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Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures

Editors

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Editorial

Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures

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Abstract
This editorial introduces the subject matter of the thematic issue, which includes a diverse collection of contributions from authors in various disciplines including, history, architecture, planning, sociology and geography. Within the context of mediatisation processes—and the increased use of ever-expanding I&C technologies—communication has undergone profound changes. As such, this thematic issue will discuss how far (digital) media tools and their social uses in urban design and planning have impacted the visualisation of urban imaginations and how urban futures are thereby communicatively produced. Referring to an approach originating from the media and communication sciences, the authors begin with an outline of the core concepts of mediatisation and digitalisation. They suggest how the term 'visualisation' can be conceived and, against this background, based upon the sociological approach of communicative constructivism, a proposal is offered, which diverges from traditional methods of conceptualising visualisations: Instead, it highlights the need for a greater consideration towards the active role of creators (e.g., planners) and recipients (e.g., stakeholders) as well as the distinctive techniques of communication involved (e.g., a specific digital planning tools). The authors in this issue illustrate how communicative construction, particularly the visual construction of urban futures, can be understood, depending upon the kind of social actors as well as the means of communication involved. The editorial concludes with a summary of the main arguments and core results presented.

Keywords
digital tools; mediatisation; urban planning and design; visual communication; visualisations

Issue
This editorial is part of the issue "Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures" edited by Gabriela Christmann (Leibniz Institute for Research on Society and Space, Germany), Christoph Bernhardt (Leibniz Institute for Research on Society and Space, Germany) and Jörg Stollmann (TU Berlin, Germany).

1. Introduction

Since the second half of the 19th century, urban design and planning for emerging modern industrial societies has been assigned the task of shaping and structuring future spaces in built, infrastructural, as well as economic and social environments. The ways in which this task has been approached has always been subject to change

(Christmann, Ibert, Jessen, & Walther, 2017, p. 247). In our thematic issue, we focus on changes resulting from the mediatisation of planning processes. Mediatisation is the increased development and usage of new technologies and media that shape our day-to-day life and work, with digitalisation acting as a single aspect of the process. In the history of planning and urban design, planners and architects have always employed a variety of the latest innovative media tools to create, communicate and visualise their imaginings of urban futures (Carpentier & Dahlgren, 2014). Examples of which, include the development of new ways of model-building and photographic presentation since 1910, the creation of new forms of exhibition after 1945 and the integration of the latest digital I&C technologies (and also of complex visualisations) in the present (Frey, Lampugnani, & Perotti, 2005). A crucial question that the Thematic Issue will explore is, how can the visual communication and creation of urban imaginations be described in a context where manifold analogue as well as digital media tools for planning are available and used? Based on the assumption that new technologies may shape communication processes in a profound manner (Couldry et al., 2014; Hepp, Hjarvard, & Lundby, 2015), we interrogate the extent to which (digital) media tools and their social uses have impacted the conceptualisation of urban imaginations and how urban futures are communicatively constructed.

The authors included in this issue specialise in a variety of disciplines including history, architecture, planning, sociology as well as geography and cover a broad range of case studies from all over the globe, in places such as Germany, The Netherlands, the United Kingdom, Egypt, and South Africa. They will examine planners' practices, asking how their (digital) visual tools have changed, how the tools influence the way in which planning professionals work and thereby create urban futures.

A remarkable material change in planning practices and communication has occurred since the 1970s. Since then, aspects of marketing, identity management and citizen involvement have been increasingly integrated into the planning process, which has substantially expanded the tasks associated with planning, both in terms of procedures and content (Batty, 1991; Pinto, 2014). Furthermore, since the 1990s the social and planning sciences have taken the 'communicative turn' (Healey, 1992, 1997), a characteristic feature of which sees planners with redefined roles as process initiators, mediators, or simply, as participants. The development of the first digital technologies during this period resulted in modified ways of engaging publics by using digitally produced visualisations such as plans, maps, computer-aided design drawings, 2D or 3D simulations of urban environments (e.g., Corner, 1999; Lange, 2011). In line with the development of the Web 2.0 in the 2000s, a variety of digital tools were created to facilitate interactive communication (Tambouris et al., 2013).

Meanwhile considerable research has been undertaken in the field of communicative planning (Fischer & Gottweis, 2012; Healey, 1997; Innes, 1995; Innes & Booher, 1999; Milz, 2019), particularly on e-participation (Al-Kodmany, Betancur, & Vidyarthi, 2012; Carpentier & Dahlgren, 2014; Donders, Hartmann, & Kokx, 2014; Falco & Kleinhans, 2018; Wilson, Tewdwr-Jones, & Comber, 2019) as well as on smart cities (Carvalho, 2015; Datta, 2015; Hollands, 2008; Karvonen, Cook, & Haarstad, 2020; Kitchin, 2014; Townsend, 2013).

What is conspicuous, however, is that digital and visual forms of communication in urban design and planning—as well as the negotiation of urban imaginations that can be found therein—are still underresearched. With regard to visualisations, if they are considered at all, it is assumed without question that they create publicity, evidence as well as transparency and serve as instruments to promote participation (Hasler, Chenal, & Soutter, 2017; Tambouris et al., 2013). However, these assumptions are largely unexamined. Little is known about the past and present uses or about the effects of analogue and digitalised visualisations within urban design and planning. Therefore, the thematic issue will address these gaps.

In the following sections of this editorial we will outline the wider conceptual background of mediatisations, digitalisations, visualisations and the creation of urban futures for the field of urban design and planning. We aim to accurately determine the facets of the topic area and the context of the individual contributions. This will be accomplished by introducing the concepts of mediatisation and digitalisation in Section 2. In Section 3 we will then suggest how the term 'visualisation' can be conceived of in general and, more specifically, in the context of urban design and planning. We will discuss the different aspects that should be taken into consideration when looking at visualisations in urban design and planning more systematically. Also, the role of visualisations and the contribution that they may make to the communicative construction of urban futures will be reflected. Against this background, in Section 4 we will sketch the main arguments and results of each article in the Thematic Issue. Section 5 of our introductory contribution will conclude.

2. Mediatisation and Digitalisation in Urban Design and Planning

The premise of the thematic issue grapples with a popular notion in communication science, which has observed the rapid development of extensive mediatisation—and more recently, digitalisation—of communication processes over the years. Across societal systems, people have been increasingly exposed to media and technologies, both analogue and digital (Hepp, 2020; Hepp et al., 2015; Krotz, 2001, 2007). As a consequence, the increased usage and experience of these novel tools has catalysed changes in human behaviour, particularly the way individuals, communities, professions, institutions and organisations communicate and work. It is believed

that such changes may have also influenced the organisation of our social world, our living environment and even spatial arrangements. As such, some scholars have argued that mediatisation and digitalisation processes have led to a "re-figuration of spaces" (Knoblauch & Löw, 2017, p. 3). The fact that social actors (e.g., architects and planners) can be (virtually) present in several places simultaneously and that, depending on the media they apply, they are able to act in various forms of translocality, illustrates this argument. Indeed, there is increased evidence that mediatised (and digitised) communication may result in different experiences, forms of knowledge, ways of acting, social processes and possibly different constructions of reality.

A particularly fascinating topic in current research on mediatisations is the emergence of digital media and technologies. Arguably, digitalisation has been the most disruptive moment within the process of mediatisation; as such, the historic process of mediatisations should not be considered as one that is simple linear, but rather as one that has developed in 'waves,' which are responsible for triggering fundamental changes—be it for media environments or societies at large. Today's typical media environments are extremely manifold (Hepp, 2020, p. 5). Existing analogue media continues to undergo further development due to the diverse, ever-changing digital media and technologies, with which it bears a close connection. Given that media are growing increasingly computerised, a 'deep mediatisation' can be observed according to Hepp (2020, p. 5). The concept 'deep mediatisation' refers to an advanced stage of the mediatisation process "in which all elements of our social world are intricately related to digital media and their underlying infrastructures" (Hepp, 2020, p. 5). Even objects that are not traditionally considered as media, such as a car, are made media by virtue of their digital connectivity. Another crucial characteristic of digital technologies is that they are software-based, i.e., automated by means of algorithms, and that they automatically generate data while they are used for information and communication purposes. Therefore, algorithms and automated data processing have agency and become actants in the mediated construction of the social world (Latour, 2005).

The adoption of planning information systems, which provide a diversity of space-related data, maps and models in digital form, indicates that deep mediatisation has taken place in urban design and planning. In this domain, the data are prepared in a way that the tasks of monitoring (i.e., the description of past and present processes) as well as of forecasting future developments are supported (Shen, 2012; Wegener, 2001). Planning information systems include geographic information systems which provide data on a variety of physical elements (e.g., buildings, streets, airstreams, etc.) as well as on social processes on the space (e.g., population development, traffic development) for the purpose of analysing and processing data as well as using it as a model to simulate and/or present certain scenarios (Fang, Shandas, & Arriaga Cordero, 2014). Based on the data obtained, computer-aided mapping supports the creation and improvement of maps, which can then be transferred to CAD programmes for urban design.

As indicated above, digital tools have also found their way into design planning, where built environments are designed in aesthetic terms. Former analogue methods have been transferred to computer systems. After undergoing further modifications, they have revolutionised urban design in the form of applications, such as CAD or CAAD (computer-aided architectural design). These computer programmes also contain presentation techniques that create impressive virtual 2D or 3D simulations or city models where the aesthetic qualities of architectural design come alive (Al-Kodmany, 2002; Czerkauer-Yamu & Voigt, 2016; Lovett, Appleton, Warren-Kretzschmar, & von Haaren, 2015; Yin & Shiode, 2014).

Such presentations have generated new means of communicating with stakeholders. Together with the opportunities offered by the Internet, it has become possible to provide extensive information that clearly illustrates changes in urban environments, while at the same time, promoting further inclusion of inhabitants in the planning process.

Previous research on these developments, however, tends toward the pragmatic as opposed to the analytical and theoretical. As a rule, this work primarily reports on options for optimisation of these digital tools in a more practical manner.

3. Visualisations and the Communicative Construction of Spaces

When discussing visualisations, such as drawings, photographs, 2D and 3D simulations or city models, etc., it is necessary to clarify that, unlike language or texts, they depict visual characteristics of an object, whether it comes from the past, present or future. Therefore, the visual depiction should not be confused with an (objective) representation of the object, which is a surprising trend amongst authors working with visualisations (e.g., Rose, 2018, in her contribution on representation and mediation). Although we may conceive of a relation of similarity between an object and its visualisation (e.g., in a photograph showing a building of the present), a visualisation does not objectively capture 'the' reality of the object. Rather, the visualisation shows 'a visual' reality (e.g., of a built environment). For example, even in a photographic (or photo-realistic) depiction of a built environment, spatial dimensions are typically reduced to a surface; furthermore, angles, selections of the whole setting and photo-technical modifications have their own distinct effects.

Phenomenologically speaking, a visualisation must then be conceived of as a depiction of an object by which the visibility of the object not being present is actively produced—both by the creator(s) of the visualisation (e.g., by a photographer or a designer) and

through a particular visual means (e.g., a camera and/or computer-assisted design software). At the same time, viewers must also be seen as producers of visualisations. The phenomenological concept of visualisation includes the notion that the object that is not physically present is "appresented" in the mind of the onlooker (Schutz & Luckmann, 1989, pp. 131–135; see also Christmann, 2008, para. 6). In other words, the object that is not present is regarded as being ap-presented by visualisations rather than as re-presented. The term 'appresentation' implies that social actors have a particular knowledge about individual objects (as well as the means of creating the visualisations), which is included in the process of seeing and interpreting a visualisation. By deciphering or decoding visualisations and activating their knowledge, viewers become an integral part of the visual process. Thus, the phenomenological approach takes into consideration the active role that creators and viewers have regarding the use of and exposure to visualisations, unlike the former traditional manner of conceiving visualisations, which keep this role somewhat hidden.

Based largely on socio-phenomenological thoughts, the sociological approach of communicative constructivism (Knoblauch, 2019) suggests that (depending upon the kind of social actors as well as the means of communication involved) communications contribute to the social 'construction' of (respective) 'realities.' There, the meaning of the term, 'communication,' extends far beyond the use of language and texts through the usage of verbal and non-verbal signs, bodies, physical things, technologies, visualisations, etc. An important point to take away however, is that the more distinct concept concerning the "communicative construction of spaces" (Christmann, 2020) applies the general approach of communicative constructivism to spatial theory and conceives communicative action, including visual communication, as a fundamental element in the construction of past, present or future spaces. It can explain how actors' ideas and visualisations related to space are promoted, contested and negotiated within complex actor constellations, how it becomes possible for such interpretations to be and how they can shape the visions of urban futures, as well as the will to materialise them. For the investigation of urban futures, the concept suggests a detailed empirical analysis of communicative negotiation processes, including communicative practices of visualisations.

Communicative practices of visualising urban futures can only be analysed adequately when a critical perspective is applied towards the analysis of implicit visual cultures of the planning and design professions as well as stakeholders. We must be aware of the fact that the immanent meaning of a visualisation also touches on questions of power. We must also take into consideration that the development of particular forms of pictorial 'language' and/or specific practices of seeing (Lynch, 1960) may be unique to different disciplines as well as the professional cultures of visual specialists. Furthermore, the production of distinct modes of visualisations and how they are perceived is relevant, e.g., in magazines, in exhibitions, at a workshop discussion or on social media platforms. Additionally, urban planning in general (e.g., Healey, 2013) and visual practices within it in particular must be discussed as situated practices based upon their own unique political, geographical and cultural contexts (e.g., Global South/Global North). Since research on planning and urban design has predominantly focused on the visualisations created by architects and planners, it should still be recognised that new participatory tools also enable citizens to formulate their own ideas, knowledge and meanings and make them visible. We should be aware of the fact that also urban movements, civil society organisations and other political actors use visualisations of urban futures in order to push their own interests and goals and to influence public spheres. Thus, visual communication not only permeates the professional world of planners and their specialised working practices, but also the everyday lives of citizens. Finally, if we follow Hepp's (2020) thesis of deep mediatisation, we must understand the extent to which algorithms co-create visualisations and the communicative construction of urban futures. Maybe Latour's (2005, p. 63) statement, "objects too have agency," can by modified to algorithms too have agency.

In the thematic issue, the aforementioned points of reflection will not be fully or systematically addressed in each individual contribution; however, some articles will discuss these themes in greater depth.

4. The Articles in the Thematic Issue

In their contribution, Bernhardt and Meissner (2020) primarily examine the role that innovative strategies of communication and visualisation played in the context of the new culture of urban planning emerging over the course of the 1970s and 1980s. In order to better understand the historical background of this process from a long-term perspective and to fully grapple with variations in socialist and capitalist societies, they take the case of divided Berlin during the Cold War period. Despite suffering from large scale damages of WWII as well as long lasting economic stagnation, the city became the showcase of ideologically driven iconic projects of urban planning in the 1950s and 1960s, with the development of large housing settlements and urban motorways. These projects were presented in extensive public campaigns and were promoted using visual instruments and media, such as international building exhibitions, regional plans from a bird´s eye perspective and the like. The article also states that as a result of the 1970´s turn in urban planning, which focused on renewal and historic preservation, new forms of public communication and visualisation emerged. While analysing two small-scale planning projects for neighbourhoods in East and West Berlin, the authors reveal the critical role of (visual) media in the rise of new communicative practices in comprehensive plan-

ning during the 1980s. Among their other findings, they explore contradictory patterns and effects of public participation and visualisation in both political systems and planning schemes in their selected cases.

Mager and Hein (2020) explore the value and the challenges that digital technologies provide in their analysis of historical mediatisations of the built environment. Within this broader field of research, they focus on the problems and potentials for using artificial intelligence to help identify buildings in historical photographs. Starting with a long-term retrospection on the interrelation between visual media and architecture, Mager and Hein highlight the role of graphic representations of architectural concepts for the production of buildings and photography and other technological innovations for the documentation of existing buildings. Special attention is given to distinct problems, such as different angles or focal lengths in historic photos which make it difficult to apply or adjust technologies of artificial intelligence to the automatic identification of buildings. While analysing a pioneering project concerning Amsterdam´s built heritage, key strategies, tools, and practices are depicted, which are needed to realise such large programmes of identification. Here, specific forms of cooperation between IT-experts, historians, and students are connected to practices of citizen's science. In widening the perspective, Mager and Hein demonstrate the methodological challenges that these quantitative approaches provide for architectural history and related disciplines in the humanities, which typically prioritise qualitative research. However, as they argue, with the help of mixed methodological concepts, new exciting insights into the history of the built environment can be generated.

In her contribution, Watson (2020) discusses the growing impact of computer-generated images in entrepreneurial planning on the African continent. These visualisations carry a strong agency within Africa's current neoliberal urban development. Instead of tackling the urban challenges faced by African mega-cities, international property development companies—in cooperation with governments or other local partners—have prioritised the construction of up-market new towns or satellite towns at the urban fringes. Watson understands planning as being shaped by visualisations and graphics through a network of computer programmes and marketing experts. In this network, photo-realistic visualisations have ousted plans, maps and elevations in communicating and marketing urban projects. New forms of collaboration between planners, branding experts and visualisation experts have incorporated urban planning professionals into the generation of these proposals, which has turned them into visualisers and has also disconnected them from the larger socio-political context as well as the people for whom they should be planning for. In her analysis, Watson explores a series of commercial real-estate projects on the continent, including Diamniadio Lake City outside Dakar as well as Eco Atlantic in Lagos. As these projects bypass democratic decision-making and planning processes while failing to address the interest of the public good, they prohibit the equitable and sustainable future of urban development. The computer-generated visualisations of urban futures serve as both indicators and active agents in this process.

The contribution by Hendawy and Stollmann (2020) begins with the observation that both planning and urban development in Egypt fail to adequately address the needs of the impoverished urban population. Instead, government planners and the private real estate sector cater to developing middle- to high-end urban enclaves and new towns; this interest also dominates public discourse regarding urban development, which is reflected in the form of news reports, online and street-sign advertising. The authors interrogate the role that such visualisations of exclusive urban futures play with regard to the shared acceptance of these urban models within society, despite the fact that many are unable to benefit from such developments. The authors use a mixed methods approach that begins with qualitative interviews conducted with cab and uber drivers in Cairo as well as an online survey with a socially diverse sample of the urban population. The findings are then framed through the first author's self-reflection when they were expected to buy an apartment while getting married. Finally, a visual analysis of exemplary advertising videos reveals the close entanglement of real estate and cultural norms. The research findings are surprising in so far as they shed light on the importance of socio-cultural norms pertaining to Egypt's family values and marriage culture, which emphasise the importance of real estate acquisition as a precondition for marriage. These cultural factors lead to an understanding of social and spatial injustice as not only being produced from top-down planning authorities within a neo-liberal political economy, but also as a form of co-production in which the majority of the population partakes.

In Weise, Wilson, and Vigar (2020) the authors understand visualisation as visual presentations of a perceived reality. Using the case study of town planning in Great Britain, they examine the process of communicative planning, which has been carried out using two separate digital tools for citizen participation. The article discusses the use of digital visualisations, which were made and/or commented on by residents, i.e., laypeople, and where planners served as enablers. The first tool, JigsAudio, allows residents to communicate through drawings as well as through speaking in order to exchange experiences concerning the general challenges of place-making in a town and allows participating residents to express their aspirations for the future of urban spaces. By contrast, the other tool, PlaceChangers, provides a collection of places in the neighbourhood that are already mapped, which can be digitally annotated in order to suggest changes should be made. Against this background, the authors considered how visualisations contribute to the discussion of alternative perspectives of places as well as what forms of spatial knowledge are activated by

the different tools. One result found that the visualisations on their own did not produce meanings or suggestions for changes; rather, they needed to be accompanied by verbal accounts or conversations to clarify their meaning. Another insight found that JigsAudio evoked accounts about abstract values and feelings with regard to (future) urban places, while responses obtained using PlaceChangers contained the description of specific issues about the design of places in the neighbourhood in terms of what is where and how it should be.

Singh and Christmann (2020) investigate the participation processes on an e-participation platform in Germany's capital. The authors consider how participating Berlin residents use visualisations within an e-participation format, how they communicate spatial knowledge and how they construct public urban spaces through the use of visualisations. Similar to the contribution of Weise et al. (2020), the article investigates how visualisations are produced by residents. From the beginning, the authors focus on the interplay between visual and verbal accounts of the participating residents and suggest a methodological approach for the ensuing analysis. In contrast to Weise et al. (2020), the investigated platform of meinBerlin did not provide any specific digital tools or guidance from planners for drawing or annotating. In their article, Singh and Christmann examine a participation project that focuses on noisy urban spaces and noise protection ("Report Noise Sites!"). Against this background, the authors detail the strategies that the participating residents use to not only visually communicate their perceptions and conceptualisations of urban places, but to report on and to characterise noise (respectively noisy places). The study also revealed some residents even attempted at to visually depict possible future solutions for (selected) noise spaces demonstrating the potential of the e-platform to active creative processes for imagining urban futures.

The application of new digital information and communication technologies in participatory urban planning often evokes expectations of a reconnection between citizens and decision-makers as well as an increase of trust in planning. In his article, Åström (2020) scrutinizes these assumptions while shedding light on planners' attitudes towards citizens. Although a huge body of research on citizens' trust in government exists, public officials trust in citizens has received little scholarly attention. The article is guided by the question whether planners find citizens trustworthy as well as what individual and institutional factors influence their trust in citizens. Åström methodologically draws on a survey targeted to a representative sample of public managers in Swedish local government (N = 1430). One of the main findings in the study show that in Sweden factors, such as planners' trust in their own power and capabilities as well as in political and institutional measures are all positively related to trust in citizens. Nevertheless, trust must be established through institutional measures to close the distance between politics and public administration and most importantly to the citizens. New forms of participation could provide great opportunities for experimenting with such trust-building arrangements. Finally, the author reflects on trust of citizens in the context of e-participation and smart city planning. He points out that smart services—which are offered to citizens in fields such as housing, healthcare or participation—may lead to improvements in the public's everyday life. However, due to processes of collecting, storing, processing and analysing the associated data, vulnerabilities may arise, which will demand a great deal of trust by citizens.

5. Conclusion

This editorial introduces topics related to the thematic issue. Its first objective was to outline the wider conceptual background surrounding the terms 'mediatisation,' 'digitalisation,' 'visualisation' and the communicative construction of urban futures as they relate to urban design and planning. The term 'mediatisation' is conceived of as an increased use of (analogue and digital) media and technologies over time that changes the way in which individuals, professions and organisations communicate and work; it may even change the way in which they organise their social worlds and spatial arrangements. The term 'digitalisation' is conceptualised as the most disruptive moment within the process of mediatisation. A characteristic feature of the digital age is that media and technologies have grown increasingly computerised and highly connected with one another. The authors of these articles do not understand the term 'visualisation' as a mere representation of an object. Instead, they propose defining it as a depiction of an object wherein what is absent from the object is made visible by the creator(s) of the visualisation (e.g., by a photographer or an urban designer), through particular visual means (e.g., a camera and/or computer-assisted design software) and by observers. They argue that by deciphering or decoding visualisations, viewers become an integral part of the visual process. Subsequently, the communicative construction of spaces approach is introduced. This approach conceives of communicative action (including visual communications) as taking place within actor constellations, where it functions as the basic element in the construction of past, present or future spaces. In this thematic issue, the authors also point out that visualisations should always be seen within the context in which they are socioculturally and spatially (local and/or global) embedded. Visualisations can only be adequately analysed when a critical perspective is taken towards the underlying visual cultures of the planning and design professions as well as of various stakeholders. Additionally, visualisations touch on fundamental questions of power.

The second objective of this editorial was to map the main arguments and results of each contribution of the Thematic Issue. They show both critical aspects and opportunities for (digital) visualisations in urban design and planning. For instance, using the example of historical re-

search on two small-scale planning projects for two separate neighbourhoods in East and West Berlin during the 1980s, it is revealed that (visual) media played a key role in the rise of new communicative practices in planning. Interestingly, this conclusion holds true for both examples in the Federal Republic of Germany as well as in that of the German Democratic Republic. Another historical research project reports on how a new digital tool is used in Amsterdam, which facilitates the process of recognising buildings in historical photographs and also the modelling of historical transformations in the built environment. Such a tool may not only expand perspectives in planning history, but it might also assist in designing the city's future through the identification of path dependencies and critical junctures in further innovative developments. Here, the authors concentrate on the positive impacts of digital visual tools rather than negative. By contrast, while using the case study concerning entrepreneurial planning on the African continent, a more critical perspective is adopted in the exploration of the following questions: To what extent have planners evolved into visualisers, how do they visually address investors and create photo-realistic renderings of urban futures, and how do they become disconnected from a major segment of the population? Surprisingly, another study, which bases its empirical findings in Cairo, suggests that visualisations of exclusive urban futures from top-down planning enterprises within the neo-liberal Egyptian political economy are not rejected outright by most Cairo residents. Rather the interviewees accepted the importance of real estate acquisitions and even appreciated the visualisations of potential urban futures in Cairo. Given the results of their findings, the authors conclude that residents 'co-produce' urban visions of top-down planning. When it comes to digital visual tools in the field of citizen participation, an investigation in Great Britain reveals the ways in which residents depict their visions of urban futures using visual tools provided by planners. There, the authors focus on the kinds of visualisations that are facilitated or impeded by each digital tool under examination.

Another study from Germany showed that within e-participation processes, some residents have an urge to visualise their perceptions and ideas or visions of urban spaces (e.g., via uploading photos, photo collages, or drawings, etc.), even when an e-participation platform doesn't provide tools dedicated to visualisations. Thus, it may be deduced that the use of digital visual tools in communicative planning may result in positive features for residents. The final article delves into the matter of planners' trust in citizens while depicting a case in Sweden, which finds that trust must be established through institutional measures in order to minimise the gap between planners and citizens. This study offers new insights concerning the ways in which the adoption of new (digital) forms of participation could be used as a vehicle for expanding opportunities for experimenting with trust-building arrangements.

Looking at the various contributions to the Thematic Issue, it is apparent that mediatisation and digitalisation processes in urban design and planning have significantly changed the ways in which urban futures are visually depicted and, in turn how they are communicatively constructed. What we can also see, is, that depending on the context, there are quite different—and sometimes even contradictory—findings with regard to the positive or critical aspects concerning the use of (digital) visual tools. This suggests that further research is still needed.

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Conflict of Interests

The authors declare no conflict of interest.

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Article

Communicating and Visualising Urban Planning in Cold War Berlin

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Abstract
This article analyses the dynamics of communication, specifically with regard to the significance of visualisations in urban planning between the two competing political regimes of East and West Germany in divided Berlin (1945–1989). The article will demonstrate the ways in which planners on either side of the Iron Curtain were confronted with matters unique to their own political contexts and conditions for public communication, as well as how they faced similar challenges in fields of urban renewal and negotiating public participation. The post-war decades in Berlin were marked by strong planning dynamics: large-scale reconstruction after WWII and the 'showcase character' of political confrontation and competition. In this context, new strategies of communicating urban planning to the public were developed, such as large-scale development plans, public exhibitions and cross-border media campaigns. Paradigmatic shifts during the mid-1970s generated new discourses about urban renewal and historic preservation. The new focus on small-scale planning in vivid and inhabited inner-city neighbourhoods made new forms of communication and public depiction necessary. In the context of social and political change as well as growing mediatisation, planning authorities utilised aspects of urban identity and civic participation to legitimise planning activities. The article traces two small-scale planning projects for neighbourhoods in East and West Berlin and investigates the interrelation of visual communication instruments in public discourses and planning procedures during the 1980s, a period that prominently featured the new strategy of comprehensive planning. Furthermore, the article highlights the key role of micro-scale changes in the management of urban renewal along both sides of the wall and the emergence of neighbourhood civil engagement and participation.

Keywords
Berlin; civic participation; communication strategy; planning history; public negotiation; small-scale planning; urban renewal; visualising planning

Issue
This article is part of the issue "Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures" edited by Gabriela Christmann (Leibniz Institute for Research on Society and Space, Germany), Christoph Bernhardt (Leibniz Institute for Research on Society and Space, Germany) and Jörg Stollmann (TU Berlin, Germany).

1. Introduction

This article examines the transformation of communicative strategies and visual instruments in urban planning over a long-term, historical perspective in order to contribute a more comprehensive understanding of the ongoing transition of "cities on paper" (Lee & Weiß, 2019) to a digital planning culture while set against the background of major transformations over the course of the 20th century. It focuses on the emergence of new communicative and visual practices in urban planning in divided post-war Berlin while paying special attention to the 1970s and 1980s. The study examines the usage of several media varieties, from sketches and wallpapers to posters in projects of urban planning on both sides of the Wall; all of which is further embedded within an

overarching analysis of the socio-political context of urban planning in East and West Berlin during the Cold War (Warnke, 2009).

The article expands on earlier research concerning the emergence of new practices and visual instruments of communication in urban planning in the 20th century, which was developed by planning historian Robert Freeman and others with regard to the role of planning exhibitions and visual tools in European and US urban planning around 1910. At that time, as Freestone highlights, "the exhibition was establishing a visuality of bird's eye view maps, plans, diagrams and pictures as a very distinctive part of the planner's professional toolkit" (Freestone, 2018, p. 199). Freestone's remark addresses the exhibition as a new communicative instrument in urban planning, the various types of visualisations, and the planners' practices ("toolkit"). He localises these key components of 'mediatisation' (Krotz, 2007) in urban planning within the specific historical context of 1910, in which this distinctive type of visual communication emerged for the first time (Bodenschatz & Kress, 2017).

Along with widening the temporal scope to the post-WWII period as well as analysing a variety of practices and visual devices beyond plans and exhibitions, the article's empirical content will be guided by questions regarding the theory of communication (Selle, 1996; Wakeman, 2014), such as: Who was 'sending' and who was 'receiving' messages concerning urban planning project; who was able and/or permitted to speak; which channels, visual instruments and strategies of communication were used and who decided what questions would be discussed? Exploring this set of questions for both political systems provides a cross-cultural analysis of emergent patterns of visualisation and communication in urban planning during the late 20th century from an East-West comparative perspective. The article begins with a reflection on the fundamental political, ideological and institutional framework of Berlin´s urban development during the Cold War Era. After examining the cultural shift in society and planning during the 1970s, the article introduces two case studies in urban planning from both sides of the divided city in the 1980s, which serve as empirical examples of the practical implementation of public communication and visual strategies, and as representations of their own paradigmatic distinctions relative to their social-political environments. In it, the position of individual actor groups will be analysed to provide information about questions initially raised about communication relations and decision making.

