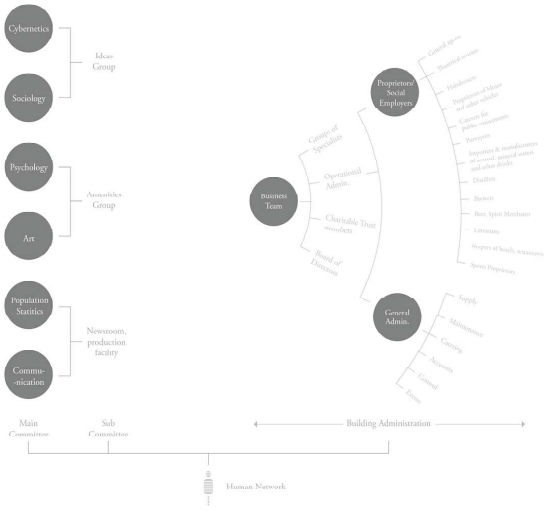


cipatory Framework with Mediating Entities (by Author)

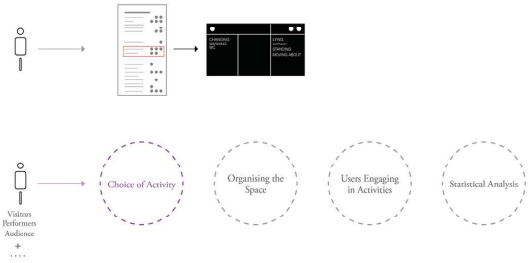
Input: User Choosing an Activity

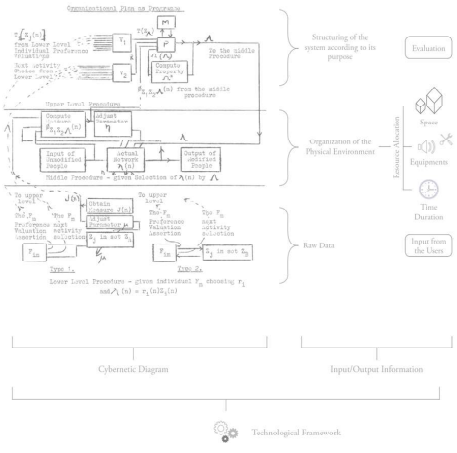


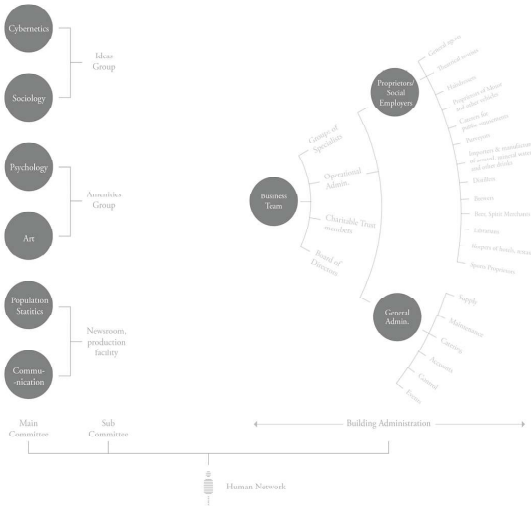




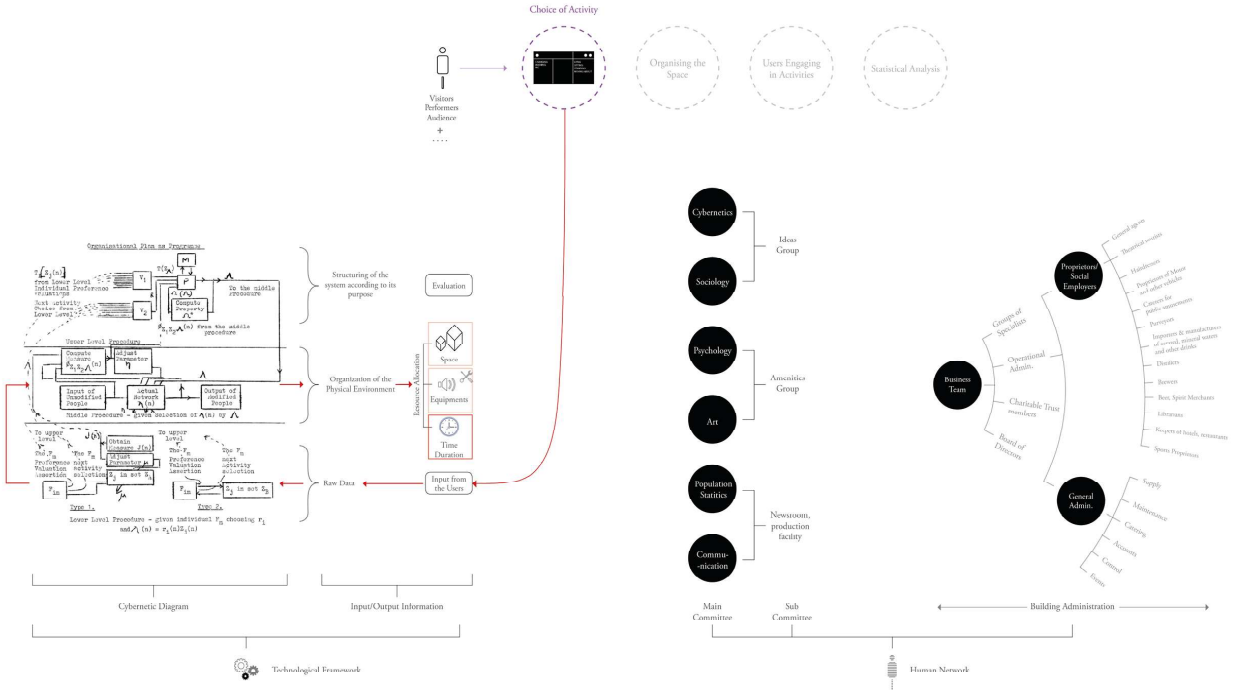
Input: User Choosing an Activity



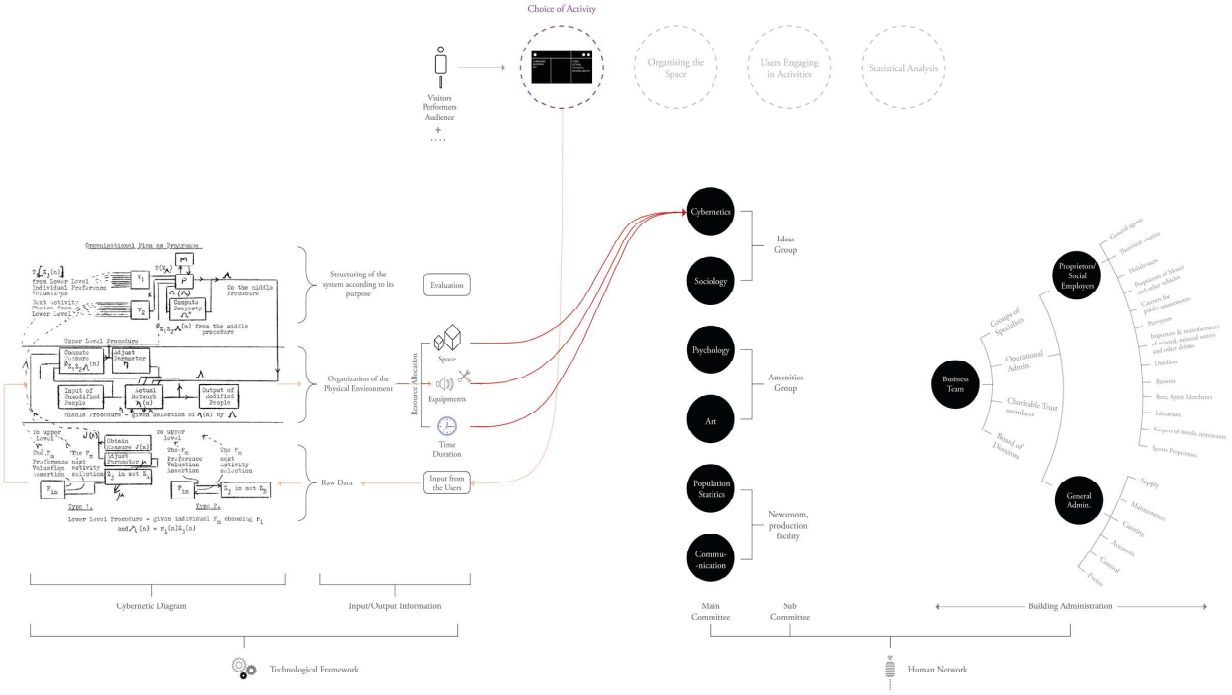




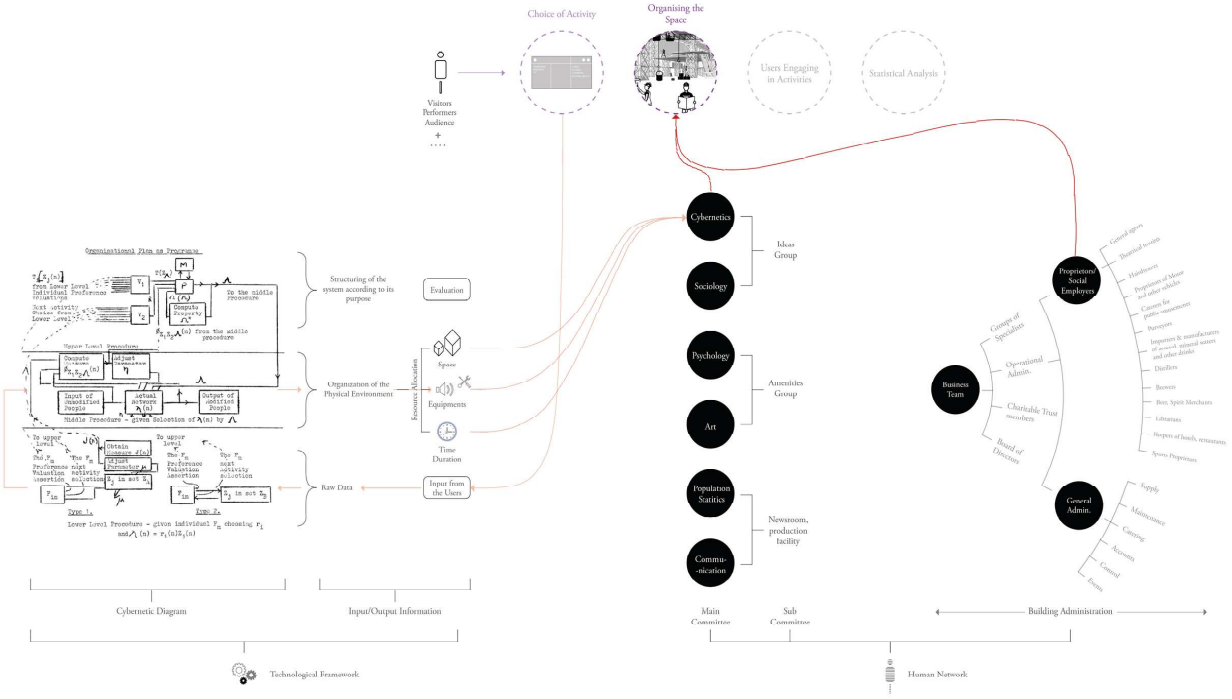
Process: Recording User Choices



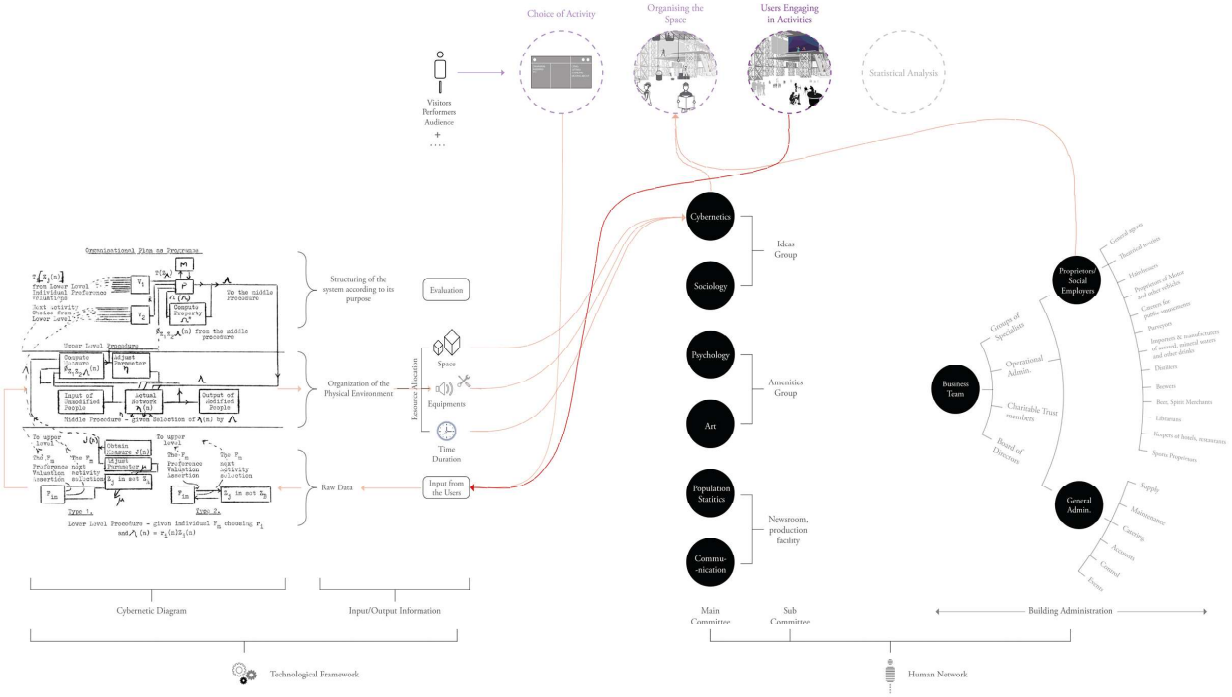
Process: Cybernetic Outputs



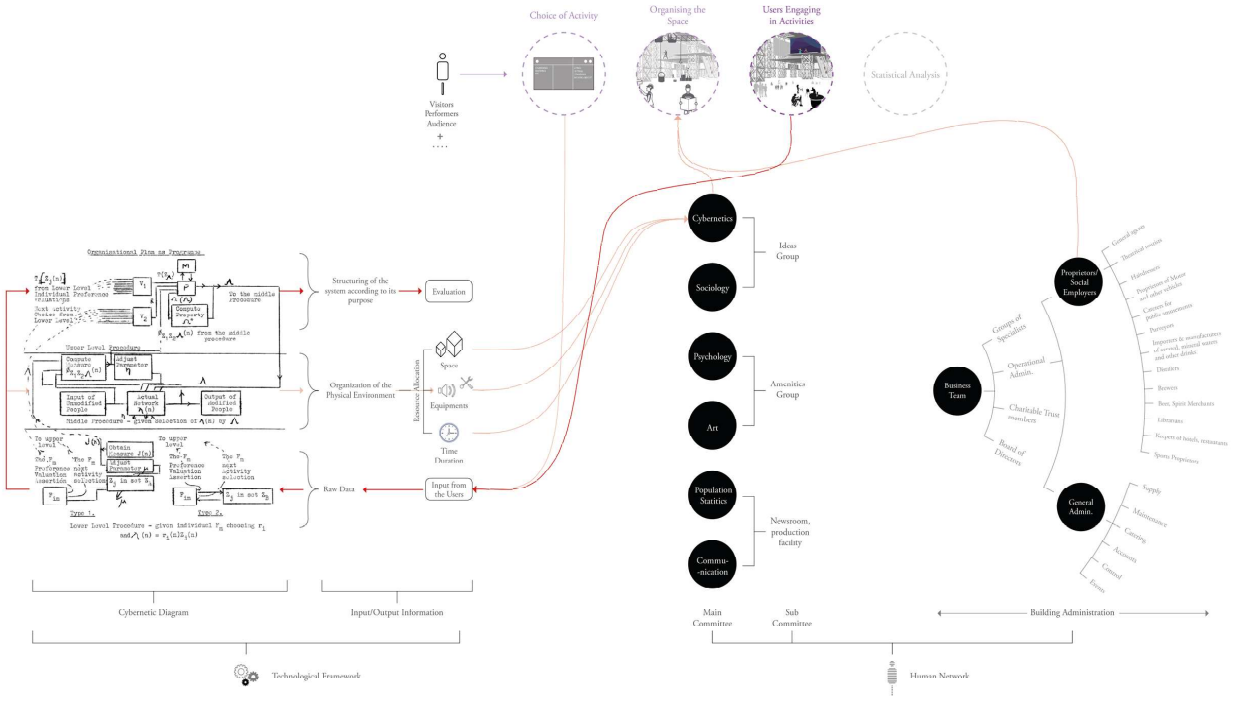
Process: Setting up the Physical Space



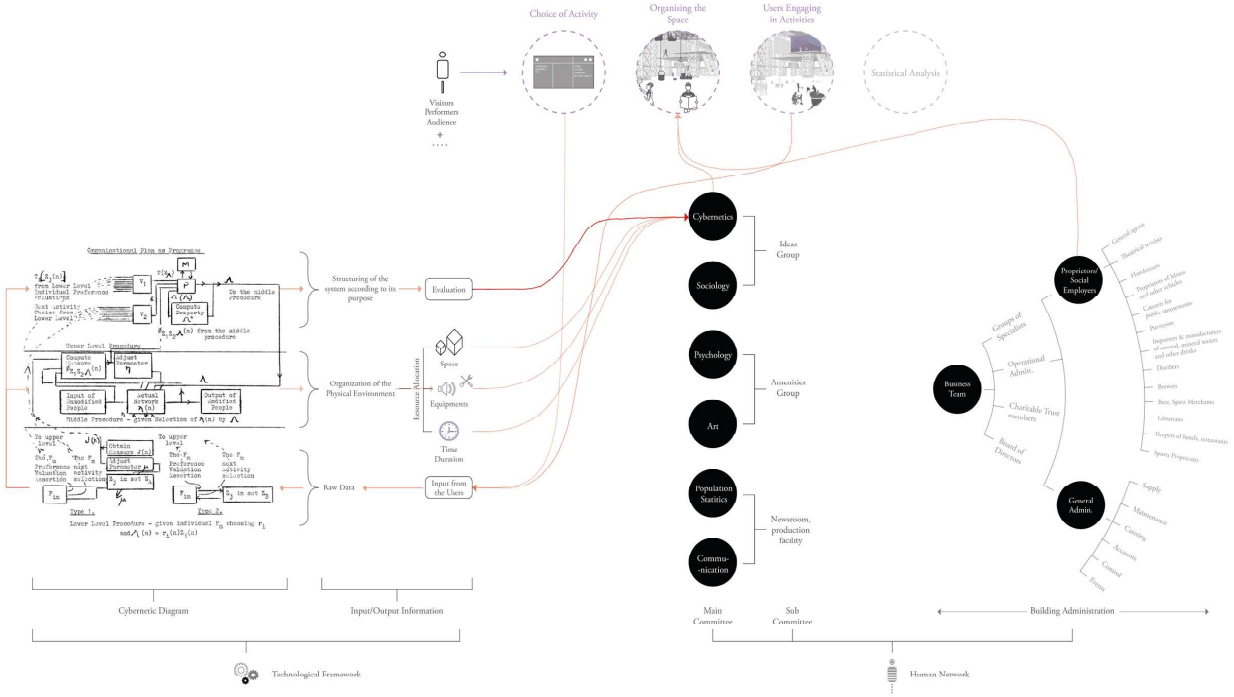
Process: Observing User Engagement



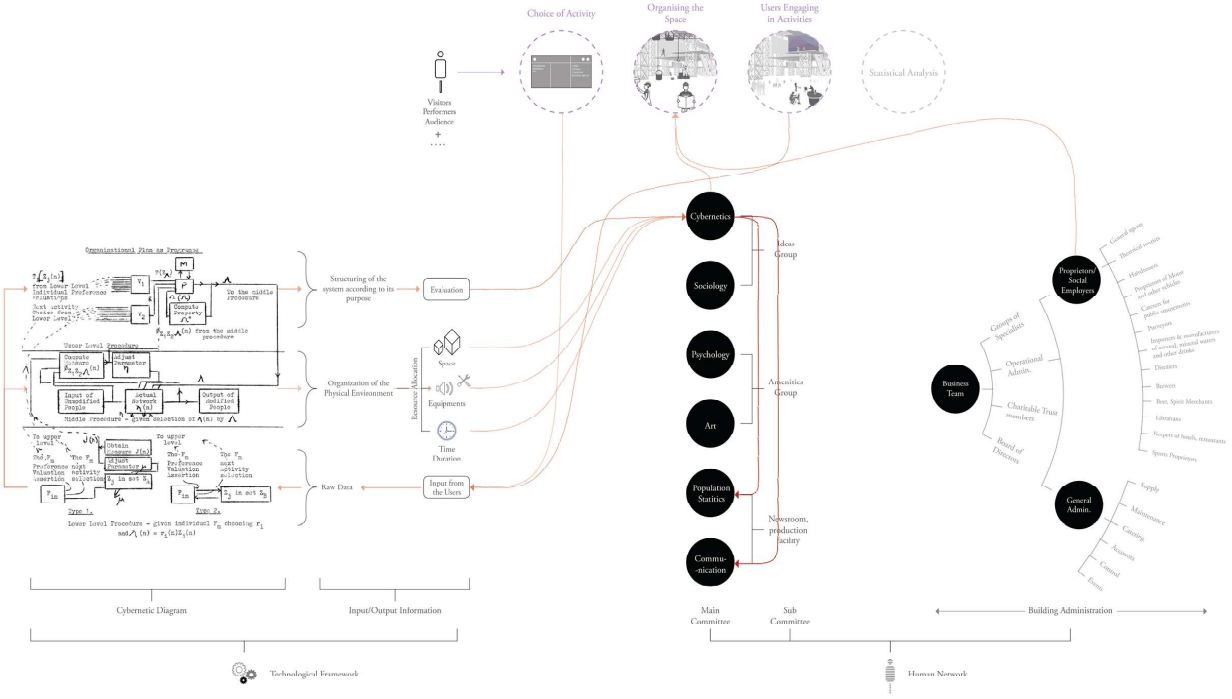
Process: Evaluating Spatial Performance



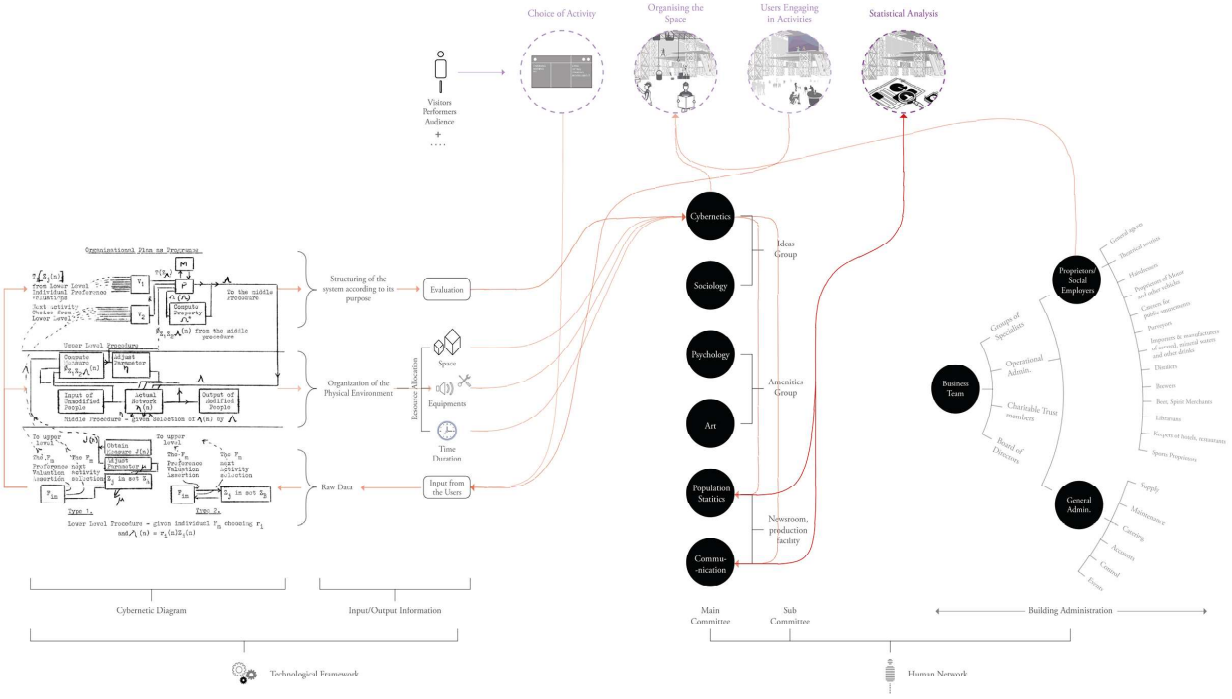
Output: Generating Feedbacks



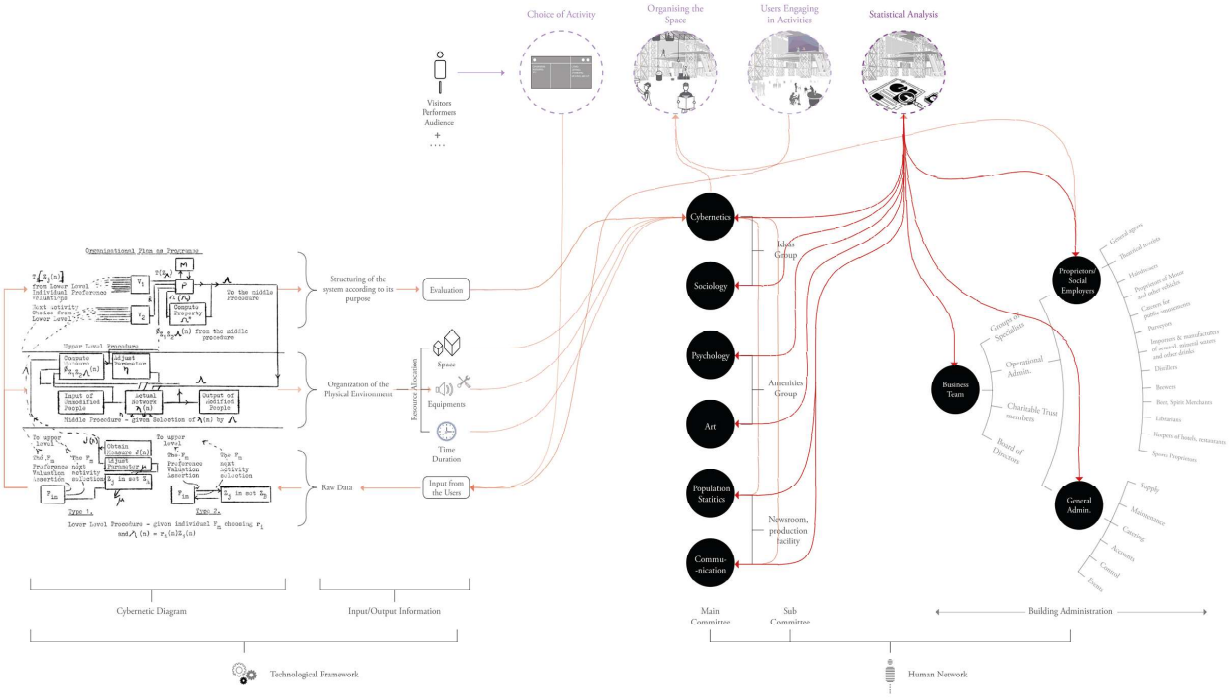
Output: Analysing Feedback



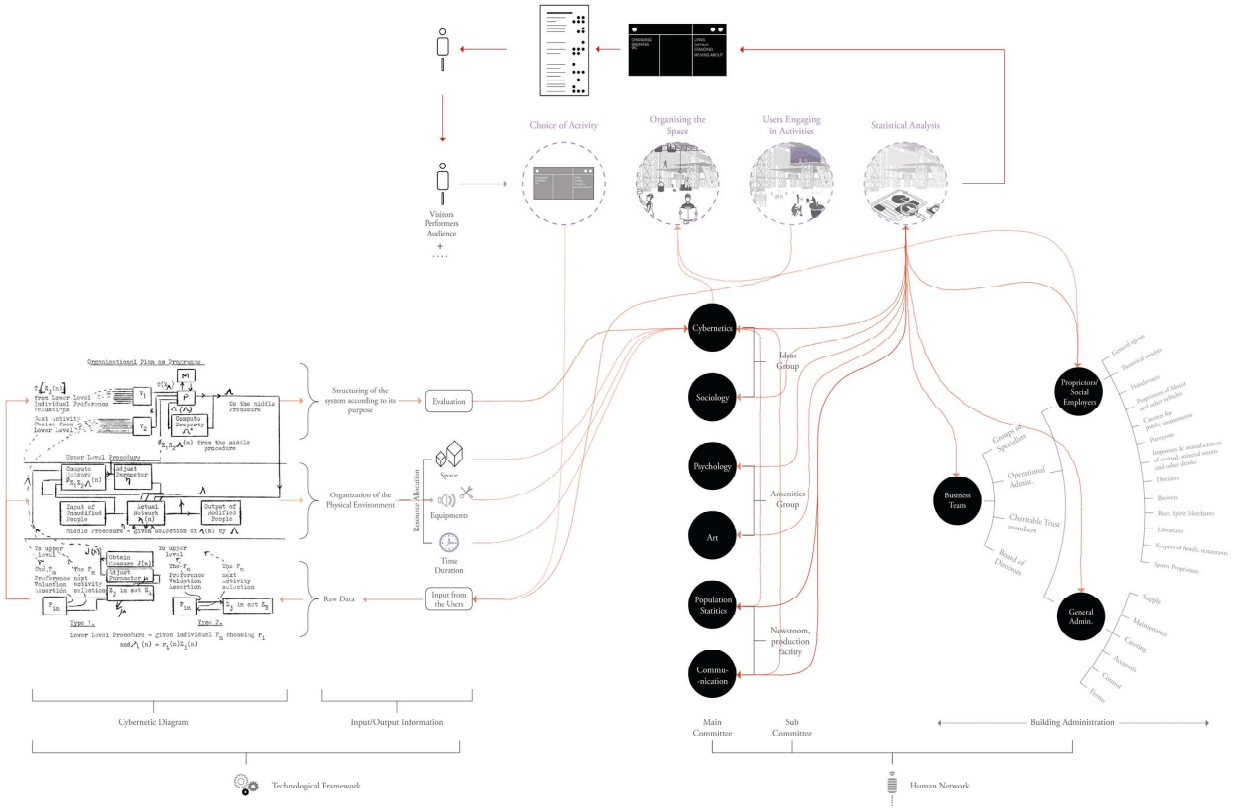
Output: Publishing Statistical Reports



Output: Modifying Programs & Layouts



Output: Updated Repository of Activities



3.3 Evaluating Participatory Outcomes

3.3.1 Shortcomings of the Participatory Loop

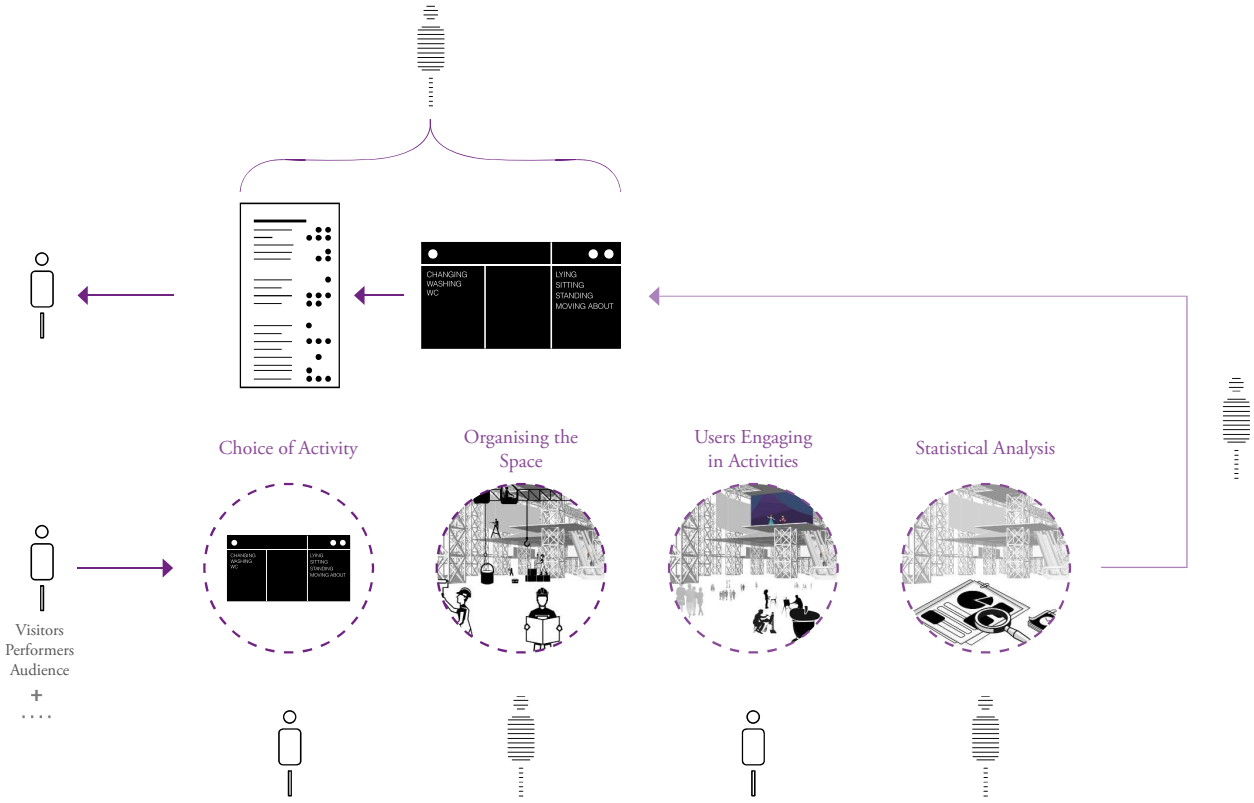


Fig. 3.4 Identifying Moments of User Agency the Participatory Loop (by Author)

Participatory Loop

The application of the cybernetic mediation, made it possible to catalyse consistent user engagement. As we can see, the loop based on Friedman's model is closed and continuous, forming a on-going process. But looking closely at the agency of the end- users in the participation process, there are alternating moments between where the users physically engage versus the moments where the users were pseudo-participating, where their engagement in the form of informational inputs were translated into the physical sense of the word through expert intervention. ie. In theory he was participating all throughout the process, but in, his engagement was reinforced. This altering condition makes Fun Palace fall short of its participatory ambitions, as analysed and mapped in the critical graph. Although the Fun Palace succeeded theorizing end-user agency and participation, the technological realities and limitations of the users at that time hindered its participatory visions.

