

The Role of Context in Media Architecture

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ABSTRACT

In this paper, we investigate the contextual characteristics of media architecture – parameters that impact its integration in the existing social fabric – from a socio-demographic (*environment*), technical (*content*) and architectural (*carrier*) perspective. Our analysis draws upon four real-world examples of media architecture, which have been specifically chosen to demonstrate a prototypical range of context-related symptoms, including a deliberate case of vandalism, the disconnection of a building-wide lighting installation, or the inappropriate integration of a screen on an existing architectural facade. In spite of its intrinsic ‘dynamic’ character, we conclude that media architecture seems not well prepared to adequately respond to changes in its context over time. As a result, we propose a set of guidelines that target all relevant stakeholders, ranging from architectural designers to content managers and public authorities, in an aim to improve media architecture’s acceptance and credibility, towards its long-term sustainability in our urban fabric.

Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors, Theory.

Keywords

Media Architecture, Urban Screen, Interaction Design, Social Space, Architecture, Urbanism, Public Display, Media Façade.

1. INTRODUCTION

The purposes of an architectural facade are multifold: next to its traditional function as a protective layer for preserving privacy and against climatic influences, it also represents a building’s cultural era and societal role. As such, a typical facade is subject to both cultural and architectural stylization, codetermining the perception of the building within the context of its location, considered on the scale of the street, the district or even the whole city [22]. Recent technological advances have allowed a facade to become separated from the load-bearing structure and to act more like an independent skin, creating the physical and conceptual space for carrying a range of external media, such as lighting and screens (e.g. showing moving images, graphics, text). Next to the changing nature of architectural facades, an increasing number of electronic displays are becoming embedded in the contemporary urban environment, ranging from simple advertising surfaces to

dedicated screens in trams or buses. We thus define media architecture as a field that comprises physical structures that utilize digital media to passively or interactively broadcast information to their immediate vicinity. Although the majority of existing media architecture seems to serve commercial, artistic or entertainment purposes, its potential cultural [17], social [5, 11], and technological [13, 25] values have already been discussed.

Our physical environment, in its ability to shape and represent the local standards and rules of social interaction, plays a crucial role in the construction and reflection of social behavior. For instance, moving through the city has always been a performative practice where the citizen interprets the surroundings for his own purposes and enjoyment [10]. Therefore, media architecture should avoid imposing any specific experience that fails to harmonize with the existing fabric, or to create an artificial reality on her own terms. Therefore, we believe that new knowledge is required to allow architects and urban planners to understand the full potential of ‘interactive’ systems over that of ‘reactive’ systems, so that the integration of media technology in our built environment will not suffer from the visual blindness and emotional disconnection that we know from current forms of public advertising. Here, interaction is interpreted beyond the direct man-machine loop and incorporates the indirect input of, and the influence on, the whole social, economic and urban context that surrounds media architecture. Through its public dimension, media architecture has the ability to reach beyond its obvious functional aspects, which it has in common with other human sciences. Through its particular way of expressing values, media architecture has the potential to stimulate and influence social life without necessarily presuming that it will promote social development.

Our research analyzes the contextual integration of media architecture within the social and societal settings that exist within the urban fabric. It aims to develop a theoretical foundation that allows it to transcend from a technological ‘gadget’ into a meaningful place-making medium that augments the architectural and urban qualities of a public space. The results of this research provide the first indications of the challenges that exist in successfully integrating media architecture in the urban fabric, in terms of media architecture’s 1) immediate and situational environment, 2) its physical carrier, and 3) the content it displays, as well as the transformation of these three aspects over time.

2. BACKGROUND

Media architecture has been promised to facilitate new patterns of use and socialization, by forming a relatively novel medium for interaction in public spaces [3] and the urban environment [4, 24]. The most obvious value of media architecture is its ability to augment social cohesion by acting as a conversation starter [1, 2, 21] and by increasing identity cognition and community feeling through the creation and sharing of content [19], resulting in the reinforcement of people’s social identity and civic pride [16]. Media architecture is therefore often seen as a catalyst that positively influences the frequency and quality of social activities in public space [12].