2. Berlin's Special Urban Pathway in the Post-WWII Period

Following the end of WWII, the German capital was terribly destroyed. As such, Berlin entered into a special pathway of urban development, which differed significantly from those adopted across other large cities around the world. The emergence of the two antagonist states—the Federal Republic of Germany (FRG) and the socialist German Democratic Republic (GDR), both established in 1949—along with the construction of the Wall between the two states and around West Berlin in 1961 contextualised urban planning and development in the metropolitan area for more than four decades. Both sides were characterised by their virtually stagnant population growth, highly thinned-out industry and an extraordinarily low dynamic of suburban sprawl. Divided into two antagonistic political units, the city found itself in a situation of limited self-governance under control of the four Allies, the US, USSR, Britain and France, as well as an apparent normalisation of everyday life while undergoing a constant, far-reaching social and economic transformation (Bernhardt, 2020). At the frontline of the Cold War, urban planning became a battlefield of propaganda and agitation between the two political systems and their respective ideologies. While planning for urban growth had been a major feature of planning during the first part of the 20th century and continued as such in most Western cities during the economic boom between the 1950s and 1970s (the *trentes glorieuses*, or *Wirtschaftswunder*), in Berlin, it played only a minor role: In West Berlin, expansive urban development was strictly limited by the Wall, while the socialist East German regime, seeking to distance itself from the influence of Western suburban sprawl, gave priority to projects featuring compact urban design.

Contrastingly, the two main periods and paradigms of urban planning in Berlin during the Cold War were marked by specific foci of planning and building, media and communication strategies. In the first twenty-five years, until around 1970, the reconstruction of the inner-urban housing stock and "great plans" to transform the city centre into a new political landscape were developed along both sides of the border within an increasingly hostile political climate (Wittmann-Englert, 2015). They triggered a top-down planning culture, large-scale bird's eye visualisations and one-way communication in which the urban population was permitted to function as nothing more than an audience (Bernhardt, 2020). As Klemek observed, at that time "quiescence was characteristic in West Berlin, even among residents directly affected by redevelopment schemes" (Klemek, 2011, p. 117). Popular media, especially local radio stations and newspapers, presented key projects, such as East Berlin's Stalinallee (Geist & Kürvers, 1989), the first large-scale housing project, which was constructed east of Alexanderplatz in the early 1950s in the new style of socialist realism, imported directly from the USSR. On the other side of the border, messages of modernisation and political superiority praised the new West Berlin motorway (*Stadtautobahn*), which was in keeping with the spirit of US highway planning. This symbol of the Western automotive age from 1954 onwards was designed and publicly presented as an "image of the future" (*Zukunftsbild*; Seehausen, 2015, p. 117). By contrast, contemporary media only rarely echoed critical comments

of citizens, as in the prominent and controversial case of the Kaiser Wilhelm Gedächtniskirche (Kress, 2014) which set a powerful landmark in the emerging new West Berlin city centre around Kurfürstendamm and the train station, Zoologischer Garten. After the construction of the Berlin Wall in 1961, the situation in terms of planning culture changed only gradually. During this time, strategic projects were realised to create a new socialist capital city centre on the East side and a cultural centre West of Potsdamer Platz with iconic buildings such as, Scharoun's Philharmony and the State Library as well as Mies van der Rohe's New National Gallery (Hoffmann-Axthelm, 2000).

3. The Cultural Shift of the 1970s

The second period and paradigm of planning in post-WWII Berlin emerged from the late 1960s onwards in the context of a growing institutional regularisation of Berlin's status as a divided city in formal agreements between the four Allies and the two German governments (Barclay, 2012). This period is typically referred to as the transition to 'urban renewal' (*behutsame Stadterneuerung*) and presented as a narrative of public intellectual critique initiated by Jane Jacobs (1961), Alexander Mitscherlich (1965) and others as well as bottom-up protests from citizens groups and rebellious students (Schubert, 2014; Warnke, 2009). However, this narrative oversimplifies the transformation in society and planning, as it neglects the broad variety of actors and new trends in urban policies, which resulted in a profound cultural shift in the theories and practices of planning. In West Berlin, it was especially leading architects from the Technical University including, Peter Josef Kleihues and Matthias Ungers, as well as the department of monument protection in the municipal administration, which developed new forms of thinking and visualising the city, particularly with regard to the old inner-urban quarters (Stimmann, 2009). At the same time, as early as 1970, East Berlin planners such as Manfred Zache, developed pioneering concepts for inner-urban renewal, which broke with established practices of destruction (*Kahlschlagsanierung*; Zache, 2000). These were only two initiatives within a broad reform movement, which also marked a turn towards "signs and signification processes" in urban planning (Hauser, 2018, p. 231).

From the late 1970s, on small-scale urban planning and the new principle of urban renewal accompanied the intense usage of visual instruments for public information and involvement. Comprehensive planning and new means of communication—later described as the "communicative turn" (Healey, 1992)—generated controversial debates in expert discourses (Albers, 2006). Therein, planners reflected the role of civic society as more than just involving the audience by passive notification, but active participation (Wehland, 1983). The main purpose of urban renewal was intended to change existing living conditions either by modernisation and renovation of historical structures, or by destruction and reconstruction. Thus, communication strategies tended to integrate the affected people, including inhabitants, tradespersons and owners via the pursuit of two goals. First, to raise legitimisation and approval for the project and second, to keep and promote the urban identity of the civic society within their urban environment. In practice, East and West Berlin planning municipalities provided information campaigns and supported citizens' interests in participating. Visual elements on posters, brochures and newspapers supported the written information, which addressed citizens directly to attend the public events, where they could articulate their opinions to experts and political representatives.

Since the planning profession acknowledged how relevant the "imageability" (Freestone, 2015) of the urban environment was in the turn from the 1960s to 1970s, visualisations were not only meant for pure illustration of urban visions, but they were subjective and socially constructed perceptions of space. The idea that visualisations are products of and reflect aspects of identity, narratives and urban discourses provided new approaches for planners to use visualisations differently (Mook, 2013).

The main challenge of the planning culture in the late 1970s involved grappling with a variety of new planning aspects: Accomplishing projects successfully meant to develop and implement renewal strategies, to serve the multiple requirements, to integrate and satisfy more stakeholders and actor groups, and to set tight but realistic timeframes. Additionally, formal requirements varied according to the categorisation of the planning projects, such as redevelopment areas (*Sanierungsgebiete*) or town planning programmes (*Städtebauprogramme*). Therein, small-scale projects often served as pilots for new functional strategies, such as sustainable or community welfare renewal, or as political representations demonstrating power and progress.

Consequently, the communication strategies varied. Designated redevelopment areas and their small-scale subdivisions comprised clear local areas, groups of affected people, and made functional authorities more comprehensible for citizens. Here, special regulations defined public communication and citizen involvement more precisely (Stimmann, 2009). Initiated by planning authorities, various local actors, including planning offices, district boards and social associations, implemented intense on-site work in the neighbourhood(s) to establish more direct contact. Although media reports and public announcements in local newspapers were used, customised visual campaigns such as leaflets or posters prevailed as communicative tools. By comparison, large programmes addressed broader issues with the general public, including the modernisation of infrastructures, management of housing shortages, and meeting social needs. Communication was primarily executed via media. Such visual instruments ranged from photographs, images, drafts and reports to exhibition models and contributions in architectural competitions.

4. Public Communication and Negotiation in 1980s Socialist Planning Culture in East Berlin

While previous research approaches described the planning system and culture in the GDR as a strict top-down, institutionalised and one-dimensional structure of negotiation and decision-making practices with a uniform, uncritical public (Pollack & Rink, 1997), more recent approaches emphasise the relevance of counter public spheres, 'loopholes' within formal GDR structures (e.g., church, culture institutions and mass organisations) as well as informal networks (Engler, 2012; Jarausch, 2008). GDR socialism was based upon the principles of Democratic Centralism and the subordination of individual interests for the common good of socialist society. In other words, the propagated conformity of interests from the leading party, state government, citizen representatives and even society itself prevented any conflicts of interest. Thus, a critical public sphere was neither necessary nor possible. Since the early 1970s the GDR constitution (originally passed in 1968 and updated in 1974) and several laws highlighted the relevance of society in planning participation and strengthened local political administration and its representatives to foster more direct contact and interactions. Still, the scope of civic society's influence on decision-making processes remained limited. However, by the 1980s, civic society developed a stronger, more prominent voice in public discourses, with groups of actors formulating their interests more loudly, which helped to further engage political activity, even against the government (Betker & Bräuer, 2006).

In East Berlin, urban planning since the late 1970s can be characterised by the strong influence on local political authorities in municipal districts. According to preparations for the 750-year jubilee of Berlin in 1987, the Berlin Programme of 1976 announced wide construction ambitions, such as the extension of symbolic architecture as a capital city, the resolution of housing problems and the arrangements for the jubilee itself. As a result, planning authorities declared complex reconstruction zones across a number of inhabited areas, predominantly in central districts, including Prenzlauer Berg, Friedrichshain and Mitte. Additionally, pilot projects (e.g., Arnimplatz) were installed, where communicative measures related to the public negotiation process were tested (Stimmann, 1985).

Generally, the practical implementation and realisation of planning projects were the responsibility of district councils. Here, several stakeholders within the planning practice, including the construction sector, housing administration and installed task forces, worked closely together, where their principle task was to report to the district council's political authorities. The proper procedure regarding urban renewal projects was comprised of internal arrangements and preparations between planning authorities on national and city level as well as the district council. Following the completion of agreements and scheduling the planning project, local representatives shared relevant public information with the people and neighbourhoods affected by the proposed changes via notice boards, posters, public displays or in assemblies. Formal objections to the proposed plans could be articulated as written submissions (*Eingaben*) or petitions. Citizens then filed these statements with the appropriate planning authority, which would then respond to stated concerns. Generally, this written communication was more widely practiced than public communication, which often replaced direct dialogues (Mühlberg, 2004). Though, other mechanisms of public communication were also utilised, which included extraordinary council sessions, assembly inputs (*Wahlkreisaktivberatung*), on-site visits and face-to-face criticism sessions. Here, the so-called public dialogue consisted of a selected audience, which was mostly assigned to representatives of civic society from the house community (*Hausgemeinschaft*), housing borough or electoral district. Civic participation was seen as both the "right and duty" of every citizen who was expected to participate in so-called democratic elections and actively articulate their concerns to state authorities (Habitat DDR, 1976). In the GDR, in-fact public and unbiased negotiation processes concerning planning projects were not accepted and the influence from civic representatives was limited. Visual instruments did not have a significant relevance. Active involvement of civic society in urban planning largely existed in the areas of producing planning quotes and accomplishing state-approved DIY tasks such as undertaking repairs as well as planting and maintaining cultivation. Here, the government initiated civic and collective work as a joint commitment towards the achievement of socialism. Political programmes as part of mass organisations propagated various types of collective civic engagement, such as awards, contests and initiatives, broadly in media campaigns, like the campaign promoted by the *Mach Mit* journal. In it, visualisations demonstrated and promoted citizen participation.

For East Berlin planning, the case of a backyard conversion in Oderberger Street 15/17 in 1980–1981 shows an exceptional dealing within the afore-mentioned structures of GDR planning culture and East Berlin urban renewal, which can be viewed retrospectively as a pioneering project that involved public negotiation, civic participation and the use of visual communication instruments. The housing block was located in the historic inner-city district Prenzlauer Berg, which was situated within the closest proximity to the Berlin Wall. While the district's housing structure faced tremendous urban decay as well as an enormous lack of green and recreational areas, the social structure of the neighbourhood was comprised of long-established Berlin inhabitants as well as low-income earners, such as students, artists and young people. Everyday life in the neighbourhood was vibrant and eclectic, and could, to some extent, be characterised by its unique bond to the urban environment. Starting in 1978–1979, two parallel ambitions evolved to convert the unused overgrown and rubbish-strewn back-

yard. On the one side, planning authorities balanced between the construction of a grocery store and workshops for the construction industry, which would facilitate local DIY repairs and modernisation activities. On the other side, a small group of inhabitants intended to improve their unsatisfying living situation by converting the backyard into a playground and green space. Encouraged by the aforementioned *Mach Mit* campaign, the inhabitants in Oderberger Street 15/17 sought to plant greenery and establish a playground for children in an effort to create a public space for the benefit of the neighbourhood.

Analyses of archival documents ascertained the communication relations as follows: Since 1979, the district municipality was aware of the inhabitants' ambitions as represented in the many letters submitted on the matter, and it adapted their plans to combine workshops and playground installations. However, they did not correspond to the inhabitants' area layout (see Figure 1). On occasion of spontaneous tree felling works in summer 1981, neighbourhood representatives initiated the first interaction between them and the municipality. More precisely, the housing borough committee (*Wohnbezirksausschuss*), the formal representative institution of the neighbourhood community, requested information from the council representative.

The option to submit written objections via submissions and petitions was extensively used. Given the extensive use of written submissions and petitions concerning resident objections to projects at this time, a number of visualisations are available and take two common forms. In the first set, photos of the courtyard depicted inadequate conditions and supported arguments for a swift conversion process, while in the second form, maps were drafted as propositions for possible conversions of the space. The function of the visual materials highlighted the written objections and citizens' demands and demonstrates their commitment to engaging in the planning process. Additionally, in the submission letter, the neighbourhood initiative emphasises their willingness to open communication channels as well as to take part in a joint conversion process. Although we cannot trace the documents back to the original author(s) of the initiative who drew the maps nor can we determine whether they received help from planning professionals, it's clear that the small group of neighbours were artists who possessed a creative affinity. The physical material of the submitted drafts take the form of copying paper, which could indicate a blueprint method for maintaining principles of proportionality (see Figure 2). Since the initiative used the housing borough committee to submit their objections in an appropriate manner, it is possible that support was obtained from other active members within or close to this local representative institution. However, it traces the strong social bondage in this neighbourhood and district.

Subsequently, the intense commitment of the neighbourhood initiative in written and visualised forms led to the adoption of more transparent practices in the state's planning procedures: first, by letter correspondence, and second, through dialogue formats, such as

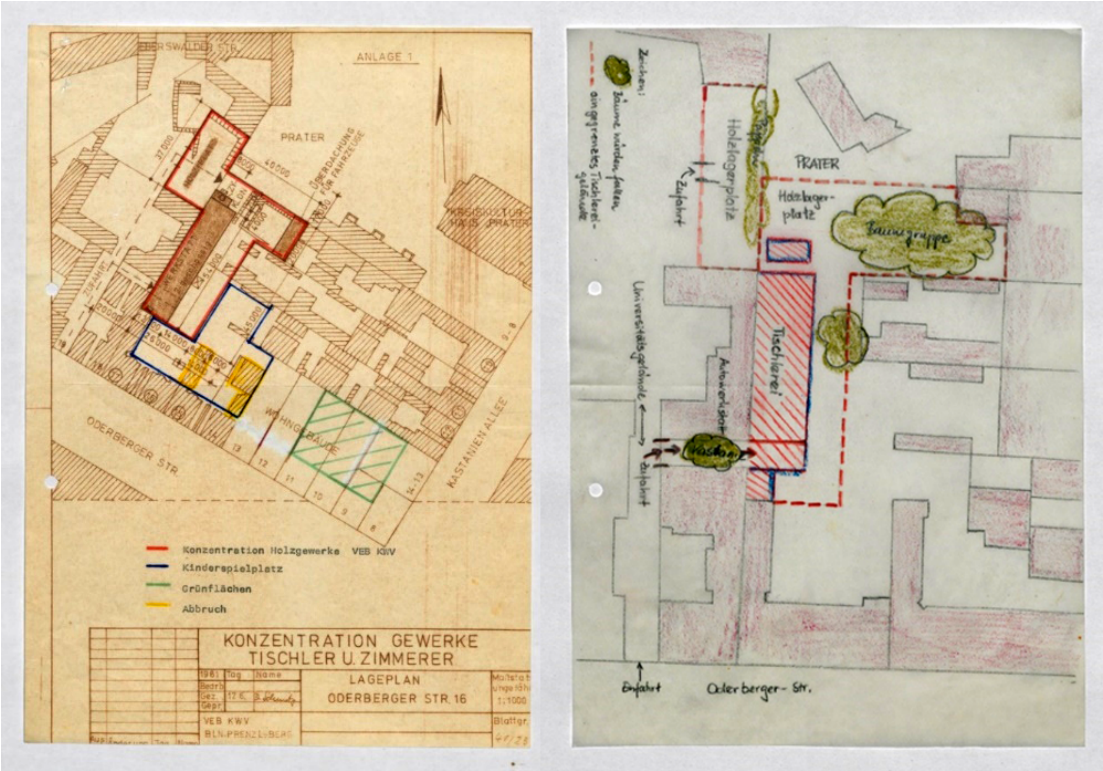

Figure 1. From left to right: Maps for the backyard conversion designed by planning authorities and neighbourhood actors. Sources: "Städtebauliche Bestätigung (Reg.-Nr. 204/81)" (1981). Image rights: Landesarchiv Berlin.

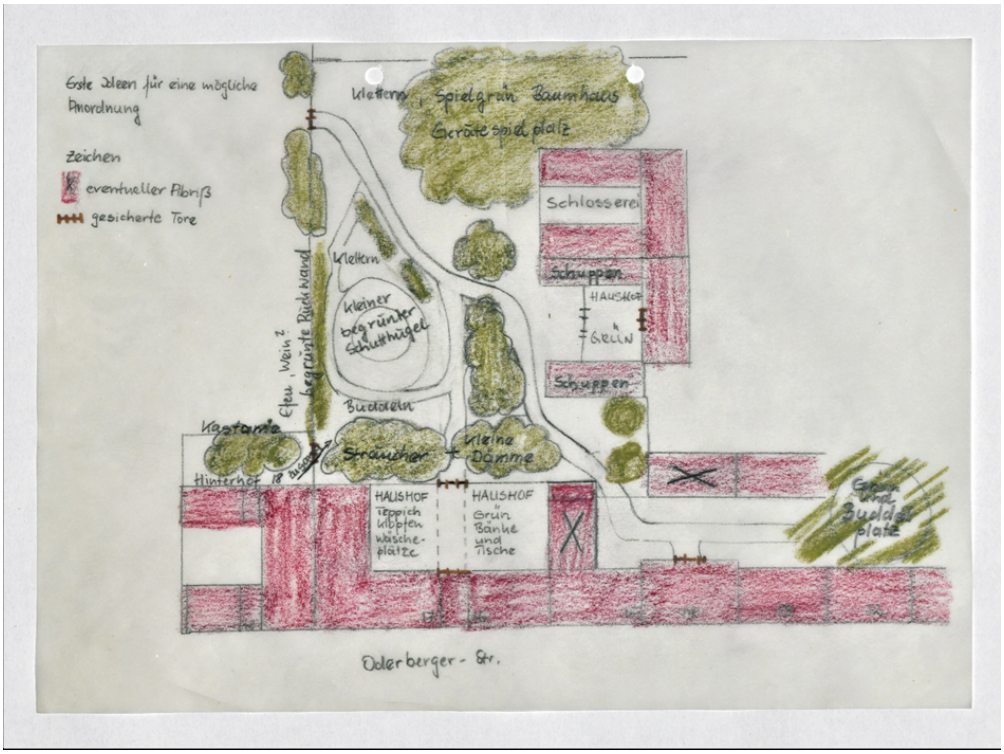

Figure 2. Draft of the conversion map drawn by the neighbourhood initiative of Oderberger Street 15/17. Source: "Eingabe zum Bauvorhaben Tischlerei/Kinderspielplatz auf dem Gelände hinter den Häusern der Oderberger Str. 15–18" (1981). Image rights: Landesarchiv Berlin.

two on-site visits and several face-to-face talks. However, 'public' meant that only a few selected neighbourhood representatives could attend as these communication meetings. Following the socialist understanding of public negotiation, key figures on both sides functioned as district municipality officers or as appointed representatives of civic society. Although the civic influence on decision-making practices related to the planning aspects of the project seem limited, archive documents reveal their impact on local politics. In district council meetings, political and planning authorities regularly analysed and reflected upon the active and critical contributions of neighbourhood representatives in assemblies and permanent submission letters. Several suggestions were ultimately implemented into the formal planning concept and the monthly or annual quota achievement documents (*Haushalts- und Volkswirtschaftsplan*) of the district municipality. Due to staff and resource shortages in Prenzlauer Berg and the housing boroughs of Oderberger Street, several planned communicative interactions remained unrealised. Nevertheless, in December 1981, the council adopted a resolution that shifted the location for the workshops and conceded to a joint conversion plan. Its contents conveyed the construction of a playground and of a more expansive green space as a cooperation between planning authorities and the neighbourhood initiative (Council of the Berlin-Prenzlauer Berg District, 1982).

Between 1982 and 1984 neighbourhood initiatives, which were formally affiliated with representatives in the housing borough committee, fulfilled the project with district council support (in the form of material, financial and advisory resources). Although the project was based on a bottom-up civic initiative, an extraordinary endeavour for its time, which was made possible due to the broad, fervent civic involvement in the planning process, political authorities credited the successful conversion for its planning propaganda. The initially so reluctant acting district municipality instrumentalised the courtyard, which, in the following years, became a famous cultural hub in East Berlin, for the growing popularity of green space conversions. The general need for green spaces within the dense and decaying housing districts and the increasing economy of scarcity is reflected in the GDR planning culture in mid-1980s (Topfstedt, 1999). While the deterioration of economic power and political sovereignty became more visible—for citizens as well as for the 'capitalist opponents' behind the Iron Curtain—the demonstration of power and control during this period in the GDR was important. Thus, the greening trends were implemented and propagated more prominently in the *Mach Mit* campaigns. This strategy killed two birds with one stone: First, it improved living conditions by masking economic limitations while demonstrating state control, and second, it sought to lower discontent through the promotion of civic engagement and buttress state support. As such, the discussed case was portrayed as success story and shaped the official narrative for a pioneering-grassroots urban renewal ("Leaflet documents," 1984).

5. Public Dialogue and Participation Arrangements in the 1980s West Berlin Planning Culture

The early 1970s witnessed the dawn of a new era in planning culture, which was largely influenced by Anglo-American paradigms (Bolan, 1969; Schubert, 2017; Wakeman, 2014). The period saw a kind of democratisation of its planning practice as communication with the public became a more crucial, legitimating element of local municipalities and their proposed projects. Over time, a steady shift took place from the original comprehensive paradigm in which single planners oversaw large-scale projects to a cooperative project-based decision-making process that used new communicative instruments to include a variety of actors and interests (Haumann, 2015). Based on the democratic understanding of the FRG, an 'open' society shall consider individual as well as collective interests in a (critical) public dialogue. According to urban renewal principles the negotiation process of planning had to include active civic participation, which was also fixed in the legal regime; for instance in the Law for the Promotion of Urban Renewal (Städtebauförderungsgesetz, 1971) and the Federal Town Planning Law (Bundesbaugesetz, 1976). In West Berlin, planning practice encountered urban renewal by various small-scale projects in large redevelopment areas. The 1980s culminated in the general pluralisation of society, which was accompanied by political upheaval, widespread frustration and population decrease (Jarausch, 2008). The municipality of West Berlin responded to both the decaying inner-city housing structures and critiques regarding planning politics with the Second Urban Renewal Programme (Senator für Bau- und Wohnungswesen, 1974), the International Planning Exhibition (IBA; Senator für Bau- und Wohnungswesen Berlin, 1978) and the 12 Guidelines of Urban Renewal (Hämer, 1984). Pioneering projects such as at Klausener Platz combined urban renewal with the testing of new communicative instruments in planning practice to increase local civic participation. Following the implementation of participatory planning as the common practice, visualisations were used as independent instruments evermore. The strategic impetus sought to promote and facilitate multilateral public communications within the process of negotiating a planning consensus (Freestone, 2015; Reuß, 2013). Here, the complexity of planning situations was supposed to be made comprehensible for all—regardless of planning knowledge/expertise—via the use of visual instruments, such as collages, illustrations, drafts, schemes, models and photographs (Schultz & Stein, 2013). On a city-wide and national level, successful pilots reportedly generated broad public acceptance and legitimisation for the planning paradigm and its political implementation (see Figure 3).

The second case, Bülowstraße, block 86–89, illustrates a pilot project of environmental sustainability in urban renewal. In 1986, it was declared as the last project of the redevelopment area in the district of Schöneberg (see Figure 4). Here, the agenda sought to modernise the historic housing structure and improve living conditions through the reduction of urban density, the establishment of greening measures and sustainable energy consumption and the guarantee that the existing population could remain at no additional charge.

Adapting the prior mentioned legal planning regulations in designated areas, a comprehensible and citizen-

Figure 3. From left to right: Posters of the international planning exhibition in Kreuzberg inviting the public to a workshop exhibition in 1980 and an assembly in 1982. Sources: "First Projects for the International Building Exhibition Berlin 1984" (1980) and "New apartments at Kottbusser Tor?" (1982). Image rights: S.T.E.R.N. Gesellschaft der behutsamen Stadterneuerung mbH.

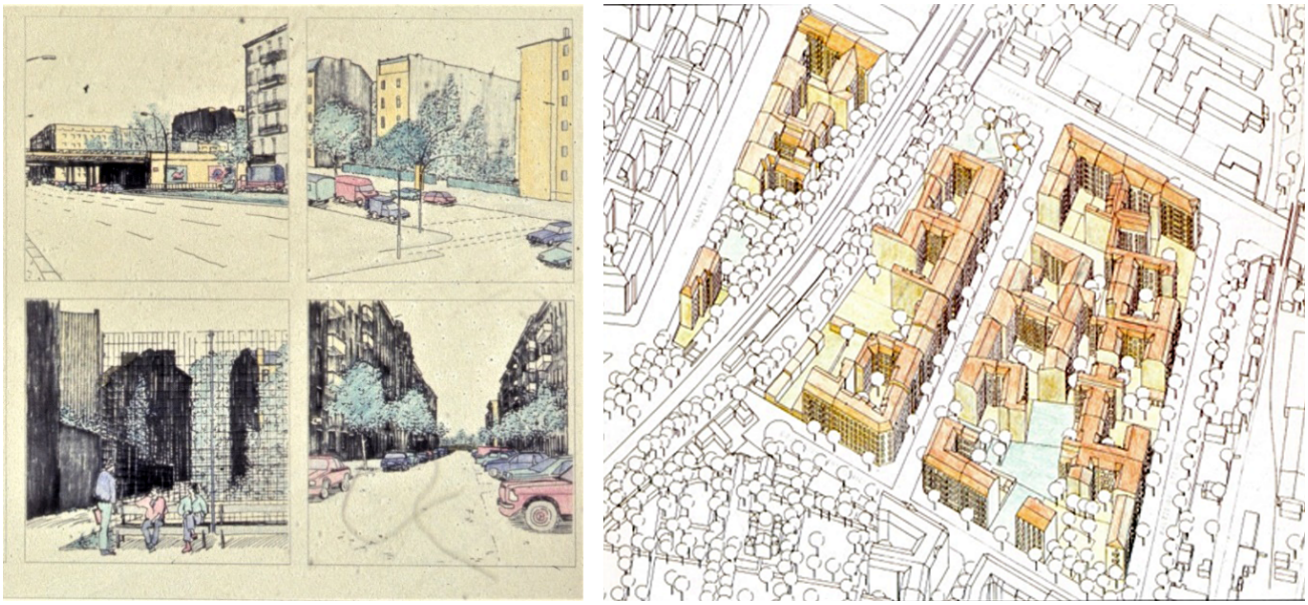

Figure 4. From left to right: Visualisations illustrating a vision of the redevelopment area after the implementation to facilitate the public dialogue and negotiation process and a sketch explaining the demolition plans to clear space and improve living conditions. Source from left to right: Planergemeinschaft Kohlbrenner & Dubach (1989); Bezirksamt Schöneberg (1992). Image rights: Planergemeinschaft Stadt und Raum eG.

oriented communication strategy was launched before the start of renewal work. This strategy entailed the planning authorities informing those to be affected by the proposed project through public announcements, displays, and arranging setup opportunities for Q&As in order to facilitate feedback. Finally, a public assembly to encourage a dialogue between the planners involved with the project and affected residents was initiated. According to stated procedure, comments and critique were to be verified by the planning authorities and, if relevant, were required to be integrated into the planning concept. Afterwards, public announcements concerning the revised project had to be displayed once more—for the public's consideration, so they could invoice any potential feedback. While this procedure followed democratic and participatory principles, it also bore the risk of prolonging the preparation process. Consequences that such extensions could have for the implementation of the planning project will be examined later.

The responsibility of the whole project fell to the district municipality of Schöneberg, which delegated several tasks to non-corporate planning offices and several district offices. Although the planning authorities built on successfully implemented projects from earlier years, the individual context of each planning area presented a new challenge every time. Here, it was to integrate both the many new planning goals (related to sustainable and urban renewal) as well as citizen-oriented communication and participation strategy. A local office was installed in the project's neighbourhood by an independent consulting agency (Arbeitsgemeinschaft für Sozialplanung und angewandte Stadtforschung [AG SPAS]), which served as a permanent direct contact and service point with experts in planning, sociology and education (Bezirksamt Schöneberg, 1991). In this case, the institution functioned as a transmitter between political authorities and residents. More specifically, the office operated as a translator of planning issues to the public as well as a consultant that supported tenants in matters of ecological issues. Additionally, also it functioned as a data collector and observer of existing circumstances within the district municipality and planning offices as well as a moderator of social and financial aspects caused by renewal consequences. Their communication strategies included individual face-to-face interactions, public assemblies as well as media campaigns (see Figure 5).