01

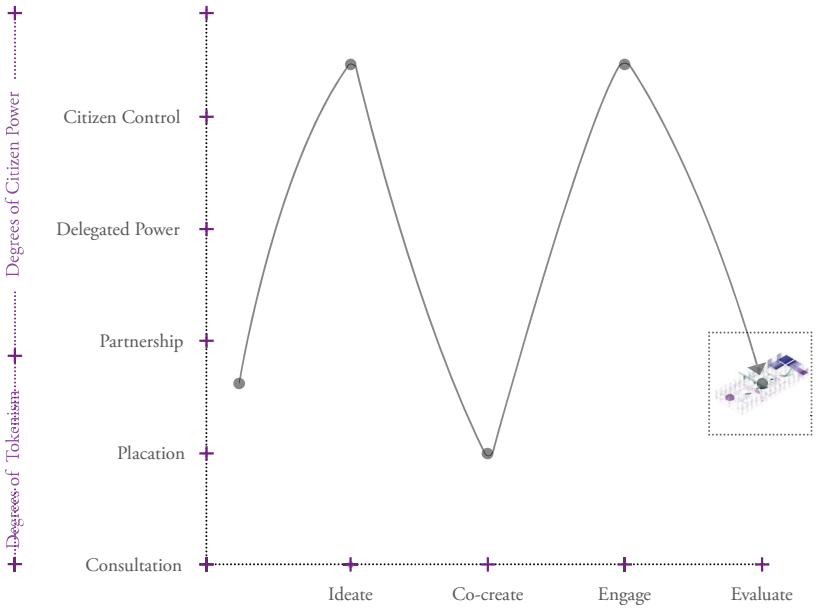


Fig. 3.5 Graph Mapping Fluctuating Intensities of User Agency (by Author)

02

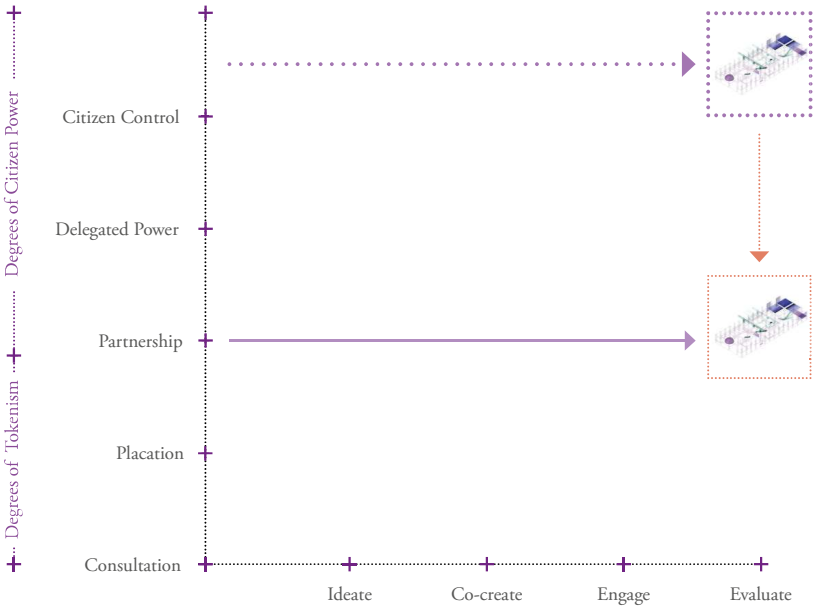


Fig. 3.6 Overall Evaluation of Fun Palace Ambitions (by Author)

3.3.2 Significance of Cybernetic Mediation

Socio-Technical Reality of the 1960s

Taking a closer look at the vast network of mediating entities, the fact that the cybernetic framework was accessible to a limited group of people made the process more tedious and elaborate. It was inevitable because of the socio-technical realities of the 1960's. It was a pre-internet, pre-digital era where the citizens were still passive consumers of technology and finished goods and had no say or knowledge about what they were using. As a result of which the project needed this huge network of mediating entities to prioritise user centric outcomes, which catalysed user participation.

What started as an initiative to empower user participation, grew into a system to control and monitor user behaviour. As stated in a memorandum of objectives postulated by the cybernetics committee, the last agenda continued to expand on this perilous line of social control, "Determination of what is likely to induce happiness particular to the issues of philosophy and theory and principle involved in determining what is likely to induce happiness and what role the organization should play in relation to the leisure of an automated society."[61] This eventually provoked major concerns questioning the intentions of the cybernetic system.

Translation of Data into Meaningful Form

But despite the fact it posed many restrictions, the cybernetic framework played a vital role in questioning the capacity of architecture to respond to the changing user's needs. This context informs the central character and core values of Price's works- a fact that was articulated by Anthony Vidler, in his writing titled "Toward a Theory of Architectural Program". Vidler discusses on the ambiguity of the influence of technology in architecture.

As he classifies Archigram's renderings of utopian visions as a substance of "image"[62] as their projects emphasized on its technological aesthetics,[63] foreshadowing its programmatic flexibility. Vidler emphasized on postulating program as a backbone for architecture's future at the time when its materiality is challenged by the 'pervasive influence of digitalisation.'[64]

Disregarding the machine aesthetics, Fun Palace employed cybernetics to posses an expressive form, by using architectural programming as a tool for agency. By doing so, it engaged in the- "translation"of data into meaningful form[65], that eventually became the overall theme of the Fun palace, where the possibility of participating in everything could be realised.

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61 Fun Palace Cybernetics Subcommittee Report, 1964, Cedric Price Archives, CCA, Montreal.

62 Vidler, Anthony. "Toward a Theory of the Architectural Program." October, vol. 106, 2003, pp. 59–74. JSTOR, www.jstor.org/stable/3397632. Accessed 14 Aug. 2019., 70.

63 Ibid., 67

64 Picon, Antoine. Digital culture in Architecture : An introduction for the Design professions. Basel : Birkhäuser, 2010., 5.

65 Vidler, Anthony. "Toward a Theory of the Architectural Program." October, vol. 106, 2003, pp. 59–74. JSTOR, www.jstor.org/stable/3397632. Accessed 14 Aug. 2019., 60.

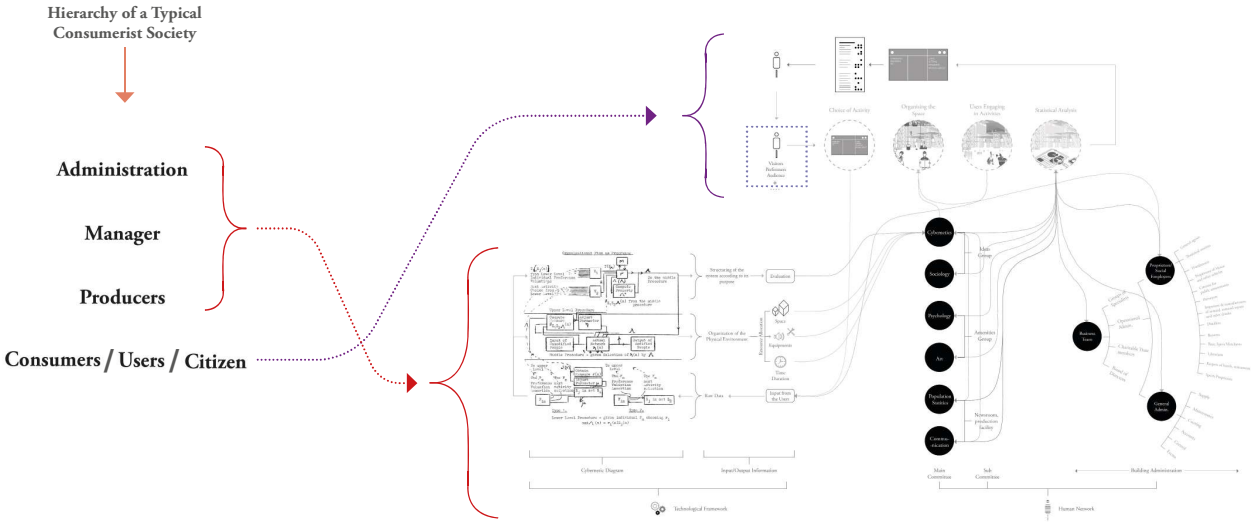

Fig. 3.7 Drawing Inferences from the Cybernetic Diagram (by Author)

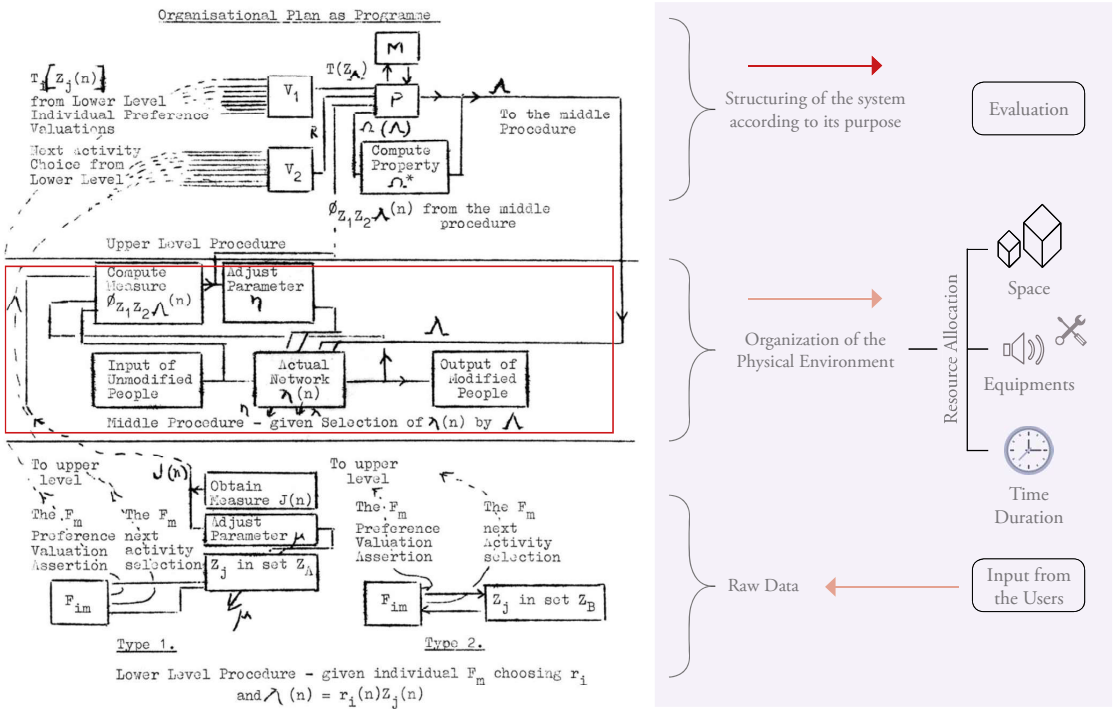

Fig. 3.8 Cybernetic Functioning: Translation of Data into Meaningful Form (by Author)

Criticisms on the Technology Focussed Urban Developments

This is a very pressing issue in today's smart city context where everything can be measured and data is virtually present everywhere and to potentially benefit from it is the biggest challenge we are facing today. And taking a look at the controversies that surround these technology focussed urban developments of today, it has always been primarily about data and data collection.

Drawing parallels to the technological functionality in Fun Palace, all the debates about the Smart City proposals today, are predominantly focussed on the one punch card system, whose intent has become largely distorted over the course of time as a mechanism to collect data for behavioural statistics and analysis. This cancels out the developments of all smart urban initiatives. To clarify this ambiguity, the analysis on Fun palace and its cybernetic significance sheds new light on the larger web of responsive events that happen beyond the tiny fraction of data collection.

Acknowledging the current controversies around the techno-centric solutions in the Quayside project, the research delves into the new ways of thinking about re-imagining techno-optimistic visions for contemporary urban developments, by taking inspirations from the Fun Palace that will create a radical social condition in the Quayside proposal, which will help intensify user agency and participation.

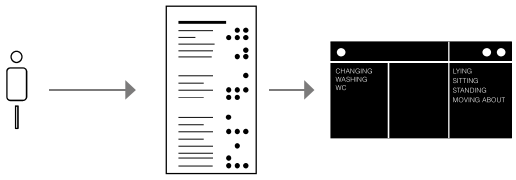

Fig. 3.9 Punch Card System of Data Collection in Fun Palace (by Author)

"Now we have all this data, what do we do with it?"

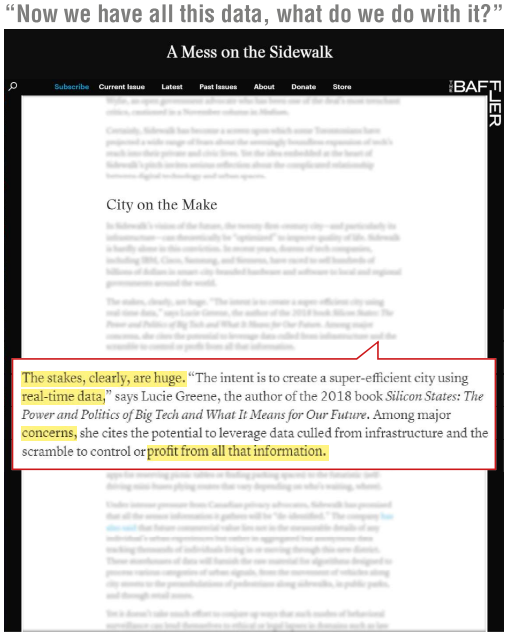

Fig. 3.10 Criticisms on Quayside Proposal

What can you do with the "Smart" City?

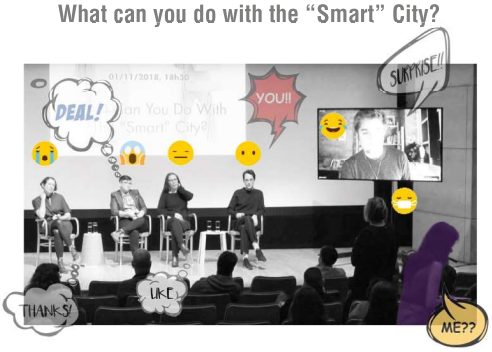

Fig. 3.11 A Critical Talk on Sidewalk Labs & Quayside Proposal (by Author)

Fun Palace, London, 1960-66

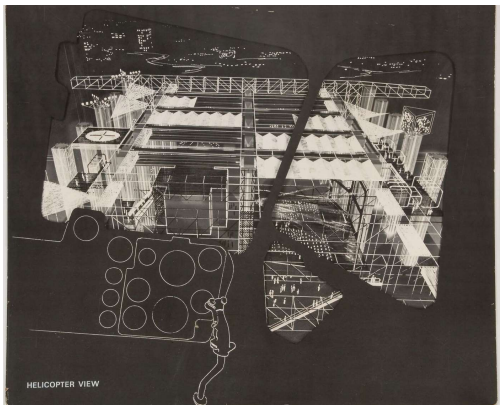

Fig. 3.12 Aerial View from Helicopter

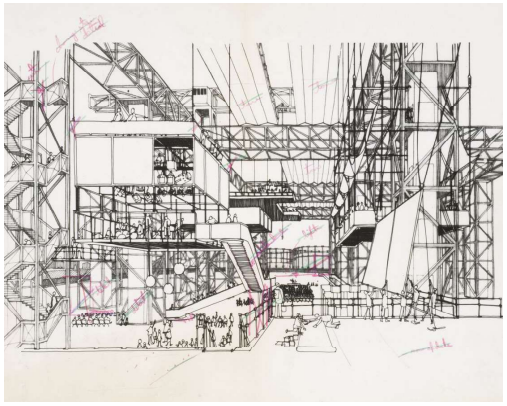

Fig. 3.13 Interior Perspective

Quayside, Toronto, 2017-19

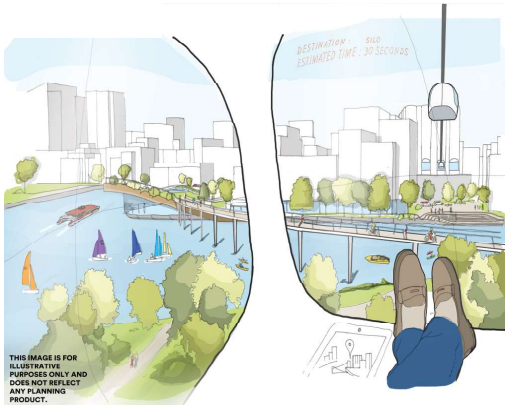

Fig. 3.14 Aerial View from Helicopter

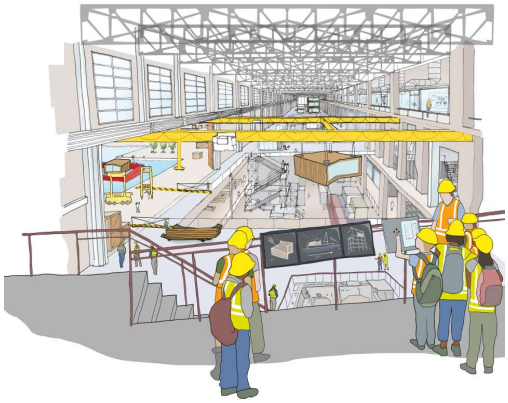

Fig. 3.15 Interior Perspective

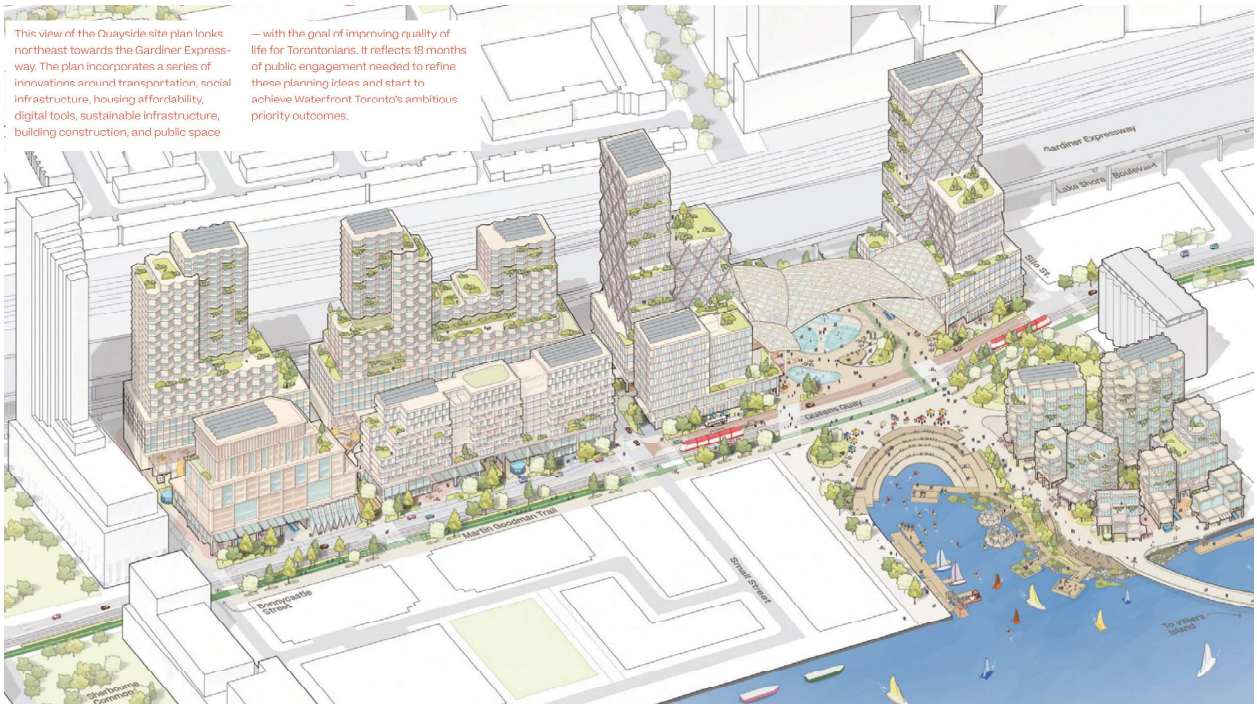

Fig. 4.1 Aerial View of Quayside Masterplan

04

4.1 Contemporary Age of Smart Cities

4.2 Quayside proposal

4.3 Kit of Parts

4.4 Cataloguing Quayside Components

04

Quayside, 2017-Present

Following the studies on Technology and Society brings us to the contemporary reality of today's progress towards Smart Urban interventions. With the advent of the internet and electronic technology, the concept of Smart Cities are reduced to a mere plan to equip the city with digital tools to optimise services and other civic infrastructures. It is like moving technology from our homes to our streets, measuring empty car spaces, the capacity of bins[66], the number of people on a street etc. Growing critiques questions to target the type of data being collected and demands more meaningful outcomes in our public realm. On the contrary to carry on the engineered trend toward greater city efficiency, this chapter sheds light on other participatory forms of Smart City initiatives that makes optimal use of ICT and digital technologies to produce collective urban experiences.

66 The Baffler. "A Mess on the Sidewalk | John Lorinc," March 4, 2019. https://thebaffler.com/salvos/a-mess-on-the-sidewalk-lorinc.

4.1 Contemporary Age of Smart Cities

4.1.1 Introduction to the Technology Focussed Urban Developments

Technology & Society

Since the postwar periods, the quest for integrating technology into the society have given rise to a range of urban developments. And in contemporary context, almost falls into two extremes, one is the 'neo-cybernetic'[67] approach inspired by the cybernetic and systems methods of the 1950s and the 1960s. And the other is a 'collaborative city'[68] that is characterized by its potentials to creatively mobilize its citizens to generate social events and scenarios, as inspired by the Situationist ideals. Regardless of their approach to planning, the two visions aims to maximize the potential benefits of employing ICT and digital technology. The goal of this thesis is to motivate the idea to think of Smart Cities beyond its proliferation of chips and sensors into reinvesting on its capacity to generate spontaneity and collaboration by bridging the two extremes of categorisation.

Beyond the Big Data

One of the major outcomes of omnipresent electronic entities throughout the urban fabric is the large volumes of information and data stored. The current capitalistic market favours the development of integrated platforms to heighten efficiency and surveillance. Smart City proposals like Rio de Janeiro and the Songdo district employ control rooms[69] and command centres inspired from the original war room models except with an innovation that provides real-time video coverage of the entire city. And the details, statistics and other relevant information about all the events happening in the city are displayed in large digital screens, where a group of expert individuals make decisions about planning, organising and monitoring the city through a set of parameters and feedback loops.

On the other hand movements such as placemaking and tactical urbanism, focusses on amplifying the use of ICT through urban initiatives that utilises smartphones to encourage fundamental 'rights to collective demonstration and celebration'.[70] These urban initiatives have identified the importance of public spaces to initiate mass participation that can realize temporary events, pop up activities that enrich the urban experience. And more importantly, these proposals questions the role of the material city in fostering such emergent participatory conditions. And as a response to which, they innovate on the physical fabric of the public realm, that can adapt to the changing use conditions.

Expanding on this second category of Smart City interventions, that emphases on spontaenity and collaboration, this chapter aims to unpack and understand the different participatory approaches seen in the Quayside proposal and evaluate them with the critical lens.

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67 Antoine Picon, Smart Cities: A Spatialized Intelligence (Chichester, West Sussex: Wiley, 2015), 67.

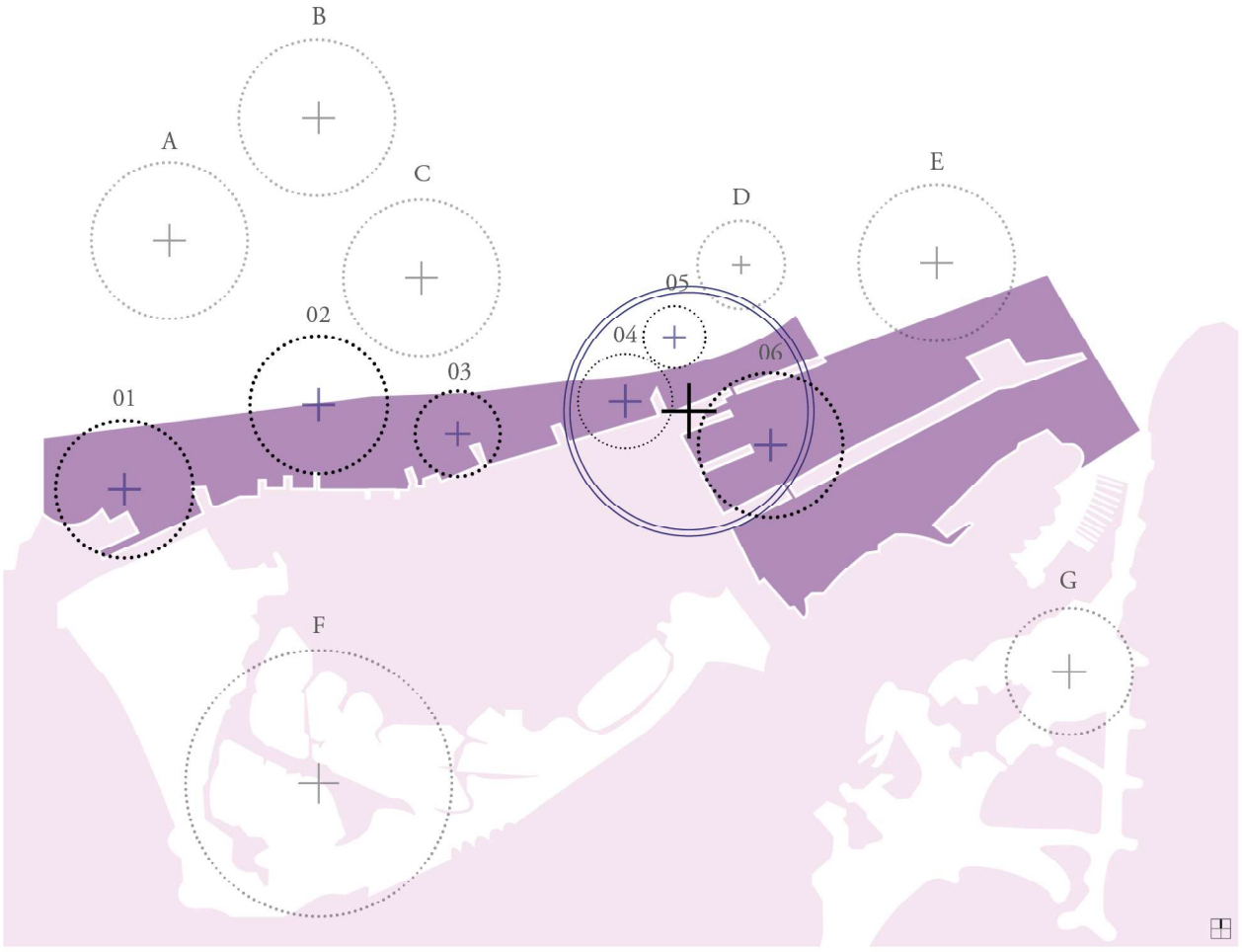
68 Ibid., 67.

69 MEDINA , EDEN . (2006). Designing Freedom, Regulating a Nation: Socialist Cybernetics in Allende's Chile. Journal of Latin American Studies. 38. 571 - 606. 10.1017/S0022216X06001179., 592.

70 Antoine Picon, Smart Cities: A Spatialized Intelligence (Chichester, West Sussex: Wiley, 2015), 84

4.2 Quayside Proposal

4.2.1 Site Context & Location



KEY

Area of Mapping

Waterfront Revitalisation

Harbour, Lake Ontario

Toronto City

01 - 06

Redevelopment Sites

01 Bathurst Quay
02 Entertainment District
03 Harbourfront
04 East Bayfront
05 The Distillery Historic District
06 Lower Don Lands

A - D

Surrounding Regions

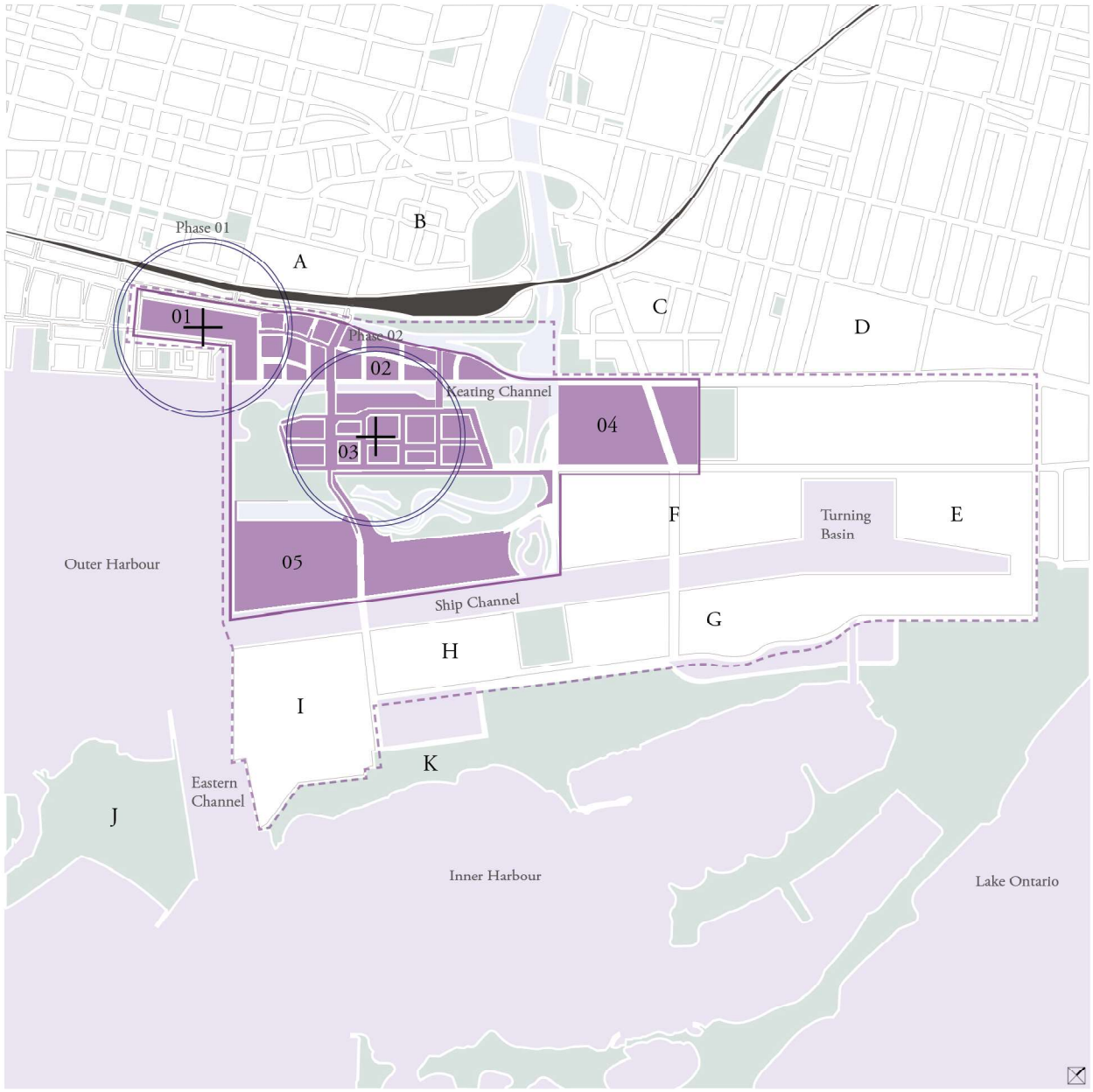
A China Town
B Baldwin Village
C Old Toronto
D Corktown
E Studio District
F Toronto Islands
G Tommy Thompson Park

PoI

Point of Interest

Smart city proposal in the brownfield sites by Sidewalk Labs in collaboration with Waterfront Toronto in the East Bayfront and Lower Don Lands precinct.

