Human and the Machine

another take on a hospital architecture

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Introduction

Current development in the healthcare sector shows a clear emphasis on the financial aspect of running the hospitals. We can trace this to the 1970's crisis and economic stagnation when many economists started introducing neoliberal views on economy.[1] In the Netherlands it led to slow erosion of the welfare state. In 1990's policy of "the purple coalition" significantly reduced number of beds and staff to stop increasing spending in healthcare.[2] In 2005 Dutch government almost completely shifted healthcare services to the private sector in order to cut costs and increase quality of services through competition of healthcare providers. Mergers between smaller institutions that are trying to stay afloat, construction of new big facilities outside the cities were land is cheaper or accelerating shift towards outpatient care and telemedicine are all signs of neoliberal outsourcing. "*The hospital director became manager. The doctors became staff. The patient became client*" [3] To picture this market-based trend, I quote a question asked by investment bank *Goldman Sachs* in the biotech research report: "*Is curing patients a sustainable business model".*[4] We can argue that hospitals reflect the mechanism in society, culture or economy.[5] If healthcare is market-driven, its architecture shows that.

The pandemic, although it has shown severe shortcomings and unpreparedness of our healthcare system, many specialists from the research sector predicts a further acceleration of the abovementioned trends in order to compensate financial exhaustion.[6] Emphasis on a outpatient care and telemedicine as ways prevent spread of contagious diseases by lowering contact between people favourably coincides with shifting responsibility for one's health from health-provider onto individual.

The most popular notion in healthcare design discourse is Evidence-Based Design which, by using "*best available evidence*" usually in the

[1] "Neoliberalism.", Encyclopaedia Britannica, accessed 24.05.2021, https://www.britannica.com/topic/neoliberalism

[2] Alex de Jong, "The Netherlands: Neoliberal Dreams in Times of Austerity - New Politics," *New Politics* XIV, no. 54 (2021). https://newpol.org/issue_post/netherlands-neoliberal-dreams-times-austerity/.

[3] "The current crisis had exposed the structural shortcomings of our healthcare systems", @dezeen, updated 2020-04-22, 2020, accessed 03.04.2021, 2021, https://www.dezeen.com/2020/04/22/coronavirus-shortcomings-healthcare-systems-reinier-de-graaf/.

[4] "Goldman Sachs asks in biotech research report: 'Is curing patients a sustainable business model?'," @CNBC, updated 2018-04-11, 2018, accessed 03.04.2021, 2021, https://www.cnbc.com/2018/04/11/goldman-asks-is-curing-patients-a-sustainable-business-model.html.

[5] B. L. Hansen, Architectural thinking in practice: A qualitative study of architectural practice seen from the view point of a refl ective practitioner, 2018

[6] "More hospital consolidation is expected post-pandemic," Helthcare Financial Managment Assosciation, 2021, accessed 24.03.2021, 2021, https://www.hfma.org/topics/news/2020/08/more-hospital-consolidation-is-expected-post-pandemic.html.

form of measured clinical outcome, revolutionized the healthcare design. The popularity of EBD finds its explanations also on the economic side. If architecture has a positive impact on patients health and can lead to short-stay or reduction in medication, it can also lead to savings. Late criticism of this thinking points to the dismissal of qualitative input or narrowness of research focus and calls for incorporating broader qualitative studies in healthcare design.[7]

While researchers and architects worldwide discuss post-covid hospital architecture's future, they often talk about capacities, flexibility, new technological requirements or infection prevention.[8] This outbreak – preparedness discourse which is purely functional and EBD which bases itself only on strict clinical input, do not consider information about socio-psychological aspects of good healthcare architecture examples. If hospitals are going to develop in a direction when physical contact would be limited to a minimum, or where the pandemic leaves a significant stigma on hospitals as unsafe places, then arise questions about extreme isolation, fear and exhaustion. Taking this observation and recent critique of EBD, I want to focus on more undervalued problems like the experiential and social aspect of future changes in the healthcare built environment.