In these various versions of communication visualisations took an important role, which will be examined in detail in a moment. Concrete aspects of ecological renewal, including energy-saving measures and sustainable living in everyday life or the advantages of greened facades, were articulated either in smaller face-to-face consultations, information sessions or via information brochures. In the brochures, visual elements, such as photos, models and illustrations, were accompanied by spoken or written information (see Figure 6). Assemblies and information meetings regarding the planning project and any of the latest process adaptions were proceeded in a similar manner; that is through face-to-face encounters in information documents. Here, the archival documents reveal that the written documents were bilingual (German and Turkish) due to the social structure of the neighbourhood. In its function as a data collector, the staff of the consulting agency, AG SPAS, not only gathered information, such as statistics, but they also con-

Figure 5. From left to right: Newspaper article about sustainable urban renewal within the redevelopment area and invitation leaflet for the second consideration meeting. Source: Bezirksamt Schöneberg (1992).

ducted surveys through sending questionnaires, which were distributed to the households as well as on-site visits with inhabitants. Within this particular format of public communication, visualisations did not play a significant role. As such, data reports for the planning and political authorities were shaped more by planners' vocabulary and less by visual elements, aside from data statistics and graphics.

Before analysing the essential communicative tool of inhabitant representation (*Betroffenenvertretung*), it is important to consider the social structure of the affected neighbourhoods. The social composition was pri-

Figure 6. Information leaflet explaining cost savings through the sustainable urban renewal measurements. Source: Source: Bezirksamt Schöneberg (1992). Image rights: ÖKOLAUS—Ökologische Landschaftspflege, Architektur und Siedlungsplanung and AG SPAS.

marily characterised by low-income and low-education level, Turkish migrants and large families (Bezirksamt Schöneberg, 1992, pp. 48–50). With regard to the inhabitant representation, population demographics were a vital element in the case of Bülowstraße, block 86–89. Formally required in 1977 for redevelopment areas, elected representatives of the affected community could attend meetings between planning authorities and related actors, which allowed them to participate directly in the negotiation and decision-making process. In this case, a permanent engagement of representatives could not be arranged because the public's focus was spread across numerous individual topics and the complexity of the whole project expected too much. Consequently, because no elected inhabitant representation came into existence, by law every affected person could attend the round tables. Archival sources reveal a heavily reliance on technical language—spoken only in German—at the meetings, which made them difficult to follow for laypeople. Hence, a structured public negotiation process including active civic participation existed just temporary and topic based.

Furthermore, the implementation of the project took longer than expected due to the complex, interdepending planning issues and the multitude of institutions involved. Additionally, the slow diminishment in funding led to fewer expenditures in the public communication strategy and employment of staff in the local office. The consulting agency AG SPAS tried to compensate the shortened expenses for direct and local communication by media campaigns such as information documents. This prolonged period of setbacks gave rise to uncertainty and doubts amongst residents who had grown sceptical of the project and its promises, of lease stability, protection from displacement and sustainable renewal. The complexity of the project and the lengthy duration of the whole process ultimately led to decreased interest in public participation.

Nevertheless, the project was realised between 1990–1992. All inhabitants, who wished to return, were provided with housing at no additional expense. Although there had been a lack of interest and scepticism about the innovative approach of environmental sustainability, inhabitants were satisfied with the final results (Bezirksamt Schöneberg, 1992, pp. 48–50). The planning authorities, who failed to implement the entirety of their communication strategy, reflected on their pioneering project and were able to draw conclusions on how to improve their approach on future planning projects. In the end, the political and planning authorities perceived the case of Bülowstraße, block 86–89, as a successful implementation.

6. Conclusion

This article examined the crucial role that innovative strategies of communication and visualisation were playing during the changing culture of urban planning that emerged in the 1970s and 1980s. In order to better understand the historical context of this process, a long-term perspective was applied to our case studies in East and West Berlin, which exemplify variations in strategy and effect in both the socialist and capitalist societies on either side of the Wall during the Cold War. Despite the unique challenges Berlin faced related to the destruction it suffered during the war and its affliction with stagnated urban development, the city rose from its embers in the decades that followed where it became fertile ground for competing ideologically driven urban planning projects. Large-scale projects for housing and motorways were presented in expansive public campaigns, which were promoted using visual instruments, such as international building exhibitions, large competitions or regional plans. While different institutional systems prevailed on both sides, often amidst intense political confrontation, both systems followed similar concepts of top-down planning and prioritised the construction of buildings for the development of the national capital or a centre of culture.

The article highlighted the fundamental shift in planning culture from one marked by its political antagonism to one that was less hostile over the course of the 1970s. Within these changing circumstances, both sides and their opposing political agendas began developing innovative strategies for urban renewal of the historic inner-city. The shift to small-scale planning and the more significant involvement of citizens and their interests led to the adoption of new approaches, which empowered local actors involved in political administration and planning. Furthermore, adaptation of the planning culture further broadened the field of responsible actors. While larger decision-making processes were typically mediated in higher state institutions, where they were strongly shaped by their respective ideological frameworks, planners typically managed day-to-day operations, including the administration of public communication.

Using two small-scale cases, the article empirically demonstrated the ways in which unique, individual contexts impacted the management and operation of planning projects. Reflecting on the use of communicative instruments and visual tools between city planners and residents, it became clear that public communication merges the political frame and formal planning guidelines with the concrete local conditions, including social structure, planning ambition and level of urban identity (Häußermann & Siebel, 2004; Selle, 2017), through the planner's customised "toolkit" (Freestone, 2018, p. 199). The use of particular visual and communicative instruments is dependent on the involved actors who produce and send messages and thereby produce a public. The East Berlin case demonstrated how a strong sense of urban identity combined with a permanent as well as clever use of regular communication strategies could strengthen civic engagement. A bottom-up approach—marked by its profound use of visualisations—initiated public communication, which later became an influential voice during the negotiation process of the courtyard

conversion. By contrast, the West Berlin case stressed the importance of altering communicative strategies to the local context. In this case, even though formalised planning preconditions offered structures to facilitate a broad dialogue between the public and planners, blind spots regarding the demographic structure of the neighbourhood in question and an incomplete reflection concerning the residents' willingness to participate in the planning process, has challenged the success (of practice rather than final acceptance) of the project.

The ambivalence of planning culture was also examined; that is, the tension between using urban planning as a function of the political imagination or as an "image of the future" (Seehausen, 2015, p. 117), and the challenges related to the practical implementation of such visions. The variety of deployed media, communication instruments and visual tools reflects the degree of social differentiation and the necessity of adapting the planner's "toolkit" as it pertains to specific topics, language, regulations and resources as well as involved actor groups, 'sending,' 'perceiving' and voice claiming actor constellations. With regard to the role of visualisations as communicative tools in planning discourses, it became clear that while visuality was treated as a device that could speak for itself in planning theory, in practice it was often used to support, accompany or illustrate written and spoken topics. Undoubtedly, visualisations appealed to audiences that were being addressed and helped promote a dialogue between the actor groups. The variety of used visualisations highlights the many creative ways this tool was deployed during the negotiation process of planning projects, which both cases demonstrate within the context of their own political systems and planning cultures.

Through the investigation of urban planning practices and their relationship to the public within the distinct political systems of East and West Berlin, two similarities can be located: One, in both micro-scale cases, major ideological concepts in social and political discourses that emanated from higher government structures were reproduced in planning processes and projects, which can be observed in forging a public dialogue and the development of the concept of urban renewal. Two, the pioneering role of the urban renewal projects that were analysed shaped subsequent projects as well as today's planning culture, more generally. With both projects, innovative communicative strategies were tested and ultimately paved the way for future planning projects and present-day paradigms related to multilateral digitised communication, civic participation in planning discourses beyond formally declared development areas, bottom-up decision-making and citizen-oriented urban sociology.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Digital Excavation of Mediatized Urban Heritage: Automated Recognition of Buildings in Image Sources

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Abstract
Digital technologies provide novel ways of visualizing cities and buildings. They also facilitate new methods of analyzing the built environment, ranging from artificial intelligence (AI) to crowdsourced citizen participation. Digital representations of cities have become so refined that they challenge our perception of the real. However, computers have not yet become able to detect and analyze the visible features of built structures depicted in photographs or other media. Recent scientific advances mean that it is possible for this new field of computer vision to serve as a critical aid to research. Neural networks now meet the challenge of identifying and analyzing building elements, buildings and urban landscapes. The development and refinement of these technologies requires more attention, simultaneously, investigation is needed in regard to the use and meaning of these methods for historical research. For example, the use of AI raises questions about the ways in which computer-based image recognition reproduces biases of contemporary practice. It also invites reflection on how mixed methods, integrating quantitative and qualitative approaches, can be established and used in research in the humanities. Finally, it opens new perspectives on the role of crowdsourcing in both knowledge dissemination and shared research. Attempts to analyze historical big data with the latest methods of deep learning, to involve many people—laymen and experts—in research via crowdsourcing and to deal with partly unknown visual material have provided a better understanding of what is possible. The article presents findings from the ongoing research project ArchiMediaL, which is at the forefront of the analysis of historical mediatizations of the built environment. It demonstrates how the combination of crowdsourcing, historical big data and deep learning simultaneously raises questions and provides solutions in the field of architectural and urban planning history.

Keywords
artificial intelligence; automated image content recognition; big data; computer vision; crowdsourcing; image repositories; urban heritage

Issue
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1. Introduction

Comprehensive digitization and the dissemination of visual material via the internet have contributed to a scholarly concentration on the image, which in the 1990s became the focal point of several reorientations within art history (Alloa, 2015). They have also led to a visual turn in the history of architecture and urban planning. More and more digital visual data are produced, but the generation of new images is not yet balanced with the capacity of computers to read this data. While facial recognition has been rapidly advancing, ‘building recognition’ does not

even exist. Reading urban and architectural images remains a task for humans. Given the number of available images, relatively few are ever analyzed. As the amount of available data increases constantly through digitization, humanists need to critically reflect on their reading and interpretation of digital sources and strategize how best to explore the formerly unavailable heterogeneous and interconnected visual datasets. Preliminary reflection on research questions and methodologies is necessary to avoid the shortcomings of archaeologists of the past, many of whom were initially driven by the desire to literally find gold and other treasure. As they focused on excavating palaces and temples, they created a skewed understanding of the past and, as a result, today's knowledge of working-class housing in ancient cities or in suburban developments is more limited than the knowledge of the buildings of the elite. Similarly, urban planners need to critically evaluate the data that they are working with and the plans that they assess.

Urban and architectural historians need to go beyond their traditional, usually limited visual material—archival documents, physical collections or books. As they dig into a big new set of imagery—electronic repositories, crowdsourcing or web-scale datasets—they need to refine their theories and methods. When dealing with huge and unfamiliar data sets, questions will arise that go beyond the traditional hermeneutic reading of text and images. They must understand code as a cultural practice and learn to see qualitative data as the result of abstract 'technocratic' sorting that relies on established interpretation systems. Innovation in computer technology, both in crowdsourcing and in AI creates opportunities and challenges for urban and architectural history, notably the recognition of visuals in vast archives. Crowdsourcing metadata for historical images is an urban planning issue closely related to issues of communication, mediatization and urban futures.

This article explores ArchiMediaL's research into the development of image recognition tools. It explains how the project uses crowdsourcing and AI technology in combination and what this means for humanities-based archival research as a foundation for design. The combination of these different technologies allows for diverse approaches. Crowdsourcing can be both socially motivated and technologically important. It helps produce a kind of swarm intelligence studying, understanding and shaping cities based on their collective nature (Rossi, 1982, pp. 5, 24, 86). Following a more general reflection on the role of visuals in architecture and planning, the article explores the mediatization of visuals and the integrative research conducted in the context of the project ArchiMediaL.

2. Preliminary Reflections on the Nature of Visuals in Urban Planning

Visuals play an essential role in architecture and urban planning: prospective drafts and plans convey what is yet to be built, photographs show places of the past and capture lost sites for posterity. Since the 19th century, photography has facilitated the realistic depiction of the real world including the built environment; since the end of the 20th century digital tools have brought new possibilities to the conception and representation of future-oriented design. Computer-aided design (CAD) has become a standard in architectural and urban design practice and digitally generated images have become a part of the real world. Despite many decades of research in computer technology and enormous progress, it has only recently become possible to take the opposite path: to recognize and analyze the real world and its images with the help of computers. But, researchers, librarians and archivists still must spend countless hours identifying buildings in the huge amount of analog and digital data available. Automated recognition of buildings in historical photographs has yet to become reality, but developing this capacity can open up previously unseen image material that is important for research.

Visual information plays an essential role in the study of urban planning and its history. Urban form and architecture start as ideas that must be translated into matter. Both general urban concepts and urban plans emerge as thoughts based on logical considerations. The design of classical Chinese capitals could be sketched easily as a square with three gateways on each side and a system of crossing roads and regular patterns of gated neighborhoods. Grid cities were also a widespread practice in the Greek and Roman world. Similarly, simple vernacular buildings are often the result of century-old practices without the need to communicate the idea in the form of construction plans. Charles-Dominique-Joseph Eisen's depiction of the primitive hut—which became famous as the frontispiece of Marc-Antoine Laugier's (1755) treatise *Essai sur L'architecture*—shows a romantic idea of early architecture derived directly from nature. A similar type of construction was certainly the reality for many huts and shelters, but any type of building going beyond that required a comprehensible communication of its organization and planning. For thousands of years pictorial representations of urban plans, of buildings, facades and room layouts have been used as tools for this purpose. They not only facilitate the recording of complex thoughts, but also allow for their precise exchange. Visual representations of cities even date from the 7th millennium BC (Rochberg, 2014, p. 14) and early building floor plans have been preserved from the 3rd millennium BC. Like today's visualizations, the ancient ones also served the purpose of spatial representation and essentially pursued two communication goals: the prospective communication of space still to be built and the retrospective recording of already existing space.

Technical drawings as well as town plans are the product of experts. Although there is a need for research, it can be assumed that innovations in visualization technology ultimately contribute to the realization of new types of cities and buildings. To give just one example,

the Renaissance saw a wealth of innovation in the visualization of buildings, such as the central perspective or the veduta, and completely new forms of urban design and architecture inspired by antiquity, but enriched by new possibilities, came into being. The graphic representation of spatial ideas has been further refined over time and some designs have become autonomous works in their own right. Without ever being built, architectural and urban drawings have influenced the built environment and developed into an element of collective imagination and inspiration. Most notable are the well-known neoclassical visions of Étienne-Louis Boullée and Claude-Nicolas Ledoux, which anticipated later aesthetic developments and were even carried out centuries after their conception (Aire du Jura, Arlay, France). The power of urban and architectural visions captured on paper is also exemplified through the works of 20th century designers. Visions for cities and buildings that were never built had a great influence on architecture and urban planning, for example Antonio Sant'Elia's primarily graphic work, Frank Lloyd Wright's plans for Broadacre City, Le Corbusier's Plan Voisin, or the urban and architectural fantasies of Archigram and Superstudio.

Technical innovations in the representation of the world have always been put at the service of architecture. Photography has been used since its beginnings to document the built environment and it has helped disseminate both architectural heritage and the latest architectural fashions. Noël Paymal Lerebours' *Excursions Daguerriennes* (1840) and the *Missions Héliographiques* initiated by Prosper Mérimé in 1851 are impressive examples of the early use of photography in the recording of historical monuments (Figure 1). They can be counted among the earliest sources that reliably represent the built environment. In the 20th century, Walter Gropius was a pioneer in the use of photography as a messenger for architectural ideals, he even had pictures retouched to make the buildings on them appear more progressive (Eckstein, 1994, p. 29). Numerous publications exist on architecture and photography. Some focus on major works, others on vernacular architecture. Their focus is on the analysis of the aesthetics of the image, the format or the content (Colomina, 1987; Lichtenstein, 2018). They are not used as tools for computer analysis. To what extent novel forms of representation have influenced the development of the built form requires further research, but some innovations of the late 20th century clearly show this impact. CAD applications that had been developed by French and American car companies since the 1960s became affordable and truly three-dimensional in the 1980s (Riccobono, 2014, pp. 35–37). They were relatively late to be introduced to architectural and planning offices (Corser, 2012, p. 13) and left obvious traces in the built environment from the late 1990s onwards. Peter Cook and Colin Fournier's Kunsthaus in Graz or Frank Gehry's Guggenheim Museum in Bilbao are two examples of buildings that were only made possible by advanced CAD applications.

In the meantime, CAD has gone mainstream as the operation of programs has become more intuitive and people have become accustomed to using input devices. For urban planning, a broad variety of digital tools has similarly been created and extended from technological instruments to means of inclusive and participatory planning (e.g., the AvaLinn mobile app and the 3D visualization tool Earth Autopsy). At present, it is the complete immersion in virtuality that promises new possibilities for the design and visualization of what is to be created. Virtual reality (VR) is on the threshold of becoming a ground-breaking environment for urban design

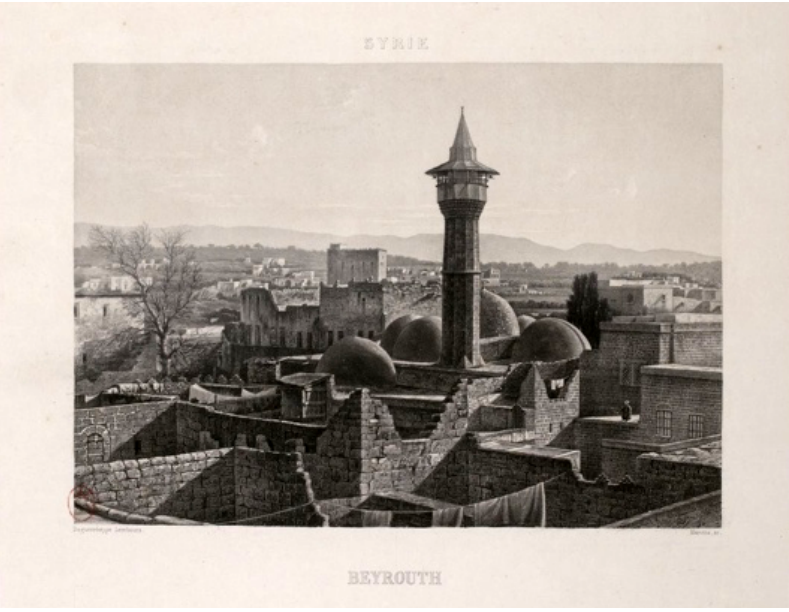

Figure 1. Cover of *Excursions Daguerriennes*, Beirut, 1840. Since daguerreotypes are not replicable, Lerebours had them lithographed so that they could be printed in series. Source: Lerebours, 1840.

and architecture as VR labs at leading research institutions demonstrate (e.g., the VR-Lab at TU Delft Faculty of Architecture and the Built Environment). In the VR-lab, designers become part of the world to be created, shape and move construction elements with their own hands and freely change the scale of the virtual world—at the same time, this almost playfully created digital model is the executable file for the production of real-world matter whereby any abstraction in the design process disappears. This also applies to the presentation of buildings and cities that have not yet been built: they are conveyed in such realistic renderings that they appear like photographs of already existing places, if one does not stumble upon the excessive perfection of the world depicted.

While the visual communication of architecture and visual planning tools are at the center of professional and academic attention regarding digital approaches, the analysis of mediatizations is largely carried out by conventional means in a painstakingly slow process that requires researchers with extensive background knowledge to carefully examine and annotate depictions of urban and architectural form. As libraries and repositories around the world fill in metadata on these images, they do so in different languages and styles, often making it impossible to find the same image if the metadata is not identical. In the process, millions of drawings, plans and photographs are lost to research. They are or will be made available digitally, but their content cannot be specified without great effort beyond the annotations made during digitization, insofar as there are no automated processes for this. Even as archives around the world are digitized, the knowledge that they include is not made available through metadata. For the history of architecture and urban planning, a challenge is to make these mediatizations usable for historical analysis and, in doing so, to also focus on those objects that have so far been insufficiently considered. Furthermore, the expensive digitization of visuals needs to be contextualized by urban and architectural historians. The databases that are currently digitized and that serve as the foundation for research represent only a small fraction of the built environment. Databases reflect particular collection strategies. A database on colonial architecture, for example, will only include that type of structure. A computer trained on these sources may assume that all architecture is colonial, which is certainly not the case. Computerized practices therefore need specialists from the humanities with sufficient computer knowledge to recognize opportunities and challenges and to translate and to apply them in the history of architecture and urban planning.

3. Deciphering Mediatizations

As mentioned above, digitization can facilitate access to a huge stock of visual material. Furthermore, digital cataloging is essential to inform about the existence and (virtual) location of the material globally and effectively. Digital catalogs such as Europeana, the German Digital Library or the Digital Public Library of America offer access to millions of digitized materials, including historical architectural and urban images, and specific repositories such as Colonial Architecture & Town Planning (colonialarchitecture.eu) contain enormous amounts of visual resources. Their digital availability—unless legally constrained—is a blessing for research, as these sources can be viewed and analyzed without much effort (and if required, the digitized object can still be physically inspected in the corresponding archive). Search filters enable researchers to easily find photos of certain objects and places or the work of particular illustrators or photographers. But what exactly is found via the search terms?

The names of objects, places and persons as well as the keywords are ultimately metatags, which have been assigned to the images at some point by somebody—and, ideally, systematically and correctly. They thus represent a historical knowledge that was attributed to the image and its content on the basis of external sources or through the specific expertise of a beholder. The keywords associated with the images can only be updated very slowly if this is done by hand and can therefore hardly extend to new terms that are important for current research. Any new findings regarding the image content can only in certain cases be included in the metadata. Far more consequential, however, is the fact that faulty, incorrect or missing meta tags mean that the image material may not be found at all. This is particularly consequential for the many images whose content is largely unknown or not recognized by collectors: Millions of images end up in repositories without any means of searching their content (Figure 2). Unfortunately, this primarily concerns precisely those buildings and areas that have so far received less attention in research (Löffler, Hein, & Mager, 2018). Longitudinal analysis of the built environment is one of the most important sources of knowledge and inspiration for today's planning. Since illustrations in turn are among the most important sources for architecture and urban history, it is of greatest relevance to make accessible those source materials that have not yet been consulted. Researchers and experts can take on this task but can only access a tiny part of the media concerned. In view of the abundance of material, even larger teams would not be able to make any significant stock available. Here, the very technologies that are also driving the production of buildings and cities promise to help: Digital technologies—in this case computer vision and open linked data.

The digital tools for structural analysis, design and planning developed over the last decades have so far been virtually unparalleled by tools that transform the visual analysis of the existing environment and its transformation not only into digital data, but also into comprehensive information. Only a few years ago, computer vision made a great leap forward and promised to enable the recognition and classification of real-world el-

Figure 2. Unknown building on a photo from 1895 in the Colonial Architecture & Town Planning Repository. Source: "Woning, vermoedelijk in Manado," 1895.

ements for a variety of tasks. AlexNet, a convolutional neural network designed in 2012, can be regarded as a ground-breaking step in this development (Krizhevsky & Sutskever, 2012). Since then, the superhuman performance of AI in certain areas of image recognition—as well as other fields—can no longer be doubted. Today, algorithms are fairly reliable in their ability to recognize the face of smartphone owners and they recognize streets, road users and cancer cells and can outperform humans in many areas. Therefore, they also appear promising in the analysis of historical images of the built environment of the past. In a joint venture between four European universities, ArchiMediaL investigates the possibilities of using current information technologies to open up previously unexplored architectural and urban image material for research by developing strategies for automatic image content recognition. The participating architects, architectural and planning historians as well as deep learning and linked open data specialists form a multidisciplinary team that operates at the interface between quantitative and qualitative methods and explores their integration.

4. Integrative Research

The research project started out by exploring the automatic recognition of buildings in historic images by AI. Analogous to automatic facial recognition, buildings are to be recognized and identified. The input objects are historical images of buildings whose contents are localized by a specially designed and trained artificial neural network. The localization allows unique identification. The recognition can be realized for a specific area by providing the computer with many images of already identified, i.e., localized buildings. This training of the network enables the computer to recognize buildings in historical images unknown to it. First, however, the training data set with several hundred historical images with identified buildings must be created.

Despite the goal of facilitating the opening up of large numbers of images on lesser known or little explored topics, the study must start in an area that is known to the researchers involved and that is also well investigated by architectural and urban history, since the performance and reliability of the algorithm can only be tested if the topic to which it is applied is well known. In this case that meant starting with several hundred thousand photographs of Amsterdam—a city that has been thoroughly researched by urban historians and is easily accessible for the project team—which could be obtained from the city's image archive (Beeldbank). The more than 400, 000 images, covering the period from the mid-19th to the end of the 20th century, contain daguerreotypes, black and white as well as color images, and have very different resolutions. They are mostly annotated, although in varying degrees of completeness—some annotations even include addresses or neighborhoods. This is also a good basis for creating a high-quality training dataset. In addition, the building stock of the Amsterdam city center has changed relatively little during the period covered by the images and is at the same time well documented. These conditions are favorable for the development of algorithms for the automated recognition of buildings in historic images.

The geolocation of buildings can be determined using a reference system that contains images of the building facades and their locations. This information can be obtained, for example, from online map services that feature facade images like Google Street View or Mapillary. Using the dense network of geolocated and oriented 360° images of Mapillary, covering most of Amsterdam's streets, it was possible to extract the location of today's facades and thus create a visual reference for the historic images (Figure 3). In order to enable an automated recog-

Figure 3. Amsterdam, Brouwersgracht 160 on Mapillary. The green dots in the map indicate the positions of 360° images. Source: Mapillary (2016).

nition through geolocation of the buildings in the historical images via deep learning, several hundred of these images have to be matched with the corresponding facade images from Mapillary. This teaches the algorithm to match a geolocated image with a building in a historic photograph. After training, the algorithm can then also locate buildings that were not included in the images of the training set. A large and well compiled training set increases the recognition performance.

In order to build the training dataset and to be able to evaluate the performance of the algorithm, it is necessary to exactly match buildings from the historical images with buildings in the Mapillary images. This task must be first performed by human beings through crowdsourcing and must meet ergonomic requirements. However, it must also be possible to perform it in such a way that it connects well with digital information processing. The ergonomic requirements refer to a simple and fatigue-free method of data entry. In addition, it is necessary to involve many people, as performing more than a few dozen matches quickly becomes a tedious and tiring task due to its repetitive nature, even if the crowdsourcing tool provides good ergonomics. In this type of crowdsourcing, the challenge is to design the matching process in such a way that it is both playful and intuitive and can be carried out without data entry errors. In order to meet these requirements, an online tool was developed that enables users to determine the scene corresponding to the historical photo by simple navigation in the virtual street space. Horizontal rotations and movements as well as zooming can be used to easily find a largely similar image section and register it as a match by a click (Figure 4). It is possible to add comments and report on possible problems—e.g., participants can indicate whether a place is inacces-

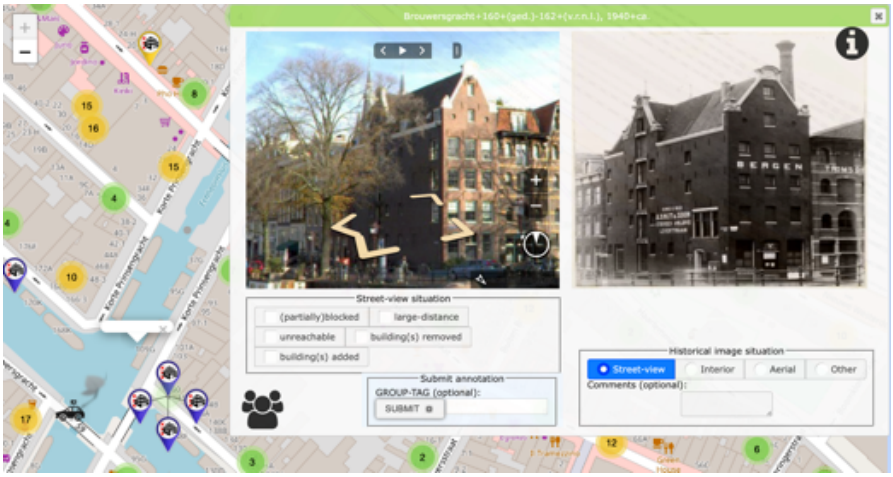

Figure 4. A historical picture of the Brouwersgracht 160 in Amsterdam from the 1940s and the corresponding street view scene in the submission form of the crowdsourcing tool. Source: ArchiMediaL, 2020.

sible or is of a different type than an outdoor street scene. They can also indicate whether buildings have been removed or added or whether their visibility is obstructed.

The administrators receive an illustrated list with the matches and can easily check their validity and also the performance of the contributors. A special login syntax makes it possible to distinguish between different groups of contributors while keeping their identity anonymous. This allows the performance of street scene recognition between e.g., architecture students, IT specialists or historians to be analyzed and compared. Targeted expansion of the user groups could allow statements as to whether local users can grasp the historical situations of their city more quickly and better than users who are unfamiliar with a city or who come from an area with a completely different urban development. This investigation is currently ongoing as a priority was the creation of the complete first training set. To date, more than 1500 matches have been made. An initial analysis shows that approximately two thirds of the assignments are valid and indicate the current location of the historic building. In addition, a smartphone app is being developed that allows users to compare historical images from their own collection with today's scenery in Mapillary and to submit their images. The resulting geolocation of the historical images, which even includes the orientation of the facade, supplements existing repositories with precisely located images from private collections. These images will help to complement historical image collections and contribute to a more complete picture of the past of specific locations.

5. Automated Image Content Recognition

The data set generated by crowdsourcing makes it possible to train a convolutional neural network in such a way that it is ultimately able to recognize buildings on the remaining historical Beeldbank images that were not part of the training data set. Despite the progress made in pattern recognition in recent years, and especially in the recognition of buildings (e.g., Amato, Falchi, & Gennaro, 2015; Andrianaivo & Palma, 2019; Gada & Mehta, 2017), this is an unprecedented task that first requires basic research. Even when it comes to on site recognition of buildings, based on current appearance, "the literature on how to develop effective neural networks to detect architectural features is still limited, as well as the availability of architecture-related datasets" (Andrianaivo & Palma, 2019, p. 77). However, AI-based recognition of buildings in historical images poses an additional challenge because the buildings have changed over time and are visually not identical to images from a georeferenced reference set (Mapillary). Moreover, it is a new challenge to let AI recognize objects in images from different domains. While a smartphone only has to recognize a single face that always appears frontal and is taken with the same camera, historical pictures of buildings are very different, as they show the object to be recognized from different angles and at different focal lengths; they may be blurred or sharp, over- or underexposed, black and white or in the tones of old color films. AI requires large training data sets to learn new tasks. To assure the success of the project, we opted to pair the AI task with the crowdsourcing mentioned above. This allowed ArchiMediaL to both use and study the knowledge of human observers of the built environment and those of the computer.