Fig. 4.2 Map Indicating Toronto's Waterfront Redevelopment (by Author)



KEY

Area of Mapping

01 - 05

A - K

PoI

Eastern Waterfront

Inner & Outer Harbour, Lake Ontario

IDEA District

Proposals in IDEA District

01 Quayside
02 Keating
03 Villiers Island
04 McCleary
05 Polson Quay
Green Zone

Surrounding Regions

A Distillery District
B West Don Lands
C East Harbour
D South of Eastern
E East Port
F Expanded Film Studio & Media District
G The Hearn
H South Ship Channel
I Ports Toronto
J Ward's Island
K Cherry Beach

Point of Interest

Sidewalk Labs proposal
Phase 01:
Quayside Plan

Phase 02:
Villiers West Urban Innovation Campus

Fig. 4.3 Map Showing Sidewalk Labs' Proposal for IDEA District (by Author)

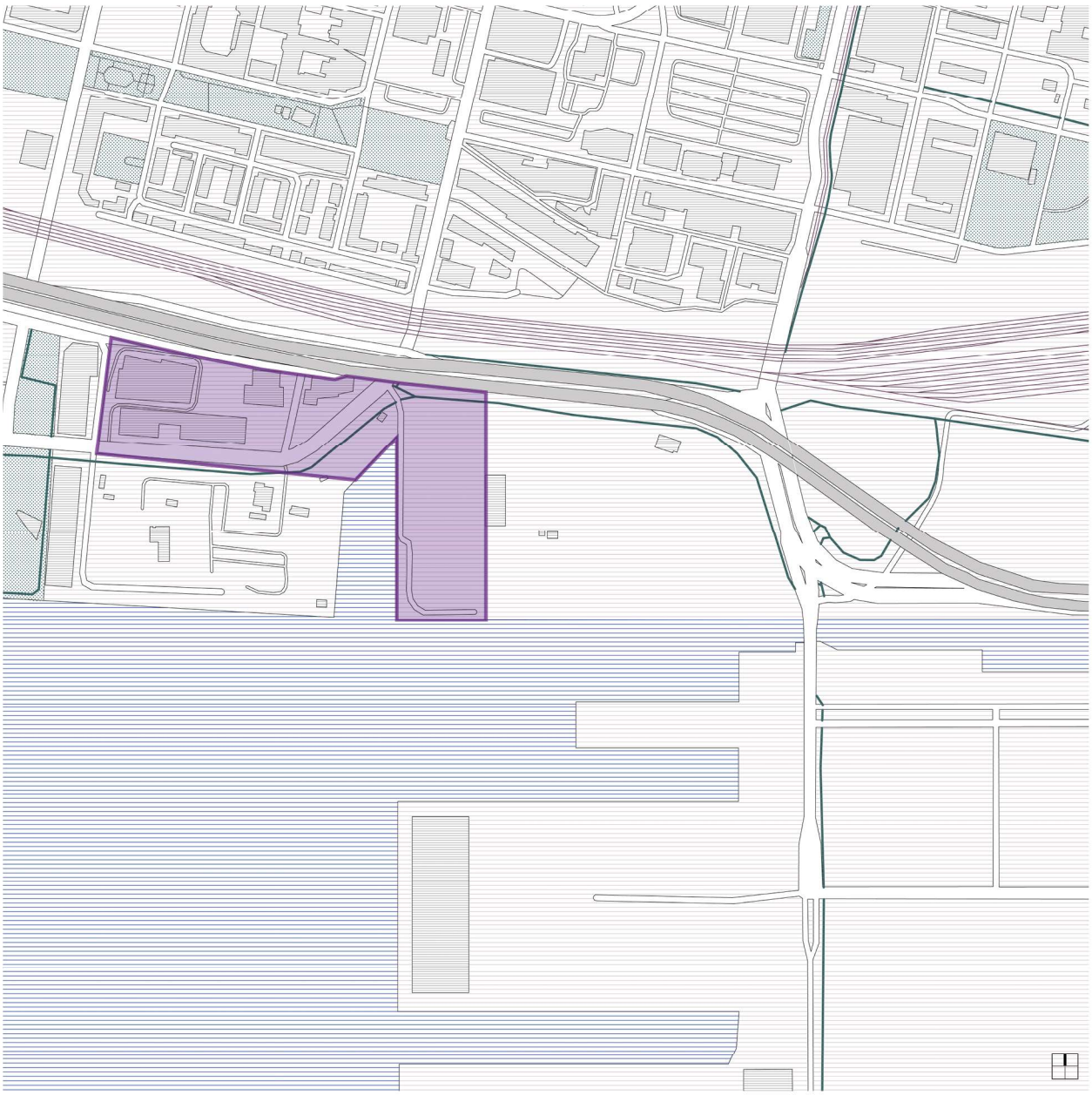


Fig. 4.4 Detailed Site Plan of Quayside Site near Parliament Plaza, Adjacent to Gardiner Expressway (by Author)

Quayside: Introduction

The Alphabet owned Sidewalk Labs' Quayside masterplan is a part of Toronto's waterfront revitalisation . The site is situated in the Eastern Waterfront, where Sidewalk Labs is proposing a new IDEA district in the 165 acre area, and the first phase of their proposal is the Quayside masterplan on a 12 acre site. The Quayside brownfield redevelopment aims to build a new community from the scratch that profoundly uses the current trends in the IoT and tests the potential of ICT in creating a well informed and connected community that promises to deliver both optimised city infrastructure and participatory conditions.

In their words, 'it is a vision for radical community built from the internet up where the physical and digital innovations coexist to catalyze a new urban cluster imagined around it's people.'[71] Like most other Smart City projects, the Quayside has a range of integrated solutions like 'self-driving car'[72], intelligent 'freight management systems'[73] that are aimed towards achieving efficiency and organization.

Innovation in Physical Fabric

Beyond its criticisms, the proposal has unique design approaches that highlights major

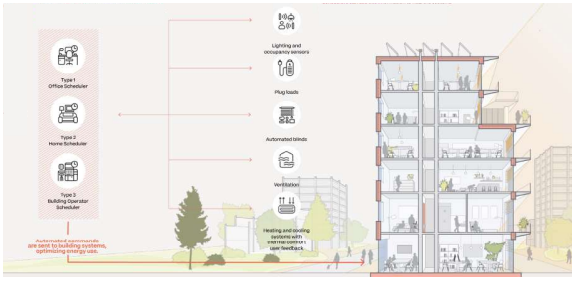


Fig. 4.5 Energy efficiency

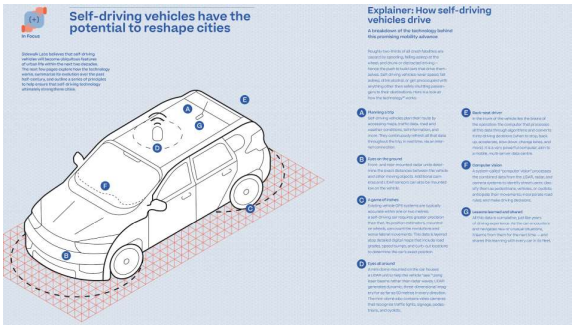


Fig. 4.6 Mobility: Self-driving cars

Fig. 4.7 Waste Management Systems

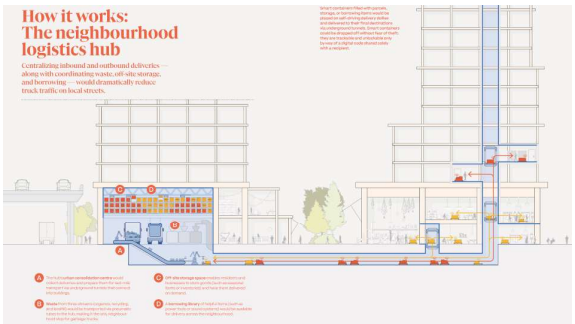


Fig. 4.8 Logistics

71 https://storage.googleapis.com/sidewalk-toronto-ca/wp-content/uploads/2019/06/23135619/MIDP_Volume1.pdf, 460.

72 https://storage.googleapis.com/sidewalk-toronto-ca/wp-content/uploads/2019/06/23135715/MIDP_Volume2.pdf, 56.

73 Ibid., 68.

4.2.3 Programs in the Quayside Masterplan

innovations in the physical fabric of the built spaces, that is capable of accommodating a range of flexible spatial conditions. The key aspect is the project's aspiration in creating a sustainable community imagined using mass timber.

Participatory Strategies

To heighten collaboration and participation within the community, the Quayside programming emphases on the design of educational and participatory spaces like the fabrication labs, pop-up learning labs, tech. bar that acts as a fertile ground for knowledge and information exchange. The following sections briefly introduces the proposal and reports in detail on some of the key elements, as the thesis design explorations will depend on some of this information discussed.

Zoning

The proposal has innovative programming that aims to foster a vibrant community. To do so, there were multiple alterations and negotiations made to the zoning byelaws to accommodate facilities like light manufacturing industries, fabrication labs etc. The residential towers are as high as 30 storeys and the podium levels that has the more publicly accessible spaces range from 4-10 storeys high. So the different programs plugged into this built fabric can be categorized into five different zones starting from the :

- Low cost and efficient residential zone.[74]
- Adaptive loft spaces that are multi use and caters to the immediate programmatic needs of the users, which over time can be altered into residential or commercial spaces.
- Commercial spaces for offices.
- Flexible Stoa spaces for retail and production.
- Public Realm that includes all the open spaces used for leisure and public accessible in the site.

Since the thesis is primarily about the importance of public spaces and user engagement, the research further explores the characteristics of the stoa spaces and the public realm proposed in the Quayside, that forms the social infrastructure.

Stoa Space

Inspired from the Greek stoas that were busy markets, exhibit spaces and a place for public gathering. Located in the ground and second floors of buildings, the Quayside version of the stoa is a mixed use space that supports a 'broad mix of pop-ups, arts and cultural installations, community uses, small businesses, maker spaces, and markets, alongside established retail tenants.'[75]

In addition to its programmatic variety, what is more unique about the stoa is that, there are a range of operable elements that extends out into the public realm that seamlessly integrates the

74 Bliss, Laura. "Sidewalk Lab's Vision for the Future Gets a Little Clearer." CityLab. Accessed January 8, 2019. https://www.citylab.com/design/2018/11/sidewalk-labs-quayside-toronto-smart-city-google-alphabet/577078/.

75 https://storage.googleapis.com/sidewalk-toronto-ca/wp-content/uploads/2019/06/23135715/MIDP_Volume2.pdf, 162.

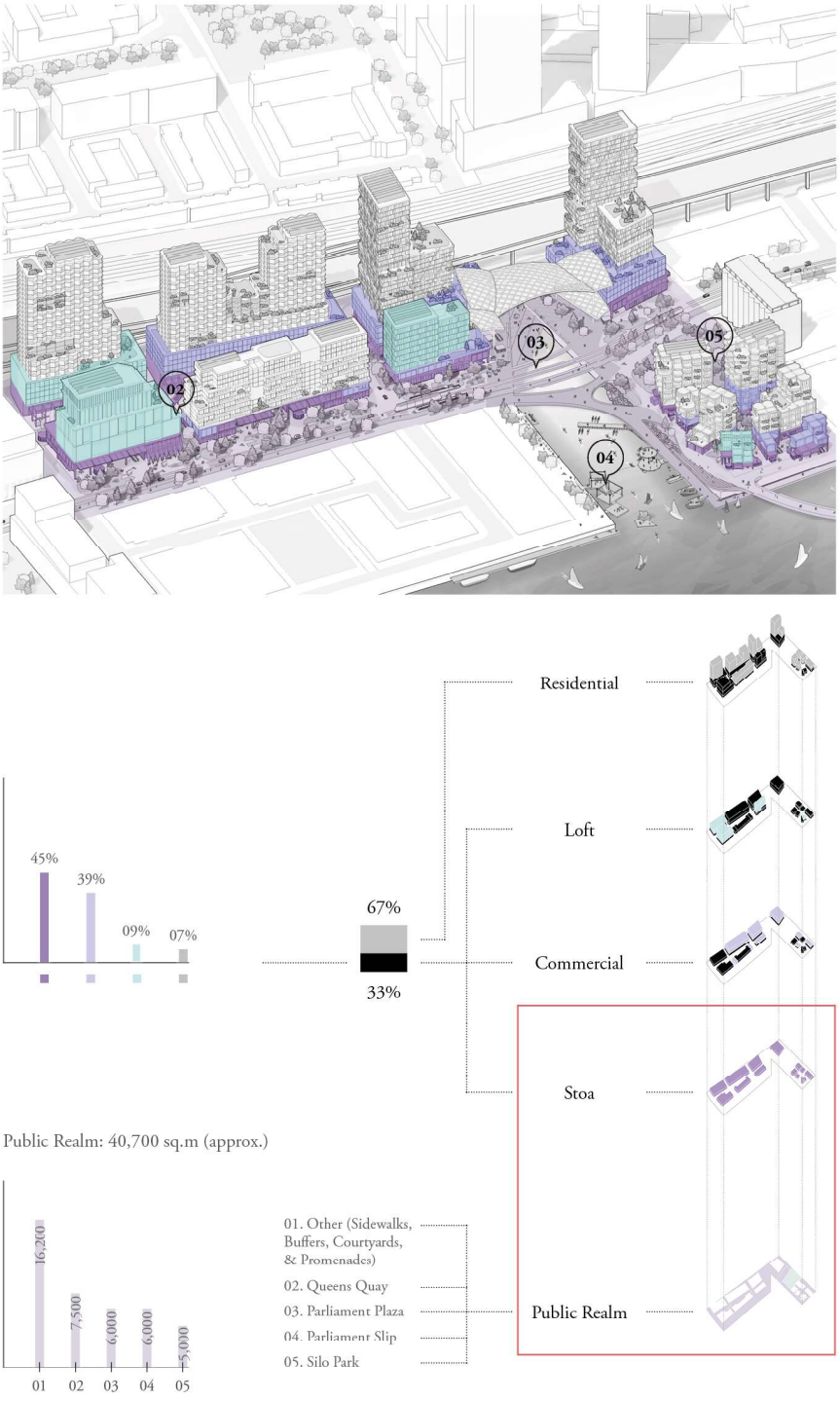


Fig. 4.9 Quayside Project Stats (by Author)

4.3 Kit of Parts

4.3.1 Elements of the Stoa Space

The main bays are 40X40 feet, that can be further partitioned to 20X20 feet spaces, using the modular building components like modular walls and floors. Each storey of the stoa is 5.5metres in height that facilitates addition of intermediate floors if needed.

Fig. 4.10 Fixed Structural Scaffold (by Author)

The Stoa spaces host a variety of retail, office, production and community spaces that connects directly to the streets to create a larger, livelier public realm.

A Retractable Facades

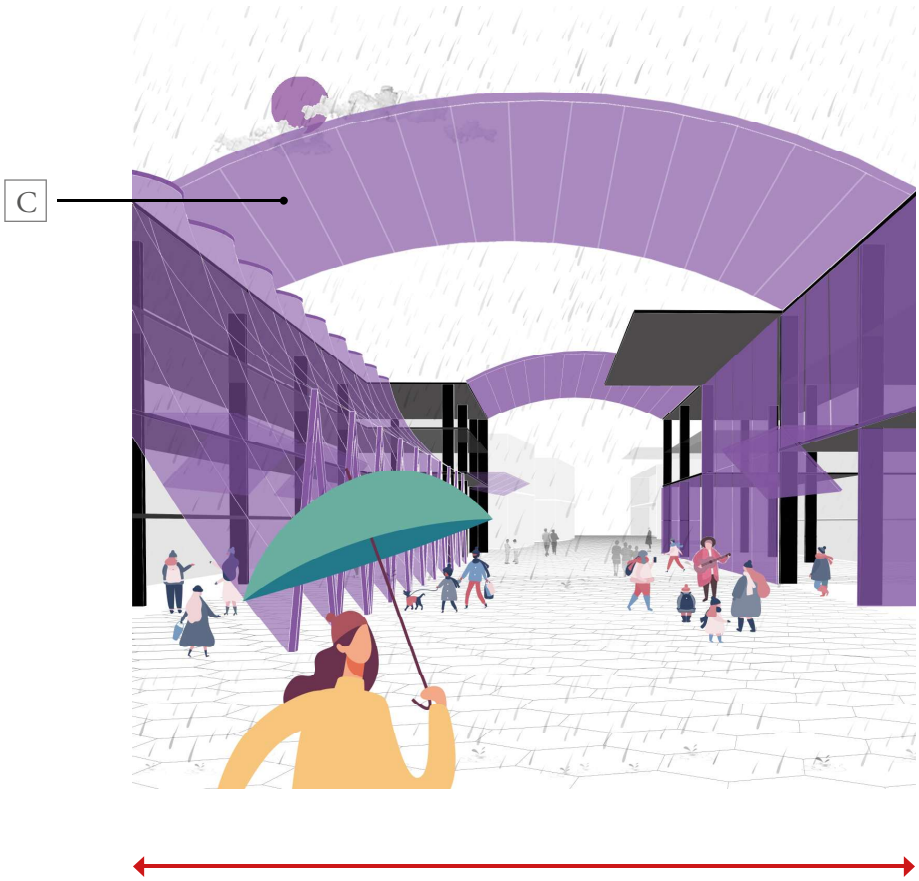
Some facades includes retractable glass door systems that can be operated with ease to open up the stoa space to seamlessly integrate with the public realm.

Fig. 4.11 Operable Elements: Retractable Facades (by Author)

B Building Raincoat: Type 01

The Raincoat consists of a “second skin” that could extend outward from a building’e edge to the protect the sidewalk from rain, wind, and sun. It could attach to one side of a building and anchor into piles beneath the street pavers.

Fig. 4.12 Operable Elements: Building Raincoats- 01 (by Author)



C Building Raincoat: Type 02

It could also function as a retractable canopy, spanning from building to building, that help integrate street life into the ground floor of buildings with a greater capacity to adjust to the changing climatic conditions in the outdoor.

Fig. 4.13 Operable Elements: Building Raincoats- 02 (by Author)

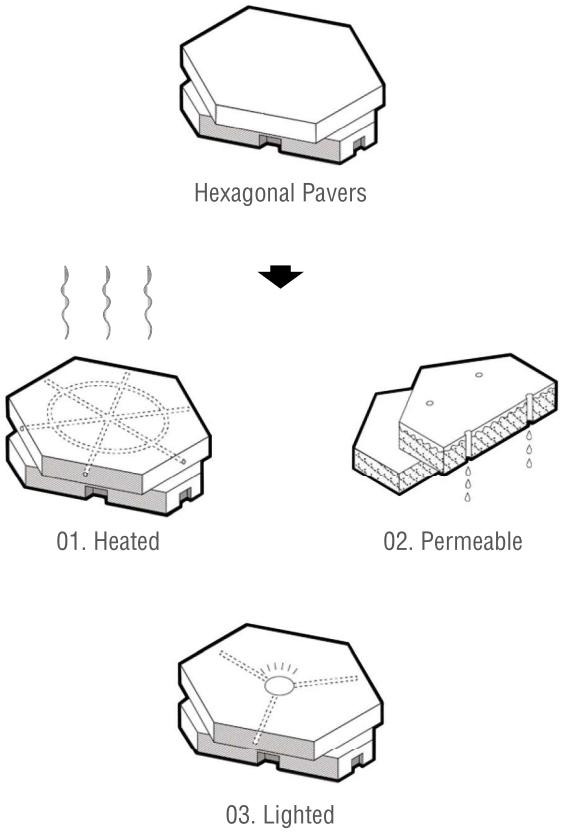


Fig. 4.14 Properties of Responsive Pavers

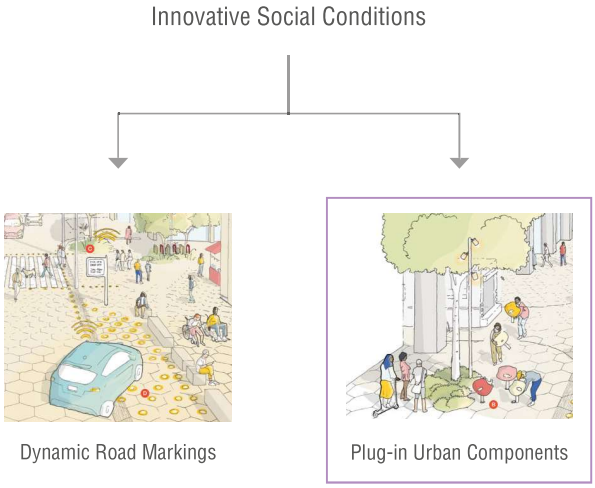


Fig. 4.15 Social Implications of Pavers (by Author)

indoors and the outdoors and creates a dynamic exchange of activities between the building and the public space. Hence, the spaces inside the stoa like art gallery, fab lab, public markets, community rooms becomes easily accessible by the pedestrians from the outside. As a result, it shares a dynamic relation with the street space that changes its form according to the changing conditions in the stoa and vice versa.

Responsive Paver System

Sidewalk Labs in collaboration with Carlo Ratti has proposed a new kind of deployable modular paver system throughout the public realm. Not only are they efficient for servicing and maintenance, they have innovative solutions that open up new potentials for an adaptive and vibrant street system.

The pavers have in-built heating system to provide outdoor comfort, and have permeable surfaces that can prevent surface water run off and they have embedded LED lights that can create dynamic road markings[76] to efficiently manage multi-modal mobility. A novel addition to this idea, is the fact that the pockets in the pavers that allows the citizens to plug in and out urban components to shape their own social experiences, that begins to imagine a new kind of social setting.

76 The Baffler. "A Mess on the Sidewalk | John Lorinc," March 4, 2019. https://thebaffler.com/salvos/a-mess-on-the-sidewalk-lorinc.

4.4 Cataloguing Quayside Components

4.4.1 Framing the Participatory Lens

In addition to the responsive pavers, the public realm has a set of kit of part components that engages with different user groups that enables them to create changing social conditions, that results in a citizen designed/ makers community setting. Along this line of inquiry the research looks into the design of participatory systems in the public realm, that fosters collaboration and spontaneity.

Constructing the Lens

The research builds a participatory lens as a heuristic to further read into the participatory ambitions of the kit of parts components proposed in the Quayside. To construct the lens, the different realities of ICT engagements proposed are mapped onto one axis. This axis includes a broad spectrum of integrated solutions ranging from techno-centric solutions like efficient freight management, self driving cars; to the more user centric solutions like dynamic road marking system that help manage multi modal mobility and can also be used to prioritise pedestrian friendly outcomes.

Arnstein's ladder is overlayed on top of the ICT axis, that helps us understand the range of participatory and non-participatory conditions exercised by the kit of parts. The task here was to map all the kit of part components proposed in Quayside onto this 2D graph, based on a set of parameters like their functioning, characteristics, user groups, domain of operation etc. By the end of the exercise, we see an overview of Quayside from a participatory perspective.

Analysing the Outcomes

To better understand the outcomes of the mapping, the graph can be vertically categorised into 3 rungs starting from the lower most non-participatory components that are mostly automated solutions. Moving up, there are more responsive and participatory solutions that encourages user participation. Now, taking a look at the overall graph, the Quayside seems a bit more techno-centric as there is a diaspora of components evenly distributed throughout the lower quadrants of the graph.

In contrary, the upper participatory quadrants have less dense mapping of components, in which the key solutions that highlights the Quayside proposal lay condensed in the middle and did not rise up the graph as expected. So the next stage was to zoom in to the graph and categorise the components based on the nature of interventions, and to further delve into the physical components that are human scale and un-mediated.

4.4.2 Mapping the Kit of Part Components

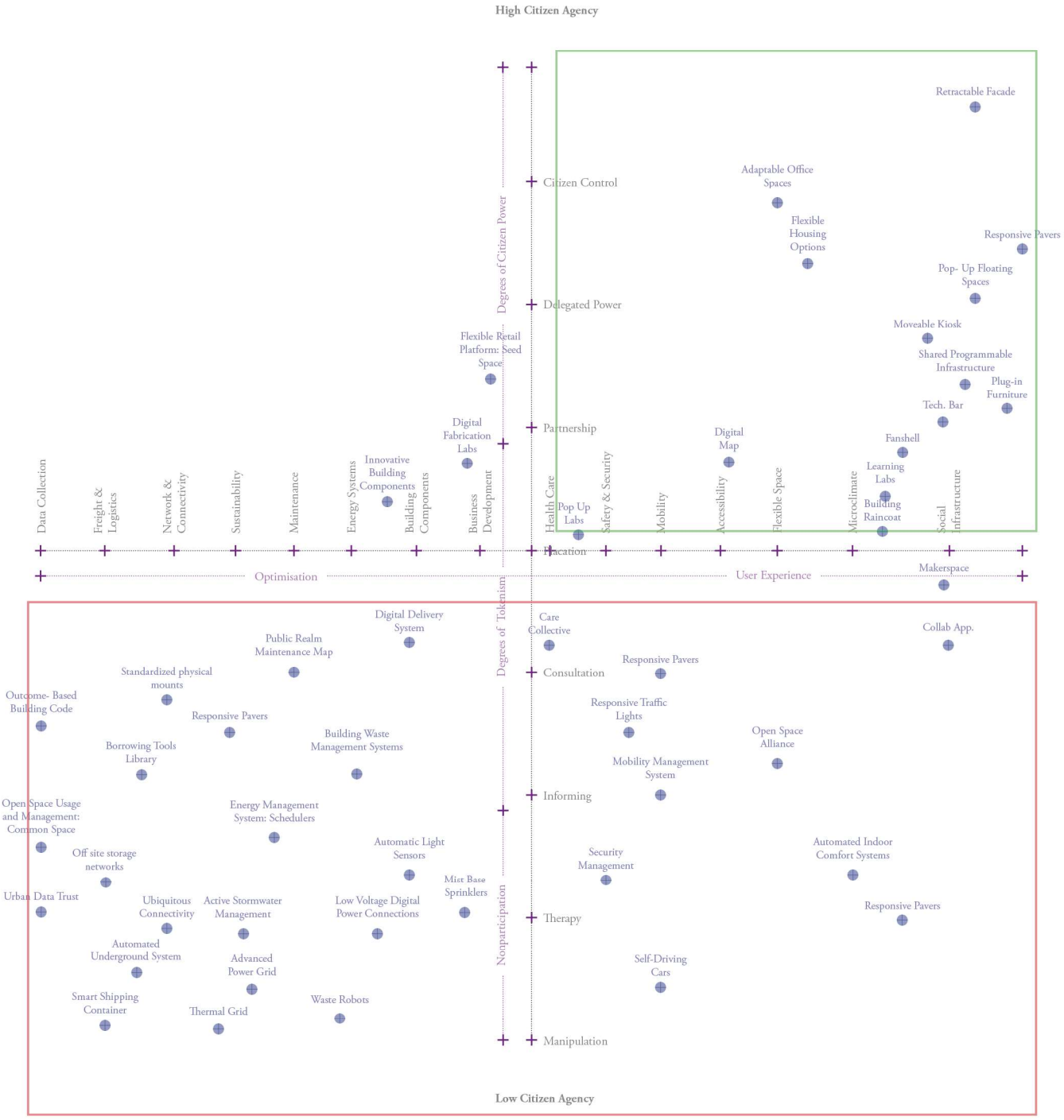


Fig. 4.16 Critiquing the Participatory Visions & Identifying Area of Interest (by Author)

4.4.3 Identifying a Set of Components

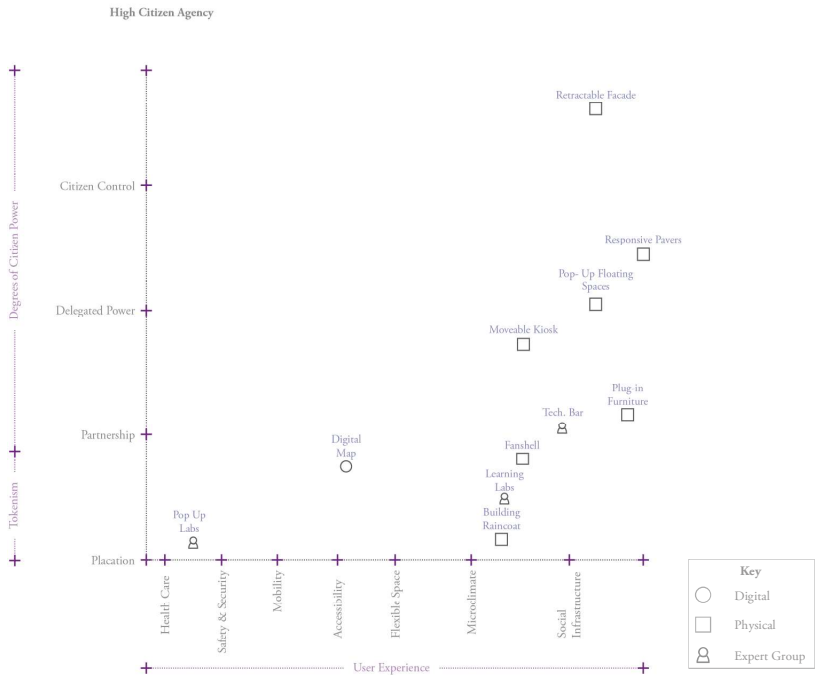


Fig. 4.17 Categorising the Kit of Parts (by Author)

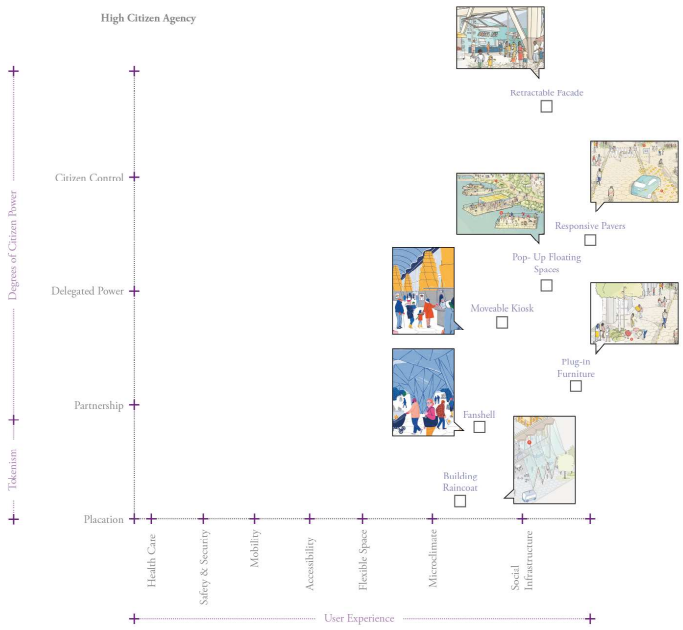


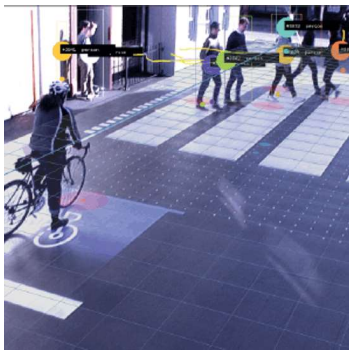
Fig. 4.18 Identifying the Physical Components (by Author)

4.4.4 Setting up the Design Agenda

Fig. 4.19 Graph Showing Design Ambitions to Re-Imagine the Selected Components (by Author)

The primary agenda of the design explorations is to reason out on their shortcomings and re-imagine the quayside components by implementing the concept of technological mediation, that heightens the user agency and therefore elevates them up the graph. Prior to the design exercise, the following chapter compiles precedent studies conducted on three contemporary urban interventions, proposed in London. The precedent studies provides insights to different ways to design participatory systems that employ ICT and digital technologies for effective user engagement. Such urban projects are gaining more success and traction across Europe, as Matthieu Grosjean talks about how the European funding has kick started smart city projects that rely on civic engagement in building a self- sustaining public realm as he mentions,
"Rather than develop a strategy or a plan, our approach has been to facilitate a supportive environment for public and private investment"[77]

77 "How to Make the Smart City a Reality: Forget Technology, Focus on the People - Energy Post." Accessed September 2, 2019. https://energypost.eu/how-to-make-the-smart-city-a-reality-forget-technology-focus-on-the-people/.



05

5.1 Starling Crossing

5.2 Hi Croydon!

5.3 Smart Carpet

05

Precedent Studies

The following projects were developed as a series of design competitions with McGregor Coxall, each of these either won or were shortlisted in major London Smart City Initiatives. They target the product oriented framework of the smart city industry but do so in a way that aims to bring community interaction and flexibility to public space.

Introduction to the Precedent Studies

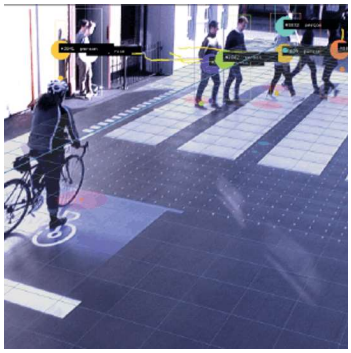
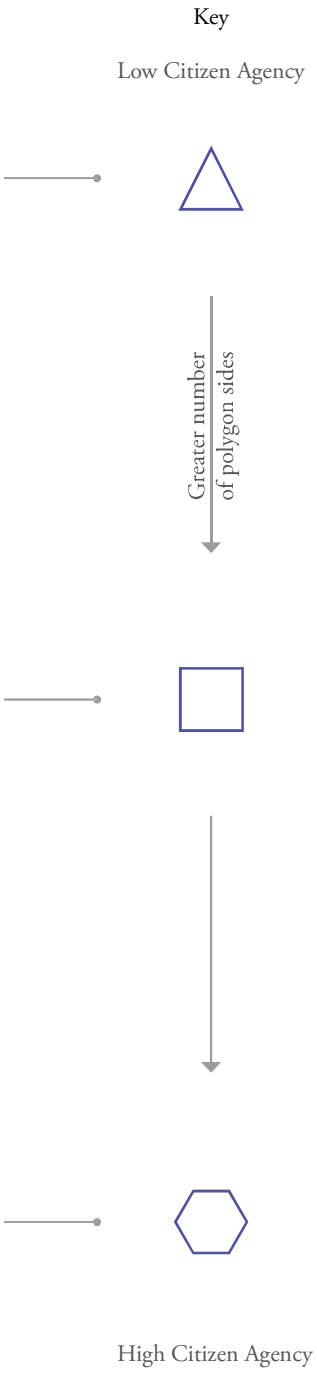


Fig. 5.1 Starling Crossing

Fig. 5.2 Hi Croydon!