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Due to the challenging nature of embedding technology within a varying socio-cultural, public setting, designers should examine and explore the implications of the cultural influences that are inherent in design instead of articulating the implications for design that follow from some understandings of the social [9]. This implies that, in order for media facades to become better accepted in our society, its contextual parameters should be considered prior, and not consequent, to its design. One proposed approach towards increasing contextual integration to stimulate social interaction is by embedding *context-awareness*, i.e. a display's ability to deliver "the right information at the right time" [6]. This approach focuses on the technical recognition of human interaction patterns (e.g. presence detection, content suggestion), enabling the display to adapt its behavior to the specific characteristics of its social setting.

The role of context-awareness has been further investigated in a *Design Space Explorer* [8], which structures the aspects of material, form, location, situation, interaction, content, purpose and experience as possible scenarios to optimize design concepts, and align all project stakeholders. This topic has been further discussed in eight challenges for designing media facades [7], including considerations on integrating screens in the existing environment, on delivering suitable content (in terms of the medium and the interactions required) and on designing for a diversity of situations that might occur in the environment.

We build upon this research to describe context from a single model that encompasses the tangible as well as intangible influences that surround a media architecture installation, and base our findings on a set of existing, real-world examples. As a result, we focus more on the social and societal values that surround a public media intervention, and will conclude how these seem still to be undervalued in the media architecture practice.

3. ANALYZING THE CONTEXT OF MEDIA ARCHITECTURE

In order to address specific issues in the practice of media architecture, we argue that its contextual integration should be investigated from three different perspectives (see Figure 1): that what is *in front of*, *on* and *behind* the public display device or, respectively, 1) the environment in which the media architecture is implemented, 2) the actual content that is being communicated, and 3) the carrier that supports the display medium.

The **environment** is the immediate vicinity, comprising of the physical reality (e.g. buildings and materiality) as well as the people and their activities. Notably, this concept also uses less tangible parameters that describe the setting's actual condition, such as the socio-demographics, culture and overall atmosphere.

The **content** stands for the information that is shown, and includes any interpretation that might be generated from it. This concept consists of both the *messenger* (the technical means that are required to broadcast the information in the public realm: e.g. LED lights), and the *message* (the literal, visual representation and its implied meaning or interpretation).

The **carrier** includes those elements (e.g. a building, a square, a facade or ornament) that fulfill a supporting role in sustaining the broadcast medium, be it for structural, functional, or aesthetic reasons. Through the societal perception of its presence, a carrier has the potential to expand the expressiveness or even steer the interpretation of the content it displays.

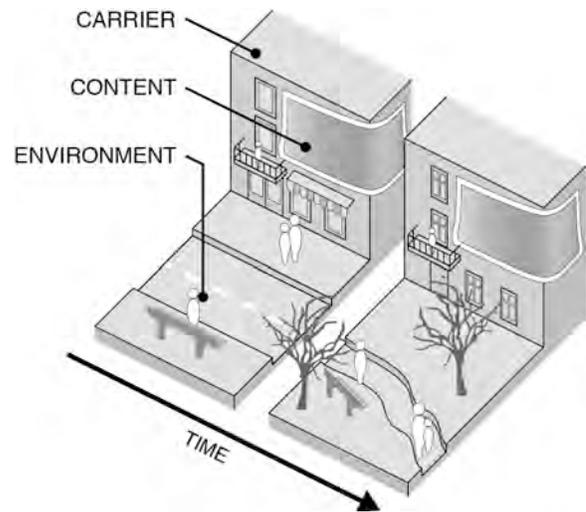


Figure 1. The potential change of context over time, in terms of carrier, content, and environment; resulting in the question how media architecture can adequately respond.

Although the three contextual characteristics are closely intertwined, we claim that each plays an independent role in understanding the *context* that surrounds a particular media architecture installation. For instance, the same content (e.g. the number of passing bicycles) conveyed in the same environment (e.g. city neighborhood), may be interpreted differently for a different carrier (e.g. facade of an environmental organization's headquarters vs. that of a hospital). Similarly, showing identical content (e.g. luxury product advertising) on an identical carrier (e.g. bus stop) will result in a different understanding for a different environment (e.g. situated in a shopping quarter vs. an impoverished neighborhood).