For this specific purpose, we designed an age-invariant feature learning convolutional neural network model with an attention aggregation module (for details see Wang & Li, 2019). Buildings can be clearly identified by their address or geolocation. Nevertheless, a location can contain different buildings at different times, and these may themselves be subject to changes such as partial demolition, extensions, additions or renovations. Therefore, the algorithm should ideally be robust against minor changes—and also against partial obstructions in the image, such as trees or cars—but still able to reliably identify particular buildings.

The data resulting from crowdsourcing provides a basis for evaluating the performance of the algorithm. The validity of the image content recognition can be observed through an expert view of the result. This only works for a limited number of findings—a much larger number of exactly matching images is required to provide a more reliable evaluation. The necessary validation and test data sets are also generated by the crowdsourcing method. Errors and distortions, which are also found in human thinking, are thus sometimes transferred to systems of AI (Leavy, 2018). This also refers to the canon of architectural history and urban or planning principles where colonial or gendered perspectives of the built environment may prevail. AI can help open up undiscovered areas of the documented past, but it is limited by the way it is trained. In this case the recognizability of the image content is limited to the areas covered by Mapillary. This means that backyards and private areas, for example, are only included in exceptional cases. Also, recognizability will be limited to those buildings that are still preserved or their adjacent buildings, otherwise there are no visual matches that can be recognized. The performance is still being evaluated and the data set has not yet been published.

6. Mixing Methods

While digital applications for design and visualization purposes are widely used in architecture and urban planning, architectural and planning history are humanities and social science disciplines that operate with different methods. So far, quantitative approaches to the visual analysis of historical representations of buildings constitute new territory. Although there have been numerous approaches to virtually reconstruct historical situations of cities (e.g., the Time Machine network) and progress has been made in 3D scanning and the printing of buildings and parts of buildings (see, e.g., "3D printer used

to reproduce Mauritshuis," 2017), these technologies do not focus on the interpretation of the digitally recorded imagery or structures and thus hardly facilitate the investigation of humanities research questions. The first conference on digitalization in art history, "Computers and Their Potential Application in Museums," took place at New York's Metropolitan Museum of Art in 1968. But even half a century later, digital approaches in the humanities dealing with imagery and space seem to have hardly been explored in depth. Only very few research projects, such as Urban Panorama (North Carolina State University) or Composito (University of Heidelberg), include automated image analysis. One reason for this is certainly the only recently achieved progress in the field of computer vision and the competitive demand from science and industry for these possibilities. Another reason is that efforts at methodological reflection and innovation in the humanities have so far been largely neglected (Hahn et al., 2020).

A central challenge here is the clash between qualitative and quantitative research. Established methods such as source criticism, discourse analysis, hermeneutics and morphological studies have provided a meticulous picture of certain urban planning phenomena and a high standard of analysis. Against this background it seems as if AI-powered automation and big data belong to a different world and may hardly be able to contribute to the intellectual task of pictorial-spatial analysis. But the quantitative approaches should not be seen as competing with the established methods, but rather as extending the existing possibilities regarding access to and handling of source material (Mager & Hein, 2019). The automated recognition of buildings in images can help to identify a large amount of image content, making a wealth of images searchable and easier to navigate as sources for research. It can also contribute to improving the availability of sources for forms of building and settlement that have hardly been considered up to now. As a result, previously less well researched areas such as informal settlements or vernacular architecture can be studied more comprehensively. Ultimately, the automated recognition of buildings in images offers the long-term possibility of identifying all existing photographic sources for a building or location and thus also contributes to creating a more solid basis for answering architectural historical research questions. Which insights can be gained by quantitative approaches will remain speculation until this field is duly investigated. New quantitative directions in the historical sciences reveal astonishing insights (Spinney, 2019). They can also lead the spatial sciences to innovate. This not only refers to the accessibility of source material, but also, for example, to the global distribution of architectural forms and structures or the worldwide analysis of the distribution of different concepts of land-use and zoning (Moosavi, 2017). Until recently, it was not possible to analyze the distribution of architectural or urban forms on the basis of millions of objects and places. The possibility of consulting (historic) big data may well provide opportunities to ask and pursue new research questions. Such questions need to be carefully framed by humanities scholars in light of existing biases—colonial, gendered, or other—and their potential transfer into the digital realm. But since AI uses data to create algorithms, possible bias results from this data even if the bias is not readily apparent. Biases that are present in the language and images used as training are taken over and continued (ALGB-WG, 2017; Koene, 2017). Therefore, in addition to careful programming, data quality is of great importance, and humanities scholars are called upon to think carefully about what can be considered ideal and universally valid. AI and large data could indeed be transformative in the sense that they allow phenomena to be compared on a global scale and over a long period of time. While humanities research addresses complex issues with a limited number of sources and case studies, new technologies can help to analyze a much larger number of sources and also make it easier to analyze visual information. We regard these possibilities as new tools that can lead to new and further-reaching questions, not as research instruments that provide their own interpretation.

In order to be able to take this direction at all, important basic research is needed. This concerns methodological issues as well as the practical experience of research teams consisting of humanities scholars and IT specialists. ArchiMediaL's approach here is to formulate research problems in such a way that they represent a challenge for all disciplines involved and that no science appears as a mere support. This approach begins with building understanding of how research is conducted in other scientific fields, what is interesting and what is possible, what experiences exist with other (auxiliary) sciences or what publication strategies prevail. The attempt to analyze historical big data with the latest methods of deep learning, to involve many people—laypeople and experts—in research via crowdsourcing and to deal with partly unknown visual material has provided further understanding of the new possibilities and the results they can generate. By locating buildings in the more than 400, 000 historical photographs from the Beeldbank archive, they become discoverable and thus accessible for research. In addition, the automated building recognition developed can also be applied to other locations and in the future serve to identify less well researched areas. The basic research carried out represents a breakthrough in the field of computer vision and offers methodological incentives for historical architectural and urban research.

7. Outlook and Conclusion

The findings of the ArchiMediaL project open up new perspectives for planning history in diverse areas. Researchers, politicians and planners can explore 4D reconstructions of the past (e.g., in their respective websites, the HistStadt4D research project or various local Time Machine projects) to increase historical under-

standing, to enrich tourist experiences, or to facilitate planning decisions. A look at the number of images collected in specific areas of the city provides a first step into research. Why are more materials available for some locations than for others? How is this spread over time? How can we complement the available data through crowdsourced intervention? The historical data available from ArchiMediaL can be used to advance community engagement and serve as a hub to collect local stories. Such stories could be complemented by visuals contributed by individual citizens that are not in official archives, but that are needed to complement the existing data with more vernacular elements. Local stories could help create new leisure and tourist locations and open up new themes and directions.

Digital reconstructions can also provide advanced understanding of processes in the past and the role of planning therein. For example, available photos can be connected to specific moments in time when urban plans were made or implemented. As a result, we may be able to study moments of transition and temporalities, scales and perspectives of planning intervention. Assessment of past crises and the intervention of public actors through policy or urban interventions, for example, related to public health events (pest, cholera, yellow fever), environmental disasters (earthquakes, floods, windstorms), or changes in the energy landscape (petroleum revolution), can provide insight into contemporary challenges from global diseases to climate change and the (re-)introduction of sustainable energy sources. Modeling of the past would complement contemporary tools that are aimed at designing the future. Smart city discussions project the future, but they usually do not acknowledge where the current environment comes from. A better understanding of the planning processes that have created our cities can help identify path dependencies and critical junctures. It may allow us to combine spatial and social data about the past to model neighborhoods and entire regions and the intersection of spatial, social and cultural developments.

New research questions can be framed through the availability of such data. Using the ArchiMediaL tool can raise numerous questions. For example, scholars could examine bubbles where more or less data is available raising questions such as: How does the availability of pictorial data from the past overlap with the architectural quality of the building stock, or the socioeconomic composition of its citizens? In the case of Amsterdam, many datasets with spatial information are available in digital form, including ones based on the age of buildings, the number of breeding birds in green areas, climate information (heat, drought, flooding), postwar monumental wall art and land value, to name but a few. The crossing of this data with the visual sources localized within the work of the project allows for the framing of new research questions that investigate the connection between architectural and urban form with phenomena such as property value or gentrification. The expansion to other cities and areas will make it possible to formulate new findings on the basis of a high number of correlations and thus to make more general statements than those that emerge from individual case studies.

The application of AI for historical research is not a mere information technology task. As with any mixed methods approach (Creswell & Plano Clark, 2018), it requires the meeting and communication of different disciplines and profound expertise in the humanities. Interpretation of the past needs careful framing of the available data to achieve meaningful findings: Such a step can only be made through transdisciplinary collaboration among humanities scholars, computer scientists, historians and designers. Moreover, this project has required people to contribute their knowledge, both to create the training dataset and to eventually evaluate the performance of the algorithm. Crowdsourcing can offer an important opportunity for participation—important not only when it comes to identifying past worlds, but also when it comes to involving people in research, integrating their point of view and ultimately awakening their interest in questions of urban history and urban development.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Digital Visualisation as a New Driver of Urban Change in Africa

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Abstract
Cities in Sub-Saharan Africa are growing faster than in any other part of the world, driven by expanding informal settlement (usually on the urban periphery) and the real-estate sector aiming for up-market property development. The continent currently has the highest real-estate value growth potential in the world. Much up-market property development is currently taking the form of new 'cities'—sometimes a redevelopment of an entire city (e.g., Kigali), sometimes a new city on an urban edge (e.g., Eko-Atlantic, Lagos) and sometimes a new satellite city (e.g., Tatu City, Nairobi). These projects are driven by international property development companies often in collaboration with governments and sometimes with local planning and property partners. All manifest as plans in a new way: as graphics on the websites of international consultants. Most involve no public participation and attempt to by-pass planning laws and processes. Producing these new plans (as computer generated images) are a new set of professionals: architects, planners, visualisers, advertising executives and project managers, working together in offices in global capitals of the world. Their aim is commercial. Planning in these projects is no longer shaped by the materiality of the city and attempts to achieve socio-spatial justice and sustainability. Rather planning is shaped by the circulation of graphics through a network of software programmes and marketing professionals. This article will situate Africa's new cities in theorisation of urban development and the role of urban planning through digital visualization.

Keywords
digital visualisation; property development; urban Africa; urban inequality; urban planning

Issue
This article is part of the issue "Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures" edited by Gabriela Christmann (Leibniz Institute for Research on Society and Space, Germany), Christoph Bernhardt (Leibniz Institute for Research on Society and Space, Germany) and Jörg Stollmann (TU Berlin, Germany).

1. Introduction

The thematic issue this article belongs to argues that the mediatisation and digitalisation of communication processes in urban planning has been taking place with increasing speed. This article suggests that these communication processes are having a major impact on new forms of urban development on the African continent, primarily through their adoption by international real-estate companies embarking on urban mega-projects. These new forms of communication have the main aim of promoting up-market real-estate developments to potential buyers of land and property, but also of inducing governments on the continent to give political and institutional support to their land and planning approvals and infrastructure servicing. This planning is very different to the forms of participation and communication long promoted by planning theorists (such as collaborative and communicative planning) which aim at democratic and inclusionary planning processes. The outcomes of these new mediatised and digitalised processes and projects are therefore far more likely to promote urban inequality and exclusion of poorer and less powerful urban residents, although as this article concludes, this does not necessarily have to be the case.

This article addresses the following questions: What new forms of urban planning processes and outcomes are emerging on the African continent? What economic

and political factors are driving these new approaches to urban development? Which actors and technologies are playing a role in these new approaches and how are they shaping urban outcomes? Finally, what are the implications of these new approaches for future urban development and the key societal and environmental issues which cities face? My research is based on existing published literature on these questions and on website explorations. It concludes that technologies involving CGIs (computer generated images) of new urban visions are playing a growing role in what are largely private-sector and profit driven proposals for new urban development. In these design and marketing processes the role of professional planners is changing as well. The potential outcomes of these new forms of planning will be to worsen existing social and economic inequalities in African cities, and to draw policy and planning attention away from meeting urban basic needs and environmental sustainability.

The first section of this article sets out the method. The second section gives a background to urban growth and change on the African continent and how the international real-estate economy has come to play an important role in shaping this development. The third section draws on two areas of theorising which suggest how planning and the role of professional planners in international real-estate companies has changed in recent years. One set of ideas explores 'entrepreneurial' planning and how it contributes to traveling planning ideas from one part of the globe to another. The second set of ideas researches the role of CGIs in the production of urban space based on a published case study of a Doha, Qatar, downtown mega-project. The fourth section of the article discusses the implications of this wave of mediatised planning for sustainable and equitable urban development in African cities.

2. Methodology

The article is based on secondary sources of information. A literature review was undertaken of reports and published articles on the urban real-estate industry on the African continent, on the role of international urban development consultancies in these projects, and on how these design consultancy firms use new computer technologies and software to produce and market their visions of new urban mega-projects. The published literature on all these aspects, especially in relation to African cities, is limited. The nature of these new forms of urban development has only been recognized and researched in the last six or seven years. Very few of these publications examine the role of new computer technologies in producing visions of these mega-projects. Only one published in-depth, theoretically framed, case study was found on CGIs, the production of urban space and the role of urban design professionals, in an African context. This case study is of the Msheireb Downtown project in Doha, Qatar (see Rose, 2016; Rose, Degen, & Melhuish, 2014). Qatar is a North African country and hence very different to the rest of Africa, although the African continent itself is so regionally diverse that it would be problematic to generalise from any one case study. However, this article is based on the assumption that the Doha case raises relevant theoretical questions which could be tested in other in-depth case studies on the African continent (on the case study method in Africa see Duminy, Andreasen, Lerise, Odendaal, & Watson, 2014).

A second source of information for this article was the web. A search was undertaken of the websites of international urban consultancy firms and any African urban mega-projects with which they are involved. Websites on urban mega-projects in Africa were also searched to ascertain the nature of their graphics, design rationales and marketing. This search yielded several potential examples, but the one mega-project referred to in this article is Diamniadio Lake City in Senegal. It illustrates a number of the characteristics of the international consultancy projects described in Rapoport and Hult (2017).

3. African Urban Change and the Real-Estate Industry

While rates of urbanisation across the continent are highly variable, in general it is recognized that many African cities are amongst the fastest growing in the world and are likely to experience a doubling of current populations in the next 25 years. Some cities are growing at a rate of 4% annually. At the same time economic growth and formal job creation have been low relative to other parts of the global South where rapid urbanization and economic development have progressed in tandem (World Bank, 2017). As a result, in Sub-Saharan Africa, urban inequality measured by the Gini coefficient is amongst the highest in the world: 43% of the urban population live below the poverty line, 60% of urban jobs are informal and 62% of the urban population lives in informal settlements (Turok, 2014). Many African countries and cities also have weak systems of public urban management which are poorly financed and capacitated, have complex and competing land tenure systems, and operate through centralised, rigid and outdated planning laws and regulations. Few countries are therefore able to effectively intervene to address critical urban problems and accommodate the rapid rate of expansion, although exceptions (such as Rwanda, Ethiopia and South Africa) do exist.

For these reasons most African cities attracted little in the way of formal private sector investment over the past decades, however that changed significantly after the 2008 financial crisis when global real-estate and infrastructure finance began to look for new markets in emerging economies. With African economies showing a post-2008 revival on the back of a resource boom, urban middle classes have grown and demand (from both domestic and international sources) for formal residential and commercial development have added to global inter-

est in African urban land and property markets. Africa is now viewed as having the highest potential real-estate value growth from a global perspective (Savills World Research, 2017).

In the years after 2008 this new global interest in investment in African cities became evident in a number of ways. Goodfellow (in press) refers to the rapid growth of foreign investment in infrastructure where risks could be lowered through public-private partnerships and revenue generating. At the same time (and often related) a growth in the urban real-estate market has been led more often by domestic and diasporic investors as there is still much hesitancy from global real-estate investors given high risk factors in many African cities (Savills World Research, 2017). Frequently these two sources of investment combine in urban mega-projects where infrastructure investment creates the potential for rising urban land values and real-estate profits. Goodfellow (in press, p. 13) suggests that the "infrastructuralization" of international finance is feeding into the "real-estatization" of domestic capital, further increasing the significance of urban real-estate. The conceptualisation of urban mega-projects usually lies with global consultancies although they are often financed in partnerships with government or domestic investors. It is not unusual, therefore, to find continental or local consultancies involved in taking forward more detailed real-estate plans from the overarching project conception developed by global companies.

Post-2008, these mega-project proposals emerged into the public realm largely through advertising on the websites of global property investment and engineering consortia. They took the form of glitzy graphics showing up-market commercial and residential developments as new satellite cities, as developments on urban land made available through informal settlement clearance or infill, or even (as in the case of Kigali in Rwanda) as completely rebuilt cities. A substantial literature now exists on these 'fantasy' African cities (Watson, 2014) from the perspectives of their relationship to formal planning systems (Ballard & Harrison, 2019), their link to economic sectors (Choplin, 2019), their spatial implications (Keeton & Nijhuis, 2019), the influence of urban policy circulation (Côté-Roy & Moser, 2019) and their processes of land acquisition (Noorloos, Klaufus, & Steel, 2019).

These fantasy city proposals have usually involved influential new players in the field of urban planning and design. They tend, at the inception stage, to involve architectural, engineering, property development and planning professionals located in global consultancies with head offices in capitals such as New York and London or, increasingly, in eastern cities. Spatial and architectural plans are developed for identified sites (where land may or may not have been formally acquired) by professionals who may well not have been to the continent at all, and who have been reliant on google earth or other secondary sources to identify contextual informants. There is little or no evidence in the literature on these mega-projects that there has been any form of public participation or engagement with the full range of stakeholders and those likely to be affected by such projects. Engagement with national and local governments may occur through politicians rather than government officials and often tends to bypass legal and regulatory planning systems. These mega-project proposals then appear on the internet in a very different form to the usual, officially produced, planning and infrastructure technical reports, rather using visualisation through 3D graphics as the primary (and often only) form of communication. Visuals for projects such as those in Kigali, Eco-Atlantic in Lagos, Hope City in Ghana, Kigambone in Dar es Salaam, Tatu City and Konza City in Kenya, and many more, are all examples of these processes. As a result of this shift, planning and design professionals are drawing on new and different skills, are engaging in different work-flow processes and are interacting with each other and with technology in very different ways. This has far-reaching implications both for the impacts of new mega-projects, if they are implemented, and for the social, economic and governance processes which shape them.

Drivers of urban spatial change in Sub-Saharan Africa are numerous and complex, and informal settlement and the informal economy are still the main determinants of spatial growth and change in many countries. The impacts of the current covid-19 pandemic on African economies and on cities will no doubt be significant and are difficult to predict. In the last several years plans for profit-driven urban mega-projects have grown in prominence and many of them are still on plans and websites, yet they promote an image of new urban development embedded in Western (and increasingly Eastern) views of modernist cities. These images will no doubt shape the aspirations of future land developers, both local and international. New digital visualisation processes in urban planning and development are the central vehicle for conveying these images, and how these are developed and circulated is the focus of the next sections.

4. The Changing Role of Built Environment Professionals through Digital Visualisation

This section of the article explores the role of digital visualisation in urban planning and development on the African continent from two perspectives. The first examines the role of international property development consultancies in trans-local processes of profit-driven (or entrepreneurial) planning and design. The second considers work-flow processes within such consultancies and the role of CGIs in the production of space. Both these aspects show how the role of planning professionals is very different from what is usually understood to be the case.

4.1. Entrepreneurial Planning and Design through International Consultancies

In the fields of urban studies and planning there has been a growing literature on global policy mobilities through

processes of neoliberal urbanism, in which it is suggested that cities can be remade with reference to imaginings of supposedly successful antecedent urban experiences elsewhere (Bunnell, 2015). These model cities have in the past tended to be European or North American but increasingly they are cities in the Middle East (e.g., Dubai) or East and Far-East Asia (e.g., Singapore and Shanghai). Recent literature also reflects a shift from the idea of policy transfer to policy mobilities (McCann, 2011) which draws attention to the "range of agents, practices and performances involved in the social production and transformative circulation of forms of policy knowledge" (Bunnell, 2015, p. 1988). The work of Rapoport and Hult (2017) focuses on a particular set of these agents and their practices of policy mobility. These are the global intelligence corps (GIC) composed of international private sector architectural, planning and engineering consultant companies which "package up their expertise in urban sustainability as a marketable commodity and apply it on projects around the world" (Rapoport & Hult, 2017, p. 1779). The authors note how these particular framings of sustainable urbanism have been incorporated into neoliberal agendas of development as economic growth, making it an easy concept to sell to governments and real-estate developers. Also termed ecological modernization theory, it advocates technological advancement and industrialization as a win–win way to solve environmental problems.

Rapoport and Hult's (2017) survey of a large number of GIC professionals explains some significant aspects of this form of master-planning. Firstly, they contain a consistent set of design principles and technologies regardless of location. Tagged as sustainable urbanism, these plans usually indicate high density (glass tower-blocks), mixed-use, landscaped open space and private car and non-motorised movement routes. Hence master-plan graphics from different parts of the world tend to have a 'cut and paste' similarity about them. In some cases, images of existing iconic buildings are positioned within new plans. For example, the 2008 plan for a new Kigali (in Rwanda) contained an image of the London building termed the gherkin (Figure 1). The gherkin was designed by Foster and Partners architectural firm in London for a very different contextual setting. Secondly, the GIC work is completed once the master-plan graphics are done. The project will then be handed over to real-estate developers (local or international) and local built environment professionals to refine depending on the target market. Hence planning professionals play different and usually disconnected roles in the mega-project process, having significant implications for plan processes (especially stakeholder engagement) and outputs. Thirdly, the GIC masterplan is not an end in itself but aims to achieve other objectives such as regulatory approval and investment, both of which will increase the value of land. For all these reasons the role of plans and planners in these mega-projects has changed significantly over the last decade. Detached from on-the-ground informants and stakeholders, and located probably in another part of the world, planners work with other built environment and media professionals to produce standardised graphics of urban visions which conform to the tastes of an up-market elite and lure land investors, and at the same time can be justified as sustainable or smart in terms of a wider development and political agenda.

A current African urban fantasy mega-project in Senegal, called Diamniadio Lake City, provides an example of the characteristics outlined by Rapoport and Hult (2017). This is a new satellite city for some 350,000 people located 20km outside of the capital of Dakar and will be close to the new international airport. National government claims that Dakar, at three million people, is overcrowded and congested with "large groups of unemployed workers lingering on street corners" (Bendix, 2018). This emphasis on visual and aesthetic aspects of the capital, which detract from its image as a modern city, is common across most of the African new city plans and lays the ground for proposing new city images which reflect modernity and global city status (Acuto, 2010). Planning approvals for Diamniadio were secured in 2013 but its completion is only planned for 2035, at a total estimated cost of 2 billion dollars.

Figure 1. Kigali conceptual master plan (Watson, 2014, p. 218).

The neoliberal approach to sustainable urbanism is evident in the Diamniadio plan. The city is seen as a component of the 2014 national development plan (Plan for an Emerging Senegal) which takes an economic modernization approach by focussing on economic growth and attracting local and foreign investors. The website graphics for Diamniadio and Figure 2 are extreme versions of futuristic modernism dominated by glass-box tower blocks, landscaped open spaces and water features. Pedestrian and car movement systems show no sign of traffic congestion, informal traders or the "lingering unemployed" (Bendix, 2018) which supposedly make Dakar unattractive to investors and the up-market elite. There are suggestions that the new city promotes sustainability, with the design responding to locally threatened baobab trees by installing green roofs (one graphic shows small strips of grass and dotted trees on rooftops) and facades which accommodate renewable energy (Bendix, 2018). The suggestion that the architecture was inspired by Sengalese culture and landscape is particularly hard to believe. The developers claim that "its sharp curves and sloping lines mimic the amorphous patterns of algae in a nearby lake, as well as the silhouettes of traditional female sculptures" and incorporating copper into each structure connects buildings to the natural landscape (Bendix, 2018).

The plans and architectural graphics for Diamniadio have clearly been developed by professionals with little or no understanding of the real social, economic and environmental issues facing Senegal and Dakar. The entire project is aimed at attracting global investors and wealthy residents, in a country where 46,7% of the population live below the poverty line (Henyan, 2016). The international real-estate company behind the project, Semer Investment, has its head office in Dubai and states as one of its aims the opening up of opportunities in Africa to the rest of the world. It is likely the professional planning and design outputs were developed from Semer offices, although the architectural renderings, communications media, and website design may have been outsourced elsewhere. It is not clear if Semer has further involvement in the project. It appears that the company sells onwards parcels of land for 'mixed use' to other real-estate developers and there are suggestions that China will be building the industrial park and may set up businesses there. National government seems to have an over-arching role in the project and is undoubtedly funding some basic infrastructure such as the high-speed rail network which will stop in the new city and serve the new minerals port close-by.

It is also not yet clear if construction on the project has started: a recent google earth picture shows the old town of Diamniadio but no sign of new development. Along with many other GIC-initiated urban mega-projects it may be that this one never gets beyond the website graphics. Nonetheless the entire concept and approach to planning as it has been understood in the past, has changed fundamentally in these new urban mega-projects shaped largely by their market-related objectives using new communication mechanisms and technologies.

4.2. The Role of CGIs in the Production of Space

Within the framework of policy mobilities and international consultants considered above, understanding digital visualisation and planning in urban mega-projects on the African continent also requires an examination of what happens in the professional work-flow process within the companies which produce the proposals. Here, planning and design professionals have their interaction with each other (and with a variety of other

Figure 2. Diamniadio Lake City, Senegal (Bendix, 2018).

professionals) and their 'output' or 'products' shaped by their relationship to computers and soft-ware codes. This is very different from planners located in state bureaucracies where interactions and outputs are usually driven by rules, regulations, policies and political power, and by bureaucratic divisions, hierarchies and cultures. The work of Gillian Rose and co-authors (see Degen, Melhuish, & Rose, 2017; Rose, 2016; Rose et al., 2014) on CGIs and the production of space, using actor-network theory, is a useful conceptual framework for exploring the work of planners who produce African urban mega-projects.

Rose et al. (2014) argue that rather than explaining the work of CGIs by seeing them as simply a marketing tool, as an exertion of affective power through visual images, or through their material influence on cities (as previous research has tended to do), there needs to be a step backwards to understand how these images were, in the first place, shaped in their process of production. These authors consider how CGIs circulate through networks and therefore they do not refer to them as images but rather as interfaces which are a series of actions that activate the network. Starting with networks directs attention on CGIs to:

> [How] they are made [to show it] as they circulate around a network of offices and computer screens; they are worked on by architects, visualisers, project managers, the client, advertising executives, and others; and the visualisation's digital file thus constantly encounters various software programmes, hardware devices, and human bodies. (Rose et al., 2014, p. 387)

Rose (2016) draws on shifts in the field of cultural geography, and new forms of cultural production, to explain one of these new forms: digital visualisation of new urban developments to show creative professionals (architects, planners), developers, clients and new inhabitants of these developments what they will look and feel like when complete. This requires achieving particular visual qualities to suggest a form of lifestyle and urban aesthetic ultimately needed to sell the urban developments (or parts of them) as commodities. The process of achieving the necessary visual qualities, and making the project desirable to a market, is highly iterative and demands frequent, quick and easy communication (digital and verbal) between creative professionals, and graphic mutability.

Rose and colleagues draw on a case study of the role of CGIs in the planning and design (and marketing) of the 31-hectare downtown regeneration project, called the Msheireb Downtown, in Doha, Qatar (see Rose, 2016; Rose et al., 2014). The developer in this case was Msheireb Properties, a real estate development company, owned by the Qatar Foundation and acting as a source of revenue for the Foundation's other work in education and research. The case shows how 'planning' in these kinds of projects has changed significantly from how it was understood and practiced across much of the African continent until a decade or so ago. Section 3 of this article argues that much new planned urban development in Africa now takes place through the kinds of companies (GICs) involved in the Doha project, sometimes in parallel—or in some kind of interaction with—traditional forms of planning through governments, laws and regulations.

As an illustration of the very different role of planning professionals in processes like the Doha downtown project, Rose et al. (2014) point to the following: Two global urban project companies (UK-based Allies and Morrison and American-based engineering company AECOM) together made a successful 'pitch' to Msheireb Properties (the client) to develop a proposal for Msheireb Downtown. Allies and Morrison is a London based company employing at the time some 300 professionals, mostly architects. AECOM is an international engineering firm with 87,000 employees with headquarters in Los Angeles. The client asked for photorealistic CGIs as they wanted to see the 'look' of the project and to be able to show these to people less able to read plans, maps, and elevations. They also wanted specific visuals to attract future investors. Degen et al. (2017) explain how these digital images aim to evoke and manipulate specific "place atmospheres" and to foreground the "experiential qualities" of the new developments. Moreover, these visual qualities have a dual and related function involving both communicating particular urban aesthetics to future users and being used as a marketing tool. Regarding the latter these authors point to the way in which 'atmosphere' has entered the commercial mainstream as a practice of architectural and urban branding, and marketing, within the context of the "experience economy" (Degen et al., 2017, p. 4). Publications on urban mega-projects and new city proposals across the African continent (see, e.g., Acuto, 2010; Côté-Roy & Moser, 2019; Watson, 2014) show that Msheireb Properties was not unusual in this request and intent. The majority of these new urban projects are portrayed as visuals of a final built form (rather than maps and plans) on property developer websites with the aim of enticing property investors and middle/upper income buyers. Often the aim is also to secure political support. Hence "computer-generated images (CGIs) have now become *the* most common type of image media used to visualise and market future urban redevelopments" (Degen et al., 2017, p. 4; emphasis in the original).

A further relevant request from Msheireb Properties was for visual graphics which showed views of streets, squares and public spaces rather than individual buildings or plan layouts. Again, this has become a common feature of website visual graphics in African mega-project and new city proposals. Views are usually oblique aerial shots (fly-by views) or views along streets with buildings lining them: perhaps the view of a potential investor from elsewhere in an arriving plane rather than that of a direct user of the space moving on foot. Some of the websites feature a moving video graphic which starts from an aerial shot and then shifts to closer views. In

the Msheireb project, Rose et al. (2014) and Degen et al. (2017) describe how this placed particular demands on the relationships between the different creative professionals from the two consultancies, as well as demands on the relationship between them and those involved in marketing the project, and the client. In the past architects, urban planners, urban designers, engineers, property developers and sales personnel had clearly defined roles in new project development and while their products were expected to align, the scales, level of detail, issues and objectives differed. It is no accident that in very many universities across the globe these professions are still taught in different and separate academic departments, and often in different faculties. Graduates may know very little about what other professionals do until they are in the workplace. Academics publish in very different journals and practitioners fall under different and separate professional bodies. These divisions all reinforced past professional roles and work-flow processes.