Fig. 5.3 Smart Carpet



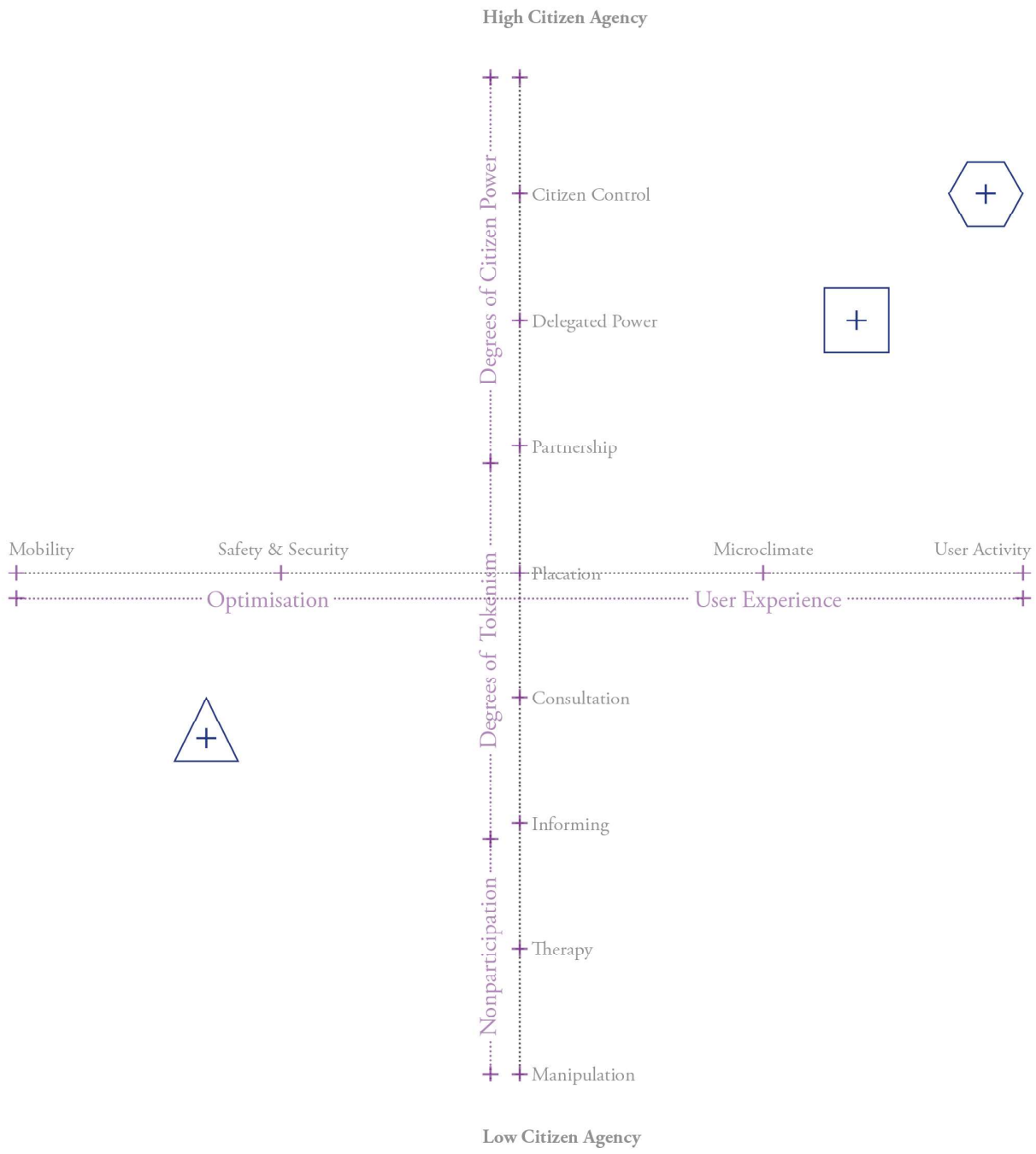


Fig. 5.4 Framework Mapping all the Precedent Studies based on their Participatory Systems (by Author)

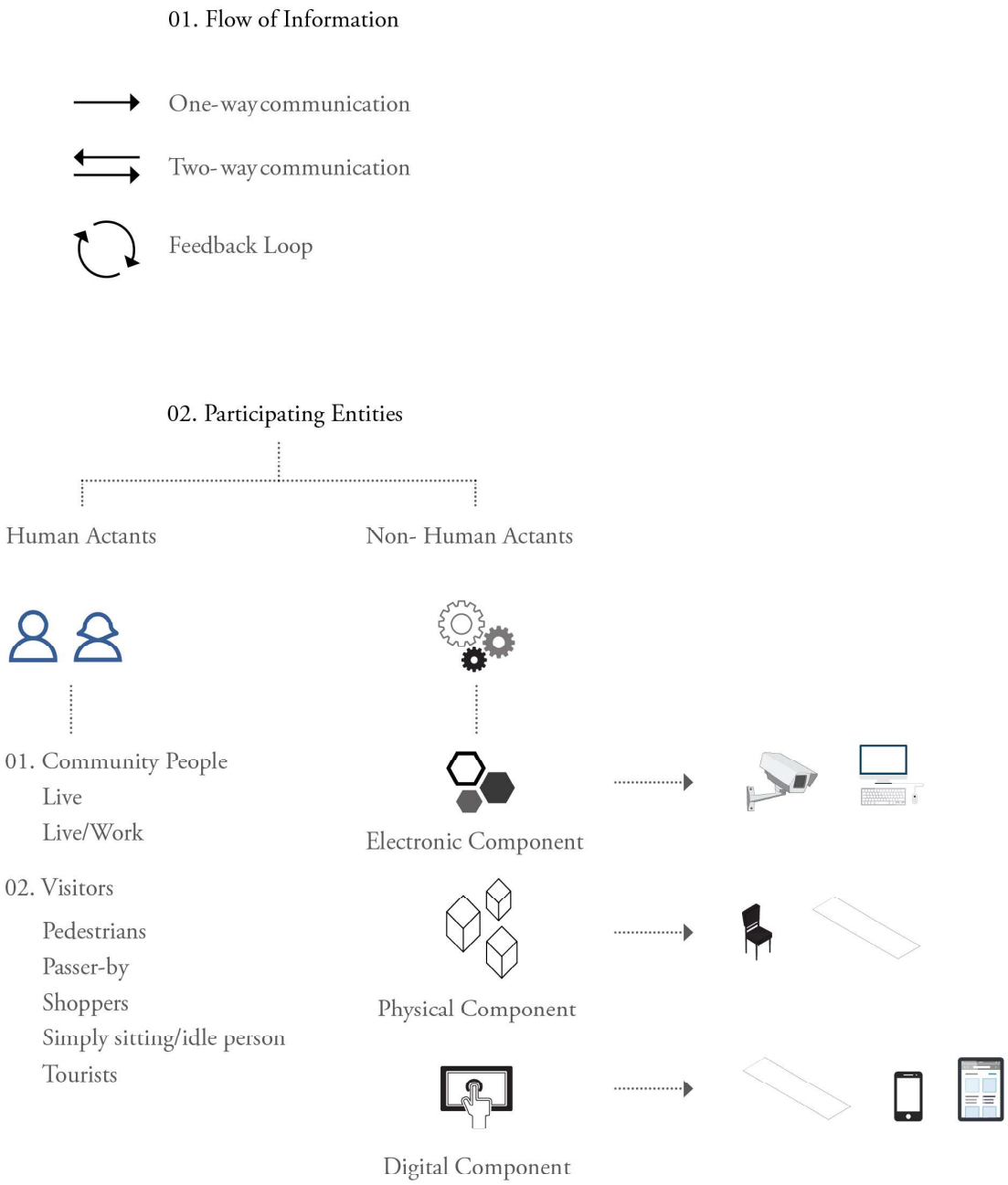


Fig. 5.5 Index to Understand the Icons used in the Following Analysis (by Author)

5.1 Starling Crossing

5.1.1 Project Specifications

South London, 2017- Umbrellium

Project Introduction

Standing in roughly for "Stigmergic Adaptive Responsive Learning,"[78] Starling is a responsive road surface that reacts in real time to different traffic and pedestrian conditions by modifying the patterns, layout, configuration, and the size and orientation of pedestrian crossings in order to prioritize pedestrian safety. It is made from LED-embedded plastic panels that display pedestrian crossing marks, warnings, and other indications that are meant to direct and alert both drivers and pedestrians.

Project Goal

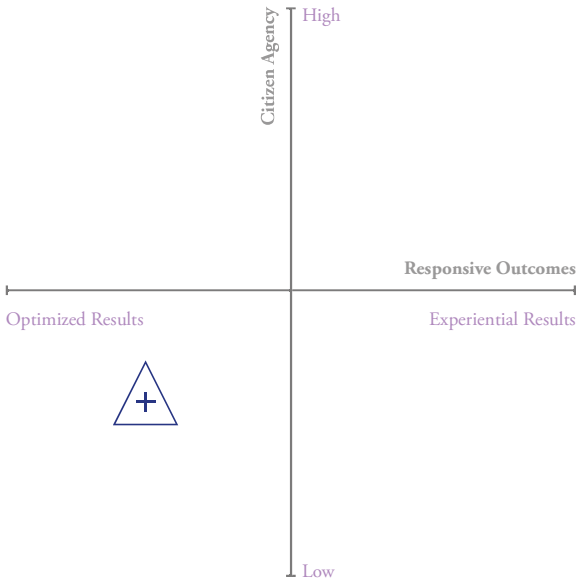
To make roads respond to real-time user movements to make pedestrians, cyclists & drivers safer and more aware of each other. The responsive road system helps to blur the segregation between the different road users, and prioritises safe and flexible pedestrian crossing at any point of the road surface.

Users

Pedestrians, cyclists and vehicles.

Tools

Camera, computer software and responsive road surface



78 "Make Roads Safer, More Responsive & Dynamic - Umbrellium." Accessed August 9, 2019. https://umbrellium.co.uk/case-studies/south-london-starling-cv/.

5.1.2 Project Agenda

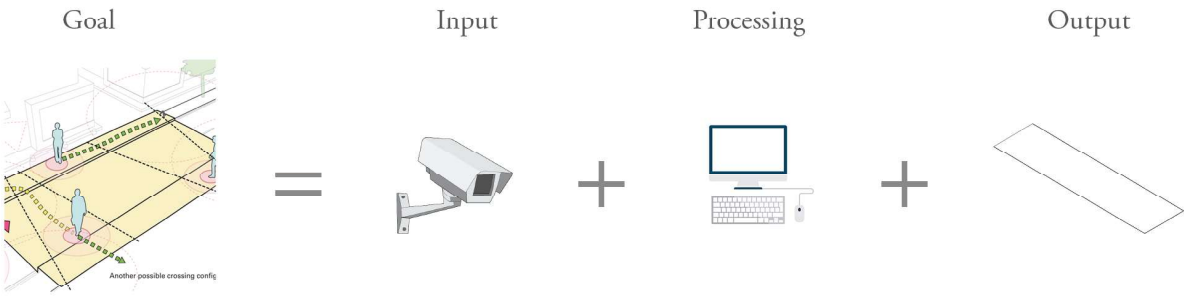


Fig. 5.6 Diagram Illustrating Overall Aim (by Author)

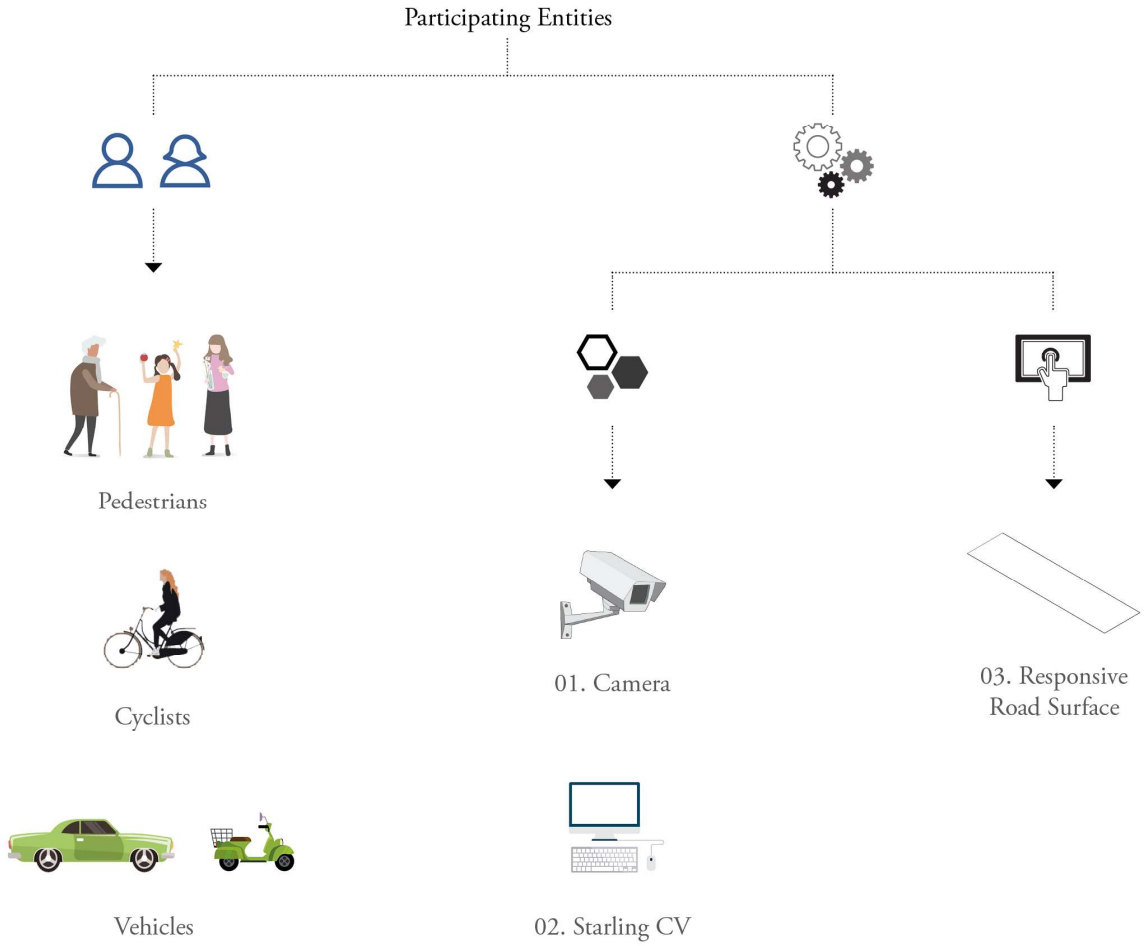


Fig. 5.7 Identifying the Human and Non-Human Participants (by Author)

5.1.3 Working

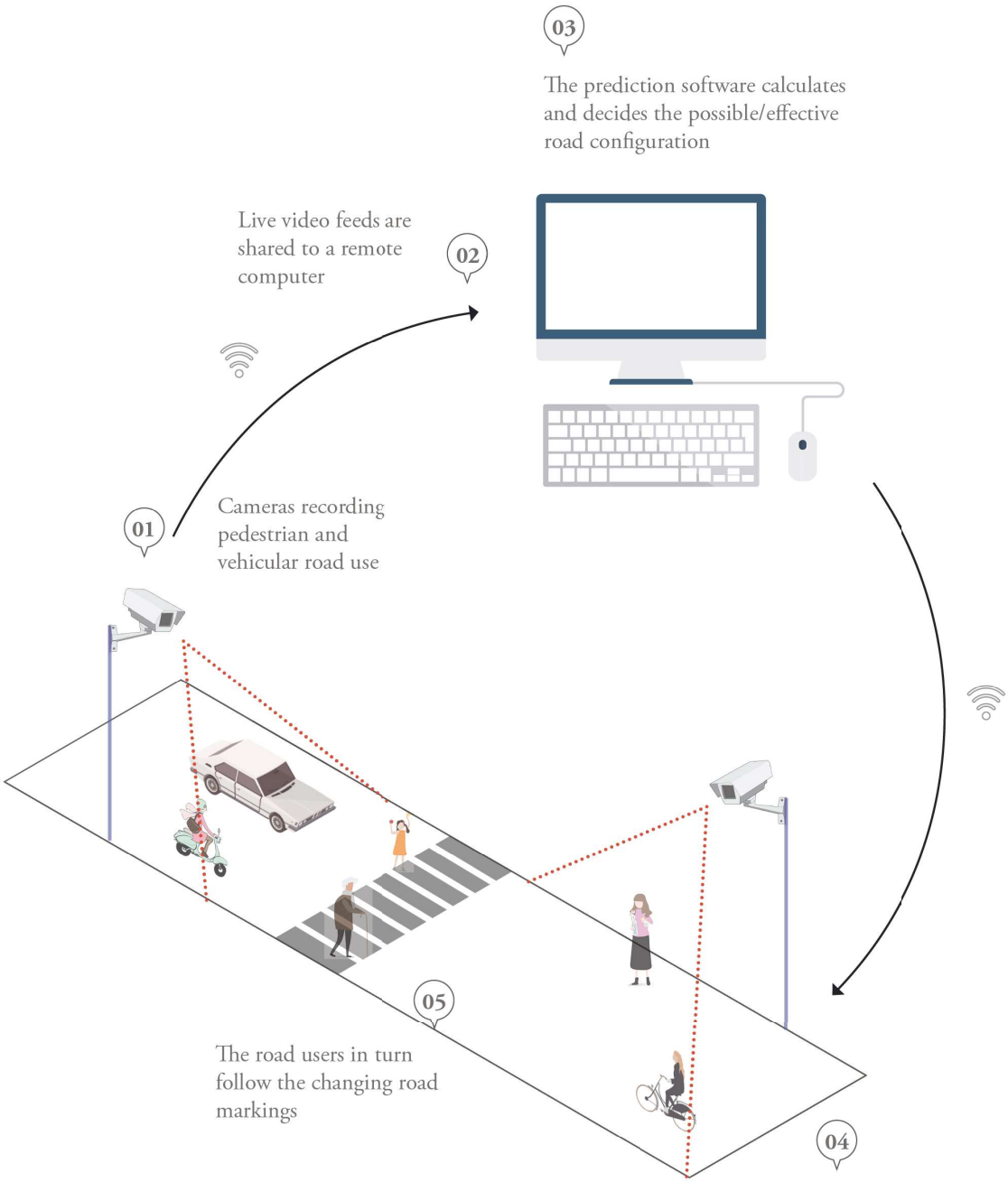
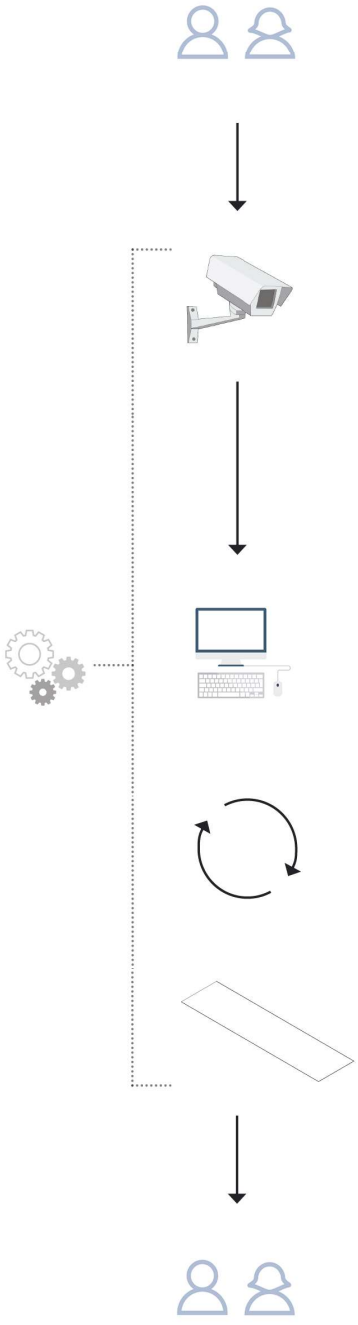


Fig. 5.8 Diagramming the Functioning of the Participatory System (by Author)

5.1.4 Understanding Information Flow



Input/Output Data Generated

The cameras fitted in the surrounding, tracks and records the pedestrians and vehicles moving across the road surface alike. The Neural Network framework in the camera enables it to calibrate nuanced human expressions and body language.

Fig. 5.9 Screenshots of Live Camera Feeds

This video footage from the camera consists of distinguished objects like pedestrians, cyclists and vehicles along with their precise locations, trajectories and velocities. This video is shared live to a remote computer system that employs a custom made software called Starling CV.

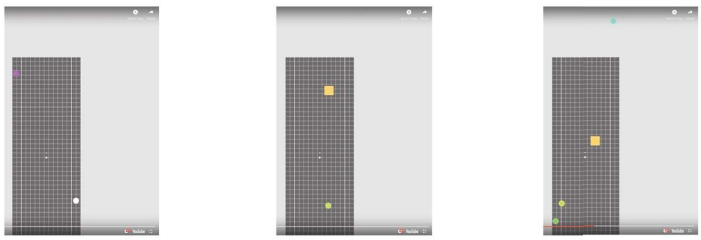


Fig. 5.10 Interface of the Remote Computer Program

Based on the inputs received from the video, this prediction software maps, analyse and anticipates where the objects on the road might move in the next moment.

Fig. 5.11 Full Scale Working Prototype

The LEDs embedded in the road panels are computer- controlled and changes the road markings according to the results from Starling CV. Lastly, the users would follow the road markings for a safe crossing.

The project is still in its development stage and a full-scale prototype of the road has been installed in South London and is being experimented and tested for different use patterns based on real time scenarios.

Functioning of the Technological Entities

01. Camera calibration based on Artificial Neural Network

Using a neural network framework the cameras monitors and classifies moving objects in busy road and roadside scenes in real-time, calculates their trajectories, and infers the location of hidden pedestrians or cyclists (e.g. behind high-sided vehicles and buses).[79] Neural Network framework can enable the camera to track the position of an object with co-ordinates , orientation and also nuanced movements, expressions and behaviours.

02. Pedestrian & Vehicle Behaviour Prediction Software[80]

The computer vision system then detects, predicts and responds to changing safety conditions on pavements, roads and crossings. This accordingly controls the curbside lightings and the LED lights in the interactive road surface to create road markings of varied types suiting the changing road incidents.

03. LED embedded plastic panels

Road markings and lighting can adapt to different usages for different times of day. At night and during the early morning, when there are virtually no people on the road, the crosswalk may "disappear" altogether. On the other hand, during rush hour, for example, the image of the crosswalk may expand in width to accommodate more pedestrians.

Conclusion

The road system acts as an autonomous entity that tracks, predicts and learns from user patterns and movements. Pedestrians become the primary source of information based on which the system operates on changing and updating the pedestrian crossings on the road surface. The Starling Crossing is able to monitor and adapt to pedestrian desire lines over long term using the principles of Stigmergy (the pheromone traces that ants leave, attracting other ants to the best paths toward food sources).

79 Ro, Lauren. "Smart Crosswalk Reacts to Cars and Pedestrians in Real Time." Curbed, October 13, 2017. https://www.curbed.com/2017/10/13/16469630/starling-crossing-umbrellium-smart-crosswalk-road-tech.

80 "Make Roads Safer, More Responsive & Dynamic - Umbrellium." Accessed August 9, 2019. https://umbrellium.co.uk/case-studies/south-london-starling-cv/.

5.2 Hi Croydon!

5.2.1 Project Specifications

Croydon, 2017- Mc Gregor Coxall & Momentum Transport

Project introduction

'Hi Croydon' is a series of 'interventions' along the street constructed of modular components that use technology to test and determine the future role of Croydon's valuable spaces in the city of London. The proposal takes advantage of the large footfall along the pedestrian street that cuts across a busy retail and commercial spaces adjacent to the Wellesley road. The proposal consists of 11 sites where the community people can actively participate in the modifying physical fabric of the street, through the creation of green lung leisure spaces using kit of parts approach to generate a more community inclusive street space.

Project Goal

To create a series of '[81]green lung spaces' that can actively filter air and transform street space into an active and engaging space for the community through a set of interactive furniture components.

Users

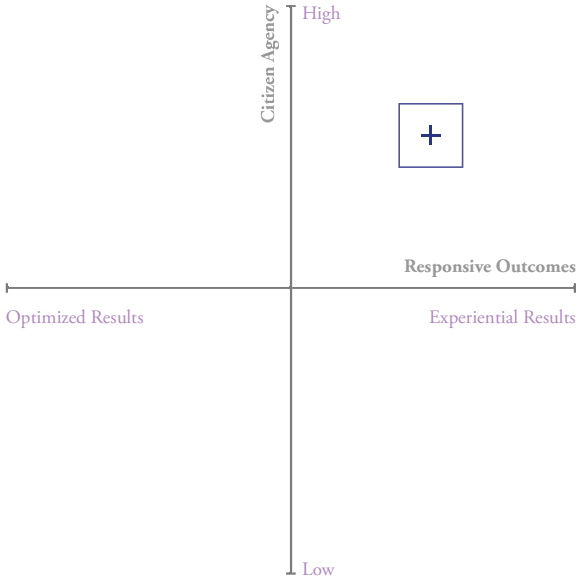
Community people. They have access to furniture components to build their own leisure space on the streets in the specified sites.

Resources

A set of pre- fabricated modular furniture that can be easily installed and moved around is made available for the community people.

Tools

A custom made Smartphone application accessible to the community people acts as a tool to innovate building leisure spaces. The digital application helps maximising options for furniture arrangement and also sparks creative ideas to build.



81 "Richard Wolfstrome - Hi Croydon!" Accessed March 28, 2019. https://richardwolfstrome.com/hi-croydon.

5.2.2 Site Location

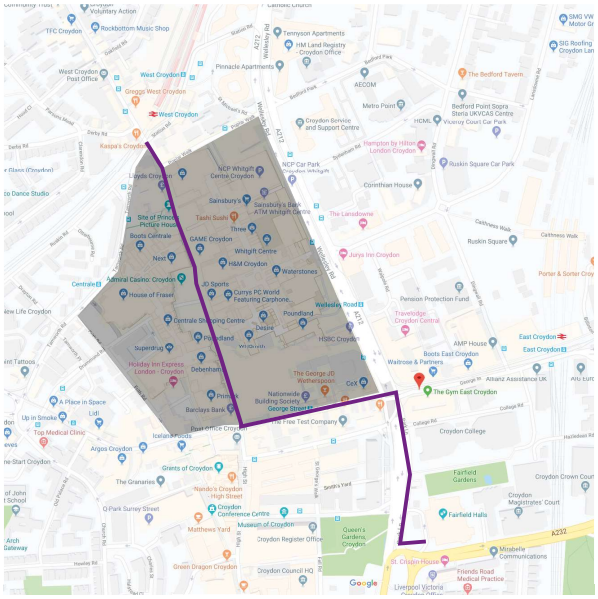


Fig. 5.12 Map of Croydon marking the retail zone

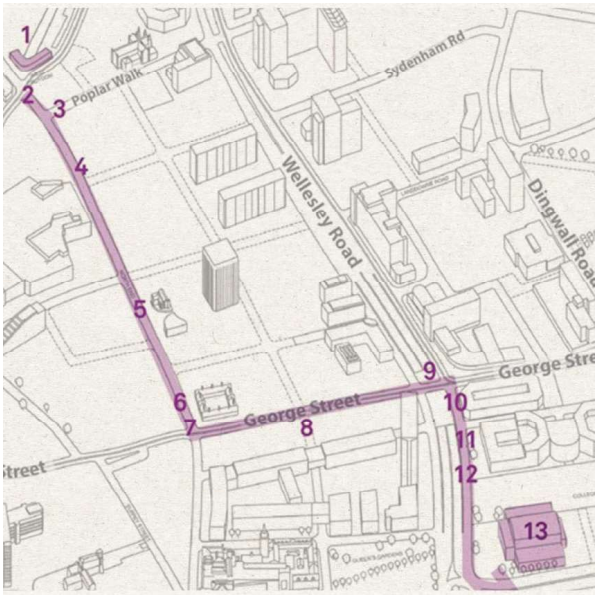


Fig. 5.13 Map locating the sites for the proposal

5.2.3 Project Agenda

Fig. 5.14 Diagram Illustrating Overall Aim (by Author)

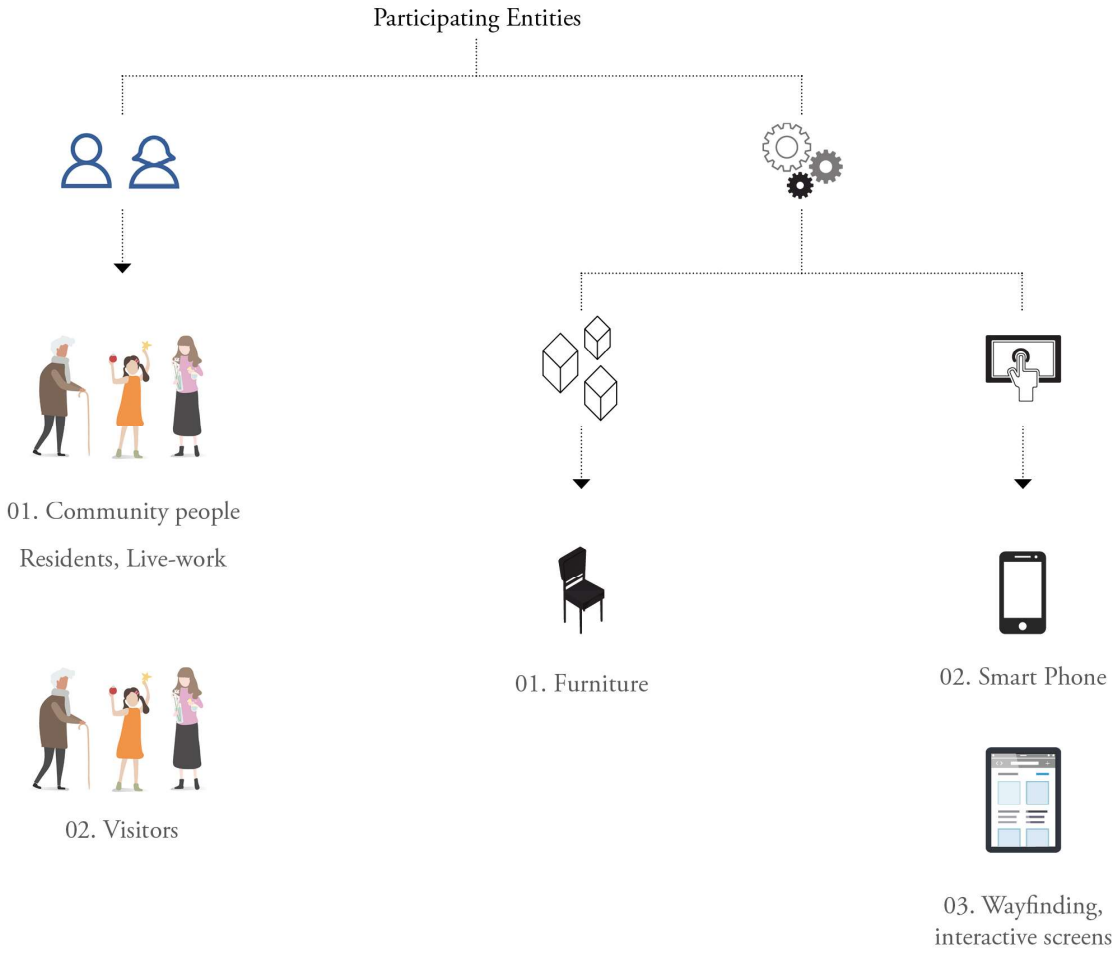


Fig. 5.15 Identifying the Human and Non-Human Participants (by Author)

5.2.4 Working

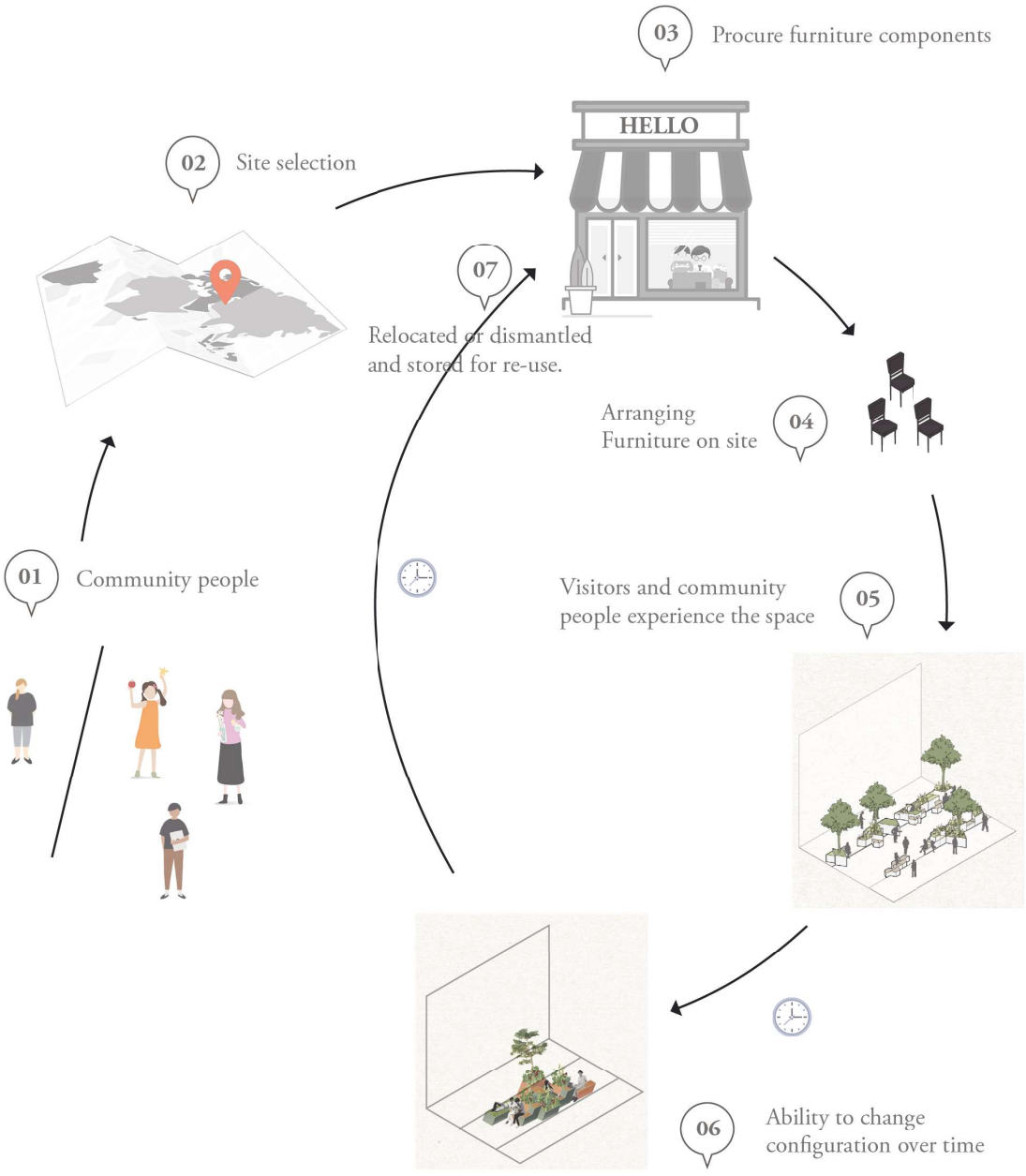


Fig. 5.16 Diagramming the Functioning of the Participatory System (by Author)

5.2.5 Modular Furniture Components

A set of pre- fabricated modular furniture components form an active street scape element that re contexualizes the use of street spaces according to the changing user desires. The furniture components are stored in a community accessible space, one in the Fairfield halls in the South end of the site and the other one in the West Croydon station towards the North end of the site.

An individual or a group of people belonging to the Croydon community can decide to create their own leisure space and can have access to the furniture components. Like 'Lego' each of these pre- fabricated modular furniture components can be built around to suit a specific topography and character of the street space. Each furniture component can be customised to accommodate a planter box, thereby creating a green lung leisure space where people can relax in a cleaner atmosphere.