In addition, many transformations of the urban environment over time are likely to impact the context of a media architecture installation. For instance, an architectural adjustment of the carrier (e.g. providing more voids in a facade, affecting the mounting possibilities for display devices) is likely to result in modified contents (e.g. displaying several separate commercials instead of one large-scale advertisement). Likewise, a future change in displayed contents (e.g. commercial content instead of relevant public messages) may result in altered perception towards the display's carrier (e.g. disinterest from nearby residents towards the building's owners). This hints at media architecture's intrinsic dynamism, unlike the predominantly static nature of architecture.

4. CASE STUDY ANALYSIS

We present four real-world cases that demonstrate the different dimensions of media architecture's context. Each case has been specifically selected to be of relatively consistent size, content and scale. The description and analysis of each case is founded on a series of open-ended interviews with respective stakeholders, such as the professionals involved in the design process, the interaction designers and the content managers (see also the acknowledgements section). The environmental situation was analyzed through observations during in-situ visits, the consultation of relevant press reports, as well as open-ended interviews with residents and passers-by. Each so-called '*symptom*' situates a specific contextual issue that has been observed by either a stakeholder we interviewed, or has been reported by third-party sources like newspapers or online blogs.



Figure 2. Vandalized media screen on Flagey Square, Brussels
(© Brussel Nieuws [20]).

4.1 Media Screen Flagey Square, 2008

Environment. This LED screen, operated by *Belgian Posters*, is located in a corner of a large public square in the agglomeration of Brussels, Belgium. This particular municipality is characterized by a high percentage of foreign origin inhabitants (87% vs. 22% nationwide, 2008), and higher than average rate of unemployment (17% vs. 8% nationwide, 2010).

Carrier. The screen forms part of a public square that fulfills an important local socio-cultural purpose, serving as a shared outdoor area for many local residents.

Content. The LED screen, oriented towards the open square, has a 12m² display area, at a resolution of 320x240px. On rare occasions, the screen has been used for film screenings or festivals [18]. However, the content is mostly delivered to the operators by the municipality, resulting into announcements of cultural or municipal interest, such as about events in upper-class shopping streets, or information about the local parking policy.

Symptom. This screen stands out for at least three press-reported acts of vandalism (e.g. [20]). In 2009, the electronic cabling was set on fire, and on two separate occasions the screen was covered in paint (see Figure 2). The arson was followed by an anonymous poster campaign that mentioned ‘*we will resist any commercial invasion*’ and negatively referred to the ‘*praising of luxury shops*’.

4.2 Dexia Tower, 2006

Environment. The *Dexia Tower* skyscraper is located in a major business district near the center of Brussels, along one of its main access roads. The area is sparsely populated, and at night often plagued by crime and violence.

Carrier. The 145m tall high-rise houses the global headquarters of one of Belgium’s major banks and its subsidiaries. Because of its physical and visual prominence, the building acts as a widely recognized landmark in the city (see Figure 3).

Content. Each of the 4,200 windows has been equipped with 12 RGB LED-lights that are individually controllable, resulting in a total resolution of 160x45px, wrapped around the building’s facades [14]. The lighting concept, developed by the lighting design studio of Barbara Hediger, aimed at visualizing dynamic and abstract messages with a large urban impact. Accordingly, the tower has been the subject of several artistic media installations, mostly initiated by the interdisciplinary design office *Lab[au]*.



Figure 3. Dexia Tower, Brussels displaying the *Weather Tower* art installation, turning weather data into abstract form.

Symptom. In 2008, the *Dexia Tower* display has been turned off, except for a sporadic 10-minute animation that essentially consists of the default demonstration of the original hardware installation. Interviews with the media installation’s designers revealed that the 2008 financial crisis (and the dramatic collapse of the *Dexia Group* in 2011), has led the bank to conclude that the societal perception towards the company had fundamentally changed.

4.3 AB InBev Display, 2009

Environment. The screen is mounted on a modern office building located in an old, but fully redeveloping industrial site at the northern edge of Leuven, Belgium. Notably, the screen was installed 4 years after the inauguration of the building.

Carrier. The building houses the global headquarters of the world’s biggest brewer, *AB InBev*. Mounted in the top left corner of its northwestern facade (see Figure 4), the screen is perpendicular to a busy ring road that runs alongside. The brick building is characterized by a strong architectural language, which reflects the former industrial environment.

Content. The 3.2x6.7m LED display offers a resolution of up to 160x336px. *AB InBev* manages the content, which primarily consists of their televised beer commercials or the company logo.