The new CGI-driven process puts these professionals into a direct relationship with each other and also prioritises the work of some over others. In the Msheireb project (Rose et al., 2014) the demands of the client in Doha were paramount as it had to be persuaded to invest in the project and with the chosen consultants. Interviews with architects revealed their dissatisfaction with the graphics produced for the client as the latter tended to look at the overall image and make a decision on that, rather than on the architecture. This left the architects unclear on how their design process should proceed.

Conventionally architects focus their work on the design of buildings, and urban designers and planners on the public space and overall configuration of spaces and land uses across the project. The client's demand that they be shown views of the streets, squares and public spaces placed more emphasis on the work of the latter professionals with the detailed building designs of the architects perhaps being paid less attention. An intermediary professional here is the visualiser who takes the work of the other built environment professionals to "interpret and execute digitally the place atmosphere suggested by the ALA" (Degen et al., 2017, p. 10). An ALA is an architectural language advisor. The work of the visualiser in this case study is explained as beginning on a CAD file by stripping out architects' design details, leaving something on the screen which looks like a wireframe model. Tensions emerged as the architects wanted to depict their buildings accurately while the visualisers wanted to evoke the life or mood of a future place. To do this, the visualiser would focus on the public space, usually cutting and pasting from online image banks of people, trees and street furniture. In the Msheireb case this caused tension between the visualiser and the client who complained of insufficient Qatari-ness in the street images (Rose et al., 2014). This requirement from a locally based client is probably unusual: Most of the website graphics of project proposals display cut-and-paste images which have no acknowledgement of context at all. Degen et al. (2017) note that despite the contact with the Qatari client the final digital-sensory fabrications were still shaped by a "singular western sensibility."

The ALA added another perspective by requiring more "poetic" images, "atmosphere" and "magic" (Rose et al., 2014, p. 399)—terms which both architects and visualisers found hard to understand but were required to take on board. A further step in the process was carried out through digital rendering which converts a working image into something more like a picture. Rose et al. (2014) explain that this process requires very large amounts of computer processing power and the work may be sent to Chinese render 'farms' where massive computers can be powered by cheap electricity to generate graphics very quickly. The detachment of all these processes from context is evident.

What the Msheireb case shows is how new work-flow processes and client priorities have significantly changed the way in which creative professionals, including planners, play their role and interact with each other and with (and through) their work tools. A significant driver of this change in the Masheireb project, but also in just about all other urban mega-project and new town proposals, is the role of the commercialised, profit-driven real-estate sector. Rapoport and Hult (2017) refer to this as "entrepreneurial planning and design" and Bunnell (2015) as "neoliberal urbanism." Even in mega-project cases where the state has a strong involvement such as Diamniadio Lake City in Senegal in promoting and approving the idea of a new city, much of the implementation and marketing falls to the private sector. This drives the need for speed in proposal production and most importantly the nature and quality of graphics and the audience at which they are directed (developers and investors, or homebuyers). Graphics also need to be produced for different purposes (website graphics, billboards, investor or buyer marketing, and perhaps planning approval) and each of these demands different qualities, forms and methods of production.

In the Msheireb example (Rose et al., 2014) creative professionals worked far more directly with each other than might have traditionally been the case and largely through the medium of their computers and CGIs. They fed into the work of relatively new professionals in the field such as visualisers, language consultants, renderers and marketing executives, with these skills being used to integrate specialist design work and 'interpret' it for the market. In the process it appears that many of the conventional aspects of these professional's work (detailed building design by architects; public space, infrastructure and land use design and definition by urban designers and planners) was air-brushed out of the final product.

For planners some very important aspects of their usual work appear to be missing entirely. The first of these is contextual analysis, providing details of local environmental, economic, social and spatial factors which would normally inform a plan. Planners involved in these

kinds of projects are often located in offices very far away from the African continent, may never have been there and may know little or nothing about this part of the world. The second is the institutional and public process of planning involving engagement with the state and the various legal and regulatory requirements of planning, and engagement and interaction with civil society i.e., public participation. For these reasons almost all the website graphics of these African mega-projects and new towns appear as strangely context-less. Similar graphics appear for proposals in very different parts of the continent, and many of these graphics are deliberately cut and pasted from online image-banks with pictures of 'iconic' modern cities such as Dubai or Singapore. Context has become irrelevant and dealing with the real and very serious social and environmental issues in current and future African cities is no longer in the job description of planners doing this kind of work.

5. What New Planning Forms Mean for Future African Cities

As indicated at the start of this paper, African cities face a particular combination of issues including rapid growth, poverty, unemployment, inequality, poor infrastructure, environmental problems and weak governance (although these vary significantly across the continent). Even though planning systems themselves are often weak and conflicted they offer one clear mechanism through which governments can intervene in how urban futures unfold. This is recognized in the New Urban Agenda, Sustainable Development Goal #11 which foregrounds urban planning as a policy tool. The kinds of urban mega-projects and new towns discussed in this article do not in any way seek to address these issues, in fact (as in the Diamniadio Lake City case), they directly aim to locate new urban development far away from the "congestion and overcrowding" (Bendix, 2018) of the existing cities, avoiding the aesthetically unfortunate image this creates of lingering unemployed workers on street corners. The new urban projects, driven by profit-motivated private sector developers, rather aim to create completely separate, middle-class enclaves either on newly cleared or created urban land (e.g., Eco Atlantic in Lagos) or in satellite towns well beyond the edges of existing cities (e.g., Tatu and Konza cities in Kenya; Hope City in Ghana and many more). This will greatly exacerbate urban inequalities and draw government infrastructure investment as well as any rates contributions away from existing cities where this is needed most. Graham and Marvin's (2001) "splintered urbanism" (referring to the ways in which the provision of networked urban infrastructural systems can spatially fragment and dislocate the social and economic functioning of cities and regions) is likely to result at a scale yet unseen (Watson, 2015).

However, it is also possible to ask if the technologies and skills involved in CGIs could not be used for other reasons, perhaps as a way of opening up participatory planning processes amongst poorer communities where government or NGOs are working with communities on upgrade proposals? In these situations as well, 'the client' may not easily understand maps, plans or building details, and intended outcomes and processes to get there can be more easily communicated through graphics and videos. A significant difference between these CGIs and ones used by property developers would be a deep and accurate grounding in context and realistic portrayals of planning and building outcomes which communities can understand as affordable and appropriate.

6. Conclusion

This article has considered the recent mediatisation and digitalisation of communication processes in urban planning on the African continent. It shows how these technologies have become very much part of a new wave of urban development proposals in and around African cities led by the global property development industry, aimed at a growing middle-class and anticipated rise in urban commercial and retail investors. Urban planning professionals have become incorporated into the generation of these proposals but in ways which place very different demands on their skills, on their relationships to other creative professionals, and on their connection to the context and people for whom they are planning. The traditional notion of planning being in the 'interest of the public good' is entirely absent in these processes and planners find themselves serving a narrow set of elitist and profit-motivated demands. The new dominance and prevalence of these kinds of urban development projects across the continent is likely to have a highly negative impact on existing cities and towns and create a major setback to the aim of more equitable and sustainable future cities.

Conflict of Interests

The author declares no conflict of interests.

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Article

The Entanglement of Class, Marriage and Real Estate: The Visual Culture of Egypt's Urbanisation

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Abstract
A majority of scholars consider Egypt's urban development a product of the neo-liberal political economy facilitated by the country's central government. In this article, we want to shift our attention towards the public and its demand for housing. We describe the urban everyday experiences of a population within a country in which a visual culture established via public media creates an urban imagination that does not reflect the lived social, spatial, and economic reality of the majority of the population. Exploration of the general public's attitudes towards media narratives that focus their advertisement campaigns on high class residential projects launched this investigation. The argument that follows is based on empirical studies within the Greater Cairo Region (GCR). In this setting, a puzzling trend from our collected data guides our central research question: Why aren't ads for luxury housing—a market segment clearly beyond the reach of most Egyptians—condemned by those who cannot afford it? To tackle this phenomenon, we shed light on how the pre—and post-marital demand for housing among young couples and their families influence the market, and particularly, the market for upscale and luxury housing in Cairo. The research consists of four phases, including (1) field interviews with Uber and Careem drivers, (2) an online survey targeting inhabitants across varying urban and social segments of the GCR, (3) the first author's personal story, which posits that marriage culture acts as a key driver for real estate narratives, and (4) a visual analysis of a real estate advertisement. To conclude, the article discusses how far a hegemonic visual culture that caters to socio-economic links between class, marriage, and real estate engages the support of a large part of the population, which in turn, co-produces a spatially unjust urban development scheme that works against their own interests.

Keywords
Cairo; class; Egypt; housing; marriage; media; real estate; urbanisation; visual culture

Issue
This article is part of the issue "Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures" edited by Gabriela Christmann (Leibniz Institute for Research on Society and Space, Germany), Christoph Bernhardt (Leibniz Institute for Research on Society and Space, Germany) and Jörg Stollmann (TU Berlin, Germany).

1. The Visual Culture of Egypt's Urbanisation

A majority of scholars consider Egypt's urban development a product of the neo-liberal political economy, which the country's central government has helped facilitate (Dorman, 2007, 2013; Nada, 2014; Yacobi & Shechter, 2005). Egypt's professional urban development discourses and practices as well as its planning education focus on satellite towns, prestigious new desert cities, and gated communities catering to the upper-middle class (Hendawy, in press-a; Hendawy & Saeed, 2019). These projects are guiding infrastructural invest-

ments, tying up planning resources and most of all, they are overshadowing the reality experienced by the disadvantaged majority urban population. Although these new city projects, often located in the desert, dominate media narratives in urban development, they have only succeeded in developing around 2% of the inhabited land mass (Shawkat & Hendawy, 2016), despite initial plans to increase inhabited density by approximately 32%. According to the World Bank (2008) the total population of the new cities in 2006 constituted approximately 2.5% of Egypt's urban population. These numbers reflect the fundamental spatial injustice of the country's urbanization schema (see Abotera & Ashoub, 2017; Hendawy, 2015; Ibrahim & Singerman, 2014).

A majority of scholars identify state-led neoliberal reforms of housing supply as the cause (i.e., Elmouelhi, 2019; Hassan, 2017), however, the experience of traversing and living in the city provides an alternative story. In a way, media play a role in conditioning the desires of the general public for luxury housing, despite the fact that it doesn't serve their housing needs. To reach targeted customers, various private and public media channels are used to promote new housing units through commercials, street billboards, SMS messages, press ads, and the like. Although these channels target a minority of the population, the general public becomes exposed to it on a daily basis. To reflect on this issue, we define the visual culture of Egypt's urbanization as one that is highly mediatized, which produces virtual and physical urban realities following Rose (2001), Rose, Degen, and Melhuish (2014) and Watson's (2015, 2016, 2020 [in this thematic issue]) analysis that real estate visualizations have agency in the generation of urban assemblages. The two subsequent images are examples of real estate advertisement, one portraying billboards at a Cairo road (Figure 1) and the other being a real estate ad on one of the developer's Facebook page (Figure 2). Another research by the first author shows that the majority of real estate ads in street billboards are in English (see Hendawy, in press-b).

Accordingly, we want to shift the attention towards the public and its demand for housing. Our article demonstrates the urban everyday experiences of a population in a country in which a visual culture established via public media creates an urban imaginary that does not match the lived social, spatial, or economic reality of the majority of the population (Hendawy, in press-b; Hendawy & Saeed, 2019). Exploration of the general public's attitudes towards media narratives that focus their advertisement on high class residential projects launched this investigation. We base our arguments on empirical studies in the Greater Cairo Region (GCR). The Greater Cairo Region consists of Cairo Governorate, Giza Governorate, and parts of Qalyubia Governorate, with a total population of around 18 million as of 2006 (Bush & Ayeb, 2012). In this setting, a puzzle from our collected data guides our central research question: Why aren't ads for luxury housing—a market segment that

Figure 1. Two billboards on Salah Salem road in Cairo. Source: Hendawy & Saeed (2019).

Figure 2. Photo from Cairo's real estate street billboards (translation: Make her happy). Source: Next Home Egy (2019).

caters beyond the reach of most Egyptians—condemned by those who cannot afford it? The pervasiveness of real-estate advertisement could be interpreted from (1) the government's perspective and its desire to promote its political agenda manifested through its urban planning schemes, but also from (2) a bottom-up cultural perspective, which functions as an indicator of the general public's demands or least desires. The former reflection was shared amongst a number of scholars (Daher, 2013; Denis, 2006; Elmouelhi, 2019; Hassan, 2017; Shawkat & Hendawy, 2016), while the latter postulate remains under-explored. Accordingly, our research addresses the following question:

> How do the exclusive illusionary narratives of urban futures remain so omnipresent and indelible in the Egyptian imagination, despite the fact that the majority of the urban population lacks the tangible means of living that experience and does not benefit from the products advertised?

We will answer this question by shedding light on how the pre- and post-marital demand for housing among young couples and their families influence the market, particularly the market for upscale and luxury housing in Cairo. The article starts by laying out the theoretical framework and expounding our positionalities that underpin the study on the classed visual culture of real estate advertisement and development in Egypt. Subsequently, the article elaborates on the methodological framework as it pertains to each of the four phases of empirical research that constitute the study. These research phases include (1) field interviews with Uber and Careem drivers, (2) an online survey targeting inhabitants across urban and social segments of the GCR, (3) autoethnography of the first author's personal story of looking for an apartment when getting married, and (4) visual-cultural media analysis. To conclude, the article discusses how far a hegemonic visual culture that caters to and socio-economic links between class, marriage, and real estate engage the support of a large part of the population, which in turn, co-produces a spatially unjust urban development scheme that works against their own interests.

2. Neoliberalism from an ANT Perspective

Egypt's centralised planning system facilitates market-driven development through laws, which foster close co-operation between governmental planning institutions and privatized building and real estate sectors (Ansari, 2011; Dorman, 2007, 2013; Ibrahim & Singerman, 2014; Hamilton et al., 2012; Serag, 2015; Sims, 2003; World Bank, 2007). Additionally, Egypt's neoliberal urban governance is marked by its lack of legal protections for the urban poor and their right to housing. In short, the present planning scheme is market-based and controlled by the government (see Elmouelhi, 2019; Hassan, 2017; Nada,

2014). The real estate sector, one of the largest markers in Egypt, can be considered a product of this neoliberal planning system. In the beginning of the fiscal year 2010–2011 this sector became the second largest recipient of public and private investments (Hassan, 2017). The investment law No. 72 of 2017, issued in May 2018, offered incentives and tax reductions for private sector investments in underdeveloped parts of the country (Nabil, 2019; Xinhua, 2019). Within this legal context, it's clear that the real estate market relies upon strong public-private partnerships; however, most of the constructed and promoted projects cater only to upper classes (see Hassan, 2017; Metwally & Abdalla, 2011), who account for just 14.1% of Egyptians (Nabil, 2019). Symptomatically, media channels are dominated by advertisements for projects that prioritize this minority social class (see Haas, 2019; Hendawy, Riad, & Elgerdly, in press; Howard, 2019; Rose et al., 2014). Investments in affordable housing for lower income classes is considered risky for developers who seek high profit margins, and given the fact that the government's neoliberal urban policies encourage and promote the construction of luxury housing, the private sector's inclinations are more partial towards investing real estate projects of this kind (Elmouelhi, 2019); simultaneously, media narratives and visuals showcase real estate projects that are unattainable to most of Egypt's inhabitants. These two objects of research—the political economy and the visual culture of advertisement—inspire the theoretical framework of this research: critical neoliberal urban theory (coined by Daher, 2013; Denis, 2006; Harvey, 2005; Pettit, 2019) and the agency of non-human actants (actor network theory), with a focus on a visual culture discourse, which highlights the agency and impact of visual representations on urban development (i.e., Collins & Kearns, 2008; Degen, Melhuish, & Rose, 2001; 2015; Merche & Lamprou, 2016; Rose et al., 2014). The combination of these theoretical approaches requires a short explanation.

In his article "The Politics of Urban Assemblages," Ignacio Farías (2011) differentiates between critical urban studies (i.e., neoliberal urbanism) and the tracing of urban assemblages within an actor network theory framework. He bases the distinction on four theoretical and methodological aspects: "the style of cognitive engagement (inquiries or critique), the definitions of the object of study (cities or capitalism), the underlying conceptions of the social (assemblages or structures), and the envisaged political projects (democratization or revolution)" (Farías, 2011, p. 365). He states that:

> The central question we need to pose is whether we study cities as an instance of something else, of capitalism (and neoliberalism) in this case, or we engage in an inquiry into the city and urbanisation as a positive, actual and self-entitled process." (Farías, 2011, p. 368)

We follow Farías in taking a critical stance towards explaining Egypt's urbanisation exclusively via neoliberal governance; framed otherwise, our objective is to disentangle the social and cultural factors—explicitly from the media—that stabilize these policies. In our article, we utilize the perspectives of Gillian Rose, Monica Degen, and Clare Melhuish, who argue that computer-generated images that communicate and market real estate projects are "a new form of visualizing the urban…instead of approaching them as images situated in urban space, their digitality invites us to understand them as interfaces circulating through a software-supported network space" (Rose et al., 2014, p. 386). Finally, in order to examine the role of class as a dominating factor in the network of visuality, we engage with the work of Haraway (1991) who "argues that particular forms of visuality produce particular visions of social difference and that institutions, such as capitalism, mobilize certain forms of visuality to see, and to order, the world" (Aitken, 2009, p. 3).

By adopting an ANT perspective on the actor–network of the visuality of urban governance, we are stepping away from studying Cairo in order to study neoliberalism; we want to understand the development of Cairo as a process of interaction, in which neoliberal governance is only one of the many co-producing factors. In doing so, we gain perspective on the potential power of the general public as actors within a network that co-produces the urban in Egypt. Consequently, our research entails an inquiry into the distribution of this agency.

3. Authors' Positionalities

Our positionalities as authors are crucial elements that construct this study's investigation and methodology. The study's topic–its underlying assumptions and preconceptions—are biased due to our own personal experiences and positions in the world. Thus, we—two upper middle-class academics and urban researchers from Egypt and Germany, respectively—reflect on these positions in the forefront of this study. Mennatullah Hendawy's personal experience with house hunting in Cairo is integrated as an autoethnographic story (Adams, Jones, & Ellis, 2014), which emphasises the power of internalised cultural values and applies our argument concerning the entanglement of class, love, and real estate. We engage with Della Pollock's (2007, 2009) work on the use of personal experiences in scholarly writing, namely her proposal of a "performative I" (Pollock, 2007). The declared subjectivity reflects the various discussions that we had during and between the four research phases and where the second author, Jörg Stollmann, who lacked familiarity with Cairo's everyday reality, both supported and critically reflected the first author's personal and scholarly knowledge. We do not conceive of the shared story as valuable because it should be read as 'authentic' or 'true,' but rather, as a way to reflect how this subjectivity could—even in a fictional sense—still discuss the engagement of the individuum within a cultural context as a process of struggle and disconcertion. Lastly, in order to acknowledge the multiple, distinct realities that we ex-

perienced as researchers along with those from participants in the field, we engage in critical reflexivity (Attia & Edge, 2017; Mills, Durepos, & Wiebe, 2010) to highlight cultural and class differences as well as to generate a critical discussion of the data and findings. To do so, data is collected from multiple sources and participants as presented in the methodological frameworks.

4. Methodological Framework

In order to explore the effects of the schism between the visual representation of exclusive real estate projects via advertisements and the physical urban realities experienced by most of the population, this research follows a mixed-method approach and applies an abductive reasoning mode within the framework of critical neoliberal urban discourse and ANT, as presented above.

Abduction is "a notion developed by Aristotle in his Organon (1995) and later resumed by Peirce (1956)." It is "conceptualized as making guesses" (Philipsen, 2017, p. 45). Dubois and Gadde (2002) explain that utilizing abduction in a study entails that:

> The original framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process. This approach creates fruitful cross-fertilization where new combinations are developed through a mixture of established theoretical models and new concepts derived from the confrontation with reality. (p. 559)

Accordingly, abduction is useful in this study, as it helps address the research question and it allows for the possibility of 'making a guess' regarding the entanglement of marriage, class, and real estate.

The research constitutes four phases of data collection and analysis, which targets several groups within the general public. Nevertheless, we are aware that the represented public in this study is only an indicative part of the general public. To help mitigate this aspect, each phase sought to include different sub-publics within. The four research phases of the study include: (1) unstructured interviews with Uber and Careem drivers, (2) an online survey targeting the general public, (3) the first author's personal story of searching for an apartment in Cairo when she got married, and (4) the visual story analysis of a sample of real estate advertisement. Throughout the article, we will present in detail how and why each method is conducted along with the research findings. In summary, the Table 1 presents the research phases and the collected data, which also reflects the structure of the rest of the paper.

4.1. PHASE 1/Interviews with Drivers: Few Feel Addressed by Real Estate's Advertisements…

The first data collection phase started in May 2019 with interviews from Uber and Careem drivers in the GCR regarding their perceptions of real estate advertisements in the GCR. Careem and Uber are both an app-based taxi service, however, Careem also includes cars from normal Egyptian taxi drivers with their cars. The Careem

Table 1. The mixed-method research methodology.

Methodology	Mixed-method approach and an abductive reasoning mode within the framework critical neoliberal urban discourse, STS, and ANT			
Phase and Time	1 May 2019–June 2019	2 September 2019	3 November 2019	4 December 2019
Method and Data	Unstructured interviews with 20 Uber and Careem drivers and 16 representatives of middle and upper classes	Online survey that targeted 120 respondents yet attracted 228 responses, which were further divided in terms of their locale, with 112 inhabitants of the old city (49.56 %), 49 inhabitants of suburbs (21.68 %), 35 inhabitants of gated communities (15.49 %) and 30 inhabitants of informal areas (13.27 %)	Autoethnography of the personal story of the first author	Visual analysis of a real estate advertisement that showcases the entanglement of class, marriage and real estate
Analysis and interpretation	Thematic analysis	Quantitative survey analysis	Autoethnography	Visual analysis
The group of the general public (micro public)	Working class	Sub-publics living in different parts of the city (Old city, suburbs, gated compounds, informal areas) reflecting the different spatial and socio-economic conditions	Middle class, female, recently married	Audience of TV ads

drivers interviewed in this study are all drivers of the normal state-induced white taxi. The drivers presented in this study represent a sub-public that is able to access various parts of the city on a daily basis. Drivers were also included in this research because they reflect the views of the working class since most of the interviewed Uber/Careem drivers are not owners of the car, but rather appointed by the car owners. Over the course of about a month, 20 unstructured interviews were conducted (50% Uber drivers and 50% Careem drivers, all the interviewees were males except one female driver). Drivers of Uber and Careem were chosen over normal taxi drivers for safety and accessibility reasons. We would like to acknowledge that the inspiration to utilize the conversations with drivers in this study stems from the novel from Khaled el Khamisy (2007), *Taxi. Cabbie Talk*, in which he shares 58 short stories with taxi drivers in Cairo concerning a broad range of topics. In general, we found drivers in Egypt to be friendly; indeed, many regularly initiated conversations with their passengers.

The interviews were conducted as casual conversations in Arabic while the first author was using the service. A set of open-ended questions was prepared in advance; however, questions were allowed to emerge organically based on the answers provided. The interviews usually started by pointing out a street billboard that advertised a new gated compound (a sample of what was pointed to while interviewing the drivers is presented in Figure 1). Afterwards, the first author proceeded to introduce herself as well as the study being conducted and asked the drivers about their age along with where they live. These inquiries were followed up with further questions, a sample of which is provided in Table 2. In general, questions sought to gather information in four key areas: current living conditions, future housing aspirations, planning culture in Egypt, and media-planning related aspects. Notetaking took place in parallel to the conversations and were later reorganized into tables to prepare the responses for thematic analysis. Eventually, the data used in this article was translated to English.

Reflecting on the first author's position as an interviewer, we are aware that the female gender as well as the action of informing the drivers of her student status enabled her to access the field as sympathy and trust were established. However, her habitus and the parts of the city she went to and from still clearly identified her as an upper-middle class-citizen to the drivers, which might have elicited certain responses.

As evaluated from our data, the drivers appeared to possess a diverse range of opinions regarding real estate advertisements in Cairo. Some drivers viewed them as a mere technical activity reserved only for marketing purposes, while some drivers found them "provocative" (meaning "revolting or "upsetting"; in Arabic مستفز). At the same time, other drivers mentioned they neither care nor recognize real estate ads, which was an astonishing answer given their visual omnipresence.

For example, one of the drivers, 39-year-old male, living in an informal area (unregistered and/or unplanned area) said "I will not look at an advertisement like this because it is already out of my budget and they speak about millions." Another driver (40-year-old male, living between a historical neighbourhood and an informal area) directed the discussion towards the general dichotomy between media generated images and reality stating that:

> I personally access a lot of these promoted compounds and I see in the advertisement something different than what is inside there, maybe because in the advertisement we see a façade, it looks nice. What is included in the advertisement is the scene they wish to have but in reality, this is not the real scene.

Moreover, many drivers mentioned that if there was no financial barrier they would have moved to such promoted areas. Nevertheless, many of them also stated that they did not think that they will feel a sense of belonging in these areas, due to the difference in social standing and lifestyle. Collectively, the views of the

Table 2. Sample of questions discussed with drivers.

Topic	Description
General questions	Age: Gender:
Current home	Where do you live and since when? Would you like to change your home? Y/N
Dream home	What is your motive/pressure to change (or remain in) your current home? Where would you like your home to be located?
Planning culture	What are your thoughts on moving to the desert/ or to a new city? To what extent do you think you are part of the 'cultivate the desert' dream? What do you think about gated communities?
Media-planning culture	What do you think about the real estate advertisements?

drivers—as a working-class population—show that a majority are aware of the real estate advertisements, yet very few feel represented by them. Most drivers shared feelings concerning a lack of 'belonging' or inability to afford to live in these housing complexes; as such we interpreted the sense of 'invisibility' felt by drivers in relation to the signs as a reaction to the exclusivity of the product, whether consciously or subconsciously.

4.2. PHASE 2/Online Survey: …But the Degree of Acceptance Is Similar among All Socio-Economic Classes…

Based on the data collected from the first phase, an online survey was developed and distributed in September 2019 targeting a broader segment of the general public, which was further demarcated into four categories based on the location of each respondent's current residence: an old/historical neighbourhood, a suburb, a gated community, or an informal area. This categorization scheme sought to represent the variety of residential locales across the GCR, which, in turn, could be used roughly to reflect the class-stratum of Egyptian society. The survey targeted a sample of 120 inhabitants in Cairo (30 in each neighbourhood category). It succeeded in attracting 228 responses, which were then divided into 112 inhabitants of the old city (50%), 49 inhabitants of suburbs (22%), 35 inhabitants of gated communities (15%) and 30 inhabitants of informal areas (13%). Nevertheless, it is worth mentioning that even though we tried to acquire inhabitants from all neighbourhoods, the categorization of areas was schematic rather than fine-grained. For instance, Anwar (2009) classifies gated communities in Egypt alone into four categories including: luxurious gated communities, moderate gated communities, lower high gated communities and post enclosed gated communities . However, in the conducted survey, all gated communities are grouped into one category. The online survey, titled 'Housing Dreams in the Greater Cairo Region' consisted of four sections:

I. Demographic characteristics (12 mandatory questions, 1 optional question);
II. Real estate advertisements in the GCR, including a sample of images (9 mandatory questions, 4 optional questions);
III. Current housing situation (3 mandatory questions, 1 optional question);
IV. Preferences for future housing (8 mandatory questions, 5 optional questions).

The profile of the respondents can be summarized as follows: 56% between 25 and 34 years old, 58% females, 63% employed full-time, 51% working in the private sector, 64% owners of current residences and 53% car-owners. A limitation in the survey sample can be observed here due to the fact that only around 9% of Egyptians are car-owners according to the Central Agency for Public Mobilization and Statistics (CAPMAS, 2016, as cited in Ahram Online, 2017). Even though the sampling aimed at diversifying respondents via their place of residence, the very poor classes still appeared to be missing, since the use of an online survey meant that the sample was limited to those who could read and write as well as those with access to technology in the targeted areas. In general, illiteracy rate in Egypt is estimated to be around 20% ("Illiteracy in Egypt decreases, but number still high," 2019). Accordingly, respondents to the survey are likely more financially well-off and possess superior digital skills across the four groups.

The survey sought to unearth the attitudes of people living in the GCR towards real estate advertisements and the ways these distinct views influenced the respondents' perception towards current and future housing. Our findings demonstrated that street billboards are the most popular form of real estate advertisement, most respondents are exposed to them in their daily lives (63%). By comparison, 56% of the respondents are exposed to such advertisements via social media. Following these forms and figures are advertisements on television, websites, phone/mobile media, and in newspapers, respectively. Additionally, 58% of the respondents mentioned that they frequently recognize the language used in advertisements, 52% usually recognize the characters or celebrities featured in the advertisement, and 42% recognize the advertising slogan.

The survey was also designed to confront the issues of segregation and exclusivity that were raised by the drivers in Phase 1. To accomplish this task, answers of the interviewed drivers in Phase 1 were added to the survey as multiple choice answers to some questions. It is estimated that 63% of the respondents view real estate advertisements as exclusive, 37% find them provocative/upsetting, and 28% find them unrealistic. When asked about their perceptions in relation to support of existing advertisements in the survey, 51% responded that they extremely agreed that real estate advertisements increase segregation among Egyptians, 29% responded in extreme agreement that there is too much advertising in the GCR and that it needs to be limited, 18% found that they felt excluded from the rest of the society, while 14% did not care about it. Our findings reflect a common perception that the current real estate advertising drives social and spatial segregation.