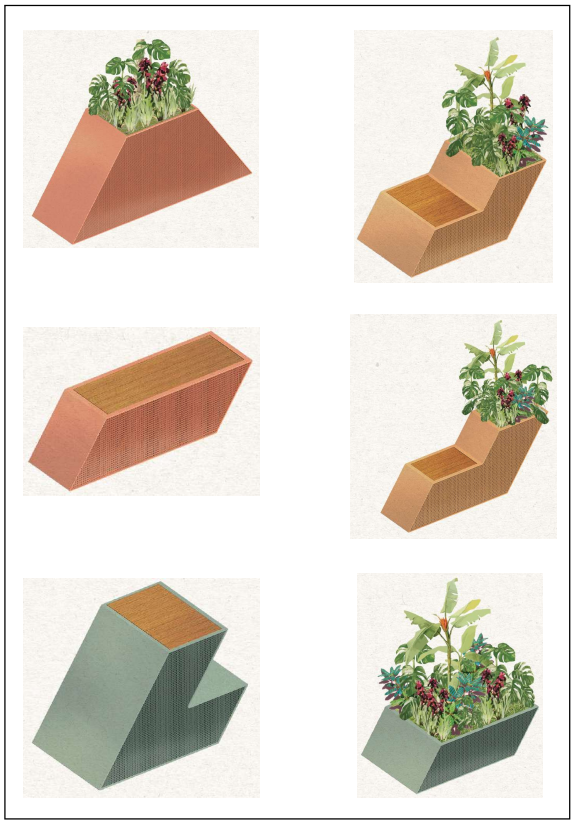


Fig. 5.17 Different Types of Modular Components

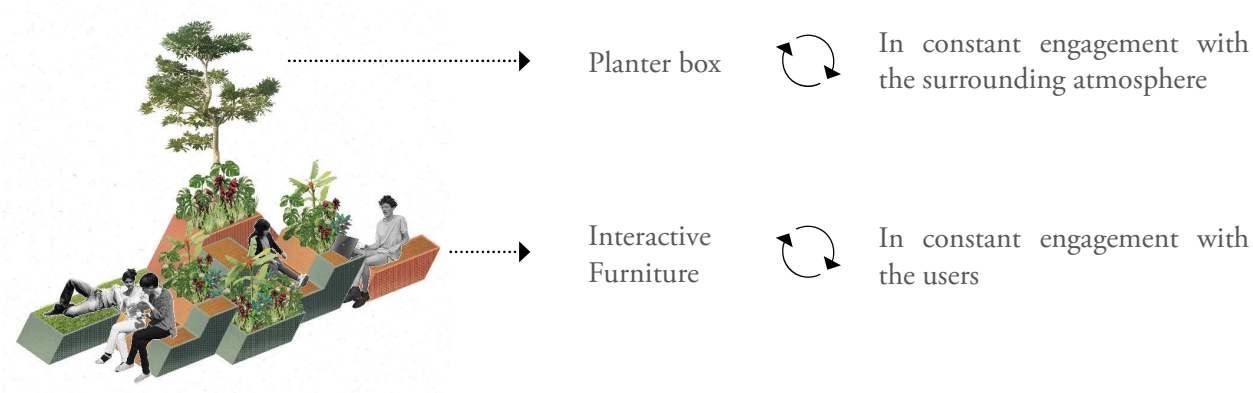


Fig. 5.18 Interactive Systems Integrated in the Furniture

5.2.6 Participatory Framework

Given the resources and tools there are various ways in which users can engage in co-creation. One way is to procure the furniture components and set up a leisure space. To push the limits of this idea participation further and to be able to experiment with various types of uses with these furniture components, a digital smart phone application is made available that not only enhances the co-creating experience, but also promotes digital literacy within the community.

Method 01

This is a very simple and straightforward way where the community people just gain direct access to the furniture components and then set it up in their desired site and use it for leisure. Later, when the need for a leisure space at that site has diminished or changed, these furniture components can be easily relocated to another site or be dismantled and moved back to storage.

Method 02

To make community participation more innovative, the proposal employs a custom made Smartphone application accessible exclusively for the community members. Below is the process of how the digital tool empowers its users to innovate and explore their physical interventions:

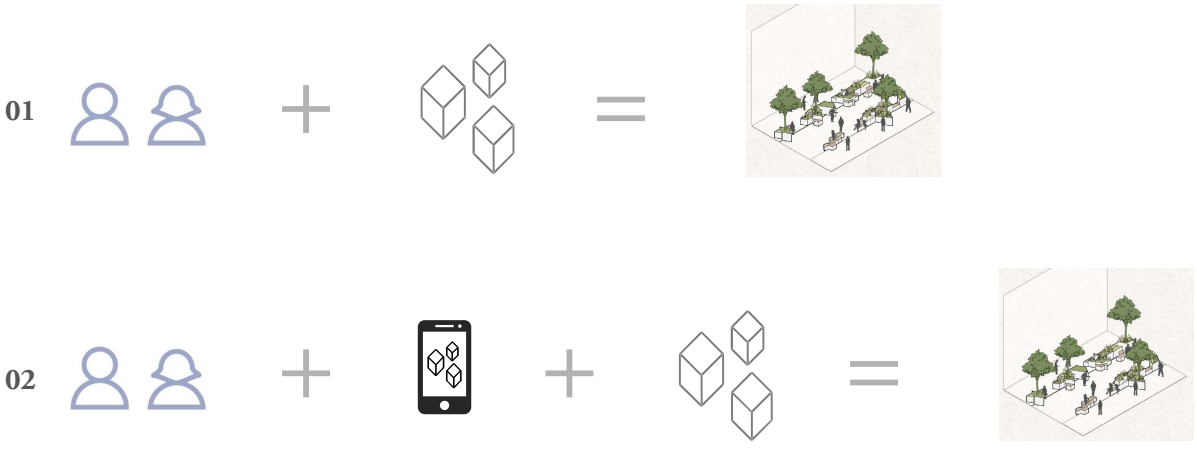


Fig. 5.19 Diagram Outlining Different Methods of Participation (by Author)

5.2.7 Understanding Information Flow

1. The digital application has the 3d model of the furniture components in it. The users can get to know the details of each component and how they can be used. Physical furniture components are modelled and digitized in a custom made Smartphone application. The user can then try out different ways of configuring these components that can be endlessly designed for events, dining, meeting spaces, work stations and play spaces. This opens up various options for experimenting and innovating and also gives the user an idea on the quantity of furniture they will require to achieve the desired layout.

2. Once the layout is decided, the user can test the feasibility and functioning of the layout through the Virtual Reality feature built in the mobile application. This will enable the user to project their conceptual layout in real space to see if it would work and decide whether or not adjustments be made. This step acts as a feedback stage, where the user and the smartphone application involve in two way interaction back and forth in order to achieve the most efficient and feasible furniture arrangement.

3. After a series of tests and trials done using the digital application, the user gets to foresee the entire design of the green lung space beforehand, which enables them to easily procure the physical furniture components and arrange them to achieve the desired layout. The smartphone application hence, acts as a tool to promote innovation and also accelerate efficiency.

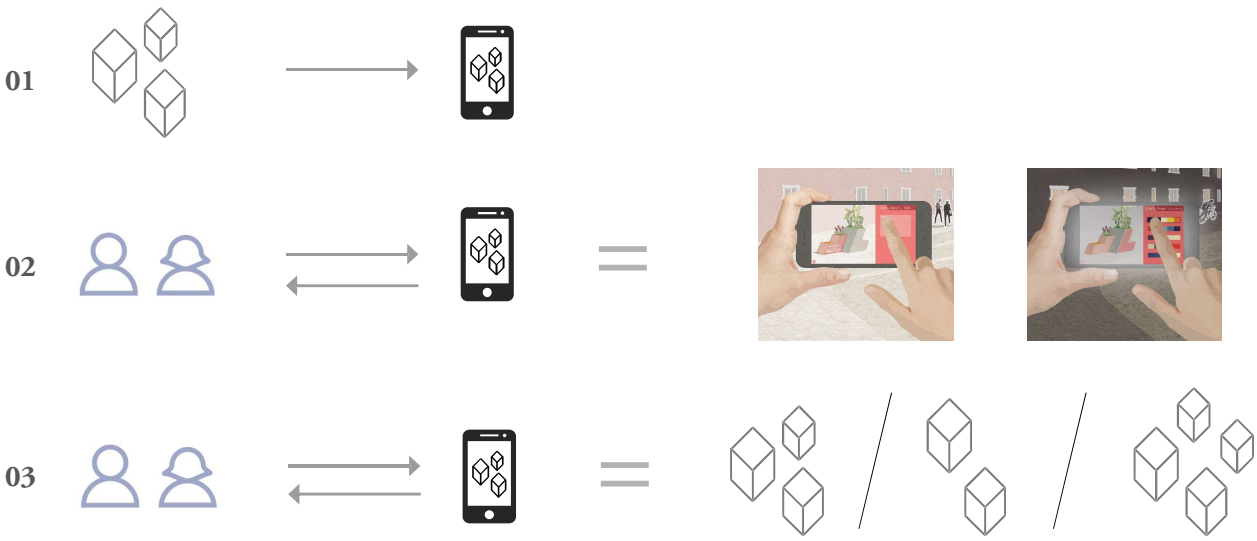


Fig. 5.20 Sequential Diagram of User Engagement (by Author)

End-User Engagement

Interactive Furniture Components

After setting up the space, the community people can actively engage with the furniture themselves. Each of the component is fitted with a digital screen, that integrates a dot-matrix into the perforated steel furniture modules that can create a series of light-works and narrative options - from directional wayfinding, event promotion, special messages, weather reports, place tweets etc. Although the community members enjoy the highest agency over this process of designing a public space, the visitors can also experience and take part in the various activities that the community might organize and also gain an understanding of the current trends and concerns that prevails in the neighbourhood through the information posted in the interactive digital screens fitted in the furniture. Utilising sensory recognition programs in the furniture, data can be aggregated indicating the number of people using, moving through and staying in a space. The outcome will be a public space that can gain an understanding of its own impact and integrates live data response to tactical urbanism.

Fig. 5.21 Daytime Render of the Proposal

Fig. 5.22 Night Render of the Proposal

5.3 Smart Carpet

5.3.1 Project Specifications

London, 2017- Mc Gregor Coxall & Momentum Transport. Additional Collaborators: Umbrellium & Pavegen

Project Introduction

The challenge was to create temporary recreational opportunities at Cheapside, located in the heart of the City of London, which connects Bank to St. Paul's Cathedral. Smart Carpet is a concept that explores the idea of creating a space where its function has the potential to change across the course of the week, or even the day thereby creating an attractive shared space that would transform the traditional road into vibrant public realm.

The proposal was a based on two prominent questions:

01. What if Cheapside could adapt to changing demands and become a destination in its own right, bringing public life to the area when its function as a vehicular link is less of a priority?[82]

02. What if it could respond to people's demands offering social, recreational and cultural programs at varying times of the day or the week?[83]

Project Goal

To enhance traditional road space into vibrant public realm by creating a street infrastructure that can cater to different activities in different time span according to the changing user desires.

Users

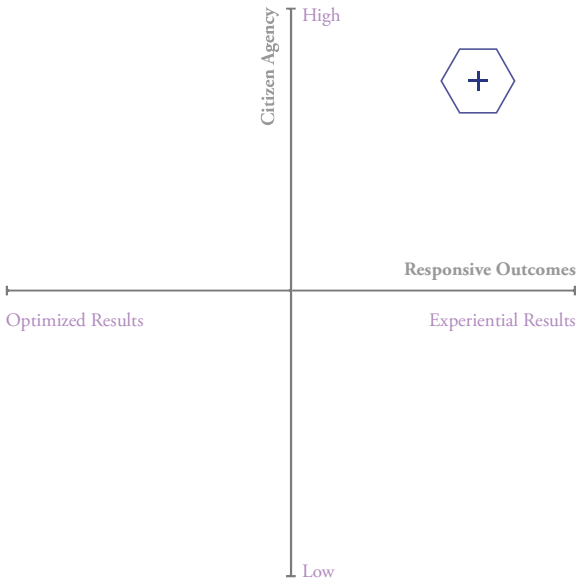
Community people, pedestrians and visitors.

Resources

A set of modular inter lockable furniture cubes that can be easy plugged into the road surface to create spaces for different events.

Framework

A custom designed paving panels that has provisions to accommodate a range of vertical street scape elements, LED lighting, the ability to generate energy or provide power and data to change the environment.



82 Momentum Transport. "The City Centre - Smart Infrastructure Competition," October 9, 2017. https://momentum-transport.com/smart-carpet/.

83 Ibid.

5.3.2 Site Location

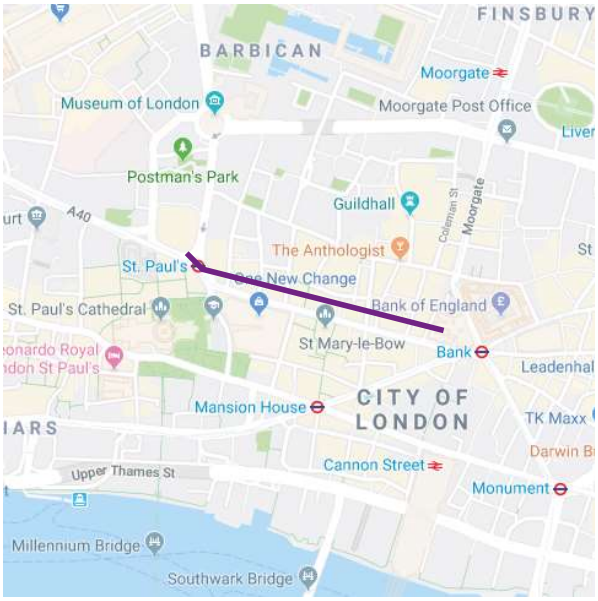


Fig. 5.23 Map of London showing St.Paul's Cathedral

Fig. 5.24 Map locating Western End of Cheapside street

5.3.3 Project Agenda

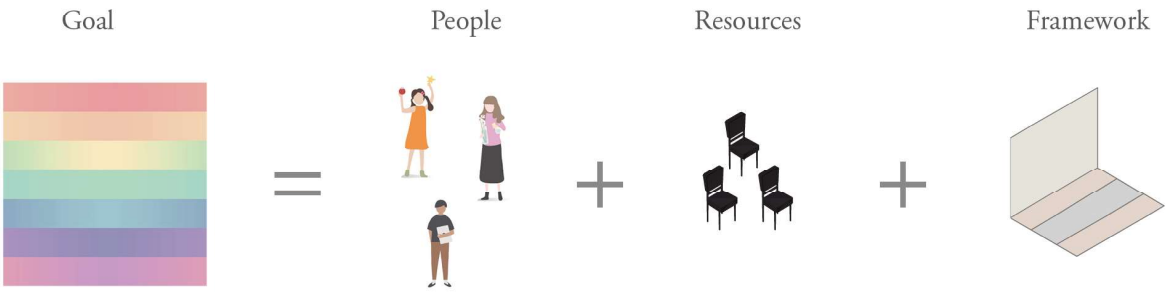


Fig. 5.25 Diagram Illustrating Overall Aim (by Author)

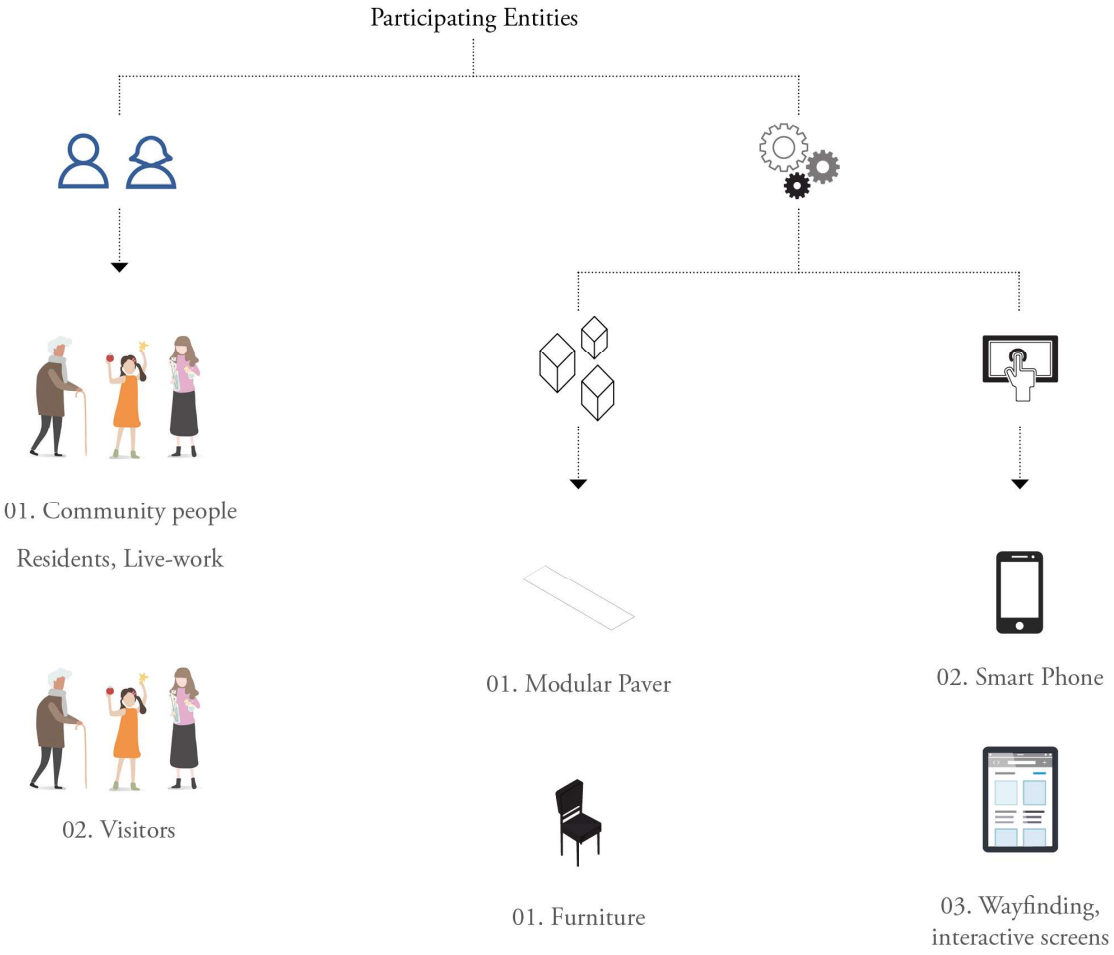


Fig. 5.26 Identifying the Human and Non-Human Participants (by Author)

5.3.4 Working

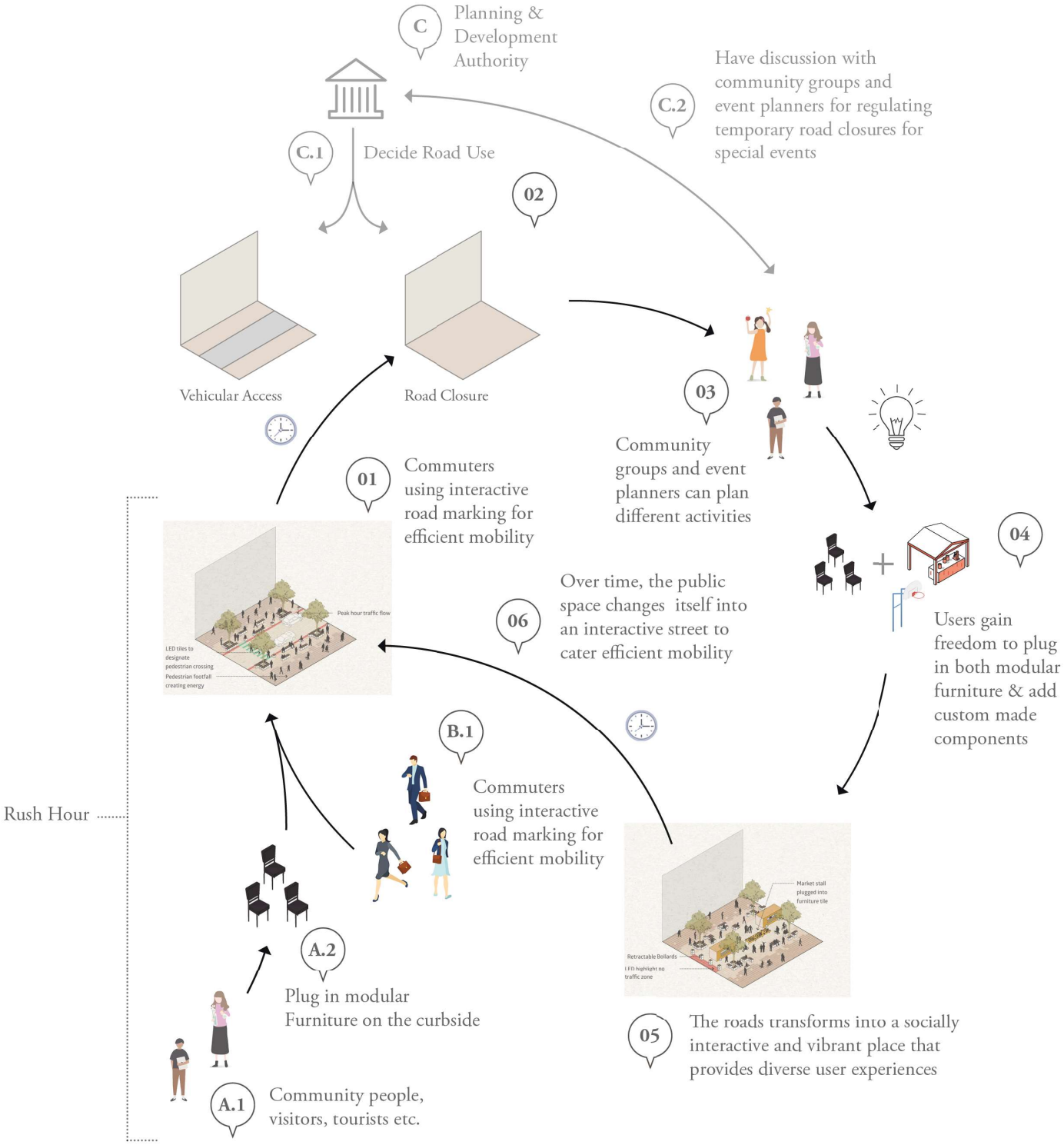


Fig. 5.27 Diagramming the Functioning of the Participatory System (by Author)

5.3.5 Participatory Ambition

Fig. 5.28 Google maps screen shot of the existing road condition of the West end Cheapside: a predominantly pedestrian & cyclist street with very little vehicular access

Fig. 5.29 Render of the West end Cheapside: being envisioned as a melting pot for various social and leisure activities that alters the character of the street from being used for mobility to a place that generates diverse user experience

5.3.6 Component 01: Modular Pavement

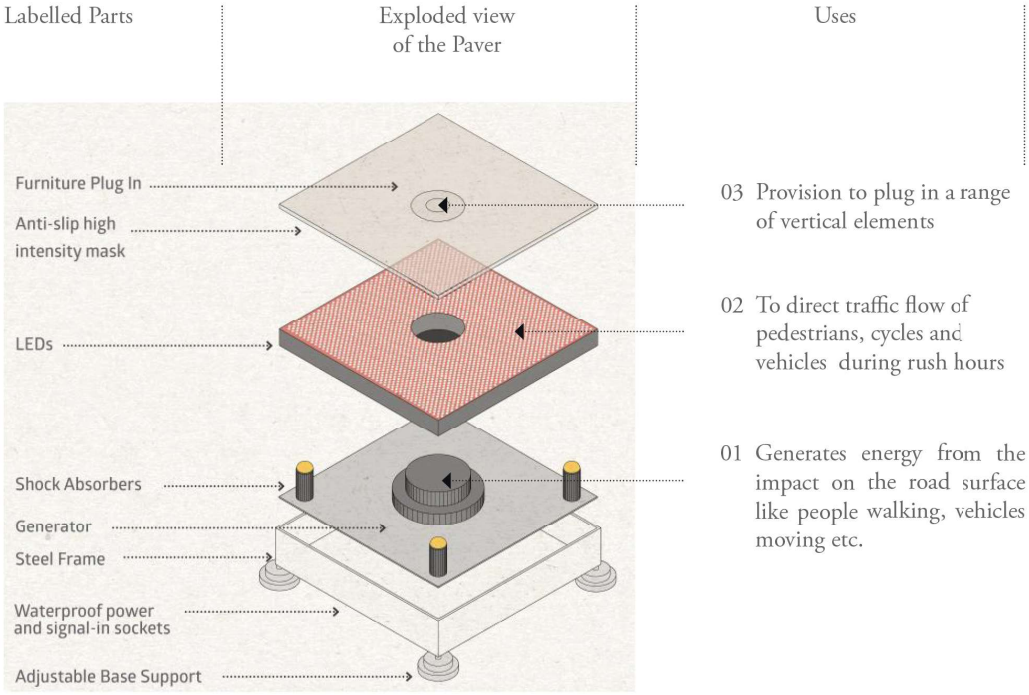


Fig. 5.30 Exploded Axonometric Showing Details of the Paver

1. The energy-creating flooring generates energy to power the public space as well as acts as an interactive and data gathering tool. The weight from the footsteps compresses electromagnetic generator below the surface of the paver, producing 2 to 4 watt seconds of off-grid electrical energy per step. The bluetooth beacons present in the system connects with the users' smartphones, rewarding users for their steps and generating permission-based analytics.

2. The proposal includes the use of LED tiles similar to those used by Umbrellium in the design of the Starling Crossing that can change the road markings based on the use. For instance, during the peak traffic hours, this technology would perform the typical street function with LED lighting defining the different road space for users, even lighting up zebra crossings. At lunchtime and in the evening, the street could be closed off to provide recreational and community space to hold workshops, exhibitions or space for exercise and leisure.

3. At weekends the area could accommodate plug in stalls, seating and tables to offer flexible spaces for food markets, whilst being a desirable place to relax and socialise with food and drink. Larger scale events could also be held with the ability to install a stage and the functionality to support performances.

5.3.7 Component 02: Plug-in Furniture

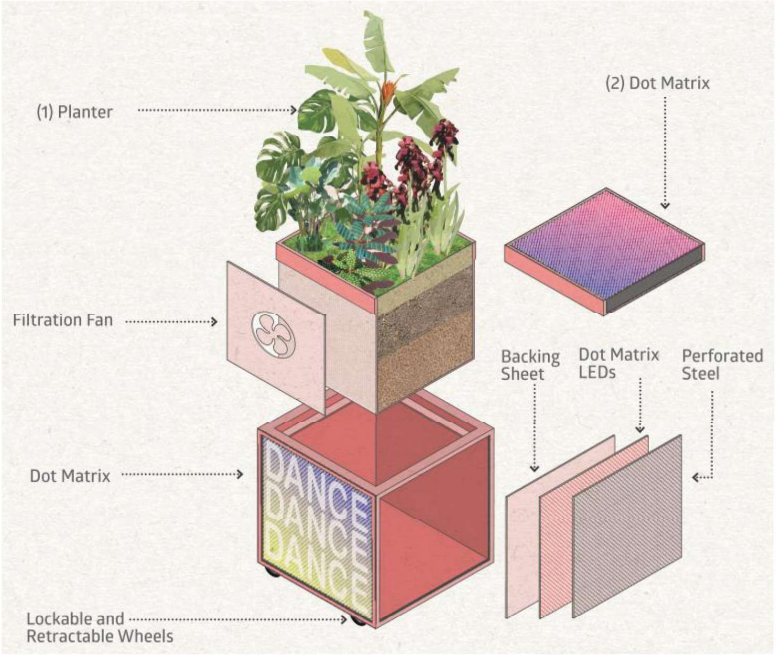


Fig. 0.10 Exploded axonometric view of the Smart Modular Furniture showing customising options. The furniture can be customised into two variants depending on the user's choice. It can be used as a seating furniture by enclosing the top surface using a solid panel or one can plug in a planter box into the hollow core of the furniture to use it as a green component.

Fig. 5.31 Exploded Axonometric Showing Details of the Furniture

The proposal has a set of pre- fabricated cube shaped modular furniture, that can be plugged into the paver tiles and arranged as required – whether this be in formations or designs submitted by the public, for cultural or leisure uses such as street entertainment or musical and social areas for food and drink to achieve public engagement in and with the space. They can be configured into a number of physical components like:

01. Can used as retractable bollards in order to halt vehicular access in times of necessity.

02. Stacked to form bleachers for viewing a play or concert.

03. Can be used as a stage for performances and so on.

The embedded LED panels in the face of the furniture is similar to that of the Hi Croydon! proposal, where the interactive screens can engage with the users through a number of options like wayfinding, being able to change the colour and display messages via smartphones, post weather updates and publish local news and tweets etc.

The users can get direct access to the furniture components and build their own leisure, recreational spaces. They can be easily moved around and displaced as they incorporate lockable wheels.

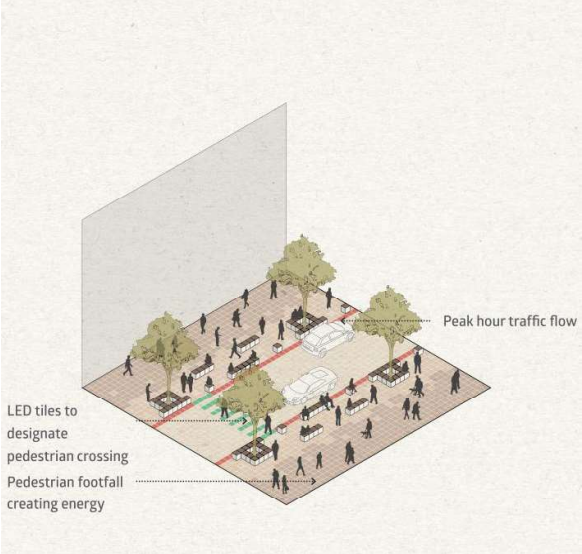


Fig. 5.32 Commuter traffic peak mode

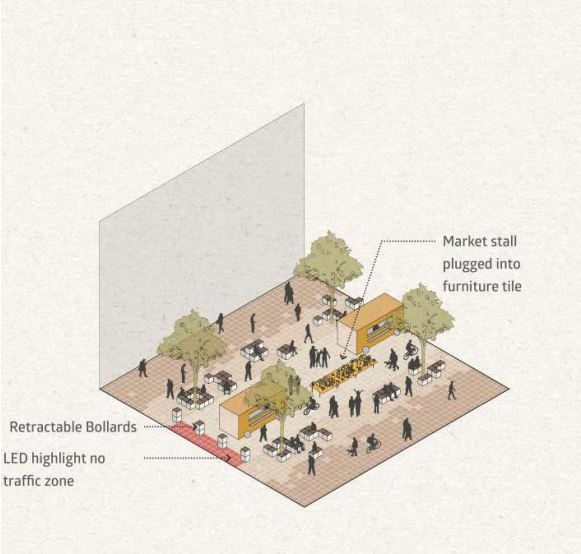


Fig. 5.34 Social Interactive mode

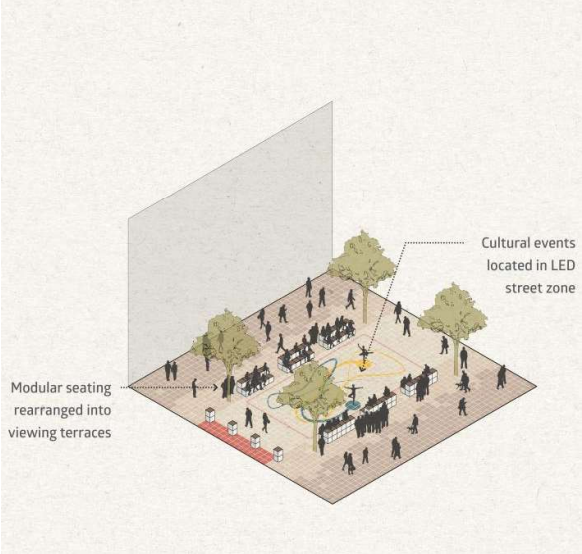


Fig. 5.33 Cultural program mode

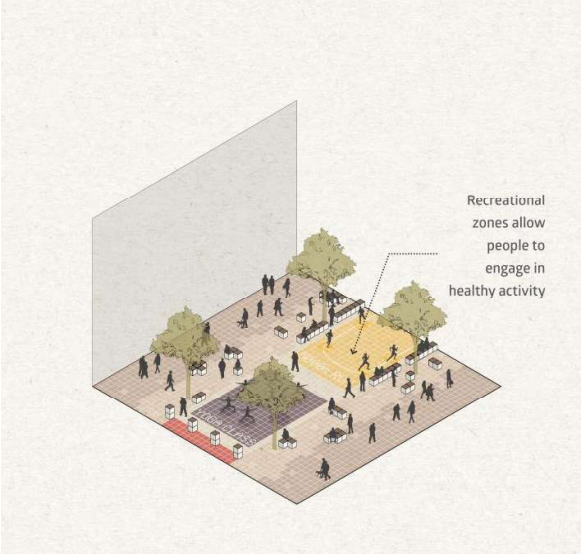


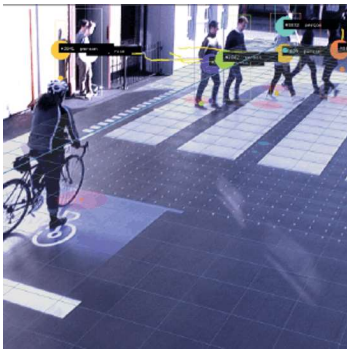
Fig. 5.35 Recreational activity mode

End-User Engagement

The street can adapt to whatever demand is found and seeks to address the conflict between accommodating high levels of traffic during the peak hours, and providing a pleasant environment for various activities at other times all of which are collectively decided by the users which involves community people, visitors, pedestrians and passer-by. In this method of setting up a base framework upon which a set of varied goals of public use can be achieved, allows the users enjoy a higher level of agency over their public space. In this case the social framework caters to a number of opportunities relating to 'The Four Principles' of Food, Film, Fitness and Fun which is starting to gain traction in various parts of London as a response to make the public spaces more socially active and inclusive.

Precedent Study Comparison

In the case of Starling Crossing, there is a fixed goal and the technological components work among themselves towards generating optimum solutions to reach the goal.



Starling Crossing

In Hi Croydon! there is a fixed goal and the users are given the required resources and tools to be able to achieve the desired goal.

Hi Croydon!

In the case of Smart Carpet, there is a fixed framework and the users are provided with basic resources but has the freedom to plug in new resources to achieve varying goals desired by the community people. The users have endless options to work within the framework.

Smart Carpet

Conclusion

The aim of the case study analyses is to get to understand the different ways in which citizen participation can occur. Each of the project has a set of goals, tools, resources and framework for the users to engage with and gain agency over the public realm in shaping it to their desired needs. However, at some points in the case studies, the functioning of municipalities and other government groups in their process of decision making alongside the community people are unclear. This is due to the fact that the projects are not fully realised, they are either prototypes or proposals to be built.

Understanding other examples where there are platforms that bridges the municipality and the community members to collaboratively make decisions that supports the growth of the social capital, the case study analyses assumes similar platforms available for the projects analysed. For instance, Living Labs (is a worldwide initiative) in Montreal has become the North American capital of Living Labs in providing co-creation and open innovation opportunities in collaboration between citizens, researchers, creators, users and entrepreneurs, as well as public, private and parapublic decision-makers.[84]

84 "Montreal's Living Labs | TechnoMontreal." Accessed September 2, 2019. http://www.technomontreal.com/en/industry/open-innovation-practices/montreal-s-living-labs.

Framing the Key Questions on Re-Imagining Quayside

This idea of conceiving a framework for a collection of events to occur prompts us to question our traditional notions on architecture as to what ways can we consider these projects Architectural?