Given the scope and timeline of the research and design project of my master thesis and the complexity of the hospital organization, I want to concentrate on a specific type of facility - Infectious Diseases Clinic. I believe that this choice of design focus is the most adequate in the pandemic context.

Considering outlined before trends in healthcare architecture and my design choice, I want to answer the question:

Which experiential and social qualities should be woven into the architectural brief of the post-covid hospital to ensure the positive experience of those who interact with it?

How can hospital architecture accommodate, different and often contrary needs of its users?

How can the physical environment facilitate bonding, empowerment and mechanisms of care?

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[7] Mahbub Rashid, "The Question of Knowledge in Evidence-Based Design for Healthcare Facilities: Limitations and Suggestions," *HERD: Health Environments Research & Design Journal* 6, no. 4 (2013),

[8] Christoper Booker, *How the pandemic is reshaping hospital architecture and design*, podcast audio, PBS NewsHour Weekend, accessed 15.03.2021, 2020, https://www.pbs.org/newshour/show/how-the-pandemic-is-reshaping-hospital-architecture-and-design.

Figure 1. Artistic interpretation of functional/technological aspects and cultural social beliefs about “healing environment” (Collage by author).

Theoretical framework

The hospital architecture's classical historiography speaks primarily about either technical advancement of architecture and beauty or progress in medicine and how these theories were applied to design.[9] Worth mentioning is that architecture historians and thinkers like Micheal Foucalt attribute the beginning of the hospital we know to the age of Enlightenment. Especially French philosopher wrote about the change of hospital from a place of dying to a place of cure.[10] Discussing the new concerns about improving the population's health in the 18th century, he introduced the term of "*Les machines a guerir*" – curing machines – a new hospital institution that served a collective purpose. [11]

Rapid technological advancements of the turn of the 19th and 20th centuries, like introductions of X-ray or the discovery of germs has dramatically technologized hospital architecture. Foucault discussions about the medical gaze, power and discipline[12] run parallelly to broader criticism of modernism, capitalism, objectification of human body and marginalisation of patients. Interestingly, the neoliberal economy mechanism that were applied healthcare and turned patient to a client somehow facilitated the changes in hospitals architecture. Although we can find first attempts into more humane environments in 19th century or modernism, it gained much bigger ground in late 20th century concepts of patient-centredness when patient-client well-being became a rising priority. Result was creation of hospital spaces by allusion or even illusion of hotels and shopping malls with the use of their segregation principles that prohibited patients from seeing negative process in hospital. [13]

Hospital architecture was also extensively examined in terms of its social relations. Researchers like Thomas Marcus or Kim Dovey has produced substantial research into how power, control or coercion materializes in buildings. They focus on clearly negative aspects of architecture's ability to frame relations between people; however, they acknowledge also the notions of bonding and empowerment, even if it is not a primary lens to them[14]. Looking at how architecture can produce positive relationships is then a valuable research goal.

Dramatical technologization of hospital architecture clearly fall into the bag of techno-scientific practices. Interesting is a feminist approach of authors like M. Puig de la Bellacasa to technoscience which incorporates notion of care to uncover marginalized by techno-scientific thinking practices. [15]

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[9] Noor Mens and Cor Wagenaar, *Health care architecture in the Netherlands* (Rotterdam: NAi Publishers, 2010).
[10] M. Foucault et al., "The incorporation of the hospital into modern technology," in *Space, Knowledge and Power: Foucault and Geography* (2012).
[11] Michel Foucault, "La politique de la santé au XVIIIe siècle," in *Les Machines à guérir : aux origines de l'hôpital moderne*, ed. Michel Foucault (Bruxelles: P. Mardaga, 1979).
[12] Michel Foucault, *The birth of the clinic* (London: Routledge, 2003).
[13] Victoria Bates, "'Humanizing' healthcare environments: architecture, art and design in modern hospitals," *Design for Health* 2, no. 1 (2018/01/02 2018),
[14] Kim Dovey, *Framing places : mediating power in built form*, 2nd ed. ed., The architext series, (London: Routledge, 2008).
[15] Maria Puig de la Bellacasa, "Making time for soil: Technoscientific futurity and the pace of