When asked about their moving plans, those living in informal areas were the ones most willing or planning to move in the near future (40% mentioned their willingness to move to suburbs, 32% to the old city, 21% to gated communities, and 7% migrate abroad and/or to other parts of Egypt). Most real estate advertisements present housing options for those who can afford living in more expensive parts of the city, namely gated communities. Accordingly, we took this analysis further and applied it to our observation of the sample distribution by the neighbourhood type and compared it with the data concerning perceptions/satisfaction with the status quo

of the housing market as represented in the advertisements dispersed across Cairo. In order to understand the acceptance and support for the existing advertising campaign as it relates to real estate, we put forth two questions in our survey, as shown in Figure 3, which presents responses to both questions in one diagram. Throughout the article 'accepting' of real estate ads is defined as "to give admittance or approval to" while 'support' of real estate ads is defined as "to promote the interests or cause of" (Merriam-Webster, 2020a, 2020b).

Figure 3 shows that all status groups have a similar degree of acceptance/support towards the current state of real estate advertisements in Egypt (which were also perceived as exclusionary narratives in Phase 1). At the start of this phase, we hypothesized that real estate ads promoting exclusive compounds that were unattainable to most would be met with opposition, particularly from those living in informal areas. The survey data shows that the individual's residence, does not affect their degree of acceptance towards real estate ads (World Bank, 2012), despite the fact that nearly all advertisements target the upper classes (those with the means to reside in gated communities).

The finding that the degree of acceptance was similar across class lines was very surprising. Looking at it from a critical neoliberal theory perspective, we would have assumed that individuals comprising poorer segments of society, who perceived and commented upon the exclusionary, segregational elements of both the advertisements and development scheme, would have shown less acceptance. We assumed that real estate ads might have a more powerful sense of agency than initially suspected with regard to influencing the general public's acceptance and support, even if their individual interests were unmet or unrepresented. When discussing the research results, we inferred that cultural and societal codes might play a major role in shaping public acceptance and support.

4.3. PHASE 3/Personal Story: …Maybe Because It Relates to Marriage as the Most Important Set of Social Conventions in Egypt?

The personal story is integrated into the study in order to interpret the data from a socio-cultural perspective. The use of autoethnography (Adams et al., 2014) stimulates

Figure 3. (A) Distribution of the sample by the type of neighborhood and their perceptions/satisfaction about the current real estate advertisements. Source: Author's calculations (Pearson chi2(20) = 11.4971 Pr = 0.932). (B) Distribution of the sample by the type of neighborhood and their support of the presence of the current real estate advertisements. Source: Author's calculations (Pearson chi2(20) = 11.4273 Pr = 0.934).

the discussion of questions related to authority, authenticity, and subjectivity. For our purposes, the authenticity of statements made are of less concern than the process of contextualizing real estate imaginations against the backdrop of local traditions as they relate to love and marriage in Egypt, which compels a deeper examination of the supposed rational and irrational economic desires within particular subjectivities that are rendered highly political:

> In 2018, Mohamed and I decided to get married. Though we were both from Cairo originally, we met in Berlin. When we announced that we were getting married, we were instantly faced with the expectations of buying an apartment in Cairo from our relatives, families and even friends, despite the fact that we were living abroad. In Egypt, 'what will people say' is often an important factor in an individual's decision-making. Instead of caving to pressure, we postponed our decision and are still searching for 'this apartment.' Over the course of this process we began to question whether or not we truly needed one at all or if we were merely complying with societal codes concerning what makes a good young family, or rather, what makes a young family look good.
>
> In Egypt, the current housing culture is dominated by the practice of owning, not renting. Given that the housing units in 'upper class' areas typically range from 90–250 sqm, a couple that aspires to maintain a high standard of living is left with limited options for living. They can: (a) rent and go against the culture of home ownership, an action that may be unacceptable to parents of the couple, (b) buy an apartment in an area with lower standards and drop out of the privilege cycle. In Egypt, where someone lives often influences the way a person is positioned and viewed in society, which I can also attest to in my own personal experiences. Finally, with option (c) the couple can leave the matter of purchasing an apartment to their parents. In some cases, parents save money over several years or lend money to the couple in order for them to buy an apartment and participate in the marriage decision via their financial control. Indeed, many parents with children from my generation have found real estate to be a safe haven for investing their savings, a practice that I've noticed among my own relatives whose purchased apartments are often left vacant for many years, which may be due in part to the lack of renters in Egypt. Nevertheless, in our case, my husband and I decided to challenge this norm.
>
> As we have searched for an apartment to buy on our own, I must admit that we've limited our search to certain areas in Cairo, which offer more opportunities for upward mobility. However, with our limited budget, we will need to stretch ourselves thin in order to find an apartment in an area appropriate for us and the image of ourselves that we want to create. Our dream apartment is very influenced by a number of (exclusive) societal pressures, which also probably fashion who we are, along with our needs and desires?

In order to develop a conversation surrounding the visual culture(s) of Egypt's urbanization, this personal account captures the way marriage and real estate are entangled with one another, and from a bottom-up cultural perspective. Even if the story reflects an upper-middle class perspective, the cultural and societal conventions are likely applicable to a wider stratum in society. In fact, across the Middle East and North African (MENA) region, it is a common expectation for couples to begin living independently when getting married (Hoodfar, 1997; Singerman, 2007). According to Assaad et al. (2017, p. 2), "achieving independent living at marriage entails a substantial financial investment." In this context, housing represents 38% of total marriage costs in Egypt; meanwhile an extra 30% of costs goes to the furniture as the couple prepares the space of their future home (Salem, 2015). Assaad and Krafft (2015) clarify that if someone takes on full financial responsibility and covers the marriage costs from their savings, it would amount to approximately 8 years worth of one's salary for the cost to get married, the initial housing cost alone corresponds to the wages of one partner for around 3 years. Therefore, "securing housing is a crucial component of getting married, and housing is by far the greatest component of the cost of marriage" (Assaad, Krafft, & Rolando, 2017, p. 2). As such, documented marriage contracts reflect a demand for housing. According to the CAPMAS, 912,606 marriage contracts were recorded in 2017, which implies a demand of nearly half a million units annually (Xinhua, 2019), Similarly, Nabil (2019) points out that "this [demand for real estate that arise from marriage] coupled with the widespread notion of real estate being a safe value, create a strong demand for property, especially in the largest cities."

After examining the findings from Phases 1 and 2 along with the reflections shared in phase 3, we came to realize that perhaps the exclusionary narratives of real estate in Egypt continue growing and maintaining their power because they have been embedded within the culture of marriage. The aforementioned personal account provides a bridge to Phase 4, which allows us to delve further into societal traditions in Egypt as they relate to class, marriage and real estate. The following section offers a visual analysis on the use of a television advertisement that employs marriage as a theme in promotion of a gated compound.

4.4. PHASE 4/Visual Analysis of Video Advertisement: House First, Marriage Second!

Our previous analysis explored the socio-cultural factors underlying the real estate market in Egypt. In our study,

we noticed that many video advertisements and internet campaigns for housing units include narratives that follow young engaged couples who are apartment-hunting. A popular one comes in the form of a television commercial for the gated compound 'Madinaty' (an Arabic word meaning 'my city'; see also Figure 2). Because commercials are accessible across income and social groups in Egypt, we are able to look at a broader range of society. Television is the most influential source of information in Egypt (Allam, 2018); indeed, according to the Oxford Business Group (2016, para. 4), "television remains the priciest medium for advertising, and with an audience that equates to 95% of the population on a weekly basis." The Madinaty commercial that was broadcasted in 2019 was selected for its popularity on television as well as on YouTube, where it had over 100,000 total views. It gained widespread attention for its title song from popular Syrian singer, Assala; it was also the source for controversial discussions and ironic comments on the internet as it showcased societal exclusivity (see BBC Arabic News, 2019). Madinaty is an exemplary desert town development of gated communities, shopping districts, and service facilities located in the northeast of Cairo. Madinaty was developed and constructed by the Talaat Moustafa Group and spans over 33,6 mn sqm (Talaat Moustafa Group, 2020), with plans to encompass 120,000 residential units that seek to house around 600,000 inhabitants (Madinaty, 2015). In 2016, the Ministry of Housing sold around 3900 housing units in Madinaty (INVEST-GATE, 2016). According to a phone call with New Cairo government office, the Ministry of Housing owns approximately 7% of the buildings in Madinaty (personal communication, 2020).

The following images present a series of screenshots from the 2019 Madinaty ad. The commercial, which spans roughly three minutes, starts with a woman overlooking the development of Madinaty. In the frames that follow, she encounters her dream man, her future husband. A reoccurring take shows the woman in a garden surrounded by lush blooming bushes and trees, evoking a dream-like setting. Via montage, the pink flowers from the garden become visually linked to the flowers encompassing the perimeter of Madinaty's golf course. Subsequently, a series of scenes exhibit green open spaces and waterscapes along with aerial views of the compound and images that allude to the facilities that are available for use (i.e., a mosque, schools, sport clubs). Around the middle of the video, a scene of celebration and fireworks over Madinaty appears and is then followed by frames of the woman getting dressed for her wedding and embracing a woman, most likely her mother, before joining her wedding party on the Madinaty premises. A metaphorical scene appears in which the woman enters through a swaying mesh of coloured ribbons; then it is followed with a shot of her touching a baby toe. We see her and her husband holding their new-born and presenting it at a family gathering, which is likely set in their own private garden in Madinaty. In short: the couple meets at the housing compound, falls in love, buys a house, gets married, has a baby and builds a family. Figure 4 presents an abstract drawing of the analysed TV advertising.

Assala's song says:

> We were here, you and me and the adoration. And love is the spring that brings us together, do you remember those days?
>
> You gifted me a necklace from roses, poems of love and Quotes, our initials carved in the trees telling our story to the world and our city's glamour still shining day and night!
>
> Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…
>
> Beauty and Madinaty are synonyms. Every corner decorated by the golden rays of the sun, the trees, flowers and roses dressing it in every colour. And summer breeze touches us, drawing us above the branches. We look forward to a bright tomorrow that plays us like melodies, darling!
>
> Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…Madianty…
>
> Madinaty is my home and orchard, it is my family, people and entity, and life's beauty in a place that is similar to myself and my dreams. It is the habitat of the beloveds and a love nectar that glides through the veins and runs like blood in my arteries.

Essentially, the lyrics' storyline indicates that the couple did not merely meet in Madinaty, but that they were actually married by Madinaty. The video suggests that the compound is endowed with transformative powers, perhaps, even, a sense of agency: to make love and marriage possible, to turn a single woman and man into a loving, independent and happily-married couple. In the ad, the metaphoric value of real estate is heightened to a level where it becomes the force that bestows future love and a fulfilling life. At the same time, the way the couple and the others are dressed, it is clear that the advertisement views its audience as members of the upper-middle class. The interconnectedness between the urban development trend of luxury satellite towns as well as the marriage-housing narrative reflect a situation in which a top-down approach or politically directed planning paradigm (see Shawkat & Hendawy, 2016) is reinforced through a culturally coded desire to consume from the bottom-up perspective. The interviews showed that despite the fact that it is both financially and socially out of reach for most Egyptians, living in a gated community has become a common goal. The process of purchasing an apartment before marrying functions as a core responsibility of the husband and his parents, which illus-

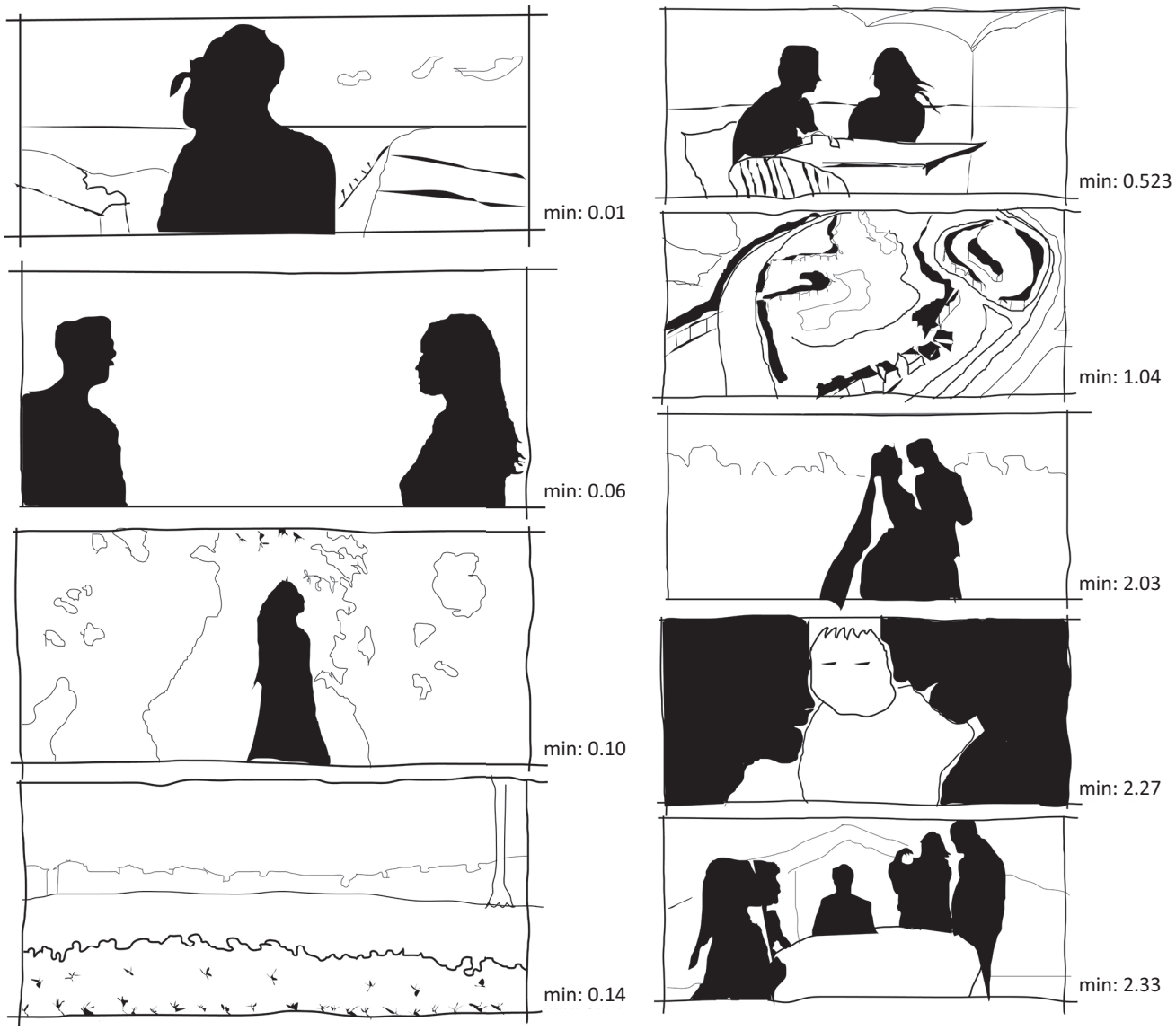

Figure 4. Abstracted screenshots from Madinaty advertisement in order from top to bottom. Source: Hendawy's drawing based on Madinaty advertisement from Sada el Balad (2019).

trates the way in which individual decisions and societal codes become interdependent with one another.

Following the ad's release in May 2019, it received a wave of criticism with regard to the compound's exclusivity for the rich and the song that accompanied the ad was also ridiculed (BBC Arabic News, 2019). While public debate exposed the unintentionally comical aspects of the marriage portrayed in the ad as well as the more serious issues concerning its exclusive, even segregated, narrative, it became evident that there is an underlying assumption in Egyptian society that the procurement of property enables the individual to achieve upward mobility and to lead a more fulfilling life. Further, critical discussions revealed that such overtly classist visuals and motifs employed in these ads are as grounded in cultural conventions surrounding marriage as much as they are in the government's liberalized urban development scheme.

5. The Entanglement of Marriage, Class and Real Estate in Egypt

Many of the real estate projects being promoted in Egypt are still under construction and will become available for future housing accommodation; therefore, these commercials functions as a means of generating funding in the projects' earliest phases (Hendawy et al., in press). Since individuals typically do not live alone in Egypt, marriage provides an opportunity to create a new household (Hoodfar, 1997; Rugh, 1984; Shorter & Zurayk, 1988). Accordingly, this premise sets the stage for interlinking the allocation of housing with marriage. In order to purchase the new apartment or house, a number of financial and societal politics come into play: starting with where the future home will be located to how much it will cost and who will bear the expense (usually, it is the groom or his parents). Class dimensions play a crucial role in

determining where the future household will be located, and further, in the regulation of expectations of the surrounding neighbourhood community. As such, marriage presents the option of maintaining one's societal status or moving up the social ladder, especially for women (Hoodfar, 1997; Wilson, 1998). Accordingly:

> In addition to emotional and social factors, economic considerations are of prime importance in the choice of a marriage partner and in the stipulation of the conditions of a marriage contract, since the material well-being of individuals—particularly women and children—is closely tied to the economic situation of their households. (Hoodfar, 1997, p. 51).

Thus, the couples' and their parents' economic situation are a significant factor that feature in the selection of partners (Hoodfar, 1997).

We started our empirical study with the assumption that there would be deep resentment towards the elite residential parts of the city that were being promoted in real estate advertisements, particularly amongst individuals residing in poorer neighbourhoods. Using a mixed method methodology, we collected data, some of which was conflicting. Although our interviews with drivers demonstrated a common understanding that advertised real estate projects widens the inequality gap in the country, our more extensive survey, which featured a broad range of respondents from across the city, found the opposite: that neither the location of a person's residence nor their socio-economic background influences the degree of acceptance of the real estate advertisements. In fact, the majority exercised a sense of neutrality towards present advertising campaigns; it is worth nothing that while they are exposed to commercial visualizations, they have also seen the advertised content physical materialize into new towns and gated communities. Beginning with a presentation of Cairo's current real estate advertisements and ending with an analysis of a commercial, the article explored the broad visual culture of Egypt's highly mediatized real estate market.

The mediatization of potential real estate opportunities functions as a powerful agent that constructs largely unattainable dreams and intangible desires as they relate to the plight of procuring property. These aspirations are appealing across class lines due to the ways in which they maintain and reinforce societal conventions pertaining to love and marriage; indeed, they operate in this respect to such an extent that homeownership becomes a precondition for marriage, rather than the other way around. Since our base assumption was disproven and we found equal support for the ads amongst different social segments, we find that it would be productive to question the extent to which top-down power structures, e.g., the central government, are responsible for shaping public opinion, and to instead, highlight the ways Egyptians co-develop and co-produce urban and spatial injustice through the examination of their lack of resistance, protest or critique. Current urban development schemes are not merely a product of the heavy-handedness of the centralized state or private developers, but of the public's embrace of such programs. Through its apparent acceptance or neutralization of the topic of real estate and the way the interests and desires of the upper classes are catered to in advertising campaigns, the public appears to have granted power to the state and developers, who will continue to propagate such narratives. To conclude, we would like to recognize this co-production not as a fatum, but rather, as a first step of empowerment. As demonstrated by the ridicule that the Mandinaty commercial received, we hope that this is a sign of more to come in terms of recognizing and questioning the entanglements of class, marriage and real estate, and the way they have fundamentally shaped Egypt's spatial injustice. Perhaps this new-found awareness will inspire new and different modes of co-production, if not something more visionary and transformational.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Reflections on Deploying Community-Driven Visualisations for Public Engagement in Urban Planning

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Abstract
Publicly available visualisations play an increasing role in enabling wider audiences to contribute to debates to shape place futures. In this article, we unpack such contributions to consider the conceptualisation, actualisation and deployment of these visualisations as separate entities that each require development and reflection. In doing so we draw on our experiences of using two public engagement tools that utilise visualisations of residents' comments. Through this we explore the limitations of visualisations in public engagement designed to support differing levels of debate and their abilities to support abstract topics and geographic associations. We discuss how visualisations alone do not produce actions and how they need to be rooted in wider conversations about a place to lead to insights and action. The article calls for the linking of visualisations for place meaning and place action at different stages of much broader public engagement projects to unlock the potentials present in them in the mediatisation of built environment outcomes.

Keywords
digital visualisations; knowledge exchange; public engagement; town planning

Issue
This article is part of the issue "Visual Communication in Urban Design and Planning: The Impact of Mediatisation(s) on the Construction of Urban Futures" edited by Gabriela Christmann (Leibniz Institute for Research on Society and Space, Germany), Christoph Bernhardt (Leibniz Institute for Research on Society and Space, Germany) and Jörg Stollmann (TU Berlin, Germany).

1. Mobilising Participation with Visualisations

Post-war planners saw little relevance or need for citizen participation—planning was a science that could be applied to cities through gathering information and making strategic plans (Jacobs, 1961). Latterly, the desire for public participation in planning has become mainstream in discussions in many nations, although there are often doubts as to the actual commitment of planners and politicians to such practices. Where commitment exists, a great deal of attention has shifted toward finding efficient and effective methods for participation, particularly of hard to reach groups (Bishop, 2015). Visualisations and associated digital technologies represent some of the most recent attempts to support citizen engagement and knowledge exchange in planning (Batty, 2001).

Regardless of methods used, a universal feature when engaging citizens in planning lies in how citizens' understanding of place can be integrated with formal, expert-driven processes (Fischer, 2000). In theory, publicly available visualisations of place-based discussions

could support wider audiences participating in questions concerning place futures. For example, with the growing role and availability of technology, citizens are able to create their own visualisations as tools for action (Manuel, Vigar, Bartindale, & Comber, 2017; Puussaar, Johnson, Montague, James, & Wright, 2018), and apply pressure to shape planning outcomes. With this comes a subtle change in the role of visualisations—from one that was used by experts to display results for their expert peers, to using visualisations through which the public may express themselves. In turn this requires rethinking the role of the visualiser, from one who creates ready-made visualisations to one who crafts the context within which public input becomes visible.

Given this shift, and the opportunities offered by the emergence of new digital technologies, we focus on the role of the visualiser (the person generating the visualisations) and their role in supporting knowledge exchange in town planning using two engagement tools we designed. When speaking of the role of the visualiser we refer to our role in mobilising engagement through public visualisations provided by these engagement tools. The engagement tools used two different strategies to visualise community input: JigsAudio creates a visual mural without spatial relation, and PlaceChangers creates an annotated map with an explicit spatial relationship. The engagement tools were used to facilitate conversations around place meaning (values shared in relation to a place) and place action (desired changes) in two engagement projects, which we explore through three research questions:

- What roles did the visualiser take in the creation of the public visual artefact?
- How did the characteristics of the spatial and non-spatial visualisations influence the types of engagement with place?
- How might public visualisations create a space for the discussion of alternative views of place?

Based upon these two case studies, we contribute to a discussion on understanding the act of visualising, and the bearing this has on how citizens engage with planning.

2. Background: Mediatisation, Visualisations and Knowledge Exchange

2.1. The (Re)Presentation of the Urban in Visualisations

Tufte (2001), a pioneer in the field of data visualisations, referred to visualisations as the graphical display of quantitative information in charts. He argues that by drawing on our ability to unpick patterns in visual imagery (more easily than rows of numbers), visualisations aid in the understanding of complex relationships in data. An example of the power of visualisations of quantitative information of urban space is presented in Szell's (2018) "visual assessment of space imbalance" in transport infrastructure of major global cities. However, in planning, the concept of visualisation goes beyond statistical relationships, and emphasises the presentation of geographical and increasingly geometrical relationships pertaining to the real-world. In this context, visualisations refers to different ways of sharing information through "drawings, maps, perspectives, 3D physical scale models, computer visualisation models, and scientific visualisation" (Pietsch, 2000, p. 521), as well as a wide range of visual methods to collect this information, such as through sketches, colleagues, photo collections (Al-Kodmany, 2002) and mapping activities (Kingston, Carver, Evans, & Turton, 2000)

Al-Kodmany (2002) shows how analogous visual methods, such as sketching on paper, relate to computer-supported methods of visualising, such as drawing plans digitally—demonstrating a continuum between digital and non-digital visualisations. When creating visualisations for public engagement, there are three key attributes that characterise any visualisation depicting the real-world. Pietsch (2000) notes those characteristics as level of 'abstraction,' 'accuracy' and 'realism.' Abstraction describes the level of detail show of the real world. For example, a building may be presented as a cube or with its detailed facade. Realism refers to the level of visual similarity or mimicry to the real world, for example, through textures and physique. Lastly, accuracy discusses the extent to which information represents the real world in scale and positioning. Seen from this perspective, it is possible to relate simple sketches and detailed drawings into a continuum of visual presentation techniques. Within these parameters, the visualiser has important decisions to make—whether to radically simplify a model of reality or to present reality more closely.

Understanding the implications for visualisation and engagement in planning, the gradient between spontaneous and scientific visualisations are one of the key decisions in using visualisations for knowledge exchange (Al-Kodmany, 2002). In public engagement, abstract techniques offer creative freedom for participants, but can be hard to interpret by planners. On the other hand, visualisations that depict the real-world with high levels of accuracy and realism, may be hard to interpret (Watson, 2020). Engagement methods need to capture a range of knowledges, both experiences of places and expert knowledge, perhaps requiring different visualisations for different engagement stages or objectives. For instance, the local knowledge of residents, and of value to planning outcomes, is less amenable to being depicted in highly accurate visualisations. Effective knowledge exchange is challenging if insights cannot be combined, especially everyday experiences of places and planning-specific expertise (Natarajan, 2017). Therefore, while Hemmersam, Martin, Westvang, Aspen, and Morrison (2015) state that visualisations in planning are essential in supporting knowledge exchange, the visualisation needs to align with its purpose.

2.2. Emerging Visualisations in Digital Civic Engagement in the UK

Historically, visualisations have always played a key role in planning especially through physical models and maps. However, the role of public engagement in planning remained weak. In the UK, the Skeffington Report of 1969 critiqued the established approach to planning, leading to legislation on public participation in planning. In the report, the committee laid out a series of measures planners could adopt to provide new opportunities for citizens to be involved in planning. Increasing demands for citizens to engage in planning have not been accompanied by great systematic success in doing so (Bishop, 2015). One response was to look towards visualisations that were simpler to read to support non-expert understandings and solicit feedback on proposals. Visualisations changed to reflect this—they were no longer to be used only by experts, but increasingly for external stakeholders, citizens and politicians to understand as well. For instance, Batty (2007, p. 326) noted that "spatial databases…(took) pride of place only in the 1990s while the use of graphics and the web for dissemination and participation has only become significant very recently.''

Methods for engaging citizens in town planning online are a recent phenomenon driven by the maturing of web technologies in the early 2000s (de Lange & de Waal, 2013). Technologies have been explored to understand their value in making people aware of the potential consequences of a development (Batty, 2001; Dambruch & Krämer, 2014). Interactive web technologies (Web 2.0) allow people to view and comment on proposals, rather than needing to travel somewhere (Wilson, Tewdwr-Jones, & Comber, 2019). However, many visualisations used in planning remain designed by experts for other experts or privileged users (such as other planners, their clients, or people with influence) rather than for citizen understanding. This makes it necessary to build critical understandings of how those visualisations are used for engagement.

2.3. New Directions in Digital Civic Engagement with Public Visualisations

Early technologies for participation in planning typically used maps-based visualisations that planners could interrogate to understand citizen opinions (Nuojua, 2010). Approaches using map-based visualisations have undergone multiple iterations, drawing on mobile apps, such as in the case of Mobile Democracy that explored 'situated action' that couples engagement through a smart phone that respond to physical tags (Bohøj, Borchorst, Bødker, Korn, & Zander, 2011), or more recently, engagement with nearby planning issues using smart watches (Wilson et al., 2019). Furthermore, the emergence of open cartographic systems, such as OpenStreetMap, allows mapping to become more engaging and interactive (Haklay & Weber, 2008). Research on spatial data systems is evolving rapidly towards the development of shared development environments for cities and its technical foundations (Nourian, Martinez-Ortiz, & Ohori, 2018).

Whilst most digital participation technologies use map-based approaches through mobile devices, there is a growing opportunity for those that avoid screen-mediated engagement and encourage participation with visualisations that are physical, in public spaces and non-spatial (Koeman, Kalnikaitė, Rogers, & Bird, 2014). The exploration of visual media to express matters of concern in images and sketches for instance (Johnson et al., 2017; Wilson & Tewdwr-Jones, 2019) are accessible and engaging, and draw on co-located modes of engagement. Other work, such as Taylor et al.'s (2015) Tenison Road Project, encouraged residents and visitors of a road to co-create data archives related to their street. They explored novel forms of displaying data with large responsive electronic pie charts and bar graphs alongside electronic voting devices in residents' homes. These methods go beyond an efficiency-driven approach to visualisation into approaches that can generate interest and encourage engagement. These examples illustrate the opportunities of non-app and non-screen-based systems to support engagement with place-based concerns.

3. Method: Relating Insight from Two Engagement Tools

To explore the role of the visualiser we refer to two case studies of public visualisations using the PlaceChangers and JigsAudio engagement tools to reflect on visualisations for community engagement in planning. We took a 'design research' approach which is concerned with generating insights on social phenomena through making prototypes (Frayling, 1993). Archer (1981, p. 30) defines design as "the combined embodiment of configuration, composition, structure, purpose, value and meaning in man-made things and systems." We separately designed two public engagement tools that employ visualisations in different ways to support engagement in planning and deployed them in 'in the wild' to understand the use of the technologies in context. We reflect critically on the function and role of the visual artefacts and explore the relationships between the social context and the designed artefacts (Cross, 1999) based on two deployments.

3.1. Analysis Framework

We created a framework of three themes to facilitate the reflection and synthesise insights on the role of the visualiser, the visualisation, and to structure the subsequent case analysis:

- The role of the visualiser: The activities and considerations made by the visualiser and its relationship with other roles on the project.

- The types of engagement enacted: The interactions observed with those visualisations in participatory processes, especially the modes of engagement, modes of communication for participants and the responses (Maher, Paulini, & Murty, 2011).
- Nature of the visualisations created: Lastly, we draw on Pietsch (2000) who suggested to characterize visualisation in relation to abstraction, realism, accuracy.

Rather than reflecting on what the technologies encouraged people to share, we explore how the technologies facilitated this, and our involvement, to understand the role of the visualisations in the wider social environment they were used.

3.2. Description of the Two Public Engagement Tools and Case Studies

To explore understandings of the technology, we chose to deploy two different technologies with distinct approaches, media, and types of visualisation through which we hoped would encourage different responses, as shown in Table 1. Reflecting the discussion above, JigsAudio was chosen to facilitate open, place-based commentaries about areas, whereas PlaceChangers was used to exemplify an approach based on Euclidean space that required participants to tie comments to places. Our research was initiated based upon the recognition of the complementarity in the researchers' approaches to public engagement.