Symptoms. The building’s lead architect was not involved in deciding upon the placement of the screen. He stated the screen’s location on the facade seems aesthetically out of place in comparison to the proportionality and the grid-like layout of the building’s features, silhouette, windows and voids.

4.4 Beeld van Den Haag, 2010

Environment. The 132m *Het Strijkijzer (The Iron)* skyscraper is located next to the main train station of The Hague, The Netherlands, and adjacent to one of the city’s main access roads.

Carrier. The building contains mainly apartment units, and stands prominently apart for its height in an environment otherwise characterized by low-rise housing. The screen itself is located on an 80m high horizontal volume of the northeast facade, which is oriented away from the train station (see Figure 5).

Content. The 266m², 1024x768px LED display consists of a series of horizontal LED strips that are architecturally integrated on the inside of the building because of installation comfort as well as legal issues (as it became an interior projection). Since late



Figure 4. LED screen mounted on AB InBev's headquarters in Leuven, Belgium.

2011, when content management company *Ngage Media* took over responsibility, the screen aims to function as a 'public notice board' and a 'situated display' that responds to relevant and timely events in its immediate vicinity.

Symptom. Five months after its inauguration, the display still shows mostly traditional ad commercials, and little to no 'contextual' content. The most obvious reason as provided by the content provider is that advertisers are still inexperienced with the concept of contextual advertising shown on a public display.

5. DISCUSSION

The four case studies are discussed as a function of the contextual characteristics we have proposed in Section 3, in order to analyze and learn from each project's contextual symptoms.

5.1 The role of the environment

The vandalism that occurred at the *Media Screen Flagey Square* reveals the contrasting interests of media architecture and its local environment, and how it should be sensitive towards the socio-cultural environment that surrounds it. Notably, a public environment's socio-cultural context evolves over time; if not over decades in terms of population turnover, then at least during the timespan of an ordinary weekday: as work commuters might be considered as the ideal customers for a specific luxury event or a skin revealing product, the same message might be interpreted as provocative for those 'users' that actually inhabit and use the environment during the many hours when commuters have left.

Investigations on context-awareness in media architecture are often limited to recognizing 'users' by their physical or social characteristics (e.g. age or gender, counting people [6]) or their activity patterns (e.g. collective action by participants, dialogue, shared focus, distributed attention [15]). Yet, context might well involve intangible or tacit aspects that are relatively complex to computationally capture or evaluate, such as religious beliefs, financial purchasing power or employment status. Content creators should thus become more conscious of the impact of the socio-cultural context, for instance by surveying or actively involving the inhabitants to determine, or at least agreeing on, the content shown. The value of citizen participation should be particularly obvious for the content shown during those times of day that the local population is the only recognizable 'user'.

Inhabitant participation also has the ability to empower citizens to create an impact on their own environment. For instance, for the *Media Screen Flagey Square*, local residents were dismissive



Figure 5. Integrated LED screen mounted on *Het Strijkijzer* in The Hague.

about the messages that related to a financial or cultural reality that did not correspond to their own, although they were enthusiastic about a series of interactive artworks displayed during a recent *Media Facades Festival*. The most frequently mentioned appraisals were the works' surprising and funny nature, the possibility for all age groups to engage and participate, and their complete dissociation from a specific socio-cultural background.

One can therefore imagine that the design of media facades and their content should be motivated by, and founded on, a detailed analysis of the existing socio-cultural fabric. While the official approval for architectural or urban interventions always involves some sort of site analysis, the same might be made applicable for media architecture, which holds the potential to have a similar, if not greater, impact on the environment than the physical building itself. Such an initiative may necessitate the approval of a validated methodology, the involvement of advisory media architecture commissions that include local stakeholders, or the mandatory inclusion of easily accessible feedback loops that allow the local population to voice their concerns or propose changes.

Ensuring the 'acceptance' of media architecture involves becoming sensitive to the socio-cultural reality in its immediate vicinity, in addition to how this reality evolves over time (from minutes to decades). Next to appropriate analyses, this sensitivity might involve the active involvement of the local population, or at least the inclusion of explicit feedback channels of the 'users'.

5.2 The role of the carrier

While most media architecture research focuses on the content or technological advances that enable the architectural display, the role of the 'carrier' of the media should not be overlooked.