Furthermore, this critique of technoscience applied to profit-led architectural practices points out the overlooked ones that aim to "*enduring the society as a whole*" and show another view on sustainability.[16] In architectural practice, this implied valuing sustainability that is tied more to the vernacular and traditional rather than highly technological. [17] In my opinion, this criticism also provides arguments for exploring practices beyond the techno-scientific domain, the ones that are more cultural and local. However latest feminist approach do not values one approach over another. Peg Rawes uses distinction in to rationalistic and affective in order to critically engage with both of them[18]. Therefore looking into architectural care practices rejected by scientific design of healthcare could complement the second.

Nonetheless in techno-scientific world of healthcare predominant is evidence based design. Neoliberal aggressive emphasis on evidence – based medicine[19] required using evidence also in design. Roger Ulrich and his study of the impact of patient's window view on their well-being gave ground to anchoring dependency of hospital design decisions on measurable clinical outcomes.[20] We can see it as The late criticism of evidence-based design includes its mechanism to universalize solutions, diminishing patient subjectivity and solely depending on quantitative data with the rejection of the qualitative input.[21] This critique calls not for the abandonment of EBD but to complement its solutions with the ones coming from less tangible aspects of the built environment. We can here also draw a parallel to critical engagement of both affective and rationalistic practices.

Often, especially outside academic fields, the term EBD is treated almost as a synonym of "*healing environment*". What "*healing environment*" is hard to grasp, and some research proves that. Kirk Hamilton, a prominent EBD researcher, defines a healing environment as the one which is an effect of EBD and which healing or curing qualities were scientifically proven. [22] In their research into the Maggie's Centres, researchers from KU Leuven use the WHO definition of health, which includes physical, mental, and social well-being and emphasizes the two later parts as recommendations for design and research.[23] Birgitte Hansen proposes to understand the "*healing*

care," *Social Studies of Science* 45, no. 5 (2015/10/01 2015).

[16] P. Rawes and D. Spencer, "Material and rational feminisms: A contribution to humane architectures," in *Architecture and Feminisms: Ecologies, Economies, Technologies* (2017).

[17] P. Rawes, "Situated architectural historical ecologies," in *Forty Ways to Think About Architecture: Architectural History and Theory Today* (2014).

[18] P. Rawes and D. Spencer, "Material and rational feminisms: A contribution to humane architectures," in *Architecture and Feminisms: Ecologies, Economies, Technologies* (2017).

[19] Michele Eliason, "Neoliberalism and health," *ANS. Advances in nursing science* 38 (01/31 2015), https://doi.org/10.1097/ANS.0000000000000055.

[20] Cor Wagenaar and Noor Mens, *Hospitals : a Design Manual* (Basel/Berlin/Boston: Walter de Gruyter GmbH, 2018)

[21] Rashid, "The Question of Knowledge in Evidence-Based Design for Healthcare Facilities: Limitations and Suggestions."

[22] B. L. Hansen, "Why use research to inform design," *Berlage Papers*, no. 31 (2009).

[23] M. Annemans et al., "what makes an environment healing? Users and designer

environment" as a social construct. She bases it on cultural or social beliefs and assumptions of what healing is and shows that designers use them to inform their designs. Hansen furthermore points out the need for more qualitative research into the notion of healing environments.[24]