JigsAudio is a public engagement tool designed to engage communities in discussing their place experiences and aspirations through drawing and talking. To use the device, participants were asked to draw their responses on a jigsaw piece, add an audio recording to their depiction:

> The JigsAudio device reads a radio-frequency identification…tag (similar to those used in contactless bank cards) on the jigsaw piece. The participant then records an audio clip (by pressing the record button) that is associated with their jigsaw piece and the piece is then placed within the jigsaw. JigsAudio contains a Raspberry Pi (a bank card-sized computer), [a radio-frequency identification] scanner and a microphone. (Wilson & Tewdwr-Jones, 2019, p. 6)

Tiles can be placed on the device to listen to the associated audio clip. The audio and visuals are then bought together on a website that shows a community's thoughts on the topic.

PlaceChangers is an online platform designed to extend traditional forms of public consultation with discursive place-based feedback. The platform is based upon research into different formats of engagement that public planners organise to support public consultations during plan making (Weise, 2016). Over four years, the platform developed from a 'tagging game' into an online service based on the premise of discussing places on a map. This type of engagement format is most useful once value-based questions around the purpose and key aims of a design project have been resolved.

3.3. Limitations

In this article, we present the experiences of the researchers involved in mobilising participation through the public engagement tools, by taking on the role of the visualiser. Deploying the technologies 'in-the-wild,' rather than in more controlled lab-based studies, meant the work had to be responsive to both the research project and the participants. In each case we provided third parties with the engagement technologies and were not able to observe the technologies throughout all of their uses. We were not able to get the views of those who chose not to participate; however, we had more structured interactions with individuals facilitating the engagement activities and who had direct contact with participants.

4. Emerging Practices Involved with Public Visualisations in Public Engagement

In the previous sections we outlined a shift in both planning engagement and visualisation, from expert-driven

Table 1. Overview of JigsAudio and PlaceChangers.

Example	JigsAudio	PlaceChangers
Genealogy of approach	'Citizens murals' and photo collections (McClure, Byrne, & Hurand, 1997)	PPGIS type systems and approaches (Kingston et al., 2000; Talen, 2000)
Modes	Mainly face-to-face/in public setting.	Mainly mediated/online
Format of the public visualisation	A collection of views on a topic wall made up of sketches and audio clips that can be played through the JigsAudio device.	A map-based presentation of annotations for place-change.
Format of individual responses	Tiles made up of sketches/drawings/ scribbles with accompanying audio annotations.	Place-based tags made up mainly of text comments, ratings, or photos, and sets about the of participant questions place more generally.

to more participatory. In this section we explore how the tools engaged people in different ways through visualisations. To reflect on the technology deployments, we use the framework introduced earlier: the role of the visualiser; the types of engagement enacted; and the nature of the visualisations created.

4.1. The Case of Engaging in the Future of Newcastle at the Great North Exhibition—JigsAudio

JigsAudio was used to encourage a debate about the future of Newcastle during the Great Exhibition of the North, June through September 2018. This special exhibition celebrated arts, culture and design in the North of England. Through JigsAudio visitors were provided with the opportunity to present their ideas, experiences, and aspirations of Newcastle. The aim was to explore how communities created and communicated through their own visualisations on issues that mattered to them, rather than using tools that planners typically use (such as proposal maps or written policy). The work was inspired by previous attempts of getting citizens to express their concerns and aspirations through apps, which were found to over-represent problems, rather than closely-held feelings and wider place-experiences (Wilson et al., 2019). The aim was to encourage longer-term perspectives than apps developed for speed and in-situ participation encouraged and test an open-ended engagement method that encouraged reflection and dialogue. Rather than sending responses to a decision maker, responses would be interpreted and understood by the respondents through a public visualisation within which people documented their feelings through drawing and talking.

4.1.1. The Role of the Visualiser

The visualisation within the JigsAudio system led to considerable thought as to how the outcomes from the discussion of the future of Newcastle should be visualised. Because of this, the visualiser (the person designing the activity) had considerable power in shaping how people would approach and respond to the activity based upon its appearance (Norman, 2013; Wilson & Tewdwr-Jones, 2019)

These considerations included the topic, where the device would be situated within the gallery, how it would be affixed, as well as the shape, aesthetics and layout of the pieces. It was decided the activity would be best situated within an interactive floor of the gallery encouraging people to reflect on the exhibition and communicate their ideas. The pieces were blank 'tiles' that could be hooked to the wall—in previous deployments illustrations already on the piece were used to guide participants that served to narrow-down what people communicated (Wilson & Tewdwr-Jones, 2019). Here, participants could choose where to place their tiles on the wall. It was decided the activity would be wall-mounted, and the device and headphones mounted to a plinth alongside.

Whilst there were decisions taken about the activity up-front, participants had control over their representations to varying degrees, through choosing colours, materials, modifications, and where to put their piece, leading the visual appearance of the activity changed on a daily basis. Following a nearby crafting activity, it appeared that some had taken the opportunity to decorate their piece with pipe cleaners and felt. At other times there were more pragmatic issues discussed, such as local air quality and transport. As the different users engaged with the activity, the visuals changed. Hooks would become filled, pieces would become scarce or would move around or be placed on top of one another. The constantly evolving and messy display reflected the different ideas, viewpoints and preference of communication of the participants, and presented something that was not static.

4.1.2. Types of Engagement Enacted

JigsAudio facilitates differing levels of engagement with the technology and activities. Before engaging, it is worth noting that participants were required to travel somewhere to engage. The barriers, therefore, were relatively high for those wishing to participate (when compared to web-based engagement tools). It was hoped, however, that once engaging with the activity, many of the barriers to expression (such as needing to use prose), to digital technology (having to own and be able to use digital technology) and nervousness (by seeing that others had undertaken the task) could be reduced. In order to facilitate this there were three differing types of engagement that were observed with people engaging with the technology:

- Observer: JigsAudio provided the opportunity for people to stand back and take the visuals in and get a surface-level understanding of the wider representations of the jigsaw pieces, as well as some of the broader concepts coming forward.
- Interactor: For those more interested, people could engage with the pieces individually, may scan and listen to a few of the pieces, and get a more detailed understanding of an individual's perspectives on an issue.
- Creator: After taking in the view of others, some chose to provide their own views on the topics. To do this, people were encouraged to draw their own depiction, add an audio recording, and add it to the collection.

JigsAudio, through encouraging drawing and talking, allowed people to communicate through alternative methods beyond those typically required to participate (such as writing). It was theorised that using these communication methods allowed people to discuss more elaborate

visions and experiences about place than people might otherwise be communicated when replying on text. The large format of the pop-up exhibition encouraged engagement with the activity without requiring people to visit specific websites or download dedicated apps, and invited participation from those in who would struggle with the formal planning system or digital technology

4.1.3. Nature of the Visual(s) Created

The resulting visualisation was a thematic (rather than spatial) representation of people's views on a topic in a mural of tiles (see Figure 1). The broad number of topics represented, and how they were represented, led to an engaging mosaic of viewpoints that could be explored by others through its visuals and audio. The visualisation was unstructured, forming a resource which represented a group's wider-ranging viewpoints.

Given the open nature of the commentaries, further interpretation is required than when compared to the PlaceChangers that used a more conventional map-based approach. Whilst it was beneficial that people could express their opinions more openly, there were challenges presented when attempts were made to understand the implications of these comments. More abstracted comments were difficult to interpret into deliverable policy proposals that could be engaged with through traditional decision-making processes. In the deployment of JigsAudio, whilst the method did inspire wide-ranging commentaries, it was difficult in some cases to understand where the comments should be directed (for example, the local government department responsible for acting on wider place-based comments). This raises the question as to how far public participation methods should align with the procedural processes of planning within local authorities. There are important considerations about whether, or when, consultation be narrowed. Is it preferable to close down discussions, and have a narrower discussion on the narrower aspects that can be commented on, or, should wider discussions then be focussed at later stages?

4.2. The Case of Byker Estate Improvement Program—PlaceChangers

Here we will discuss the opportunities and limitations of a narrower approach to engagement using the PlaceChangers platform deployed in early 2019 on the Byker estate, a large housing estate in the east of Newcastle upon Tyne, UK. The following engagement was predicated around the housing association wanting to establish actionable changes to public spaces, streets, greenspaces, alleyways, playgrounds and other facilities. The estate was large and covered multiple communities in different types of dwellings. Given the size of the area and the diversity of potential concerns, the delivery team wanted to create a resident engagement program that was simple to deploy whilst being able to systematically capture wide ranging concerns.

An interactive public map was used as part of a wider engagement programme consisting of local street stalls, evening workshops with elders, visits to local schools, as well as site visits and walks. The mapping tool within the PlaceChangers platform was chosen by the architect in order to provide more structure to the debate than would otherwise be possible via the existing Twitter channel, which was also used by residents to give feedback on the estate. Subsequently in the delivery of the programme of work, small notices with tags could be scanned by mobile phone cameras placed around the estate as well as online posts with a link to the interactive map.

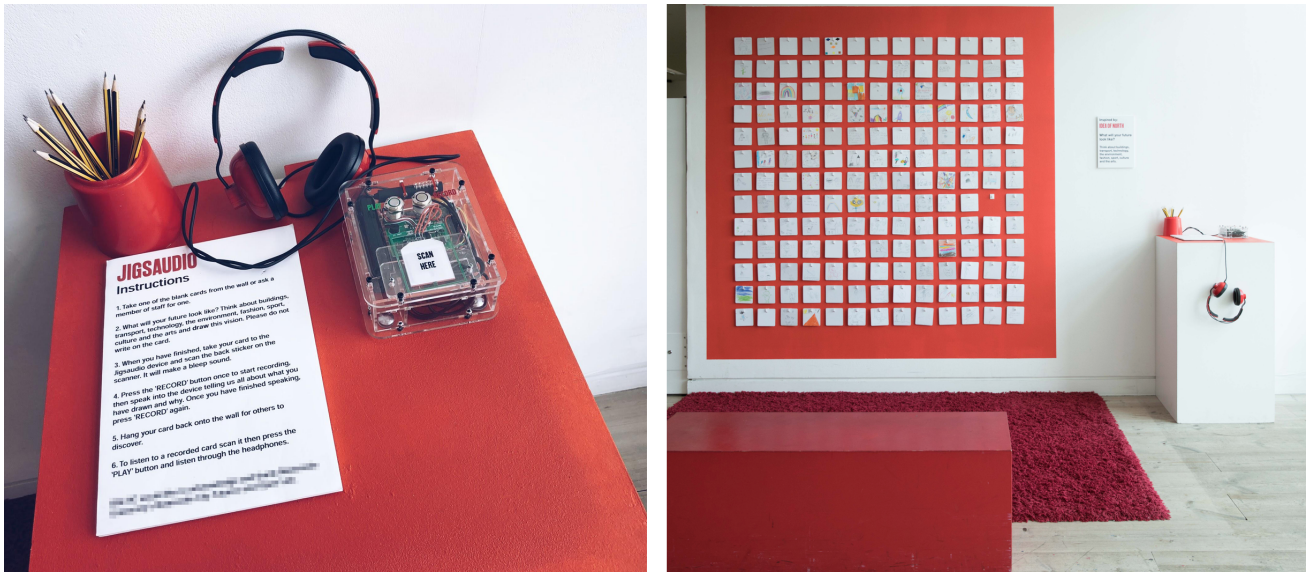

Figure 1. An example of one deployment at a modern art gallery in Gateshead, UK: JigsAudio device (left) and the public visual artefact—a tile mural of individual contributions (right).

4.2.1. The Role of the Visualiser

With the map-based interface, the visualisers, in this case largely the architects guided by the developers of the platform, struggled with the typical concerns mentioned in relation to map-based presentation, including to help individuals orientate, and to shift relevant aspects into focus. The visualiser advised the architecture team on the presentation of the estate and the various focus areas so that it would be familiar to residents. There was also the concern how to ensure that respondents would easily recognise the online campaign as an official part of the resident engagement programme and so a well-used map of the estate was used as an overlay to the standard base map, along with the logo of the relevant organisation.

To create a shared presentation of the estate, the architectural team decided to use a colour-coded map of neighbourhoods that are found widely across the estate as it was thought that this would help residents locate where they are (see Figure 2, left). In addition, a number of well-known communal points of interest were placed on the map of the estate with some extra information. Those points were both used to provide feedback on general areas but also to help with people's orientation. Applying Lynch's (1960) idea of visualisability, this approach emphasised nodes and districts. Districts were heavily abstracted, no longer so much differentiated by their building typology, but by colour coding of neighbourhoods on a map. All responses were summarised under each area of the estate, which later helped to recognise how concerns varied across the area as a whole.

4.2.2. Types of Engagement Enacted

Responses were obtained from three architects and approximately 30 local residents through the online map: 491 improvement ideas were submitted. As opposed to solely engaging online, the campaign enabled residents to engage via in-street booths where the architecture team provided a crucial link between the voices and opinions of citizens and their interpretation and referencing in the platform (see Figure 2, right).

Some responses were closely related to specific types of features or locations on the estate, and map-based presentations lend themselves to responses that are more likely to relate to place action as opposed to place meaning. Some responses related to value-based issues, such as the importance of green space, or the social causes of littering, where it was impossible to relate them to any specific location. All responses required detailed reflection and review by a facilitator to relate them to a programme of work with actionable interventions.

The key concerns observed to a large extent related to safety concerns and issues with upkeep, especially litter, bins, and fences etc. The campaign succeeded at flagging a wide range of specific concerns regarding particular areas or features on the estate which, in turn, led to honest feedback on feelings towards the place qualities that could be addressed through design interventions.

4.2.3. Nature of the Visual(s) Created

Overall, the map-based visualisation was useful at recording the views of different stakeholders, to keep notes from site visits, and later to help the design team to sift through the responses by accessing responses through the map interface. Annotations were clustered and covered the whole of the estate. The visualisation was seen as an artefact of progress that provided the team with the comfort that a lot of work had been done to capture and document the various insights gained from both the public and the design team. In the follow-up, the design team got involved in coding all responses with topic keywords to facilitate the analysis, leading to simple summaries of issues in bar charts for each sub area. This translation was essential in communicating the key issues observed on the estate and to create an argument for change.

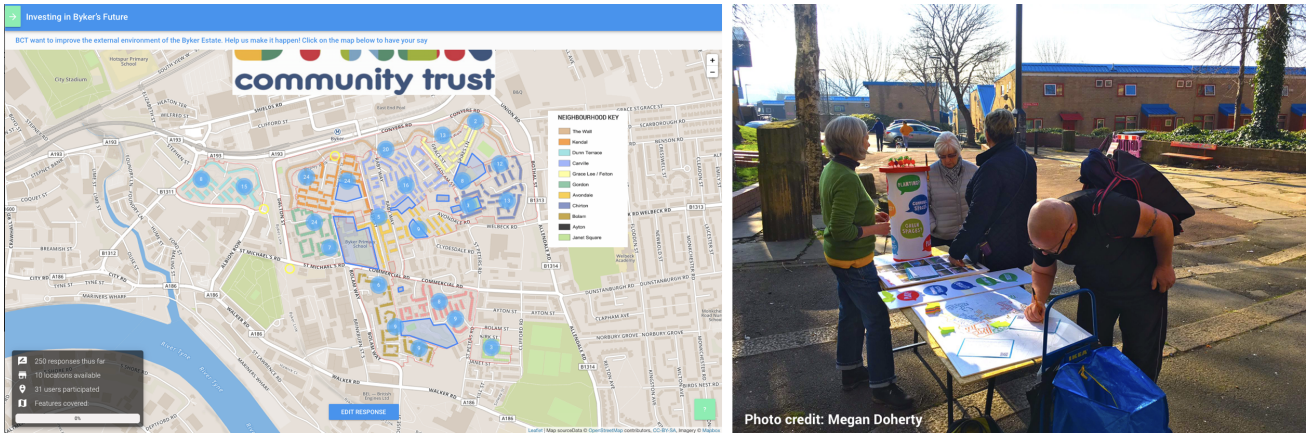

Figure 2. Presentation of the public facing map with various annotations from the public and consultant: the public visual artefact (left) and public event embedding the consultation in a local context (right).

5. Insights for Future Work

5.1. What Roles Did the Visualiser Take in the Creation of the Public Visual Artefact?

Reflecting on the two examples, we note that the visualiser played an important role to embed the visualisation in a place-based context. Initially, the visualiser performed activities to set up the visualisation and embed it in the respective context and community by providing the right level of context for public respondents to be able to interpret what they were asked to do and to develop an appropriate response. The aims of the project played an important role in determining which type of visualisation, and its format, would be appropriate. In the PlaceChangers example, where the focus was on ideas for improving an existing estate, this meant to present an abstract map of the estate that shifted different neighbourhoods into focus. With JigsAudio, which aimed to enable a discussion in relation to the value of a place, it meant setting up an environment within which participants could reflect, and respond creatively, without needing to identify specific places. The geographic context here was only implied through cues and prompts provided as part of the engagement activity.

In the aforementioned project examples, the visualiser takes a role different from typical tasks in creating a visualisation. The role of the visualiser here is to anticipate the format of contributions, and the ways in which the contributions made by others are logged, presented, and related in order to enable the creation of a public visual artefact. The visualiser therefore needs to consider guidelines and hints that help others to contribute to the visualisation, regardless of whether the visualiser is present. The contributors themselves will emerge as essential in the creation of the visualisation. In a visualisation driven by public responses, it means that the role of professionals, such as architects and planners, can shift to support the facilitation and interpretation of the content of the visualisations. Therefore, as suggested by Paulini, Murty, and Maher (2013) in collective design processes, an important consideration of the visualiser to make is not solely the form and nature of the public visualisation, but also the likely roles that participants take in the production of that visual. Box 1 provides a few roles that emerged.

5.2. How Did the Different Characteristics of Spatial and Non-Spatial Visualisations Influence the Types of Engagement with Place Qualities?

PlaceChangers and JigsAudio abstract a place-based conversation in different ways (see Table 2). As we note from the discussion of the two visualisations, different types of visualisations are likely to evoke a different response that is either more useful for place meaning or place actions. With JigsAudio, there is no explicit mention or use of geographic space in the visualisation. Here individual contributions consist of drawings and audio in response to an open question, that may be more likely to explore values and feelings in relation to a place and therefore are more useful for establishing place meaning. While the PlaceChangers platform is also deployed within a place-based context, responses require explicit spatial references and so require respondents to think about where their opinions relate to and therefore is most useful to consider place action.

Place meaning relates to the interpretation of the place and various views of set priorities; place action may be more around specific, often narrow actions, and the prioritisation of those actions with everybody involved. Typically, at the beginning of any public engagement project in town planning, it is counterproductive to try and tie feedback to locations without any specific focus—rather an approach built around establishing place meaning offers the opportunity to establish broad aspirations and fears to feed into a design project. What seems to be required instead, related to the perspective of 'infrastructuring' community engagement, is an artefact-centric view that accommodates visualisations in an integrated approach that establishes place action based on place meaning. This is exemplified in any design process that begins with fuzzy and abstract problem spaces that later narrows to practical activities and action (Paulini et al., 2013). Naturally, earlier design stages require visualisations with coarser accuracy or realism, and greater abstraction. Later design stages, instead, require visualisations that incorporate a greater degree of

Box 1. Consideration to be given to emerging roles in participatory processes that involve public visual artefacts for participation in town planning.

Visualiser: Shapes the setup and envisions the future digital public visualisation.

Interpreter: Participants and professionals interpreting individual contributions, for example, through tagging.

Facilitator: Participants or professionals to embed the visualisations with engagement activities.

Contributor: Participants or professionals to make additions to the public visualisation.

Observer: Those who enjoy the visualisation and reflect but may not contribute.

Table 2. Review of the public visual artefacts in JigsAudio and PlaceChangers using the characteristics of visualisations (see Pietsch, 2000).

Example	Sketch mural	Annotated map
Abstraction	High: On level of individual contribution and the public visual	Medium: map is abstracted based on built environment, but does not reflect lived experience
Realism	Low: Not a requirement for this visual	Low: Dimensions and spatial placement of build environment can be seen, but it is clear that it is a map
Accuracy	Low: Not a requirement for this visual	Medium: Contributions relate to some location in the neighbourhood. Accuracy is not a requirement.

the real world (for instance in terms of constraints) to greater accuracy, realism, and therefore require less abstraction in the place-based relationships they suggest.

5.3. How Might Public Visualisations Create a Space for the Discussion of Alternative Views of Place?

As indicated, visualisations with different levels of abstraction encourage different responses—earlier stages of engagement can accommodate wider place-based discussions, whereas later stages require ideas on concrete proposals. It suggests that designers of digital participation technologies need to understand how to encourage people to express their abstract ideas towards place before comments on specific parts of plans are discussed. Parameters become more refined over time, from abstract conceptualisations and ideas become more detailed specified plans. Visualisations only perform well if they present a clear message relative to the purpose, cultural frames, and expertise of the person intended to be engaged. Therefore, in the mediatisation engagement on urban issues and the further exploration of visualisations for public engagement, we suggest Figure 3 for which different visualisations are required.

By the term 'informal engagement' we mean engagement that takes place in informal settings and on topics that are less strictly aligned to formal planning processes, rather than those that require engagement with planning policies and specific proposals. Here public visual artefacts could play a significant role to serve as early conversation starters for built environment projects. The different engagement approaches (from informal to formal engagement) recognise that the shaping of place often falls outside of formal planning processes. Therefore, we need to pay attention towards how we open up informal discussions outside and acknowledge people's experiences of place and long-term aspirations with flexible visual tools that are not constrained by formalities (in terms of process), or high levels of precision. A key direction for new methods of engagement is the increasing overlap of digital technology and built environments (McCullough, 2005). Architecture and the built form provide a foundation upon which digital technologies can provide interactivity in future urban spaces that may lie beyond screens and maps.

6. Towards an Ecology of Public Visualisations for Participation in Planning

We considered two engagement tools that used public-facing visualisations to evoke a response from members of the public for a specific planning purpose developed by us. Each of the engagement tools demonstrated public-facing visualisations with different degrees of precision and accuracy in how they depicted aspects of the real world. In the case of JigsAudio, we find a visualisation that evokes responses that are abstract and implicitly linked to a place. Through its physical embedding, the visualisation does not require any specific reference to a place, and thereby offers the opportunity for creative and unconstrained responses. These messier and all-encompassing comments require a vital stage of translation to fit within formal decision-making processes. In order for JigsAudio to form an effective participation method, this step must be carried out by someone close to the participants, who can take the comments and understand them within the context of shared experiences and concepts.

In the case of PlaceChangers, we find a visualisation that is more explicit in terms of the location comments referred to, and therefore requires respondents to raise ideas and responses that are more specific and narrower

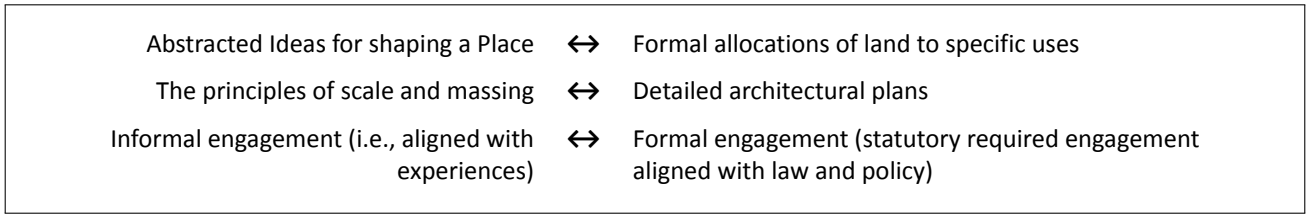

Figure 3. Levels of abstraction and engagement approaches.

to a particular location. The visualiser makes important decisions relating to the setup of the initial map canvas, as to what to move into focus, and what to abstract or remove, in order to shape the discussions. Here, too, responses will require interpretation by someone close to the case, in this case architects involved.

We suggest that the first approach is an example of a visualisation that is powerful in evoking discussion about place meanings, that is the values and feelings citizens attach to place. The second approach uses visualisation that evokes responses around specific narrower issues (what is where) and is better suited to place actions, perhaps later in the development of a plan for an area. Future work should look to define when and how visualisations suited for engagement on place meaning (spatially more abstract) with those suited for place action (spatially more explicit) can be linked. We believe that this could strengthen the support for broad informal public discussions and the ability to generate proposals from the bottom up in a manner that can have an influence in the formal processes of the planning system.

The article also highlights the changing role of the visualiser involved in these public engagement projects. Rather than the production of final maps or renderings that present place-based visions, the role of the visualiser shifts towards creating frameworks within which the public can pull contributions together in a process where public visual artefacts arise. Tools for participation should reflect the terms they are engaging people on. These new practices will involve considering how to embed the public visualisation in emergent public engagement projects. It will also involve the creation of formats within which members of the public can co-create public visualisations of what is needed and wanted. Lastly, it will also require negotiating and defining potential roles individuals in the creation of the public visual artefact, and how they relate to project stakeholders. While significant attention has been typically given to professional's collaboration tools, including mapping systems and modelling tools, further research is required on the power of these informal, often more simplistic visualisations in public engagement processes, and the role of the visualiser in these contexts when removed from the realm of the planning professional.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Citizen Participation in Digitised Environments in Berlin: Visualising Spatial Knowledge in Urban Planning

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Abstract
Digital information and communication technologies influence not only on urban planning but also citizen participation. The increasing level of politically driven involvement of the public in urban planning processes has led to the development of new participatory technologies and innovative visual tools. Using an empirical case study, the article investigates a completed participation process concerning an e-participation platform in Berlin, while focusing on the following questions: (1) How are visualisations communicatively deployed within e-participation formats? (2) In what ways do citizens communicate a kind of spatial knowledge? (3) Which imaginings of public urban space are constructed through the use of visualisations? The exploration of the communication conditions and the 'methods' employed will demonstrate the way participants visually communicate their perceptions and local knowledge as well as how they construct their imagining of urban places. In this context, visualisations in participation processes are understood as products of 'communicative actions' (Knoblauch, 2019) that allow people to present their visions in ways that are more understandable and tangible to themselves and others. Within this context, by the example of the state-driven e-platform 'meinBerlin' a discussion will trace how far digitalised and visualised communicative actions from Berlin residents contribute to the social construction of urban spaces and the extent to which they can be considered a part of cooperative planning.

Keywords
citizen participation; digitised environments; e-participation; meinBerlin; spatial knowledge; urban planning; visual methods; visualisations

Issue
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1. Introduction

Since the second half of the 19th century, approaches to urban design and planning for the emerging modern industrial society have been subject to perpetual reorientation and change, which coincided with the age of rapidly developing (digital) information and communication technologies. Historically, an extensive mediatisation—and digitisation, more recently—of communication processes has taken place with increasing speed. Accordingly, in the field of urban planning, there is an observable trend involving the integration of innovative media technologies and digital tools in planning processes, particularly in the sub-field of public participation, which includes citizens in the processes of creating, communicating, and visualising urban futures.

A core question for us, which addresses a gap in the research, is: how do digital tools and their social uses influence the communication of perceptions and conceptualisations of urban spaces? Furthermore, how can the (visual) communication and communicative construction of urban futures be best described? Using the example of a digital participation platform in Berlin, Germany, we will examine a distinct participation process concerning the topic: 'Report Noise Sites!' (*Lärmorte Melden!*). With this case study, we will break down the aforementioned core question into three further queries:

(1) How are visualisations communicated within e-participation formats?
(2) How do citizens communicate spatial knowledge?
(3) Which conceptualisations of the public urban space are constructed through the (re)use and (re)design of visualisations?

Our analysis will employ a sociological, or to be more specific: an ethnomethodological approach (Garfinkel, 1967), which will focus on the description of citizens' 'methods' of communicating on an e-platform.

The article begins with an overview of the broader context of the study, which will sketch out the key arguments in both public debates and research literature concerning citizen participation, including e-participation, which will follow in Section 2. After that, we will introduce our case study, the 'Report Noise Sites!' online survey, which was administrated on the e-platform 'meinBerlin' (Section 3). The methodological approach applied and the process of analysis through which texts and images regarding residential communication will be described in Section 4, while Section 5 will examine how participants linguistically and visually conceive of noise spaces in Berlin. Section 6 will conclude.

2. The Context: Citizen Participation and e-Participation in Society and Research

Media discourses and the growing body of interdisciplinary research studies show that citizen participation in urban planning processes has become a central socio-political issue not only in Germany but throughout the world (e.g., Diller, 2015; Gribat, Kadi, Lange, Meubrink, & Müller, 2017). Both civil-society actors and political actors share the common interest of fostering a more inclusive approach that more directly involves citizens in the planning process and focuses on obtaining social consent to development projects and decisions through expanded public participation. In the spirit of deliberative democracy, participation translates to an approach that emphasises the maintenance of an open dialogue and the communicative involvement of citizens in decision-making processes (e.g., Barber, 2003; Dahl, 1971; Giddens, 1994;).

Outside the abstract domain of democratic theory and legal procedure, discussions concerning how public participation can be practically implemented should not be overlooked. Research literature on the subject continues to grapple with understanding the effects and extent of the public's participation, particularly whether such efforts genuinely increase citizens' involvement in the decision-making process or in how far they merely produce cultures of 'particitainment' (as a connection between the two words 'participation' and 'entertainment'; Selle, 2011). Additionally, debates are also preoccupied with questions related to what forms of participation are most adequate for each stage of the planning process. Indeed, Arnstein provides one of the most prominent approaches used in differentiating the degrees of participation. In the "ladder of citizen participation," Arnstein (1969, p. 217) describes three levels of participation: non-participation, tokenism and citizen power. In her description, she elucidates the inseparable link between participation and power and that eight sub-levels of participation can be distinguished where the share of power for citizens increases from level to level. Arnstein's concept of participation indicates that citizens engage in actions that go beyond a mere consultation or a local knowledge transfer; rather, they are understood as cooperating partners. Keeping this theoretical approach in mind, one can observe throughout the 1960s and 1970s (i.e., Habermas, 1962; Lefebvre, 1968) as well as the 1990s (i.e., Healey, 1992, 1997), the rapid development of concepts related to the enhanced involvement of civil-society actors in political and urban planning processes.