How does architecture become a functional territory for technological advancements to mediate between users and the architectural entities?

In this digital age, what would be the role of architects in promoting citizen engagement to shape the public realm?

And clearly in the smart city context, what we consider as an architectural framework of physical entities is transcending towards an informational framework that incorporates multiple users, diverse entities (physical, electronic and digital) and supports multi level decision making. This introduces us to re-imagine the role of architect as the one who opens up opportunities for user experiences. And this line of inquiry becomes the fundamental basis on which the Quayside kit of parts are being re-imagined.

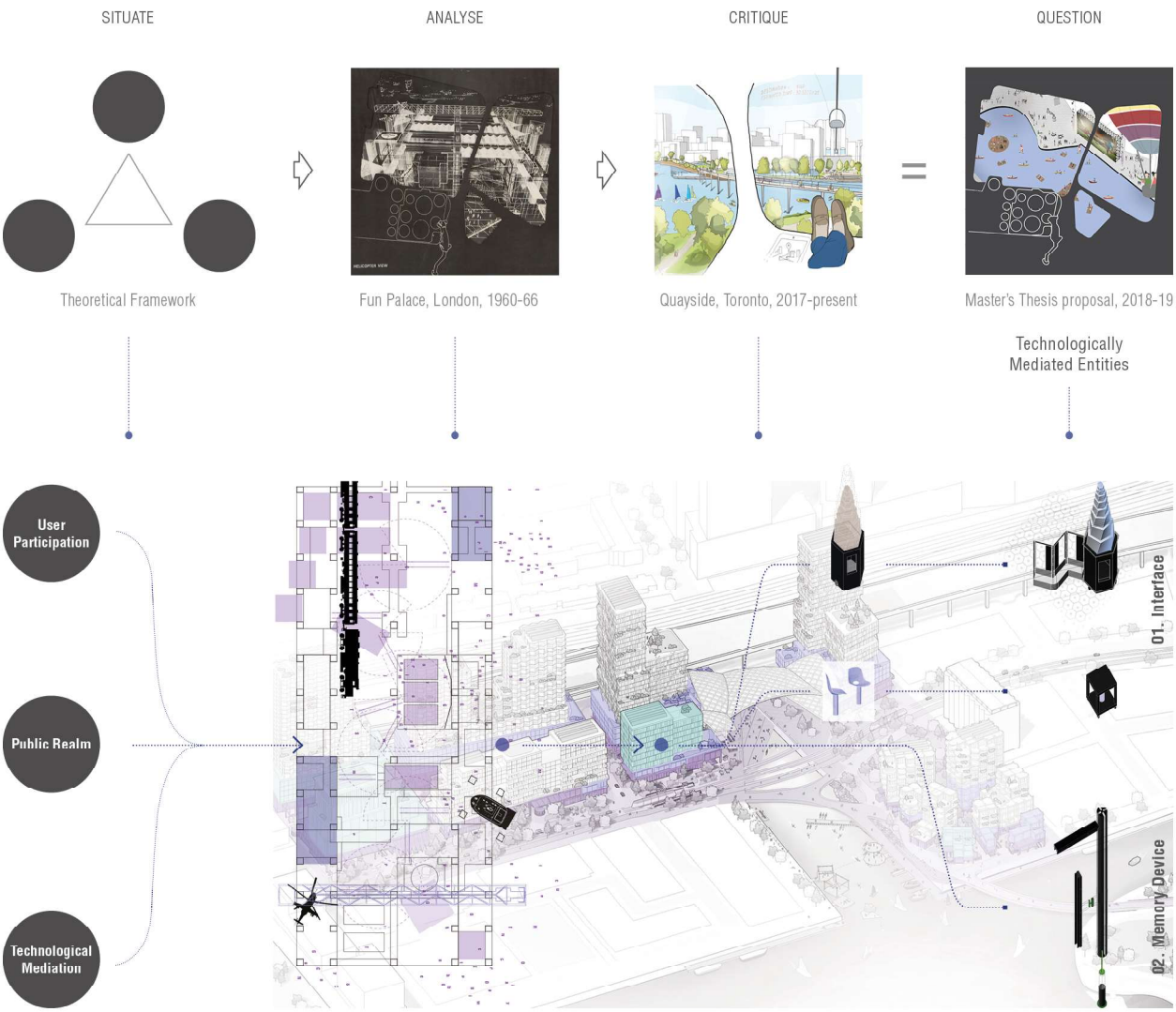


Fig. 6.1 Thesis Outline (by Author)

06

06

Design Explorations

This chapter compiles a set of design explorations conducted as experiments building up on the ideas and concepts discussed so far. In doing so, each of the design intervention challenges the different modes of designing participatory systems.

6.1 Moveable Kiosk

6.1.1 Introduction

Component	
Description	Light weight kiosk structure with a detachable lantern that can be extended up to 8 meters high. It represents a collection of lightweight, tall, narrow structures that could create shelter from wind when grouped together on the ground (almost like a stand of trees).
Goal	Mitigate Wind Tunneling Clustering of this kiosks will help form A Lantern Forest would help address the challenge of wind tunnels that form in the spaces between buildings, often called urban canyons.
Redrawn by Author	

Fig. 6.2 Table Reporting on Sidewalk Labs' Ideas for the Moveable Kiosk (by Author)

6.1.2 Understanding Barriers of Access

Fig. 6.3 Positioning the Kiosk (by Author)

Fig. 6.4 Response to the Wind Conditions (by Author)

6.1.3 Setting up the Design Agenda

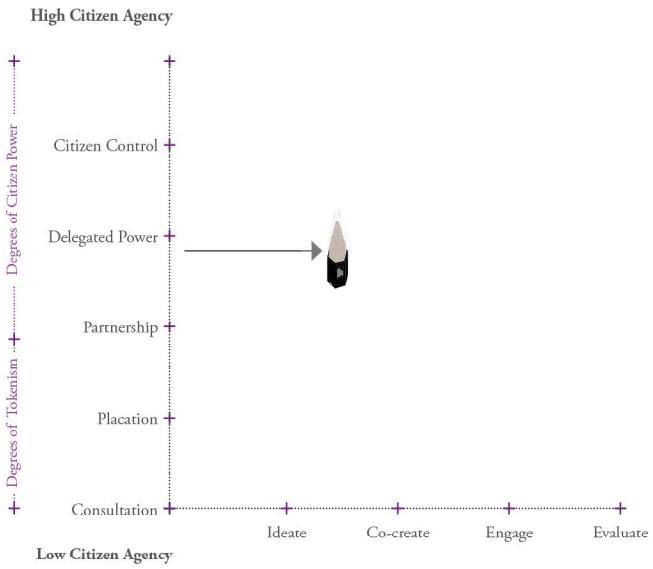


Fig. 6.5 Evaluating Quayside's Kit of Part Proposal (by Author)

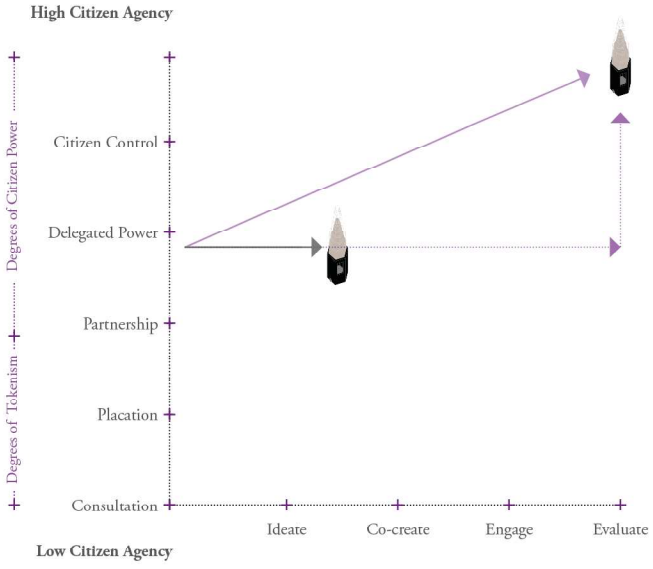


Fig. 6.6 Setting up Goals for Re-Design (by Author)

It is necessary for people to engage with the kiosks to make outdoors comfortable. Imagining it in real-time, it is going to be a bit of a challenge for someone to get a sense of the changing wind conditions, in order to set their kiosks in a favourable location.

This actually hinders their ability to fully engage with it, and so the participation is discontinuous and falls short of its ambitions in the graph. To address this condition, I propose to increase user agency by implementing the two aspects of technological mediation.

One, is to provide a means that visually informs the users about their surroundings, so that they can consistently engage with it. And the other one is to innovate on the physical fabric so that the users can act on it.

I start by installing a wind sensor in the lantern, that is going to measure the wind speed and direction and accordingly changes the colour and intensity of the lights, to make the lantern responsive to the wind speed and direction.

6.1.4 Design Process

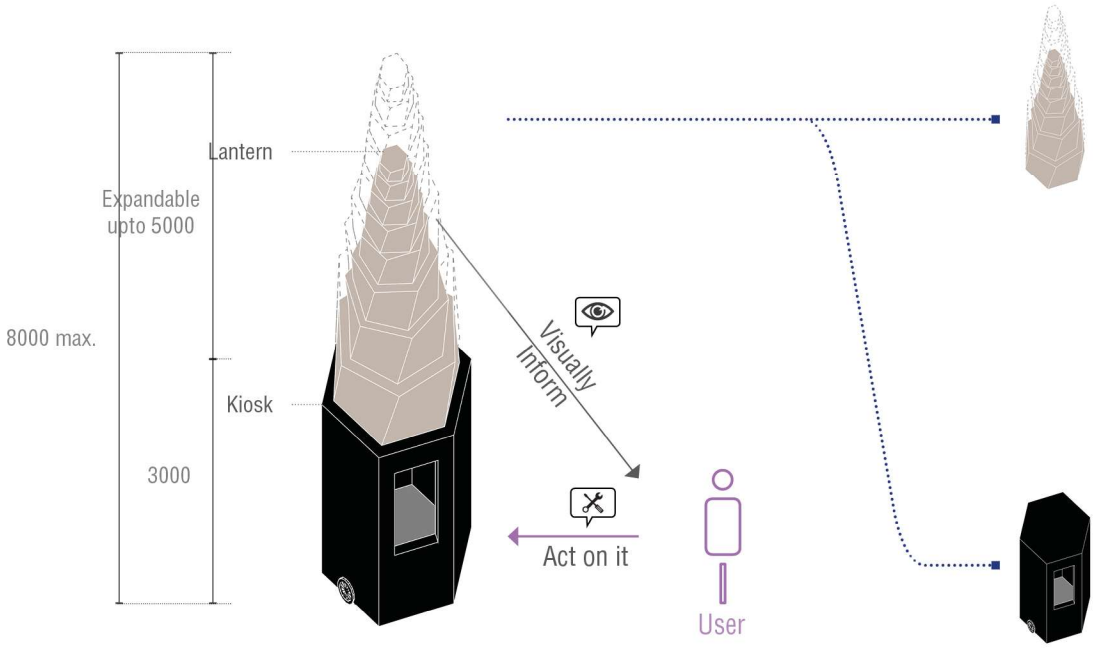


Fig. 6.7 Constructing User-Entity Associations (by Author)

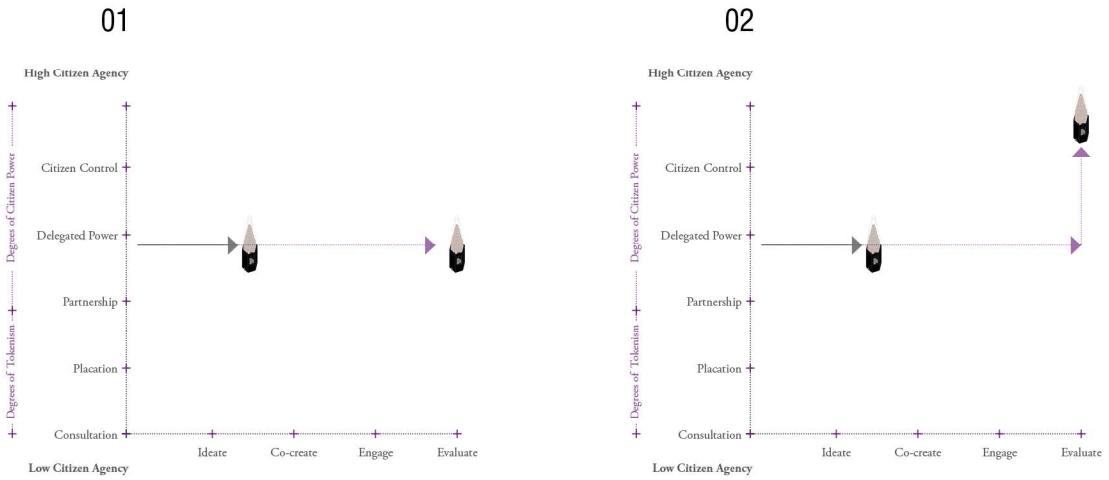


Fig. 6.8 Outcomes: Heightening User Agency (by Author)

01. Embedding a Layer of Technology

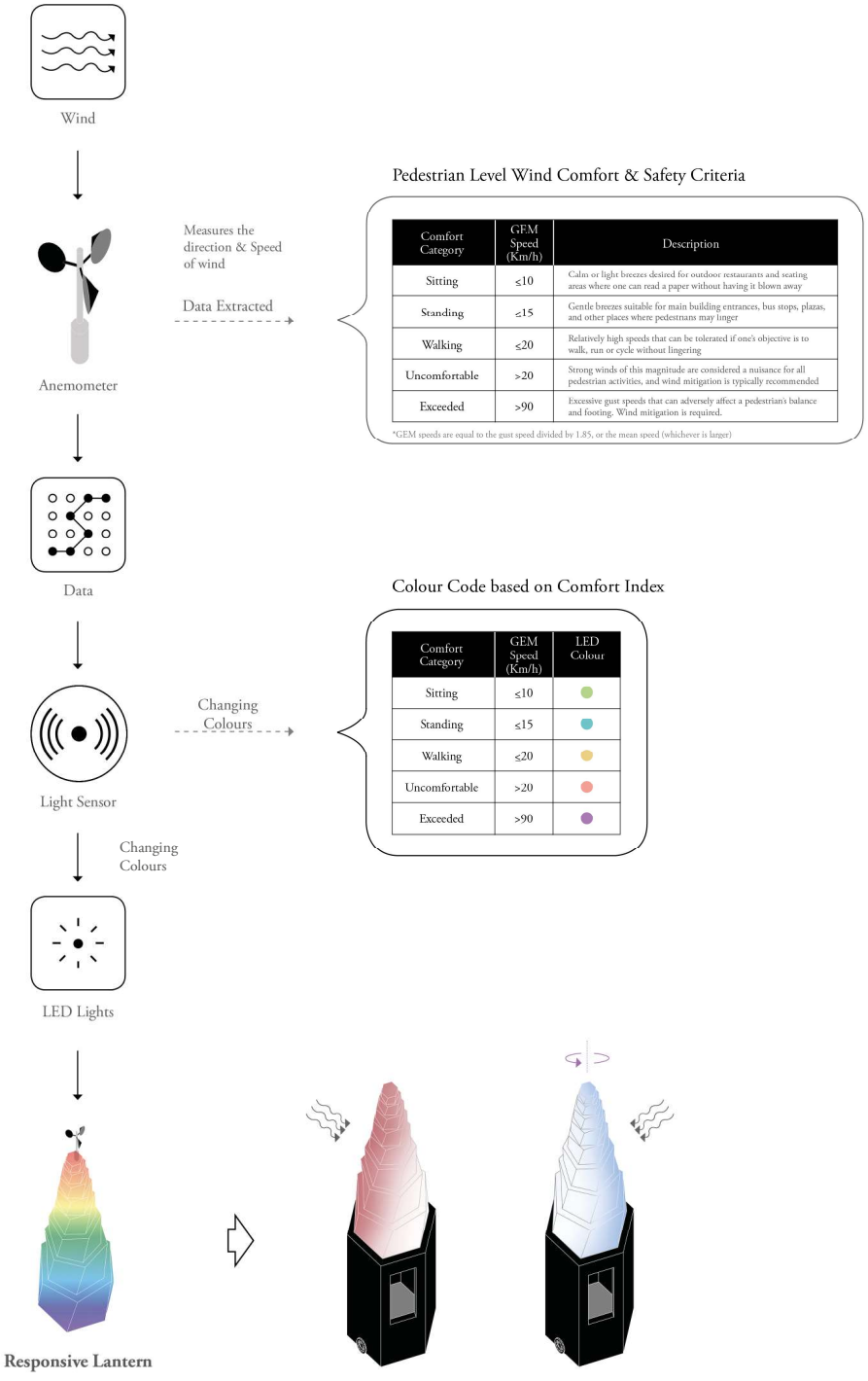


Fig. 6.9 Functioning of Technological Intervention (by Author)

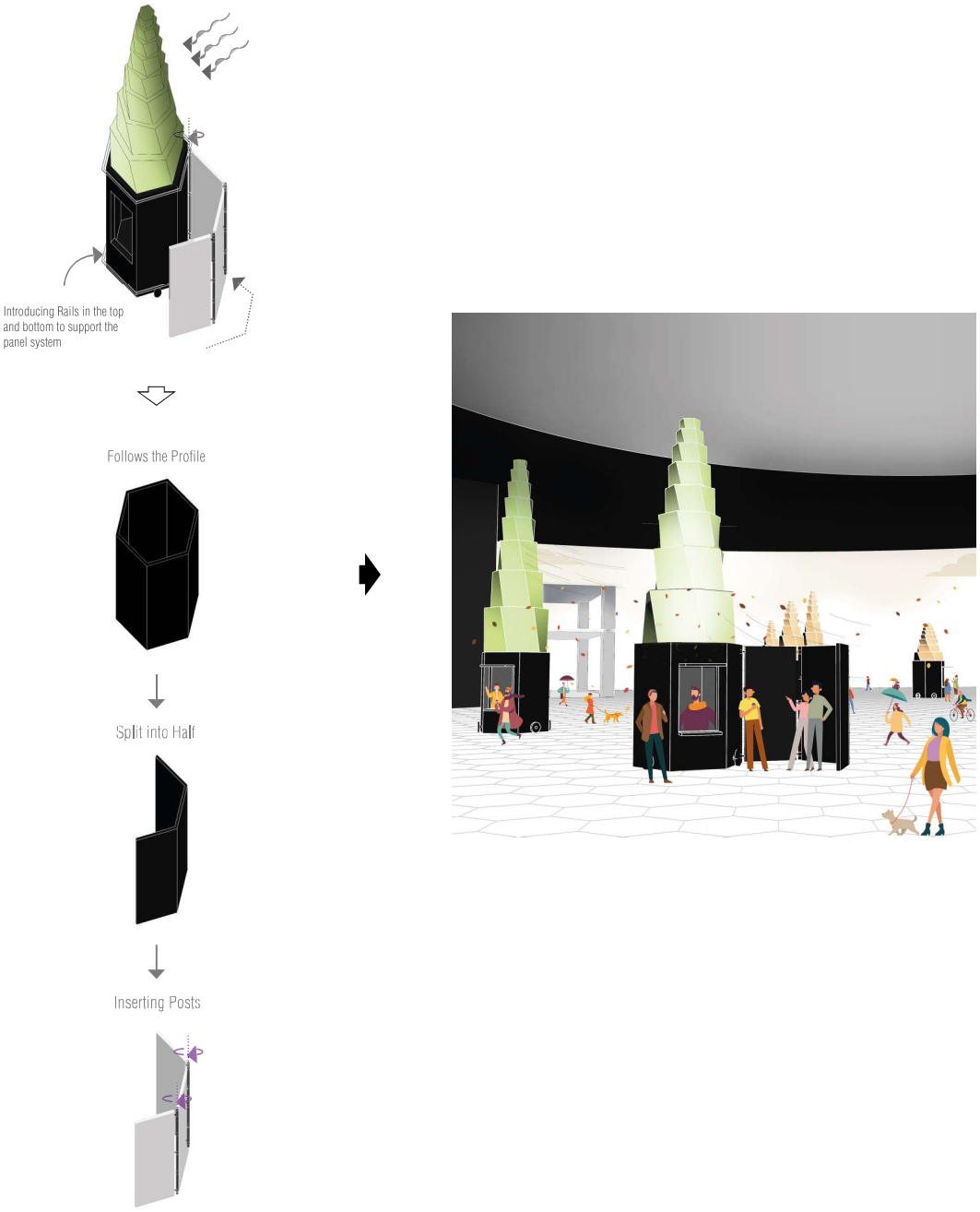


Fig. 6.10 Iteration 01: Proposing a Flexible Panel System (by Author)

With the changing lights as a visual cue, my primary response to innovate on the physical fabric was to provide a flexible wind barrier, so that the users can swivel it around to create a spaces of comfort. With this idea, the kiosk started to behave like a set of assembly that can be linked to form different spatial configurations, than just objects in space.

To further enhance the social intensity, and to make people drawn to it, I looked at it in the context of a regular street setting, to then identify the elements that can be brought into the kiosk, to activate the space.

Since the Sidewalk Labs has reinterpreted the lamp post in the form of a lantern, I was keen on integrating the bench. As a result of which, I propose a flexible bench assembly, that can be extruded along the orientation of the panel system that can create spaces of rest and leisure, and open up potentials for other diverse social scenarios, like they can contain small group activities or can be collectively arranged for a larger scale festivity or, it can behave like a responsive street system.

Fig. 6.11 Social Elements of the Street (by Author)

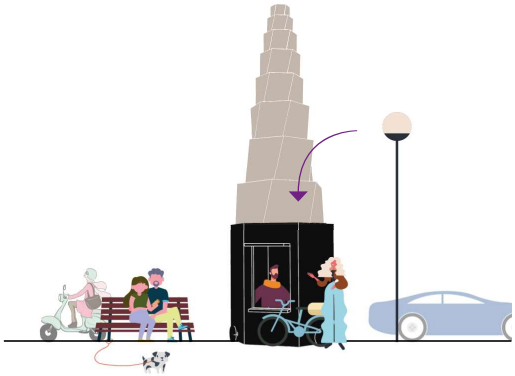


Fig. 6.12 Quayside Kiosk with Lantern (by Author)

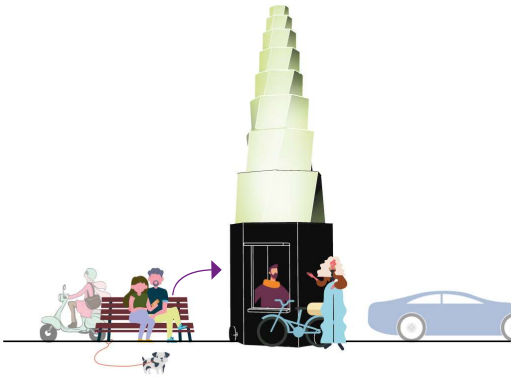


Fig. 6.13 Integrating Bench into the kiosk (by Author)

Proposing a Flexible Bench Assembly

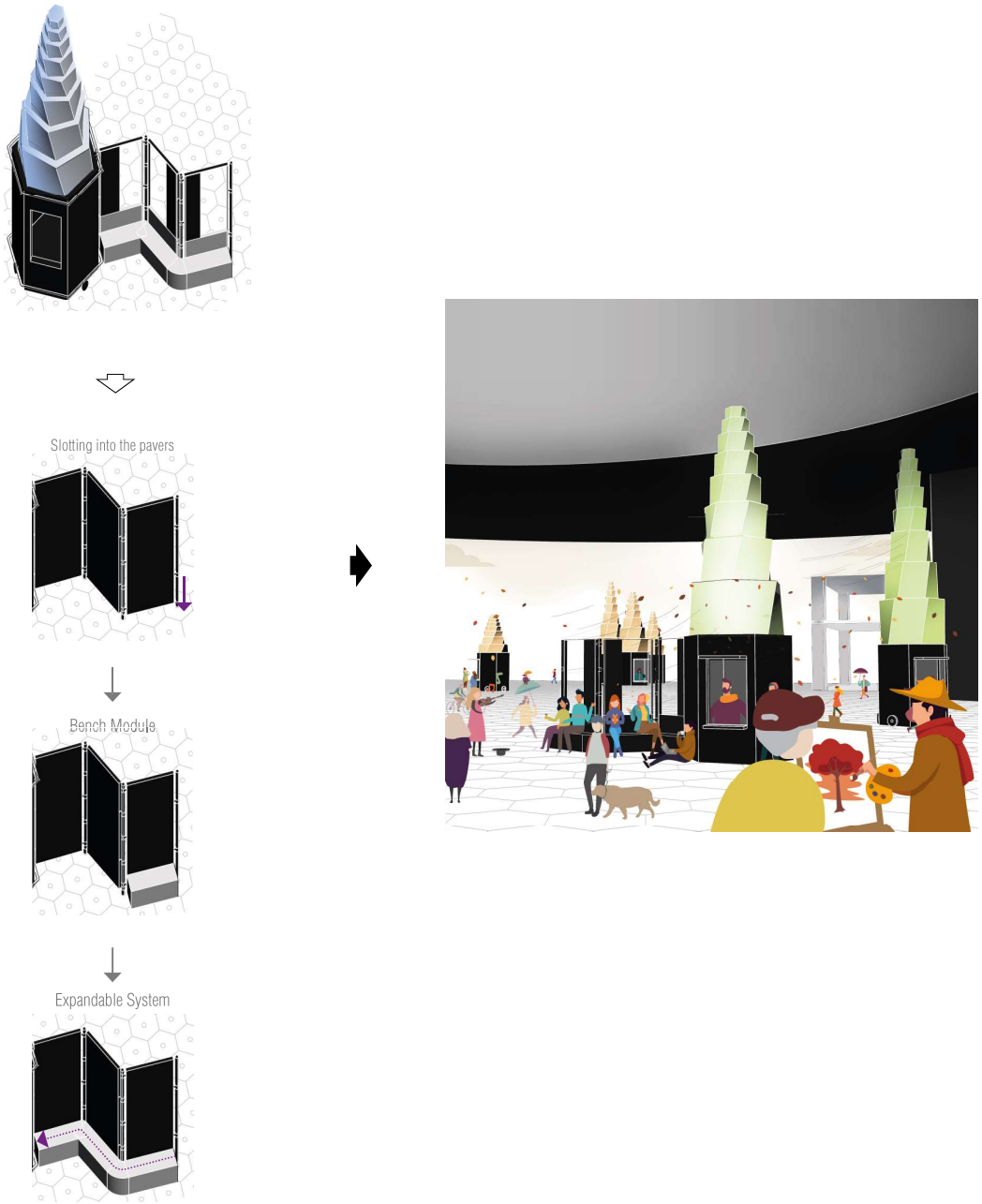


Fig. 6.14 Iteration 02: Details of the Flexible Bench (by Author)

6.1.5 Participatory Outcomes

Fig. 6.15 Organising Campfire (by Author)

Fig. 6.16 Setting up Festivities (by Author)

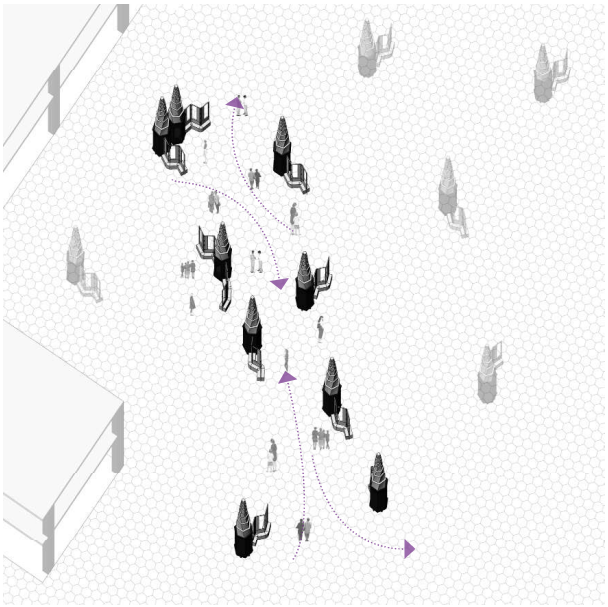


Fig. 6.17 Responsive Street System- 01 (by Author)

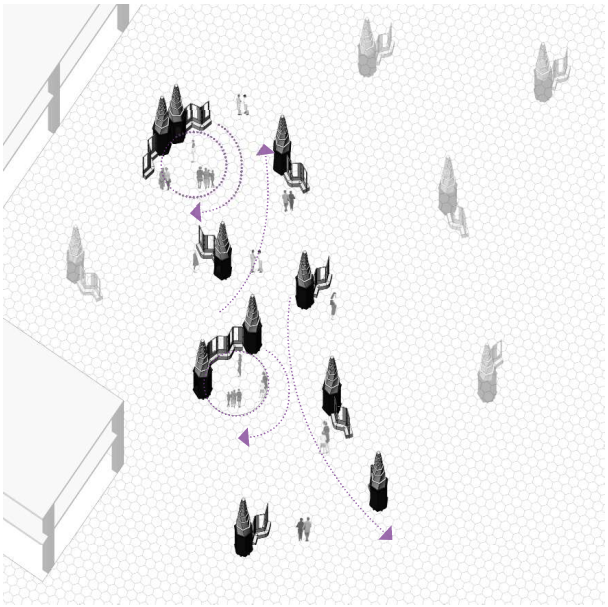


Fig. 6.18 Responsive Street System- 02 (by Author)

6.1.6 Evaluating the Design

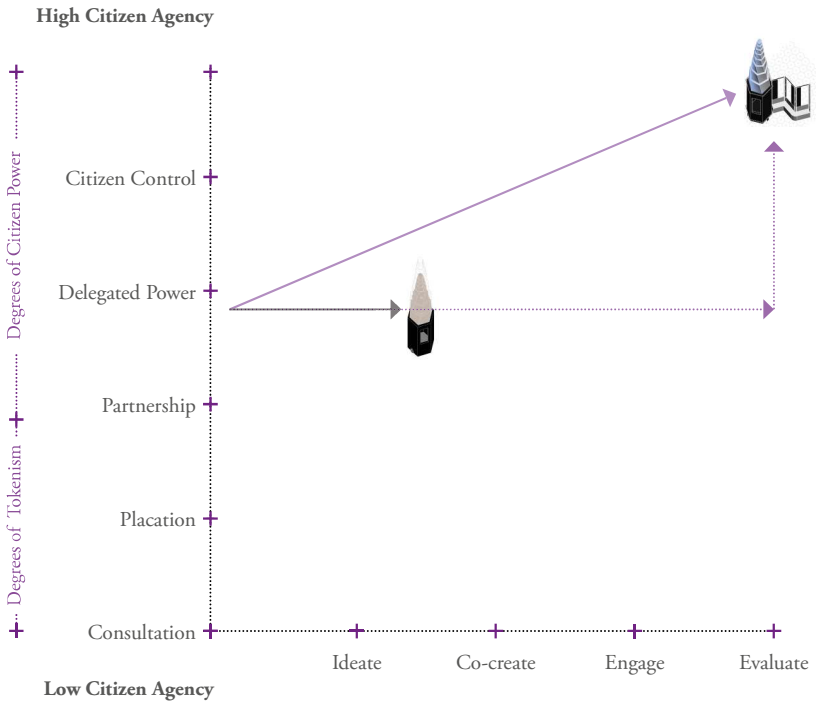


Fig. 6.19 Graph Showing Increased User Agency (by Author)

So this kind of an adaptable… reconfigurable kiosk increases the user agency for the vendor/ retail community of quayside. And empowers them to program their public realm in different ways. As a result of which, its takes its position up the participatory ladder.