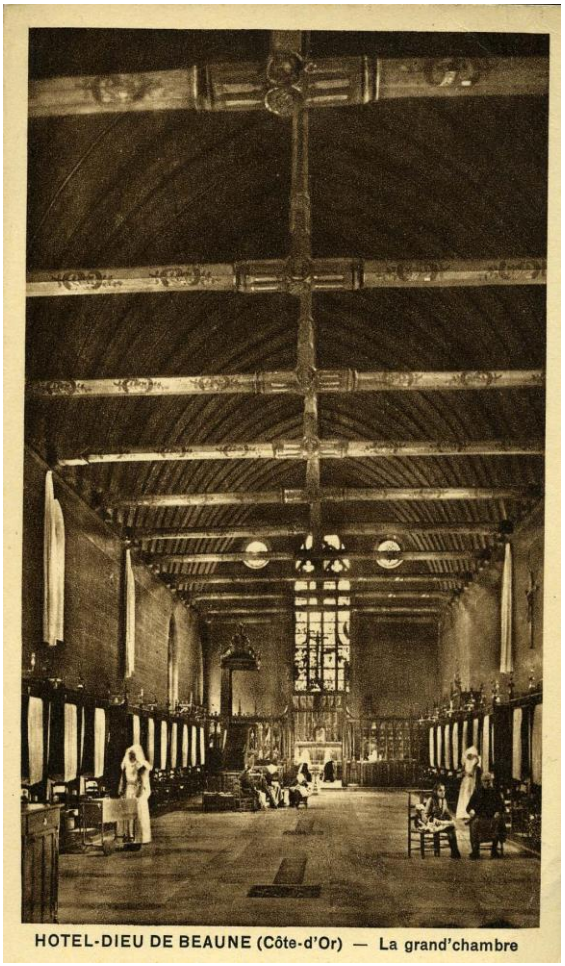

Figure 2. Grand Hall of Hotel – Dieu de Beaune – example of *forgotten* care practice

about the Maggie's Cancer Caring Centre London" (2012).

[24] Hansen, Architectural thinking in practice: A qualitative study of architectural practice seen from the view point of a refl ective practitioner.

Methodological positioning

The Evidence-based design usually focuses on a specific target group (group of patients with similar traits) in a specific place. This research's legitimacy lies in measuring the impact of the environment on clinical outcomes (like blood pressure or stress levels), and it usually measures a single aspect. [25] Some authors point out that this idea of using only quantitative methods dangerously reduces the physical aspect of architecture to numbers. In her research about danish hospitals, Hansen uses two interesting for me qualitative lenses –one of the social relations and one of the experiential aspects of architecture. [26]

To explore the ability of architecture to form social relations, authors like Thomas Marcus or Kim Dovey used space syntax. These are methods of diagramming space arrangement and patterns of people behaviour which allows to connect aspects of space and society in the analysis.[27] Marcus and Dovey also focus on language and narrative description as a way of complementing their research. They look at written sources like briefs and guidelines, trying to uncover relationships related to physical forms.[28] The look at the various dimensions like private/public, formal/informal, sightlines and rituals, boundaries and territoriality or hierarchies.[29] Their spatial syntax methods have a strong position in understanding how each space in a building and its entirety can frame power relations between people. However, it is too rational by reducing architecture to a simple diagram which does not look into social and experiential processes that could be a part of a healing.

The experiential lens adapted by Hansen looks at the subjective world of architecture experience. She studies spatial and material characteristics of architecture and in this regard she discusses questions about *Bachelard inspired* poetic experiences, memories, cultural beliefs and myths. To map this experiential aspects for a qualitative design, her research-method is based on verbal statements, visual material and field trips to studied objects.[30] Due to the emphasis on studying subjective experience, this methods helps to extend our knowledge how architecture affects our being beyond prevalent generalisation of how people feel in space. Furthermore it provide another layer to socio-psychological examination of healthcare spaces.

Valuable information about experiential and social aspects of architecture can be access through interviewing. That would encompass asking about how architecture impacts their feelings or emotions through its physical qualities and how their position within the structure of a hospital relates to others. Other

[25] Wagenaar and Mens, *Hospitals : a Design Manual*.
[26] Hansen, Architectural thinking in practice: A qualitative study of architectural practice seen from the view point of a refl ective practitioner.
[27] "Overview," UCL Space Syntax, UCL, 2021, accessed 24.05.2021, 2021, https://www.spacesyntax.online/overview-2/.
[28] Thomas A. Markus, *Buildings and power : freedom and control in the origin of modern building types* (London: Routledge, 1993).
[29] Dovey, *Framing places : mediating power in built form*.
[30] Hansen, Architectural thinking in practice: A qualitative study of architectural practice seen from the view point of a refl ective practitioner.

methods would include observing the users and analysing non-interactive sources like diaries or relations[31] In my approach this method would include questions about functional aspects of architecture but also the ones that consider feelings or emotions.