5.2.1 Architectural Integration

By way of its wide-ranging and aesthetic appeal, the elegant architectural integration of media architecture plays an important role in determining the perceived quality of its physical surroundings. The lack of architectural integration of *AB InBev's* display can be largely explained by its installation well after the building's completion date, and the exclusion of the original architect during its conception. This case therefore demonstrates the responsibilities of architecture (in terms of design rationale) and urbanism (in terms of regulation) in the emerging media architecture phenomenon, even by pro-actively engaging the possibility that some sort of media installation might be added well after the full construction of a building or a neighborhood. This issue might even be more apparent for a building that

exemplifies an exceptional architectural quality: making any well-suited media addition to a strong, expressive or well-balanced layout is considerably more complex than mounting a rectangular surface on the largest open space of the facade that is available.

Therefore, we propose that research should involve new ways to make architects and urban designers actively aware of both the opportunities and complexities of integrating media architecture in an existing physical context. Such an introduction should be sensitive to both best-of-practice as well as less successful examples, and clearly define the responsibilities of all building stakeholders in terms of media architecture, even when no media architecture was originally planned.

Ensuring the 'architectural' quality of media architecture involves the pro-active consideration of its potential presence during the planning of architectural or urban interventions, even when it is not yet planned or even anticipated by the stakeholders.

5.2.2 Societal Integration

The impact of media architecture reaches beyond its manifestation in public space, and should incorporate its presence within a broader, societal reality. For instance, the radical decision to disconnect the media facade of the *Dexia Tower* has demonstrated that in spite of no physical, contextual changes on the site, the perception of the carrier had a dramatic and decisive impact on the media architecture. The *Dexia Tower* is in itself just a building, but also acts as one of the main public representations of a banking institution, which unfortunately includes all the subjective connotations that have dramatically changed in recent years. The impact of public perception on media architecture reveals a gap between the inherent timelessness and robustness of architecture, which does not allow any action that is similar to "turning something off" (with the exception of demolishing a building or abandoning the premises), versus the quite casual act of removing the content on a display medium. It also highlights the current apparent public perception of media architecture as a gadget, a purely aesthetic embellishment that can be easily turned off, regardless of its architectural and spatial experience for which it was originally conceived, funded and built.

These observations are in contrast to the belief that media architecture should be fully integrated, that is become an almost indispensable part of the architectural quality of a building, and the urban fabric it co-determines. Turning off media architecture has wider implications than making it invisible to the outside world. It has an impact on at least the social, cultural, economic, architectural and urban scale, such as in neglecting the opportunity to convey a public message (social scale), removing the opportunity to act as a canvas for artistic expression (cultural scale), impacting the revenue of businesses that might rely on its place-making abilities (economic scale), denying the responsibility to continue to add value towards the experience of the space it determines (architectural scale), and dismissing its position in the city as a persistent orientation point for residents, tourists and commuters alike (urban scale). Moreover, as the *Dexia Bank* has understandably only metaphorically meant to revert back to its 'core' business, it has now become a real challenge to overcome such loaded motives when the media architecture will ever be switched back 'on': should this then be interpreted as reverting back to its non-core business?

The core of this issue is determined by the societal perception of media architecture as a superfluous gimmick, in particular in terms of not appreciating the broader role of media architecture. More research is required to determine the real impact of media architecture in all its facets, to be able to demonstrate its true

social value that reaches beyond providing the public with dynamic forms of light emissions. Here, media architecture could potentially benefit from the concepts and theories of architectural sustainability [23] in order to optimize its lifespan: for instance, media architecture should allow for flexibility in set-up and use, thereby transcending any initially prescribed forms of ownership and inhabitation of the building. This could be outlined in voluntary but interminable commitments or building regulations, issued and monitored by public authorities.

Ensuring the 'durability' of media architecture involves objectively determining its true impact in society beyond its obvious visceral and visual effects, involving, but not limited to, its social, cultural, economic, architectural and urban implications. Such an analysis should also consider how potential societal changes over time might influence these implications.