6.2 Plug-in Furniture

6.2.1 Introduction

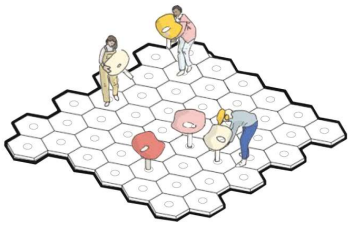
Component	
Description	A set of pre-fabricated or finished furniture components that plugs in and out of the paver system. They are designed to enable easy installation and removal of street infrastructure, such as signs, traffic lights, and equipment for special events.
Goal	Vibrant Street Life 01. Help people use the furniture to create their own seating spaces for gatherings, and other lively activities. 02. Utilize the existing infrastructure
Redrawn by Author	

Fig. 6.20 Table Reporting on Sidewalk Labs' Ideas for the Plug-in Furniture (by Author)

6.2.2 Understanding Barriers of Access

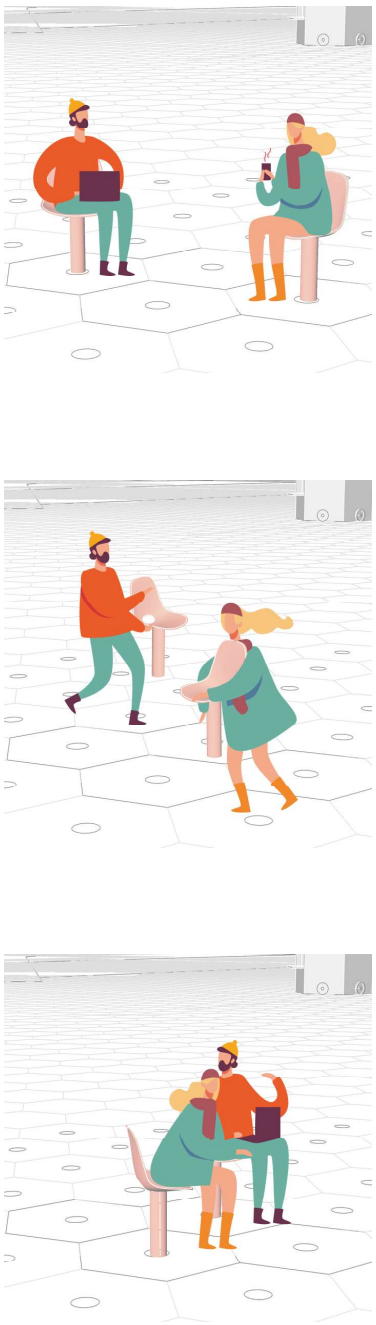


Fig. 6.21 Constraints in Physical Re-Organization (by Author)

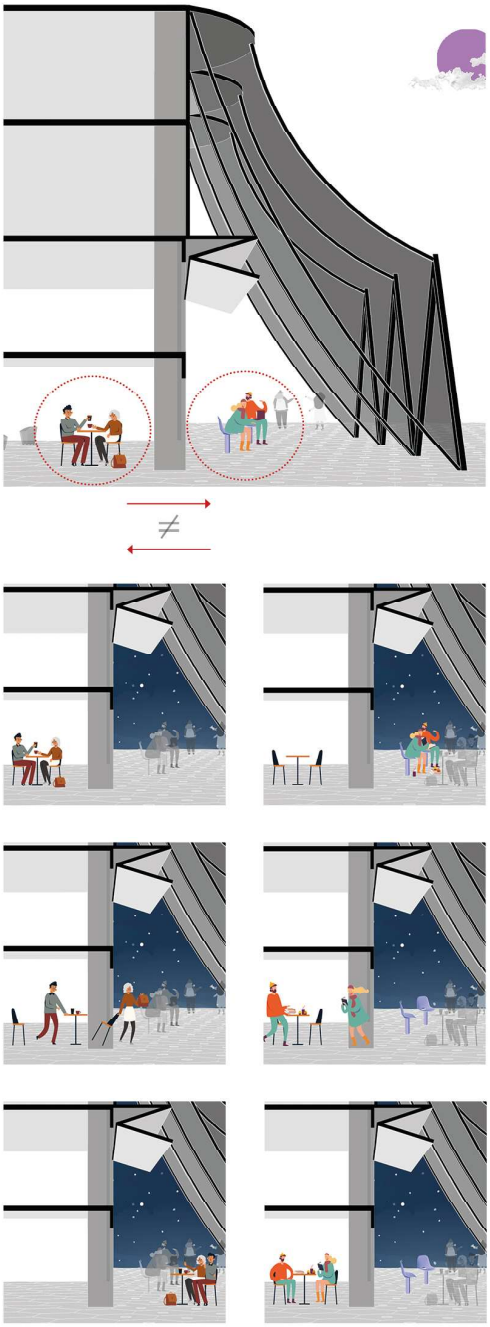


Fig. 6.22 Constraints in Seamless Exchange between Interiors & Exteriors (by Author)

6.2.3 Setting up the Design Agenda

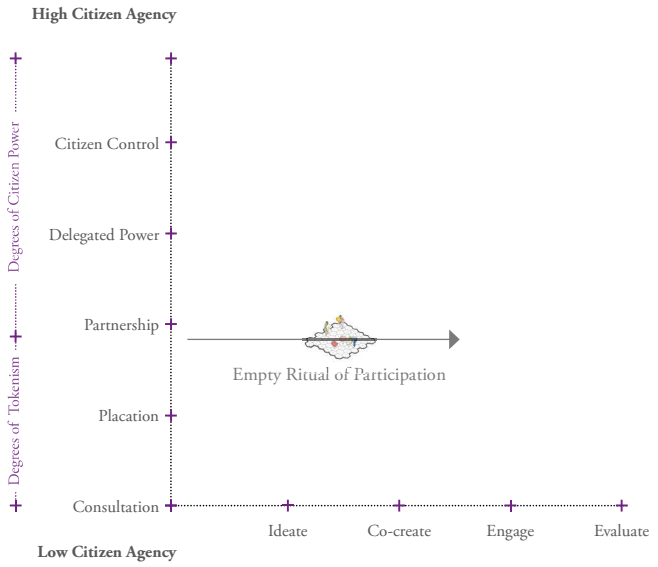


Fig. 6.23 Evaluating Quayside's Kit of Part Proposal (by Author)

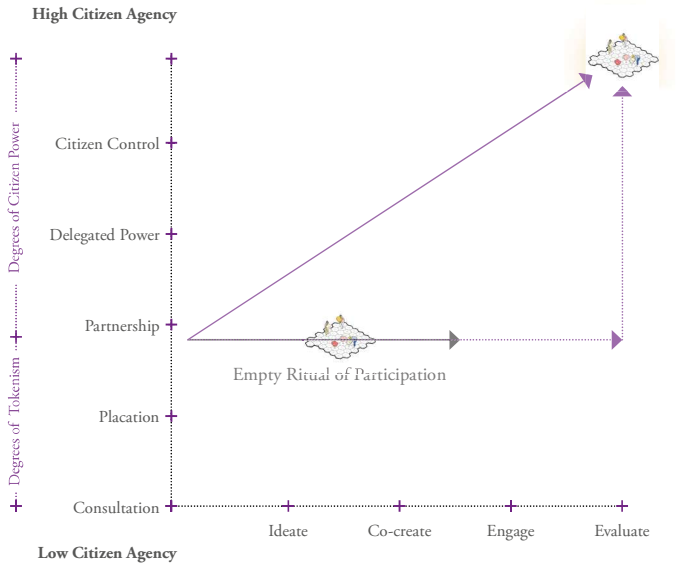


Fig. 6.24 Setting up Goals for Re-Design (by Author)

It seems like a good thing to have a flexible social infrastructure where furniture can be plugged in and out. But the idea of the furniture has many shortcomings to it that we will discuss.

The fact that they are prefinished, predetermines their use too much. Also, the fact that their physical organization primarily depends on the pavers poses some inconvenience in fostering social relations. And it also restricts the seamless exchange of activities between the interiors and the exteriors..

Since the existing furniture system does not fully address its ease of use and agency, it falls lower in the graph. And to increase its productive engagement, I imagine a set of generic components instead of finished products, that can be arranged in multiple configurations. This motivates an emergent participatory condition as it does not predetermine the use too much.

To make use of the existing Quayside fabric and to add more value to the participation, I embed a layer of technology, in the form of a gravity powered generator that can plug in and out of the pavers to enable flexible use. And it converts the weight acting on it, into electric energy, that can feed into the paver grid. This is indicated with the changing light colours, which will motivate more people to use it to create a vibrant social realm, by also giving something back to Quayside's sustainability.

6.2.4 Design Process

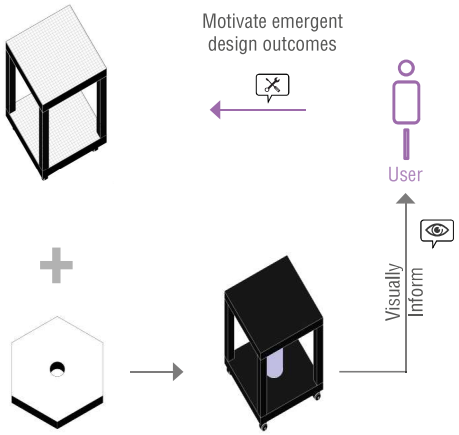


Fig. 6.25 Constructing User-Entity Associations (by Author)

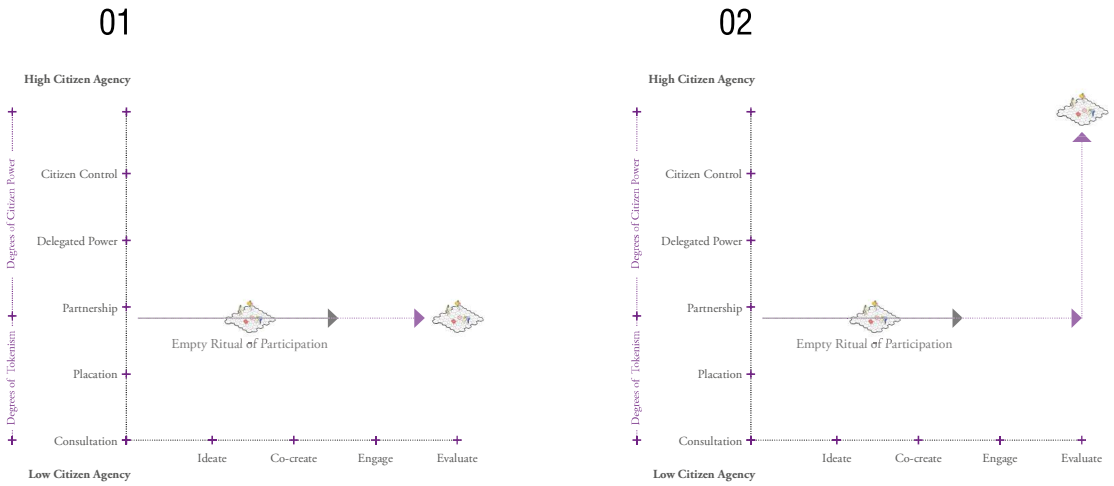


Fig. 6.26 Outcomes: Heightening User Agency (by Author)

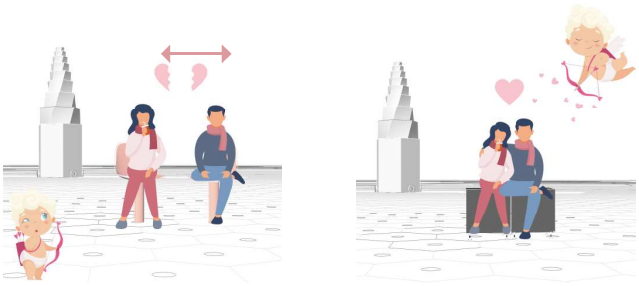


Fig. 6.27 Pre-Finished Components vs Assemblage (by Author)

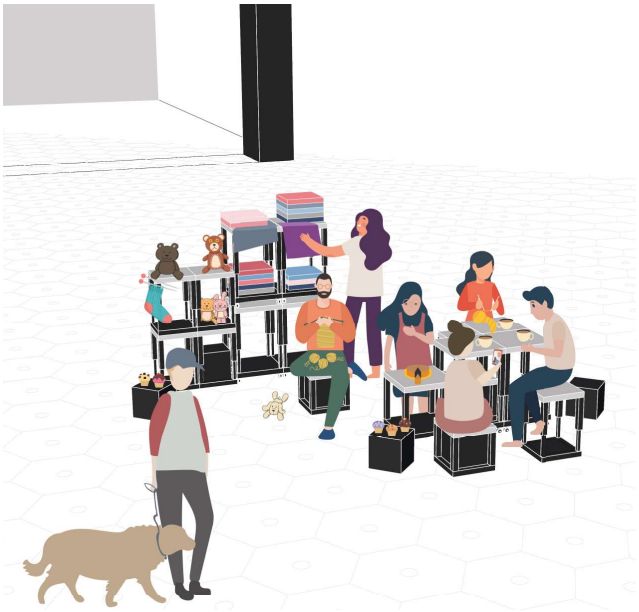


Fig. 6.28 Emergent Participatory Conditions (by Author)

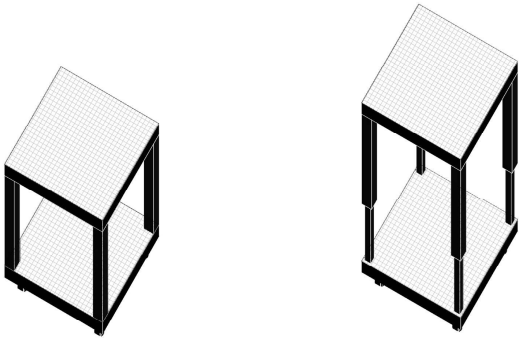


Fig. 6.29 Furniture Detail (by Author)

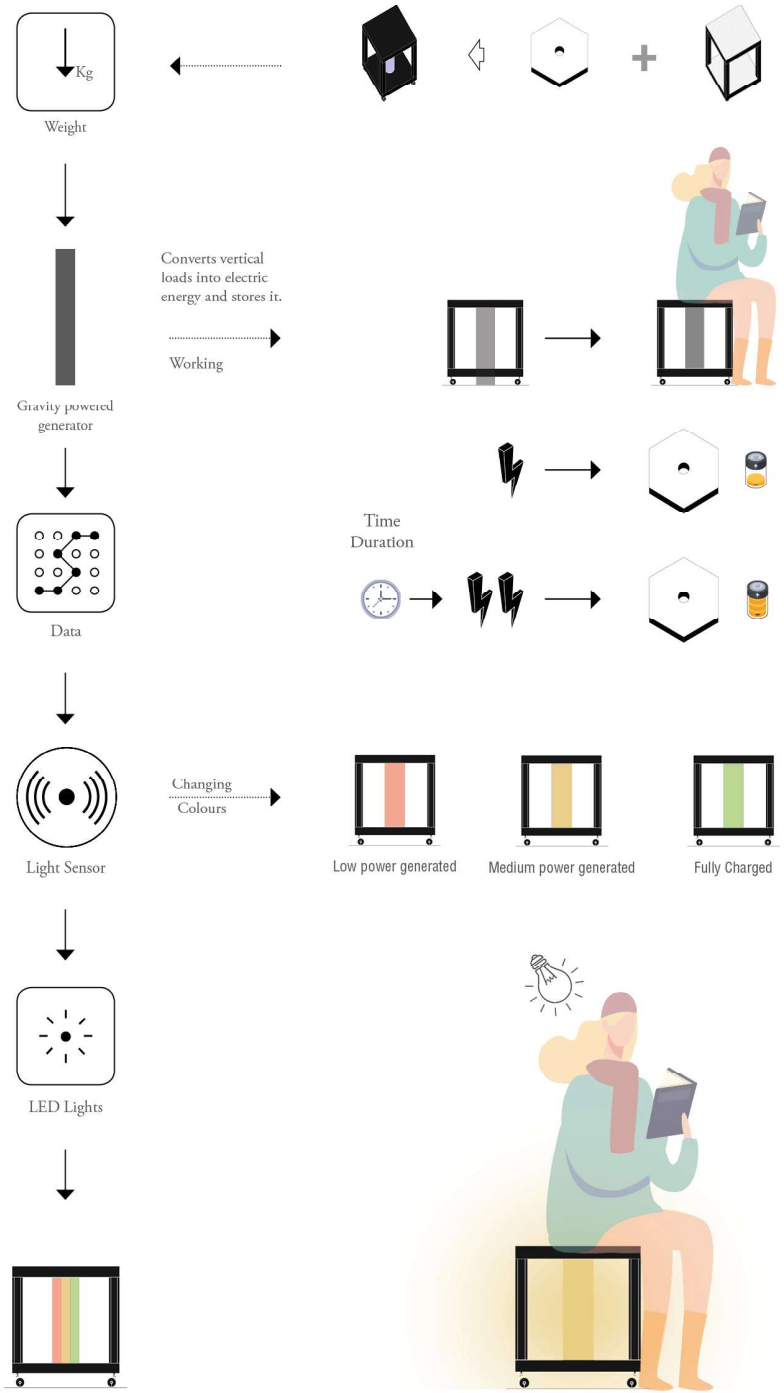


Fig. 6.30 Functioning of Technological Intervention (by Author)

6.2.5 Participatory Outcomes

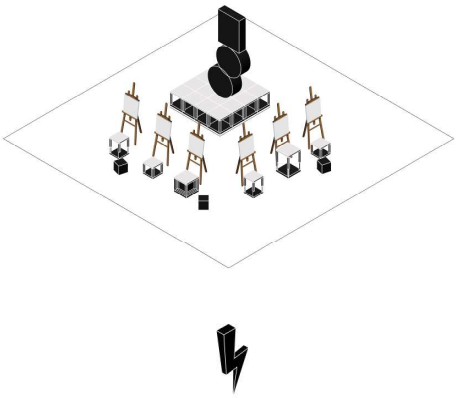


Fig. 6.31 Art Class (by Author)

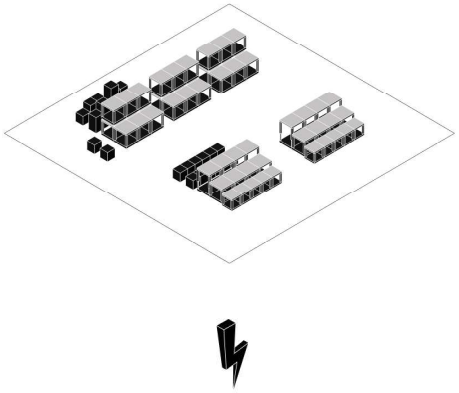


Fig. 6.33 Farmers Market (by Author)

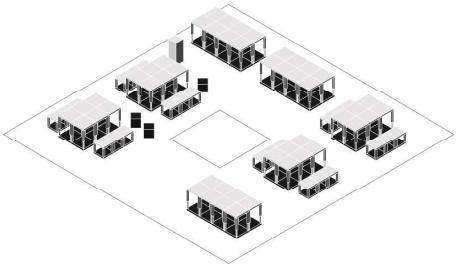


Fig. 6.32 Community Picnic (by Author)

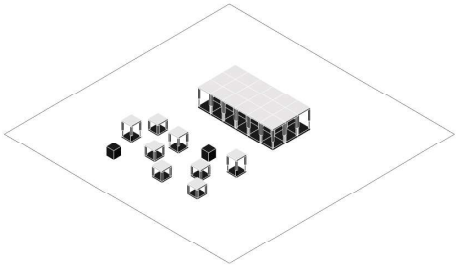


Fig. 6.34 Live Concert (by Author)

Fig. 6.35 Pop-up Garden Group (by Author)

Fig. 6.36 Community Organizing Events (by Author)

6.2.6 Participatory Outcomes

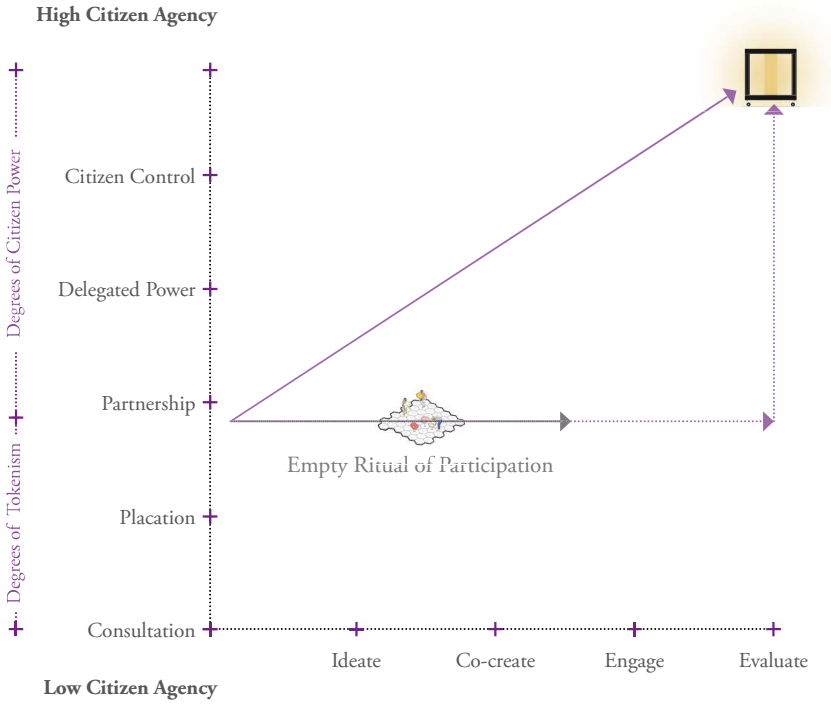


Fig. 6.37 Graph Showing Increased User Agency (by Author)

So eventually, this moves the hybrid entity up the graph, because it encourages emergent design conditions with a value added outcome.

Rethinking the two components is very straightforward, that introduce us to the idea of how the technologically mediated entities start becoming active participants in the participatory process by visualising data and promoting responsive outcomes.

In doing so, they are very neutral in their behaviour, like they report on an existing condition, and the users can choose whether or not to act on it. So to question this character of neutrality, the third proposal is just a sketch of an idea, that is probably not neutral, because,'it has a mind on its own', and it promotes compelling ways to engage with it, by interacting with the users.

So with this, I introduce to the last design intervention of the thesis, Pol[e]arizer, a smart pole, that is more like a human participant, that is aware of its surroundings, context of use, it has a memory, and can communicate.

So, the idea of the smart pole, is a build up from the previous components. The kiosk for instance was beneficial to the vendors and retailers. The furniture was more like a neutral set of entitiy available to the community and visitors alike.
So the Smart Post is something that would specially benefit the residents of Quayside, as they are the major occupants, and have invested a lot of money, but live in tight, rigid spatial conditions.

6.3 Technological Intentionality

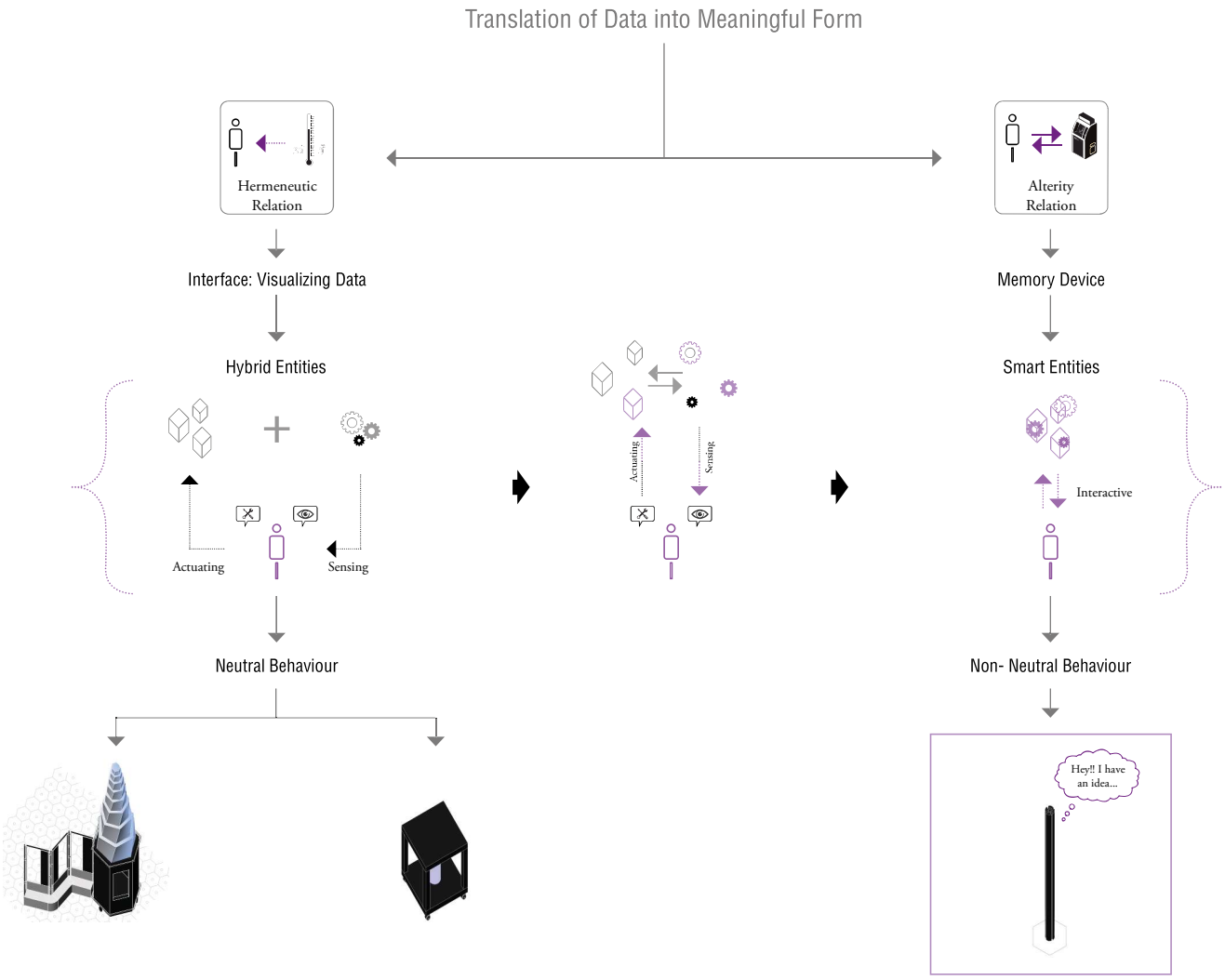


Fig. 6.38 Diagram Illustrating the Behaviour of the Technologically Mediated Proposals (by Author)

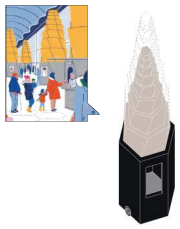
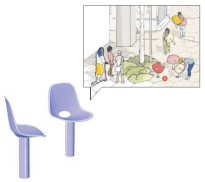
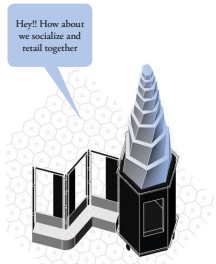
Description	Re-Imagining Quayside 'Kit of Parts'		Proposal
Sidewalk Lab's Idea	 Moveable Kiosk	 Plug-in Furniture	
Thesis Intervention Employing Tech. Mediation			
Beneficial User Groups	Vendors, Retailers	Visitors & Community	Quayside Residents
Behaviour	Interface		Memory Device

Fig. 6.39 Table Cataloguing the Design Intent of Proposals (by Author)

6.4 POL[E]ARIZER

6.4.1 Intent of the Proposal

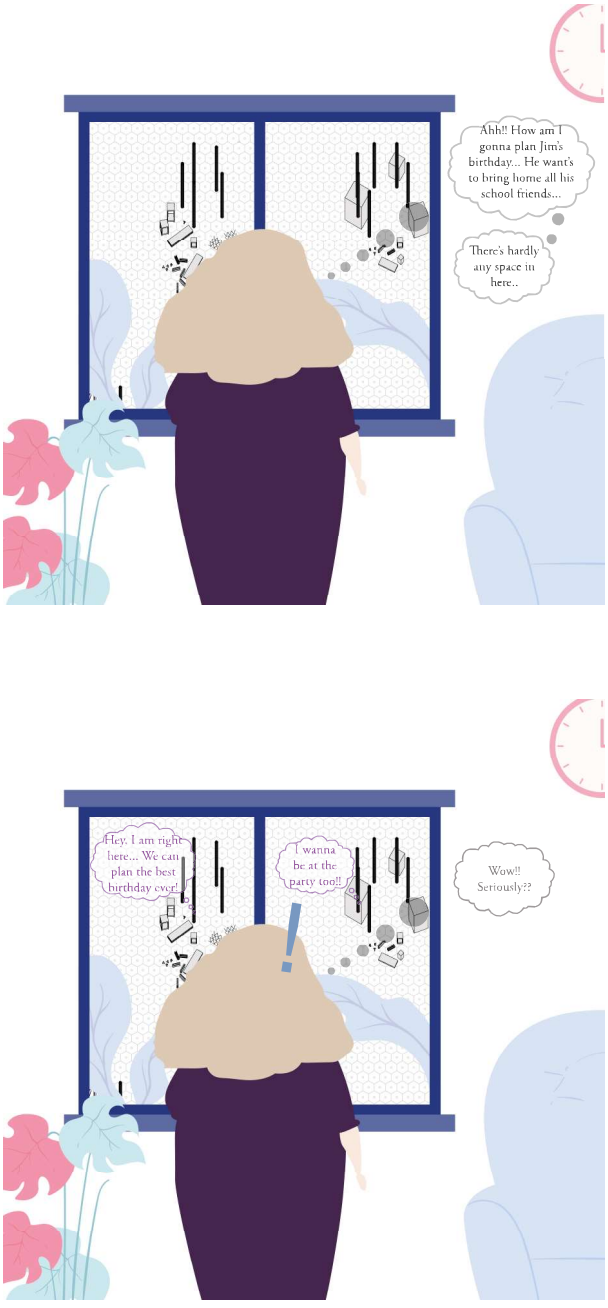


Fig. 6.40 Above & Below: Quayside Resident Hoping to Host an Event in the Public Realm (by Author)

If a Quayside resident, wishes to plan a birthday party for her kid, but doesn't have enough space in her apartment, what does the public realm that is right below her home has to offer?

This sparked the whole idea of proposing an entity that would make use of the pavers as a reliable infrastructure to enable people to build a range of 3 dimensional spatial conditions. So my first response was to have a smart pole that has automation, sensors & actuators in it. And has a set of sub-components that plugs in and out of it. It informs the user through their smartphone, if something goes wrong with its loading conditions. But for this to happen, people need to feel welcomed to use the kit of parts and build something.

So, I added a layer of an embedded learning scenario, by proposing an AR app, with which the users can engage with the kit of parts in Realtime and build different spatial configurations.
There are examples of a scenarios rendered where the residents plan a range of spatial conditions. So this idea of embedding an assisted learning, kind of breaks down some of the expert barriers, that an average user with no design background would need, to design such spaces.

6.4.2 Design Process

Proposing a Smart Pole to Eliminate Expert Intermediaries

Fig. 6.41 Smart Pole (by Author)

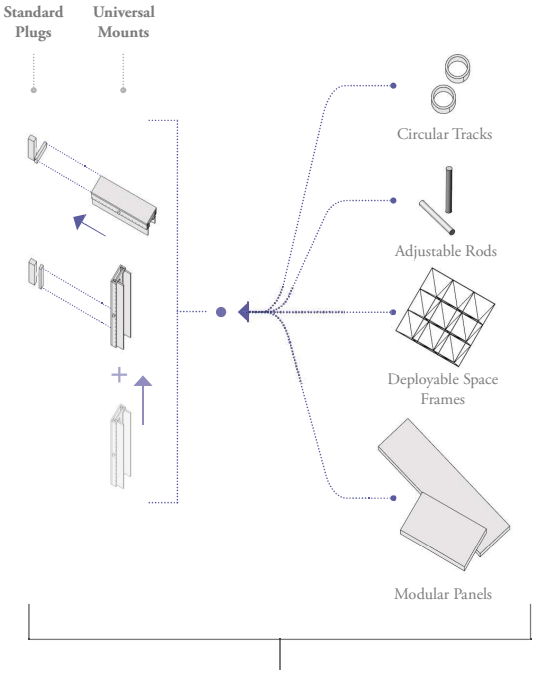


Fig. 6.42 Sub- Components (by Author)

Fig. 6.43 Interacts with Users via Smartphone (by Author)

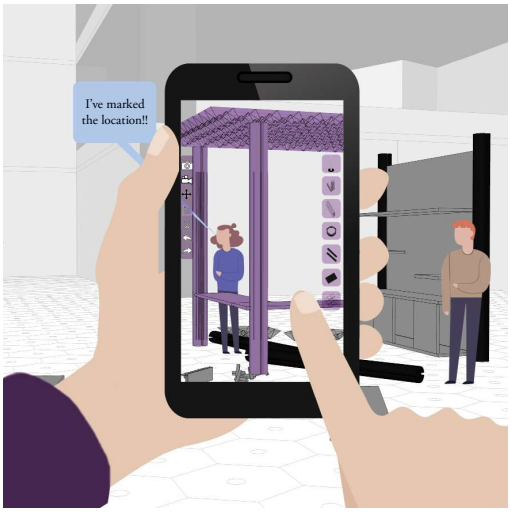


Fig. 6.44 User's Visualizing Spaces using Sub-Components through the AR App (by Author)

6.4.3 Participatory Outcomes

Fig. 6.45 Pop-Up Community Kitchen (by Author)

Fig. 6.46 Pre-Planned Birthday Party (by Author)

But the moment we propose a flexible infrastructure like this, there are many concerns that comes with it, and the two things I am looking at,.. Is of the spatial configurations that might get repetitive on site, and its unprecedented use cases.

So, to tackle this, I set up a social agenda for the Smart Pole, as that of a Polariser, that is analogous to an optical filter, and I use it as a metaphor for thinking about how the pole functions. So the optical filter transforms undefined, mixed vibrations of a light ray, to vibrate in a single plane showing maximum difference.

So now, the aim of the smart pole, is to streamline the multiple social aims, into innovative participatory outcomes, that primarily benefits the quayside residents.

6.4.4 Social Implications of Smart Pole

Identifying the Social Role

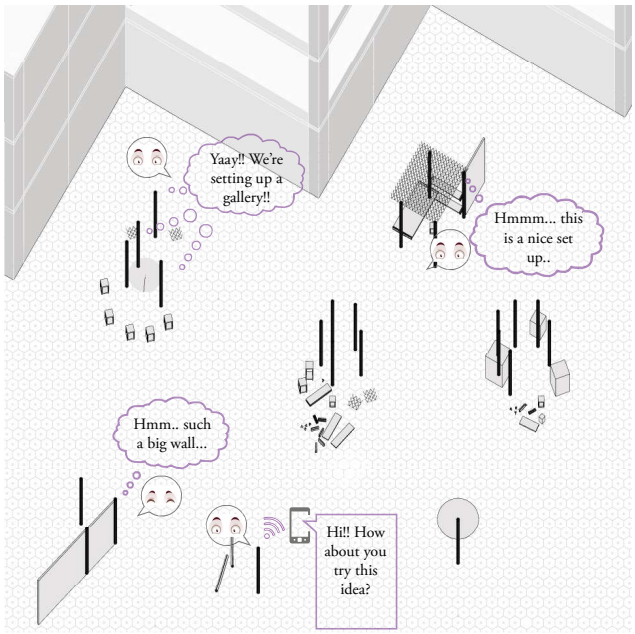


Fig. 6.47 Self- Aware Smart Post (by Author)

Maintaining Innovative Participatory Outcomes

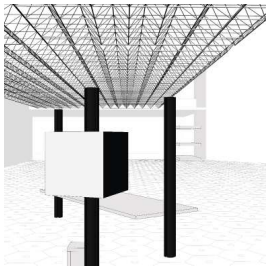


Fig. 6.48 Repetitive Forms (by Author)

Fig. 6.49 Unprecedented Use Cases (by Author)

The first part of the informational diagram explains the working of polarizer collaboratively with the users to empower them in producing diverse spatial conditions.

I introduce the idea of a memory, which contains a repository of configurations people have made over time. And in stipulated time periods, ensure that a spatial configuration does not get replicated more than a desired number of times. This condition that I specify here, is very arbitrary there's no set conditions, and is a variable parameter, that depends on the way things get built in the site.

The following informational process diagrams explains the functioning of the polarizer and the user engaging in a continuous feedback process, similar to the fun palace. It shows moments when the polearizer starts interacting with the user, by giving them feedback through the VR app, by suggesting different configurations, to prompt new ways of thinking, when it anticipates the outcome of the next configuration to potentially have a degree of similarity, both in its memory and its repetition on site.

To manage the activities to foster vibrant social experiences, the smart pole observes the use conditions in relation to certain parameters. When there is a conflict in intentions, the polarizer sends visual signals suggesting a list of alternative activities that can happen based on previous use cases, prompting for a change of use. In realtime, these two processes happen like, almost parallelly.