While we take a diagrammatic approach of a space syntax or discuss the architecture with their users we should have in depth understanding of its physical aspects. The study of the form and aesthetic through deconstruction, reduction would help uncover the meanings that physical aspects could have on a social relations and experience. It is also a matter of in depth understanding of architecture as a point of reference to these studies.

Method for examining an experiential aspect of architecture deals with the complicated problem of subjectivity. Each user's experience results from the multi-layered reality of social and cultural context, personal history and memory, moods and atmospheres in a physical space. It is a pool of endless possibilities.[32] Analysis of verbal statements alone without grounding them in a physical setting can be misleading. Therefore each oral information should be placed in a context not presented only in text.

In my project to answer the questions of experiential needs, I will examine in the first part architectural examples in the case study and in the second part, I will interview different hospital users. In the case study, I will use both the techniques of form study and space syntax. If possible, I will look at the available written information about the project or relations of it various users – from staff, patients to visitors if possible. I will prepare analytical drawings and 'thick' description with visual narrative to present and organize results. In the second part, I will emphasize interview outcomes and use imaginary to anchor answers in a physical context.

[31] Linda N. Groat and David Wang, *Architectural research methods* (2013).

[32] Hansen, Architectural thinking in practice: A qualitative study of architectural practice seen from the view point of a refl ective practitioner.