5.3 The role of content

The inherent 'dynamic' nature of media architecture suggests its use for innovative approaches in terms of the contents it can display. However, immediately after its inauguration, the operators of *Beeld van Den Haag* were confronted with an absence of content and readily available mechanisms that allowed alternative usages of the display. This lack of content ultimately resulted in the temporary discontinuation of the screen. Remarkably, the act of disabling a new media architecture installation for a lack of content contrasts the detailed care and relatively long timespan that is required to conceptualize, receive permission for, fund and construct it. One may wonder if media architecture can really become an intrinsic part of the architectural or urban fabric, if the management of its contents is treated as an afterthought during the building's comprehensive development process. The later involvement of content managers relaunched the *Beeld van Den Haag* display, which resulted in the temporary measure of displaying traditional televised commercials and public messages (e.g. time of day, weather forecast, tweets about Den Haag). However, it is still the question how we can measure the 'quality' of media architecture's content, and how the perception of its quality might affect its impact, ranging from its social acceptance to the architectural integration.

We argue that new methods or tools are required to overcome the obvious availability and quality issues with content, in particular for media architecture that reaches beyond the broadcasting of commercial messages. Ideally, such methods or tools should be applied well before its actual construction, and be sufficiently robust to guarantee the continuity of content throughout the total lifespan of media architecture. The obvious stakeholders in media architecture encompass at least its designer, the carrier's owner and designer, and those involved in its content design and maintenance. Architects may ask the power or need guidelines on how to optimally co-determine the content while respecting the carrier's architectural expression, whereas operators and owners may wish for ways to overcome repetition and to assure the appropriate message for the right people. The 'users', i.e. inhabitants and passers-by alike, should become more involved in voicing their opinions in what the content should, or should not, consist of. Such methods might include ways to analyze and foresee how such 'users' are likely to perceive media architecture, and should test the validity of assumptions on how content is experienced by actual people in real life. Taking into consideration an open communication of all the motives of the stakeholders should lead to content that positively contributes to the carrier's architectural value, causing a positive reception from people, while still maintaining a healthy commercial revenue.

Ensuring the 'quality' of media architecture involves a considerate and open approach that takes into account the motives of all stakeholders, inclusive of the aesthetic wishes of the architect, the commercial intentions of content managers, and the subjective concerns of 'users'.

6. CONCLUSION

The 'symptoms' mentioned in this research involve the apparent inability of media architecture to adequately respond to contextual changes in its environment, its carrier or its content. More specifically, the cases show how media architecture can be vandalized due to *changes* in socio-cultural sensitivity of its passers-by (5.1); can be misaligned in a distinctive architectural grid due to its installation *after* the building's completion (5.2.1); can be disconnected due to a drastic *change* in the societal perception of its carrier building (5.2.2); and can display no, or no original, content due to a lack of *timely* planning (5.3). Despite the inherent 'dynamic' character of media architecture, that is its theoretical ability to show anything, at any point in time, on any sort of surface, it is still confronted by issues of inadequate and inconsiderate integration when its context tends to change. Moreover, in spite of its claimed social, cultural, economic, architectural and urban qualities, media architecture is still considered as an embellishment, an artifact that can simply be added or switched off, or display no, or inappropriate, content.

In this paper, we have proposed three contextual parameters to describe these context-related symptoms of media architecture: the environment in which media architecture resides, the content that is displayed, and the carrier that supports it. Based on the analysis of four real-world case studies, we have proposed a set of guidelines for the design of media architecture, aiming for 1) a sensitivity towards the social-cultural aspects in its environment, 2) a durable architectural and societal integration, and 3) early consideration and continuity in providing qualitative content. These issues should not be considered as isolated elements, but as intertwined concerns that require a systematic approach.

The analysis of context-related symptoms in this paper has indicated the dynamic complexity of the urban environment and the need to thoroughly reflect on the context of media architecture, including its environment, carrier and content. This should ideally happen during the design process of any sizeable architectural or urban development, prior to its approval or actual construction, even when the installation of a media architecture installation was not originally planned. Accordingly, stakeholders should actively consider how context can become an intrinsic part of any media architecture design process, in order to enhance its general credibility and, hence, its survival and sustainability throughout the next generations. Additional research should lead to new evaluation methods that measure the real value and potential of media architecture, by building upon the further analysis of real-world cases in a variety of complex urban contexts. This will include analyzing the typical design processes, capturing the actual perception by the general audience and determining its real impact on the urban fabric.

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