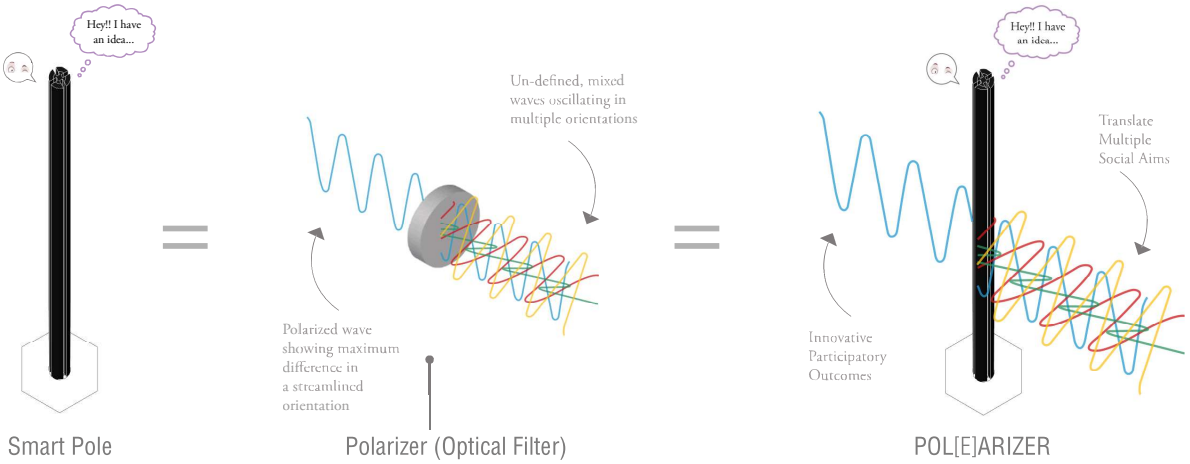


Fig. 6.50 Assigning a Social Role Analogous to a Polariser- Optical Filter (by Author)

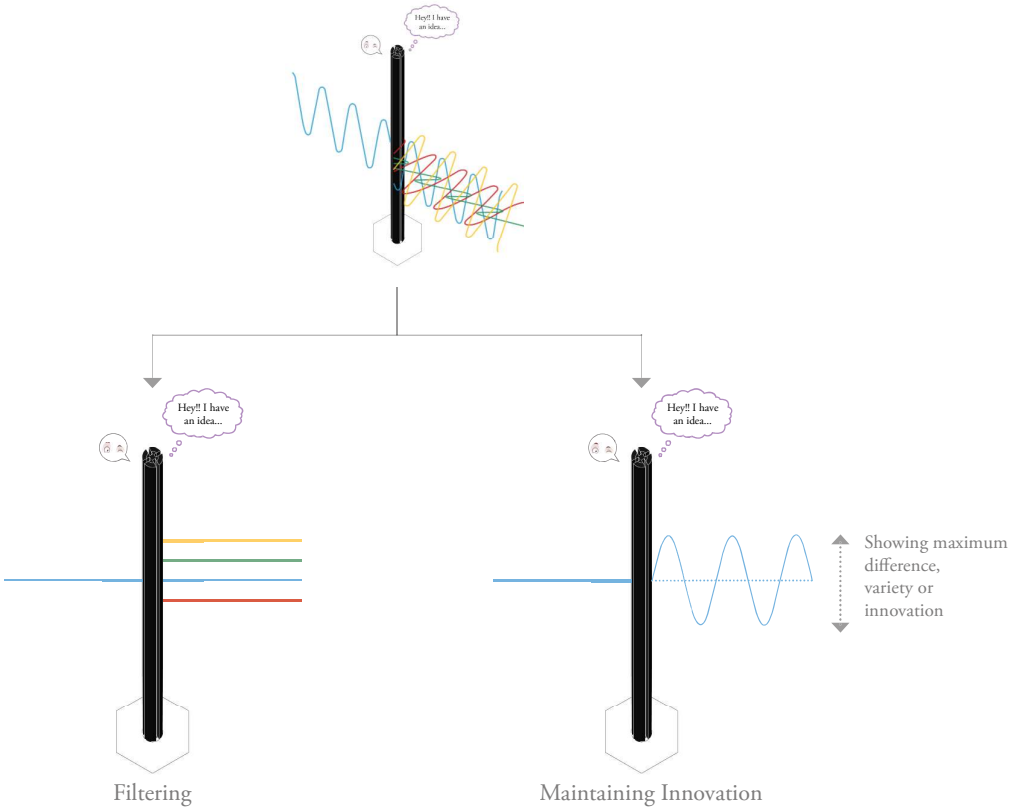


Fig. 6.51 Defining the Functioning of POL[E]ARIZER (by Author)

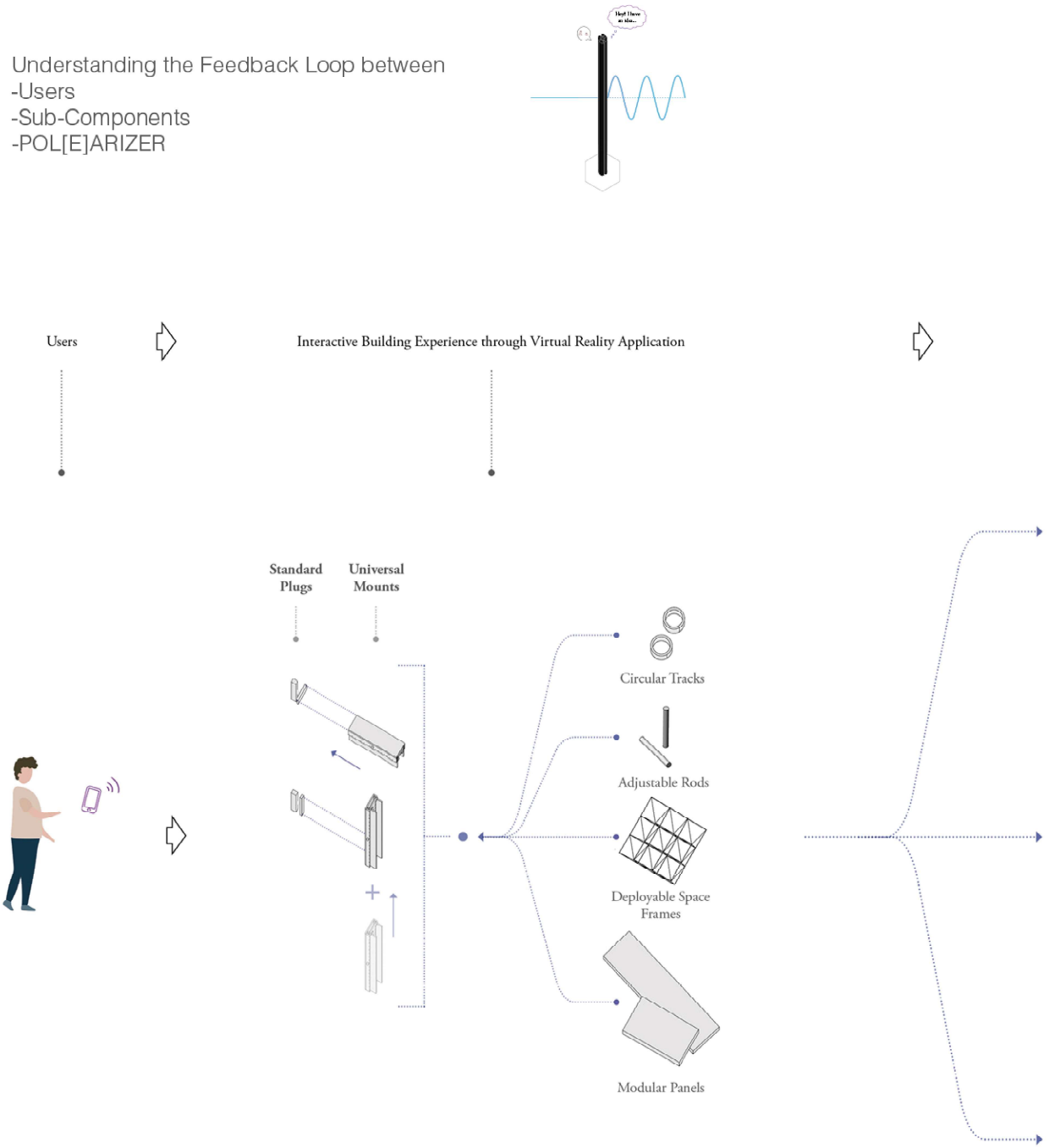
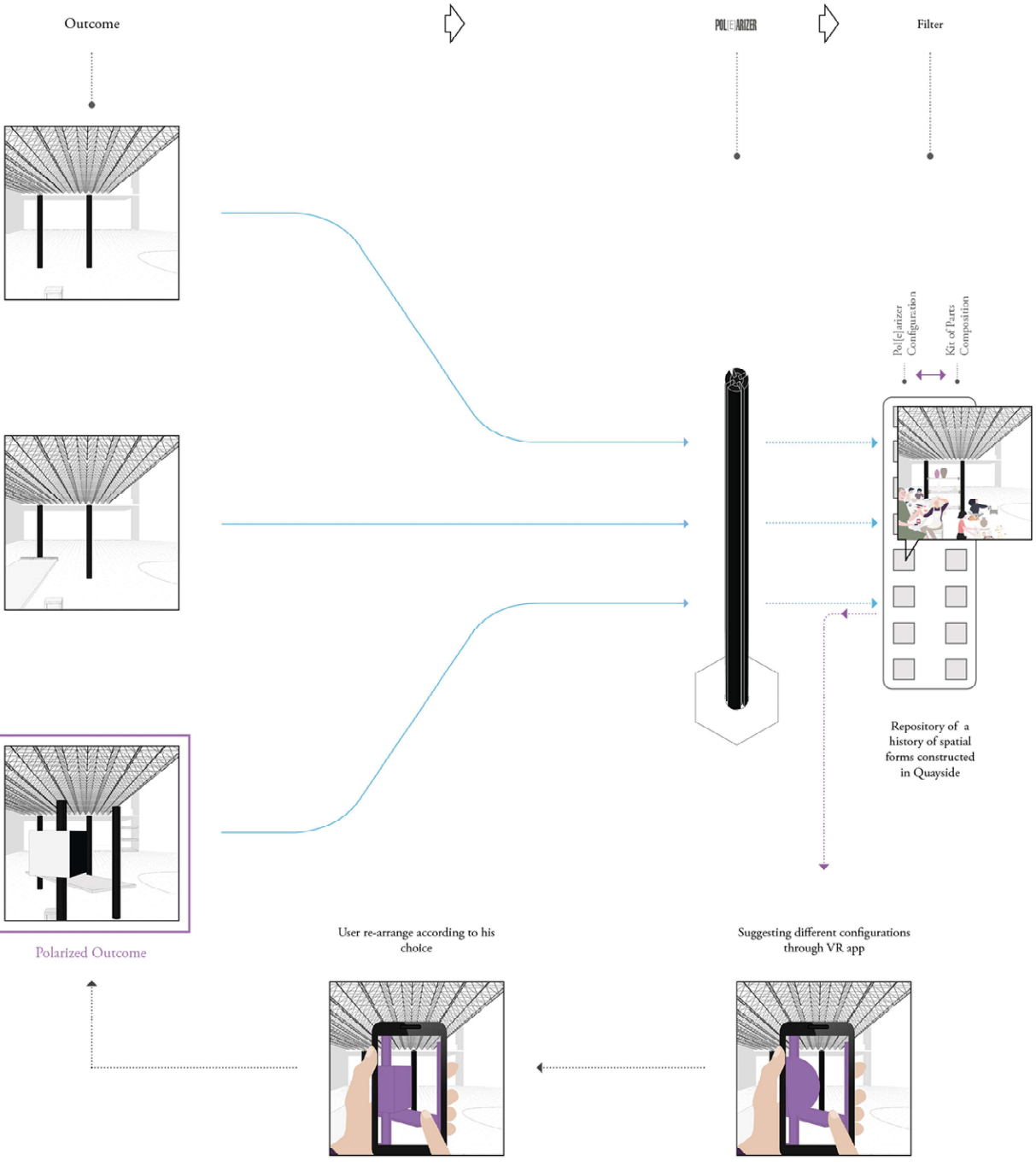


Fig. 6.52 Interactive Designing Between User & POL[E]ARIZER through the Augmented Reality Application (by Author)

6.4.5 Design Process: Constructing Information Exchange



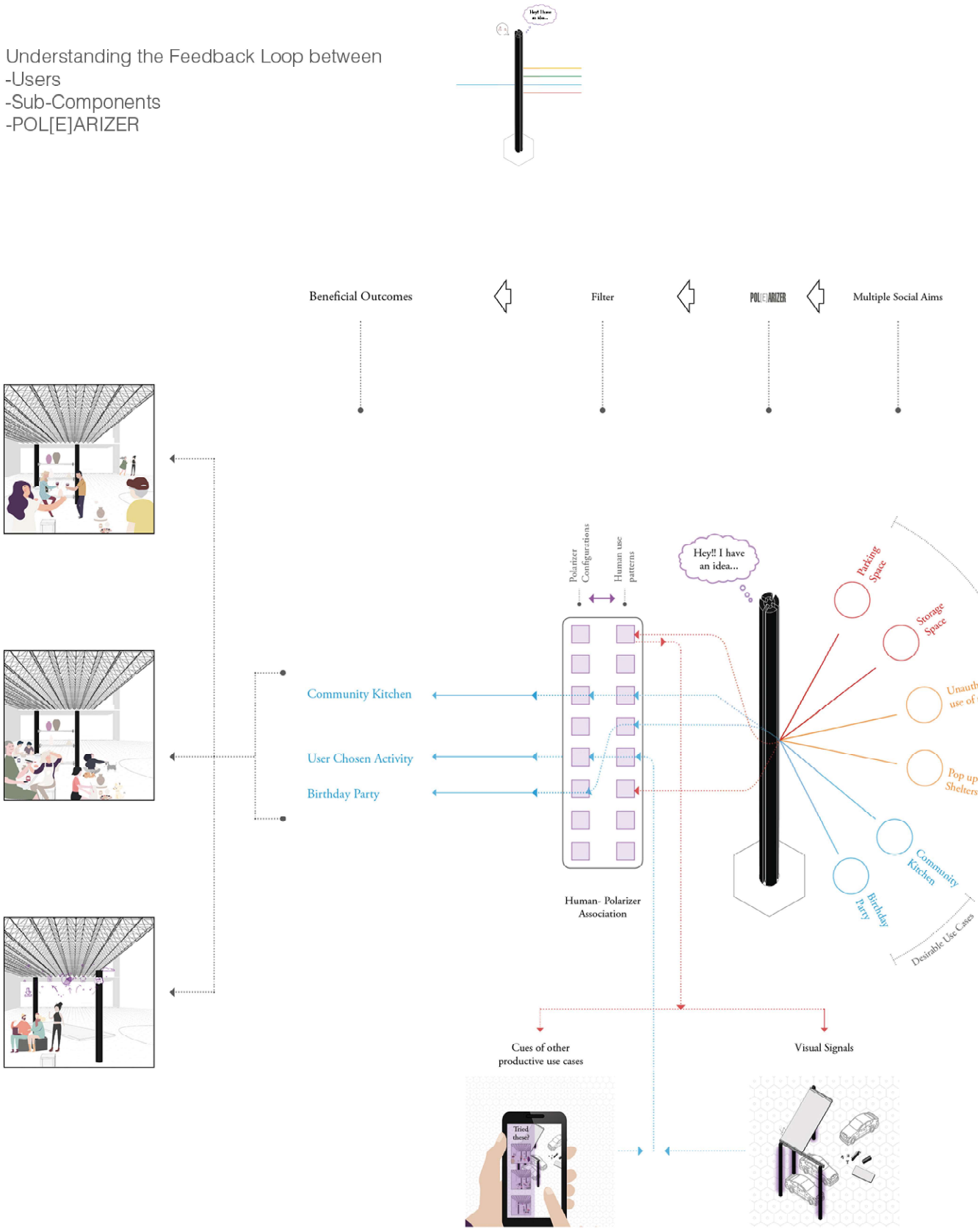
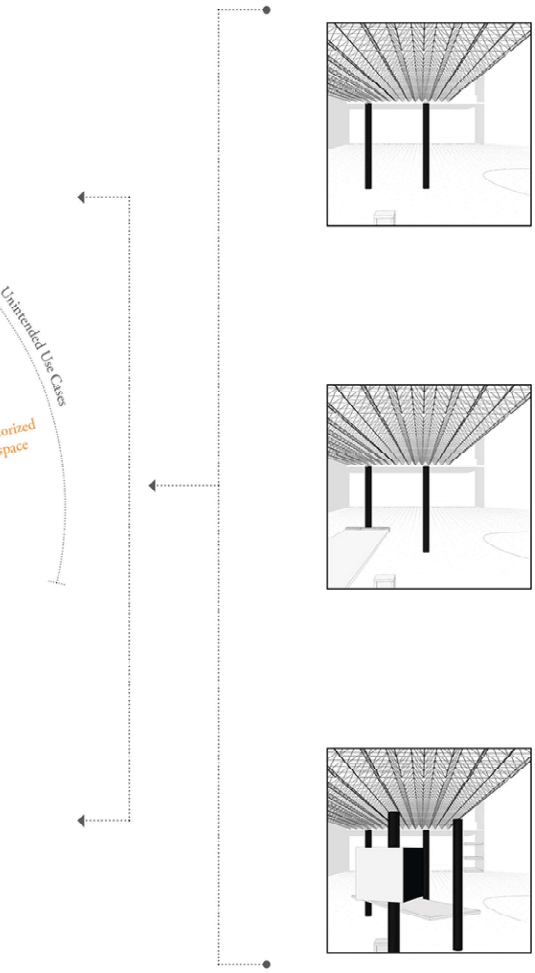


Fig. 6.53 Interactions Between User & POL[E]ARIZER to maintain vibrant use of public realm (by Author)


Unintended Use Cases
orized
pace

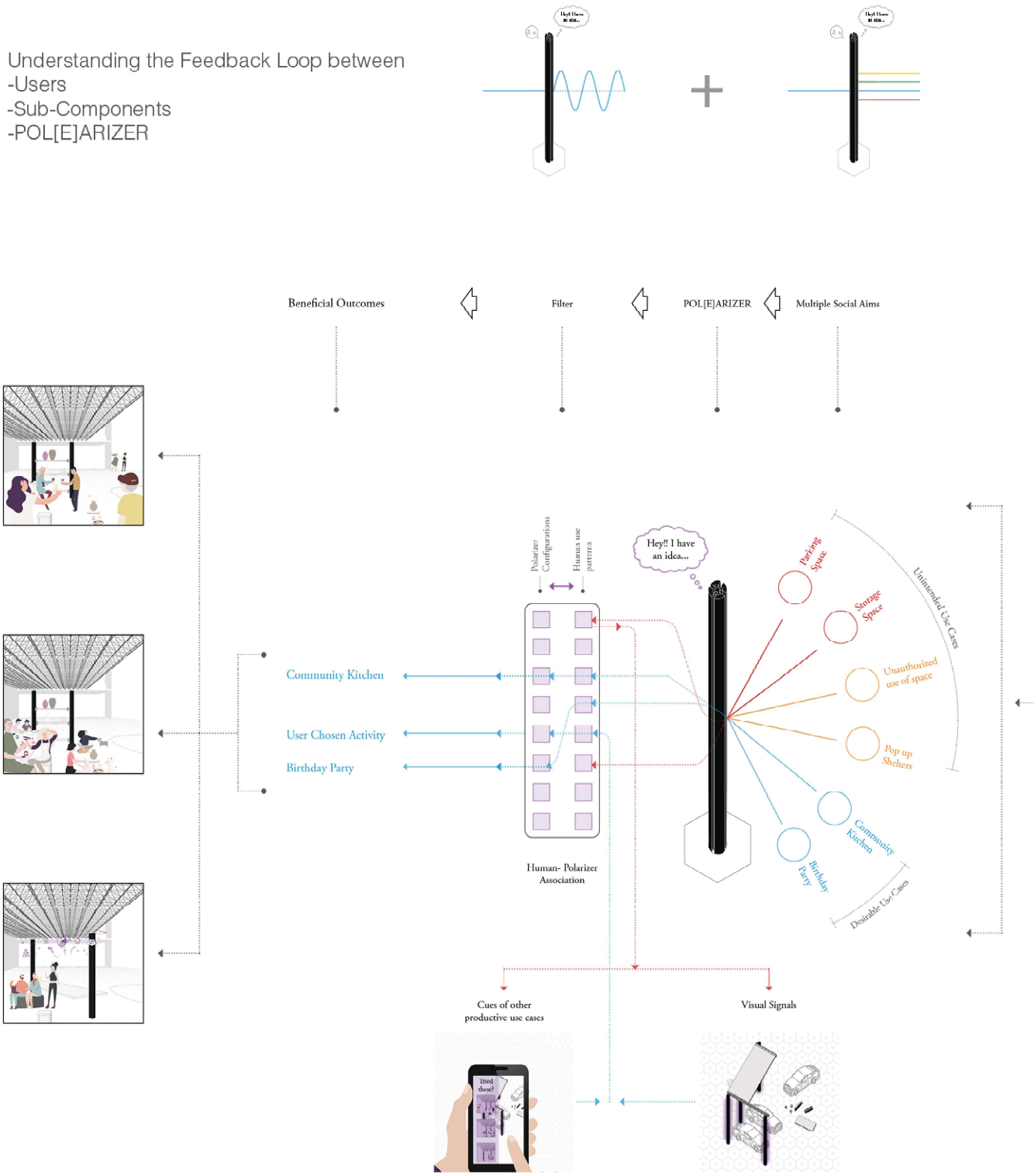


Fig. 6.54 Simultaneous Functioning of Design and Feedback on User Designed Spatial Conditions (by Author)

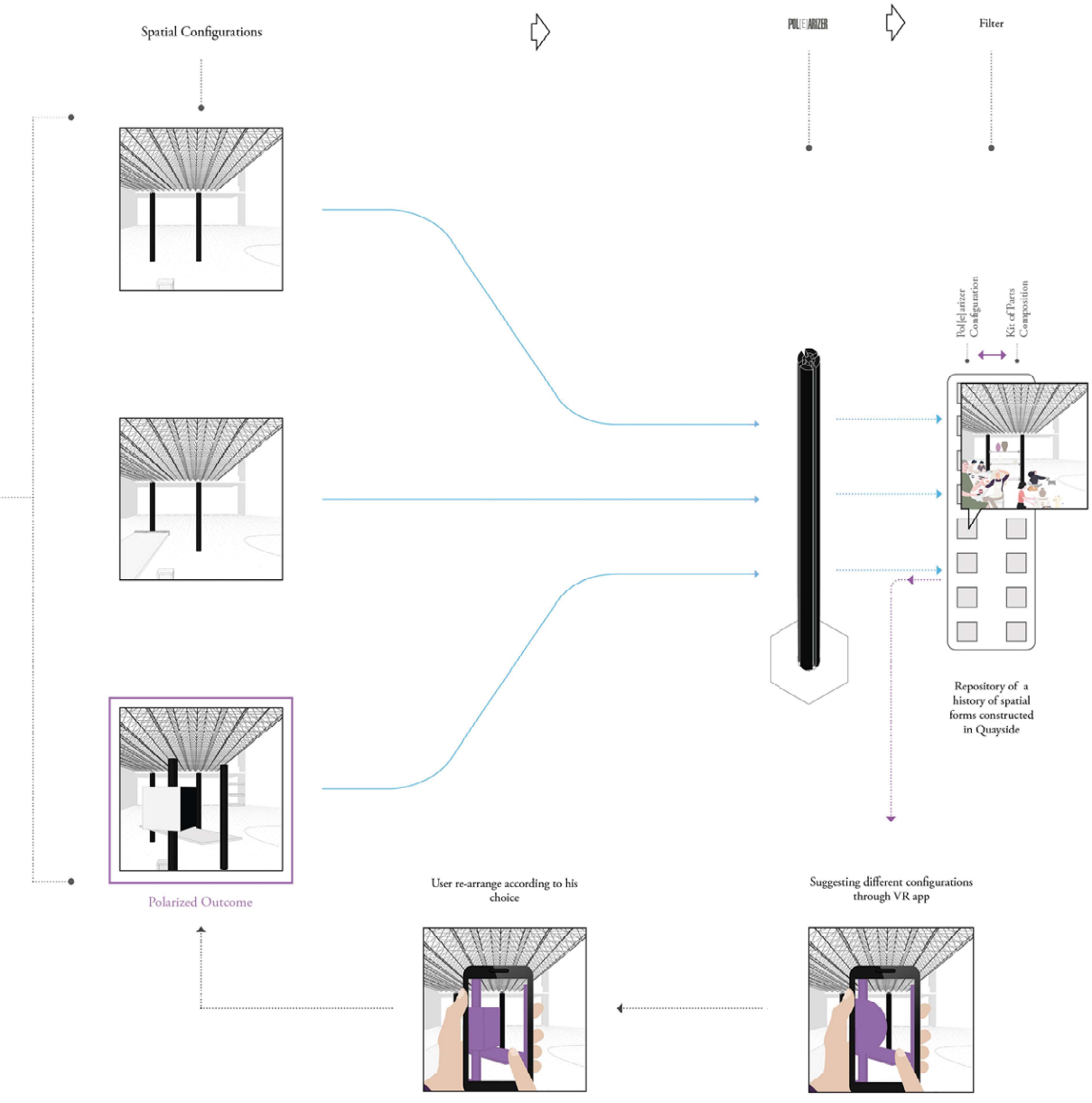

Spatial Configurations
POLE|ARIZER
Filter
Pol[e]arizer Configuration
Kit of Parts Composition
Repository of a history of spatial forms constructed in Quayside
Polarized Outcome
User re-arrange according to his choice
Suggesting different configurations through VR app

Fig. 6.55 A giant Open Air Theatre built by the residents, where the community experience watching FIFA floating in the Parliament Slip (by Author)

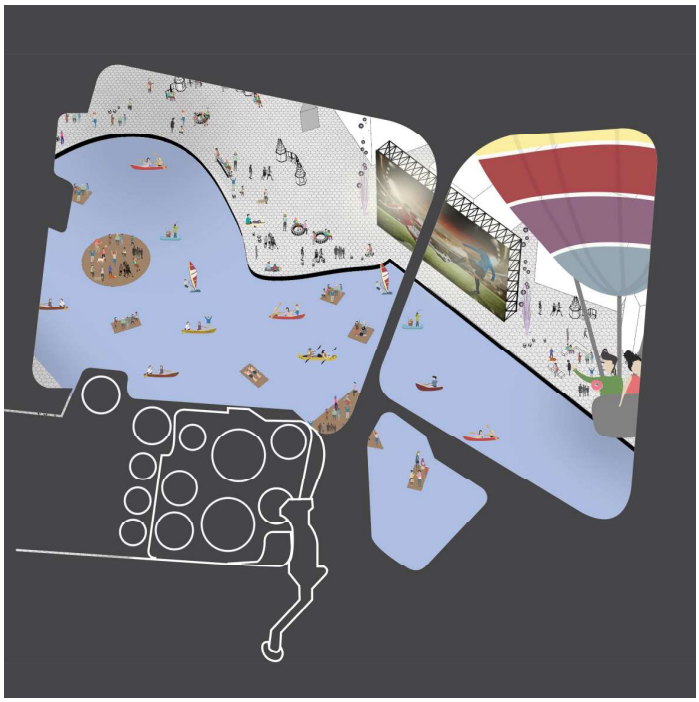
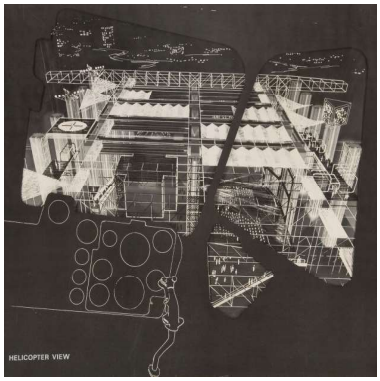
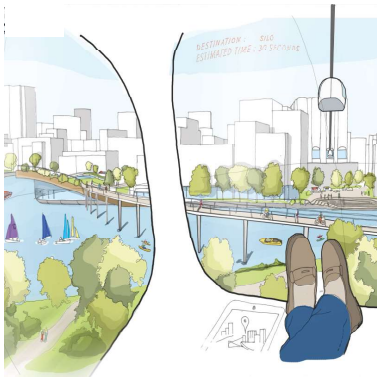


Fig. 6.56 Relevance to the Participatory Vision of Fun Palace (by Author)



Fun Palace, London, 1960-66



Quayside, Toronto, 2017-present

Thesis proposal, 2018-19

Fig. 6.57 Overall Design Agenda (by Author)

The design proposals dicussed in this chapter aims to highlight the value of participation by encouraging people to creatively program different social activities and provoke new ways of thinking that empowers both the residents and quayside's public realm.

And that is the participatory vision that the design explorations borrow from the Fun palace to re-imagine Quayside.

6.5 Conclusion

The projects presented in this thesis are very preliminary design responses. They are not refined, but are starting to set up the dynamics in questioning the capacity of designing technologically mediated participatory systems. The advancements in ICT and the internet has led to a celebration of the 'participatory culture' where the boundaries between production and consumption have become blurred giving rise to a number of terms like prosumer, designer-user presenting the idea of the "empowered user" who is capable of producing ideas, knowledge, information and content that allows them to gain considerable influence in politics, social issues and urban life.

There is an aspect to this participation, that is the real physical "publicness"[85], sharing space and time together in the public realm that engages with a set of technologically equipped urban components, that catalyse creative mobilisation of citizens by empowering them with the agency to program different activities in the public realm.

Empowerment can be understood as the increase in knowledge and access to the urban tools to achieve an active and transformation condition in the public space. Discussions on these proposals questions two fundamental aspects that remains very relevant to the concept of empowerment. The first one emphasises on the kit of parts approach to create a collaborative city. And the second one starts to question the potentials of constructing participatory conditions through 'information processing techniques'[86].

The increasing participatory culture emphasises on the design for different conditions of reality. So instead of designing final products, the kit of parts approach creates a democratic access to participation, and make it possible for the individuals and community to practice architecture in the shaping of their social experiences. Embedding a technological layer on the kit of parts, breaks down the barriers of access and allows it to respond to varied inputs and incorporate feedback that reflects meaningful participatory outcomes, that instils a sense of ownership and belonging for the citizens who engage with it.

Each of the three proposals plays a unique role in harnessing the capacity to cultivate new ideas and to mediate between different stakeholders in the Quayside public realm. The moveable kiosk not only helps users organize a range of spatial configuration, but also creates awareness of the micro climatic conditions in which it is installed. It builds a direct relation between social encounters, retail pop-up and outdoor comfort forming a link of sustainable framework within which the users practice programming based on their priorities.

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85 "Episode 10: Responsive Architecture - Sidewalk Talk - Medium." Accessed September 8, 2019. https://medium.com/sidewalk-talk/city-of-the-future-podcast-episode-10-responsive-architecture-3914ae11a75b.

86 Steenson, Molly Wright. 2017. Architectural Intelligence: How Designers and Architects Created the Digital Landscape. Cambridge, Mass: MIT Press., 5.

The plug-in furniture system is a set of democratic entities that primarily deals with social inclusion, emergent participation and sustainability. The furniture system is designed to operate within the existing design conditions of the Quayside fabric. The idea is to give something back to the realm that begins to motivate the users to build different social settings that does not pre-determine its use.

The Smart Post is a more complex, infrastructural move, that amplifies citizen empowerment to build profound three dimensional spaces. The idea resonates and expands on Antoine Picone's suggestion of 'spatial turn'[87] using digital technologies through geo-location and augmented reality that enhances interpretation of the physical space by overlaying interactive and contextual electronic content.

By adapting an embedded learning system, the Smart Post eliminates the need for expert intermediaries, as it is capable of fostering educational and participatory conditions that contributes to the documentation and enrichment of the urban experience.

Furthering with this line of inquiry, brings us to the idea of devising high agency, interactive architecture systems, whose central theme is about the construction of co-constitutive associations with the users by defining interactions that take place digitally. In the case of the Smart Post, setting up a nuanced and productive antagonism between user and the artefact becomes pivotal in encouraging creative spatial and social conditions. In doing so, the post and its sub-components are constantly being altered, modified, re-configured and scaled, which brings us to wonder, as Robin Boyd prompts,
'What kind of architecture is it, when the fact of its construction isn't the point of it?[88]

This perspective contributes to second theme of the thesis that starts to explore on the idea of constructing flows of information. In today's connected world, a new role of the designer emerges as a mediator and curator of social processes through the design of information exchanges between humans and urban artefacts, that allows for unprecedented participatory outcomes.

Looking at the proposals collectively within a larger framework in relation to the other parts of the Quayside fabric, they become nodes of information exchange, interfacing between the data and the physical space. In this mediated space, it can be seen that 'the movement or flows of information has a complementary effect on the physical movement.'[89] This informational mapping of social the processes brings a new kind of aesthetics and virtual dimension to the Quayside public realm.

87 Picon, Antoine. Smart Cities: A Spatialised Intelligence. Chiches ter, West Sussex: Wiley, 2015.14.

88 Steenson, Molly Wright. 2017. Architectural Intelligence: How Designers and Architects Created the Digital Landscape. Cambridge, Mass: MIT Press., 3.

89 Ibid., 9.

The thesis proposals aim to push the needle towards the future of participatory systems built on bridging the gap between pervasive technologies and physical built environments. As Mark Weiser mentions, "The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it."[90] Such a disappearance is a fundamental consequence not of the lack of representation of technology, but of better mediated communication that is as easy as human conversation.

It is imperative to note that the actual realization of the proposals has its own set of limitations that also gives rise to new issues and grey areas. As technologies starts questioning the permanence of the material city, it signifies for an important change in the fabric of the built forms. As Antoine Picone frames this condition as a main objective in his book titled Smart Cities: A Spatialised Intelligence, where he stresses on the need for re-imagining the physical structure of the city to facilitate the spatial qualities rendered by the pervasive technologies.

Although the physical form of the cities are not transformed, initiatives like the Smart Carpet, Quayside smart proposal are starting to further towards this direction, as they shed new lights on the opportunities for people to celebrate collective expression and demonstration through different modes of collaboration.
The other set of conflicts revolve around the moral and ethical outcomes of using participatory technologies. The emergent urban fabric combines both visible and invisible conditions. The invisible data (or) information influences the functioning of the physical experiences in real time. Bridging the gap between the physical and virtual space involves the design and programming of AI and algorithms as an integral part of this collaborative and responsive urbanism.

This opens up new debates on the implications of technological behaviour on human conditions. Some of the ambiguity questions the non- neutral character of the data being collected, machine learning programs that reflects and repeats based on certain parameters, etc. that have the potentials to fragment social clusters and urban experiences. Hence, current discussions emphasize on the need for more transparent and integrated functioning of the pervasive technology to foster objective and post-rational world of a cyborg life. Along with the contemporary trend towards participatory designs, the proposals discussed in the thesis aims to imagine a techno-optimistic vision of a collaborative city where humans and technological artefacts mutually co-exist without one being the determinant of the other.

90 Weiser, Mark. "The Computer for the 21st Century," n.d., 8.

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