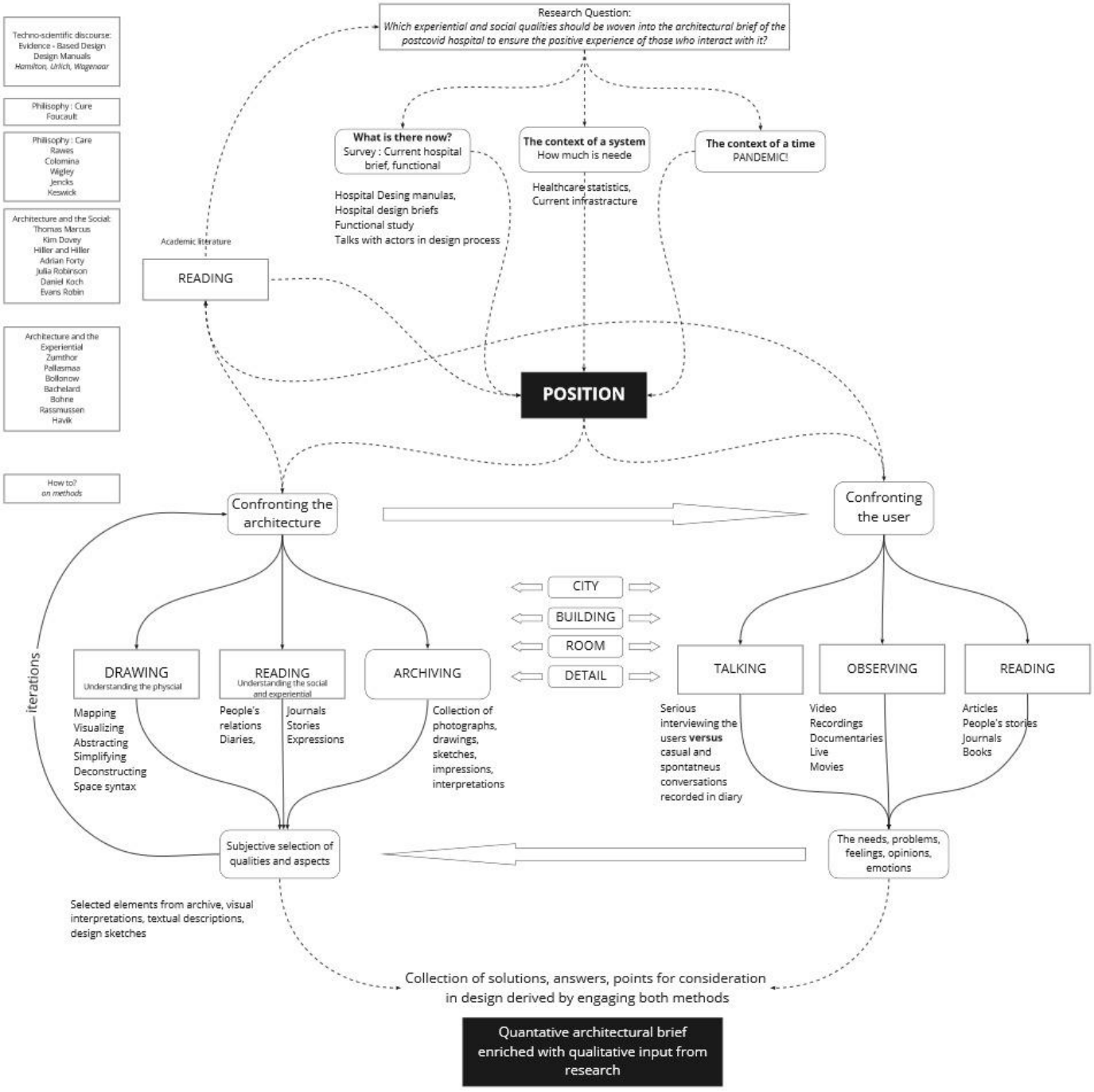

Figure 3. Research organisation diagram (drawing by author)

Conclusions

When dealing with subjective perspectives, especially in the experiential part of the study, we must know that their number can be limitless. This research will not exhaust them all. Instead, it is another endeavour to spark a change in healthcare architecture discourse and contribute to a trend that tries to look beyond numbers. It is important to note that every choice I make here is subjective, especially in qualitative research of subjective information. The question is how we can critically look at our position as researchers concerning the position of examined subjects.

Following my design decision to focus on the infectious diseases facility, I decided to follow two case study inquiry lines – the historical and contemporary. In each, it will be valuable to look at two different sets of examples. One set in each inquiry line could be related to the typology of the architecture of isolation and cure (which relates to the current crisis), and the second set would be more related to the architecture of *care*. On the one end of the scale, I would like to pursue examples of lazarettos, fever clinics and modern infectious diseases hospitals on the one end and medieval poor-relief institutions, prominent examples of humane healthcare architecture or public buildings of health and care like roman baths or sanatoria, on the other. An investigation into the recent cases would encompass the newest examples of infectious diseases clinics or the emergency responses to the Covid-19 pandemic and the architecture focused on *care* like rehabilitation clinics, care homes, or care centres.

Secondly, to map out the perspectives from the current Covid-19 crisis, the interview method will be a direct source of information. Further, I will combine this with constantly emerging people's relations of healthcare spaces experiences during the pandemic. Although they will not be related to specific case studies but rather to overall experience, I believe they can uncover valuable evidence.

Following latest feminist perspective, this research want to look from both rationalistic and affective perspectives. The idea is to engage with both of them critically. While working with such complex healthcare architecture, the multilayered approach that will use different lenses could help avoid fragmentation and singularity of results. Proposed two tactics – case study and interviewing - aim to paint a broader picture of the hospital, compare and collect different subjective perspectives. Through the deconstruction of its physicality, reduction to abstract diagram and user experiences analysis will paint an image of how these elements interact. The second method would be a reference point in understanding the pandemic reality. Crossing results from both will help find architectural solutions for questions about the future.

As an inexperienced researcher, I find designing research an iterative and almost organic process. Every preliminary attempt at the research I have made up to the point of writing this plan has led me to a new conclusion about how the next attempt should look. With every new iteration, I discover new ways in how I can revisit previous attempts. In the end, I can find myself constantly changing, altering and fine-tuning my approach along with the acquisition of new knowledge.

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