The market has also responded to the increased need for participation, which can be reflected in the development of a 'participation industry' over the years. In addition to urban planning offices, companies have also begun to specialise as 'participatory service providers' as they develop technical instruments and initiate (e-)participation formats. As participation has grown into a more institutionalised practice in Germany, a steady demand for participation formats has followed, which has led to the creation of numerous new norms as well as inflexible procedure patterns regarding the inclusion of citizens in the planning process. Given the extensive bureaucratisation that has taken place, it is not surprising that such procedural developments have drawn criticism, which can also be understood the result of a reflexive politicisation of civil society (cf. Beck, 1994). The emergence of a participation industry—a reference to the concept, 'cultural industry' (Horkheimer & Adorno, 1944/2003)—can be understood as a consequence of the neoliberalisation and commodification (Harvey, 2005) of urban planning and participation which is reflected in the increased need for organisations to specialise in the development and application of participation tools as well as the shifting role of the planner, which has grown more akin to that of a moderator of 'event-like' participation formats. Simultaneously, significant changes in information and communication media have profoundly evolved since the 1990s (i.e., Castells,

1996). As such, the emergence of digital technologies and the increasing 'mediatisation' of society (i.e., Hepp, Hjarvard, & Lundby, 2015; Knoblauch, 2013) has further enabled unparalleled social accessibility, which catalysed numerous ways of sharing ideas, concepts, knowledge; thus facilitating 'communicative participation.' In this context, e-participation still represents a comparatively novel approach to promoting public participation and is primarily the subject of discourses in e-governance, e-democracy or 'civic culture' (e.g., Couldry et al., 2014; Dahlgren, 2003; Sæbø, Rose, & Molka-Danielsen, 2010; van Dijk, 2013).

In recent years, an almost unmanageable number of studies have highlighted the many current and historical formats of media-supported (e-)participation around the world, which have coincided with discussions related to the potential of Web 2.0 and social media. With cases involving meta-studies, these potentials are systematically examined in terms of usefulness or the manageability of digital approaches (i.e., Carpentier, & Dahlgren, 2014; Tambouris et al., 2013). In the field of political participation, elections or donations often captivate the main interest (Bimber, Cunill, Copeland, & Gibson, 2015). With urban planning, attention is primarily focused on the use and development of digital media, namely in neighbourhood planning (Manuel, Vigar, Bartindale, & Comber, 2017). In such contexts, the development of digital tools, app-technologies (e.g., Al-Kodmany, Betancur, & Vidyarthi, 2012; Wilson, Tewdwr-Jones, & Comber, 2019) or web-based platforms (Steiniger, Pooraziz, & Hunter, 2016) are implemented and evaluated in planning procedures or are used for scientific crowd sourcing (Szell, 2018) and play a central role in many studies. Falco and Kleinhans (2018), for example, examined 113 globally active digital participation platforms where they observe the "availability and functionalities" of such platforms of co-production in urban development. Among their findings, they discovered that nearly a quarter of the platforms were:

> Either used for practical solutions for spatially-bound problems, objects or services in citizens' living environments or targeted towards future-oriented vision, planning or policy making of local areas, neighbourhoods, but also cities (master plans and local community plans). (Falco & Kleinhans, 2018, p. 64)

In many cases, digitisation has promised that the creation of new interactive and cooperative formats, networks and platforms would also establish new forms of communicative involvement or 'inclusivity' (cf. Hasler, Chenal, & Soutter, 2017) with regard to participation processes (Brückner & Märker, 2015; Leitner, 2018). Such promises often followed an implicit normative narrative that the use of digital media would be automatically accompanied by a greater willingness to participate (Hepp & Pfadenhauer, 2014). However, many initial hopes of digital participation remain unfulfilled, due, in part, to some formatting that proved to be less citizen-centric than assumed. According to van Dijk, preliminary understandings of e-participation can be best described "as the use of digital media to mediate and transform the relations of citizens to governments and to public administrations in the direction of more participation by citizens" (van Dijk, 2013, p. 56).

To summarise, there appears to be an observable trend in studies on e-participation that focus only on the production and implementation of digital tools in an application-oriented and technical way; less common are studies that tackle matters of commitment or the perspectives and motivations of participating citizen (cf. Donders, Hartmann, & Kokx, 2014). However, an even greater gap in the research is apparent, which our article will address; that is, concerns related to the nature of what happens on platforms, how citizens communicate and contribute to planning processes and what resources and modalities they use to convey their (local) knowledge. Instead of focusing on the evaluation of participation formats or their technological functionality, a citizen-centric perspective will be adopted, which will study both the written (language) and visual communicative actions taking place on e-participation platforms.

We will analyse how digital platforms are used as participation tools where citizens can communicate more directly in planning processes and make their 'voices' heard (Couldry, 2008) and their social position visible. Visibility plays a critical double role: on the one hand it is about socially displaying one's own points of view and the position of those social groups one represents; on the other hand, communication is also visually conditioned—that is, ideas and (subjective) perspectives are no longer generated exclusively through written text but also through the use of map-based methods or other visual tools combined with comments, surveys, etc. Surprisingly, there is not a lot of research which can be referenced on this topic. As such, we will examine how citizens participate and communicate in urban planning processes through digital instruments as well as the role played by linguistic and visual forms of communication. To illustrate our findings, we will employ an empirical case study on the participatory process of an e-participation platform in Germany, which will focus on a poll, 'Noise Protection and Noise Locations in Berlin.'

3. The Case: Online Platform 'meinBerlin' and e-Participation on Noise Protection

The online platform 'meinBerlin' was introduced in 2015 by the State of Berlin in Germany and publishes content from the Senate Office of the Governing Mayor (Senatskanzlei des Regierenden Bürgermeistes). The platform is dedicated to providing information on a number of events and projects happening in Berlin and is not used solely for residents to participate in urban planning initiatives. The content and individual projects were set up by responsible employees of the Senate admin-

istrations, district offices and neighbourhood management. Among its many other features, the site offers citizens opportunities to participate in projects located in their own neighbourhood as well as within city-wide planning processes. This platform is based on the open-source software Adhocracy, from the non-profit association Liquid Democracy, which can be used freely by the government administration as well as local initiatives and organisations.

The main function of the platform is to facilitate participation processes digitally. This applies not only to urban development and planning processes, but also to public discussions concerning participatory budgets or sharing political opinions. A variety of opportunities to participate are made possible through commenting, submitting and evaluating proposals for planning projects. Furthermore, it is possible to visualise and to place suggestions on a digital map. As of March 2020, 48 projects are listed in the online platform, whereas 167 projects have already been completed. One example of a finished participatory project we selected for our analysis is 'Report Noise Sites!'

In modern cities many citizens are exposed to a variety of sensory, acoustic, visual or olfactory stimuli. Especially the experience of noise is a relatively common issue of concern in big cities. This is not only a result of the large number of people, from locals to tourists but also of the many mobility options from cars, motorcycles to trams, which in sum produce a characteristic soundscape. Whether or not these experiences can be classified as 'noise' cannot be answered, yet. On a national (Federal Immission Control Act (Bundesimmissionsschutzgesetz) as well as on an international level, emission limits are legally defined in order to determine the extent of loudness/audibility based on the degree of its harmful quality. 'Noise' as an initially acoustic phenomenon is, however, also directed at the sensory perception of acting subjects and the sensual-meaningful 'typification' (Schutz & Luckmann, 1974) of sounds as 'noise' based on experiential embodied knowledge. Considering the subjective nature of hearing, it becomes difficult to universalise 'noise' (Maeder, 2013; Maeder & Brosziewski, 2011). Though the permanent honking on Mumbai's or Cairo's streets might be to the dislike of some people, for others, the experience imparts an acoustic construction of a culturally specific urban identity, while also functioning as an essential form of communication through which road users coordinate their actions with one another. Therefore, noise remains undefined for our purposes. At the same time, noise as a restrictive, disturbing phenomenon also forms the socially shared framework within the participatory process under our investigation, which can be understood as the 'common ground' for communicative action involving participating members.

The city-wide survey 'Report Noise Sites!' is embedded in the larger project 'Berlin Becomes More Silent' (*Berlin wird leiser*), thus functioning as part of the comprehensive 'Noise Action Plan' (*Lärmaktionsplan*), which has been conducted and organised by the Senate Department for the Environment, Transport and Climate Protection (Senatsverwaltung für Umwelt, Verkehr und Klimaschutz). The project began in 2013 and will continue between the period of 2018–2023, in the effort to reduce noise emissions throughout the city of Berlin. Since 2018, there have been various analogue formats (events and soundwalks) and digital surveys, which sought to fashion the acoustic setting of the city, making it sensorially perceptible and to identify places considered noisy as well as quiet. This rather extensive knowledge developed through various formats, which allowed conclusions to be drawn concerning future planning processes and will be incorporated into noise action planning.

The 'Report Noise Sites!' poll, which is the chosen case in this article, was conducted and moderated between April and May 2018. Using a digital map for reference, participants were invited to indicate the areas where they were disturbed by noise and how the noise disrupted their physical environment. To assist participants in describing the disturbances they experience, the platform provided four categories of noise from which to select: road noise, rail noise, aircraft noise and 'other'. Citizens were also permitted to submit comments where they could illustrate their personal accounts. Additionally, they were allowed to comment on other citizens' posts, which elicited both positive and negative evaluations. Subsequently, the Berlin Senate Administration collected this feedback and provided detailed responses to the 50 best rated comments.

When looking at the data, which is comprised of least 1589 comments, we quickly realised that only 27 participants used visualisations with their written statements. It is possible that technical features on the platform to create visual material were lacking; however, for those that chose to share images, it appears that communicating a visual mediation of meaning was important to at least to some of the participants involved.

Although visualisations were not used in the survey or later in the report, a qualitative investigation of the images was indispensable for our purposes, which sought to discover their relevance to participants and what subsequent deductions found could hold for planners.

4. Methodology: Qualitative Analysis of Texts and Images

As mentioned previously, our study is guided by the following questions: (1) How are visualisations communicatively used within e-participation? (2) How do participants communicate spatial knowledge? (3) Which conceptualisations of urban space are constructed using visualisations? To answer the questions posed, we developed a methodology which allows for in-depth analyses, which can be applied to interpretations concerning both of visual and text-based (written comments) data.

As such, the study therefore follows the methodological premises of qualitative research. Qualitative empirical research is characterised by the fact that typically case studies are conducted in which non-numerical data are gathered and the analysis of acting and meaning-making is focused (e.g., Glaser & Strauss, 1967; Silverman, 2006). In our analytical approach we particularly focus on the analysis and interpretation of visual data in the form of various pictures, drawings and photographs which we subsume under the larger umbrella term of 'visualisation.'

From a sociological perspective, we understand visualisations as meaningful devices of human imagination; products that are materialised or embodied constructions created by actors (in our case: citizens) in an effort to make their world tangible to themselves and others. We don't perceive visualisations as mental representations (Lynch, 1960) or as specific communicative tools, but rather, as a part of mediated 'communicative actions' (Knoblauch, 2019), which actors deploy in social situations (in our case: planning processes and/or political decisions). A number of different methodological approaches for the analysis of visualisations exist in the social sciences (i.e., Pink, 2012; Rose, 2016; Schnettler, 2013).

Our study employs the theoretical framework of ethnomethodology (Garfinkel, 1967). Ethnomethodology follows the idea that social reality is created by the actors themselves within a continuous production process. Garfinkel calls this an 'ongoing accomplishment.' This means that actors in social interactions do not simply orient themselves to a (pre)given social order, but rather actively produce this social order as an ordered structure. These kind of practical everyday methods of commonsense reasoning and producing reality can also be understood as 'ethnomethods.' A central assumption of this guiding premise is that people apply distinct procedures and practices to make themselves and the structures they produce visible, understandable or in one word 'accountable' (Garfinkel, 1967, pp. 1–2). Thus, ethnomethodology explores how people perceive everyday life worlds and how (new) social orders are meaningfully constructed in and through processes of social interaction (e.g., on an e-participation platform). The challenge for our study was essentially to transfer these assumptions, which are mostly applied for the analysis of social interactions, to online communication between residents on a e-participation platform.

For analysing participants' written statements and integrating the visualisations used, we have developed our own methodological procedure. Given that visual analysis in combination with the analysis of written comments remains an unconventional practice in this empirical field, it is necessary to develop distinct methodological procedures appropriate to the research subject and for the research questions we have outlined. In our investigation, we analysed participant responses concerning how they attempt to make their personal experiences with urban noise spaces understood. More specifically, we investigated how the participants make their perspectives on the described noise phenomenon 'accountable,' what kind of (visual and linguistic) practices and 'ethnomethods' they apply and what their statements contain: how they visually construct meaning and account 'evidence' on noise spaces for urban planners (see Section 5.1) and how they suggest solutions for the future. At the same time, it was examined how citizens use visualisations in this context. In other words, we looked at the citizens' techniques of showing, demonstrating, 'highlighting' (Goodwin, 1994) and accounting for noise in and through visualisations. Pictures were analysed for what was shown and but also what was not shown. As such, our methodological attitude towards the visual data was to treat what was both shown or not shown in the visualisations as relevant data (see Section 5.2).

In the beginning of the investigation it was already apparent that the participants were faced with solving a pragmatic problem: how can noise be represented in its relation to space? Since it was not technically feasible to represent noise in an acoustic manner on the platform, the participants could only 'display' noise via the use of language and visual imagery. In this context, 'noise' as a sensory phenomenon could only be perceived visually and symbolically through the mediated depiction of places and objects; as such, we consider the investigated visualisations as 'appresentations' (Schutz & Luckmann, 1989, pp. 131–135). In the tradition of phenomenological sociology appresentations refer to specific syntheses of human consciousness, which bring together two connected features, only one of which only is accessible to direct experience. In this sense, we do not see noise in the pictures, but rather, the visible objects that appresent and account for noise.

5. Accounting Noise Spaces

The present section delves more deeply into the empirical cases. The original language of the data collected is in German and the subsequent analysis was also conducted in German; however, they have since been translated into English for our article. We begin our analysis with some examples of the comments posted, which illustrate the linguistic devices participants apply to appresent noise as an invisible phenomenon. Here, we focus on the communicative accounting practices of linguistic sign systems (see Section 5.1). Contrastingly, the examples that follow in the category of 'road noise' turn their attention to the performance of visual communication and the image-text relations (see Section 5.2). The main argument of this section follows our previous discussion concerning ethnomethods of visualising, which result not only from the mechanical production of photographs, which indicate a current situation, but also from the creative contribution of a design that imagines a possible future. Despite the variety of responses collected, what ties them together is the mediation between what is shown and what is appresented.

5.1. Describing Noise Spaces: The Use of Language in Written Comments

We begin our empirical section with the analysis of selected comments from the participants (see Figure 1). Participants who do not use pictures, photographs or drawings to communicate must use other resources or devices to express the type of noise they perceive.

Contributions on the matter of noise are expressed in a variety of ways. First, participants often use expressive verbs (e.g., bluster, clatter, rumble) and metaphorical descriptions of sounds (see Figure 1, first paragraph). Comparisons (e.g., to that of a racetrack) also play a decisive role as does onomatopoeia ("da-da-da-da signal," "Rrrhrrrr!!")—which as expressed in the comments, shares a surprising similarity to the language of comics—in the representation of loudness. These expressions provide insight into the participants' imaginations concerning environmental noise in reference to an embodied/corporal and spatial knowledge and ultimately demonstrate how sounds are sensed and perceived.

A second form of expressing the experience of noise includes references to decibel measures of volume. Instead of circumlocutory narrations of subjective perceptions or written descriptions of sounds, the numbers represent a form of evidence is based on objective measurements.

A third category of description involves the presentation of one's own bodily perception which is directly impacted by noise (e.g., through stress, lack of sleep, health problems, etc.). In the second comment (see Figure 1, second paragraph), a resident report how her neighbourhood has changed from an idyllic, quiet sanctuary to noisy, disruptive space where alcohol and drug consumption are common. The citizen also complains that the observance of legal regulations and the expectations of maintaining social order are no longer guaranteed by politicians or the police. The once quiet space has grown into a place of fear and, over time, a health risk. The perceived reality of social space (e.g., the neighbourhood) is now sensorially constructed as a place of noise that has exacerbated the commenter's own health.

From an interactionist perspective, language serves the communicative expression of the bodily perception of the affected subject. In addition, the lack of physical co-presence in digital space must also be overcome. While in face-to-face interactions, feelings, emotions or the bodily perception of considerable noise can be interpreted by the display of 'body-glosses' (Goffman, 1971, pp. 122–137); for instance, when actors cover their ears. As such, online communication requires other techniques of self-representation and externalisation. Therefore, language serves as a means of depicting noise, though only in a symbolic manner.

5.2. Visual Communication and the Construction of Noise Spaces

Before we look more closely at two selected visual examples, we have included a small self-compiled selection of images uncovered in the data which give a first overview of the diversity of the images.

As mentioned, only 27 participants took advantage of the opportunity to include images in their comments. The images can be distinguished in terms of their form and how they are presented corresponding to the pregiven categories (road noise, rail noise, aircraft noise and 'other') on the platform.

1. Noise by cars and trams
On the Holtei Street between Wühlisch Street and Boxhagener Street, drivers are stepping on the gas. Squeaky wheels and howling engines are a daily occurrence. In addition, the tram traffic on the crossing Boxhagener Street screeches and grinds aggressively. The loud warning signal of the tram doors at the Boxhagener Street/Holtei Street stop is also a noise factor, especially at night, as well as the drunken tourists who often wait here for the tram.

(Source: https://mein.berlin.de/mapideas/2018-02070/)

2. Noise source loud music and meeting point for beer drinkers and drug addicts - evenings and nights
Actually, it is very idyllic and a nice quiet area at the Seegeluchbecken in Reinickendorf, but in the last few years it has also become a source of noise. Several times a week, in the evening until the night and longer, parties are celebrated with alcohol and drugs and loud music with speakers. My family and I cannot rest at night – I often call the police. However, the police do not often have time for people affected by the noise, despite there being a noise protection law. The police are responsible for compliance with the law. The public order office is not responsible after 10 p.m. Unfortunately, I run into brick walls. There is no remedy in sight from the police, the environmental office, or the politicians. It would be nice if one of them would take care of the problem. The neighbours are afraid and do not dare to make calls.

We long for peace - I am already over 70 years old and I would like to get my high blood pressure under control. Thanks for your project, hopefully it will be successful.

(Source: https://mein.berlin.de/mapideas/2018-02668/)

Figure 1. Examples of written descriptions of noise (authors' own translation).

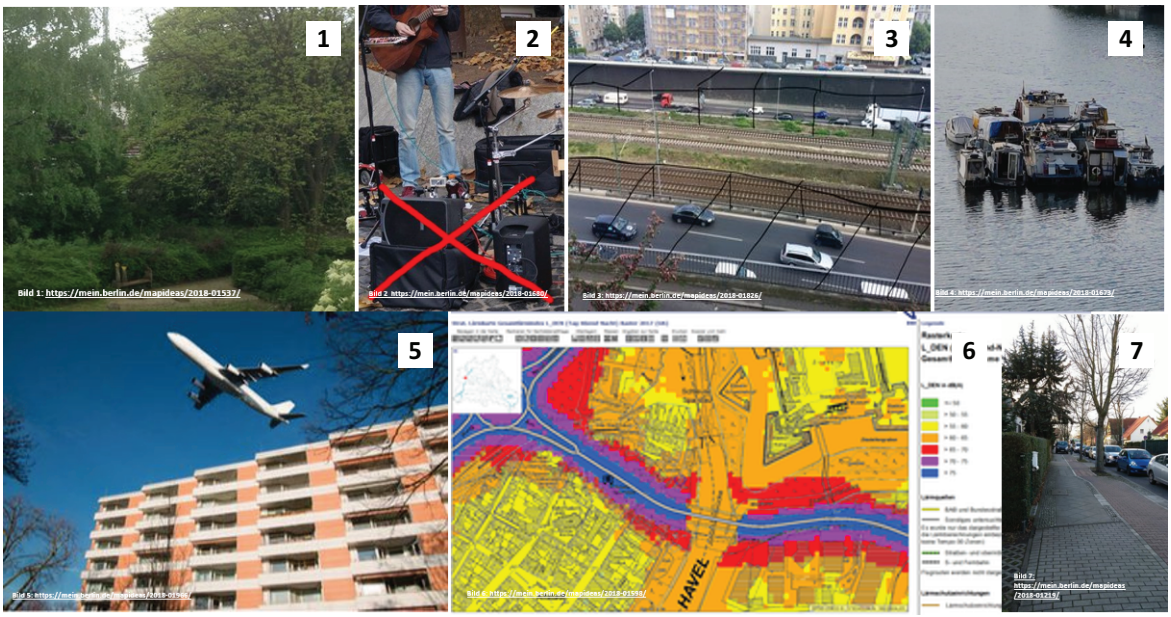

Figure 2. Collage of communicated noise visualisations by citizens. Compiled by the authors based on images from the 'meinBerlin' platform.

The collection includes a broad range of images (see Figure 2), which self-made as well as professional photographs, plans, noise maps and flyers. With some representations, it is not always clear whether participants have created their own images or whether they have been taken from the internet or other sources. References are rarely found, which makes it difficult to assess whether the photo shows an actual place in Berlin (see Figure 2, pictures 3 and 4) or a completely different one altogether (see Figure 2, pictures 1 and 5). Only from the 'amateur' quality and/or the perspectives of certain photographs can it be postulated that they are self-made. Thus, some photos seem ambiguous at first glance (see Figure 2, pictures 1 and 7), which suggests a more thorough analysis of the image is required. Noise maps (see Figure 2, picture 6) or other digitally processed images are taken from administration websites or reports. Some images are 'manipulated' (see Figure 2, picture 2) by 'highlighting' (Goodwin, 1994) specific areas or objects using digitally drawn arrows and edited lines. Additionally, places or 'noise sources' embodied in iconic objects and vehicles (airplane, ship, cars) are presented and pointed out; the intent of which is to generate visual and symbolic evidence for the phenomenon of noise. Interestingly, humans are less often seen as 'appresentation' of noise than objects, possibly due to rights and laws on privacy. A final point of reference regarding the meaningful classification of the images results from their relational arrangement to a more or less detailed written description. In this respect, however, a distinction has to be made as to whether some images are merely a symbolic illustration or if they were actually taken from the respective lifeworld of the citizens concerned. In any case, a thorough examination from an analytical perspective of the corresponding visualisations is required.

5.2.1. Noise and the Appresentation of the 'Traffic Island.'

In our next example, we will illustrate how images are communicatively used for reporting and displaying the phenomenon of noise. In this respect, we follow the aforementioned methodical approach. The following set of images can be tentatively described as a traffic situation.

Starting with a description of Figure 3 (left), a federal road with two different traffic flows is shown. In the image, it appears to have rained recently because the street seems to be wet. The dark-coloured car on the left side of the picture passing the photographer, is the principal focus. Since the car was photographed while it was in motion, the blurred effect caused by the car's movement can be interpreted as a vehicle moving at high speed. If one structures the picture, different 'tracks' and lines can be recognised. First, the street in the centre of the picture is dominant. Second, one can also diagonally split the picture into different parts to focus the view on several aspects of the picture (car traffic, pavement, streets). Third, looking at the side of the street from which the photograph was taken, the spatially marked bus stop comes into view. This us leads to the question: What kinds of objects are put in relation to each other, or more precisely, what does the citizen intend to show (see Figure 3, right)? The noise of the traffic could be one answer, but the picture could also tell another story, which is somehow unseen, yet appresented. For instance, there doesn't appear to be a traffic light or crosswalk near the bus stop, which could stop traffic and make it possible for people to cross from one side of the street to the other. Such absences of could present problems for crossing from one side of the street to the other. When we treat the picture as a whole—that is, consider-

Figure 3. Traffic situations. Edited by the authors based on images from the 'meinBerlin' platform.

ing what is shown what isn't—questions concerning the social situation arise, such as, how can pedestrians safely cross the street?

Turning to participants' written comments, we can see that the topics of our visual analysis also appear in the text (see Figure 4). The resident not only describes the high speed of the cars and the loudness of traffic noise, but he suggests the addition of traffic islands to facilitate pedestrians crossing the road. Although it isn't possible for the picture to directly show what's 'missing' from the citizen's perspective, from the shared account concerning the relation between the existing objects enable us as interpreters by the use of our everyday knowledge to synthesise the gap between the presented and appresented details of those typical situations.

5.2.2. Imagining and Designing Sustainable Futures

Drawings possess their own unique quality and are used far less than photos. As shown in the following Figure 5, the drawing is more than an ordinary sketch, but an architectural design.

This rather professionally-made sketch shows the front view of the A 100, a very well-known, loud and heavily frequented motorway in Berlin, which has had a significant impact on the living conditions of the living people there. Figure 5 (left) shows a section of a building on the left side. The building is located directly next to two parallel-running roofed roads as well as four spatially separated railroad tracks, which seem to run alongside a platform. Below the elevated roads and tracks are sev-

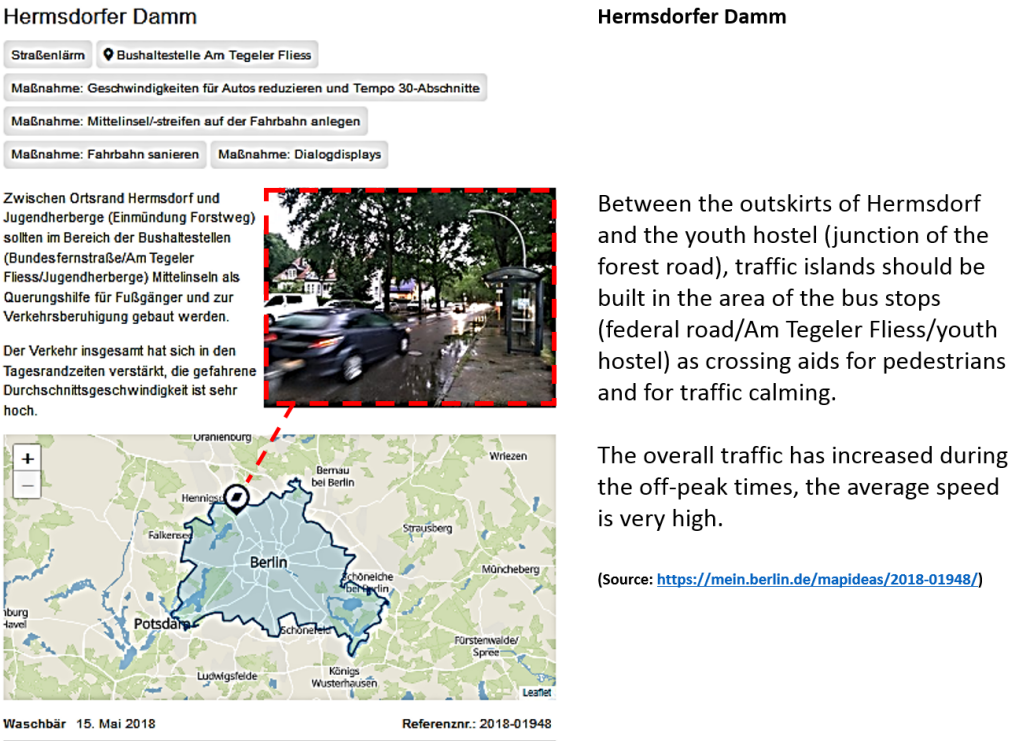

Figure 4. Traffic Island (authors' own translation). Edited by the authors based on images from the 'meinBerlin' platform.

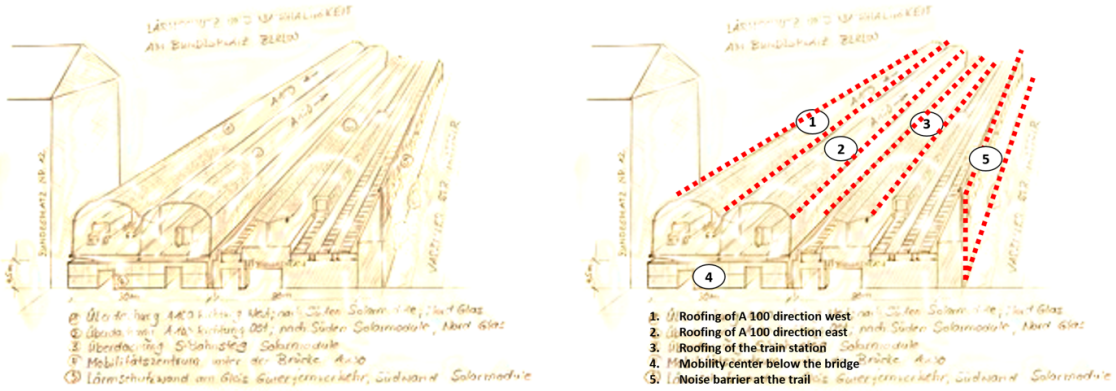

Figure 5. Drawings (authors' own translation). Edited by the authors based on images from the 'meinBerlin' platform.

eral underpasses or tunnel systems. An entrance to the railway station is also indicated in the sketch. The drawing is remarkable in that it shows a unique perspective, a bird's eye view, which appears rather realistic. Indeed, it resembles a cross-section of model showing the inside of the tunnel together with the passing trucks. Since no other background features (e.g., atmosphere, sky, etc.) are shown in the drawing, the focus is entirely on this powerful representation of the traffic flow, which, in a sense, indicates the extreme level of noise that is generated. The drawing also includes an inscription. With the given title, 'Noise Protection and Sustainability at Bundesplatz Berlin,' which is between Innsbrucker Platz and Heidelberger Platz, the sketch provides a programmatic concept of sustainability while connecting it to current discourses in urban studies. Some of the streets are named as well, which clarify the exact location. In addition, some objects in the picture are numbered and explained in a corresponding legend at the bottom of the picture (see Figure 5, right). The central motive of the drawing is to propose a roofing and a sound protection wall and thus a specific design of how sound and noise can be reduced.

Finally, the written comment (see Figure 6.) from the participant explains that the drawing is a proposal on how to make lasting improvements to the noise situa-

Roofing the urban motorway between Heidelberger Platz and Innsbrucker Platz

The city motorway between Heidelberger Platz and Innsbrucker Platz runs through a highly dense urban landscape, where thousands of Berlin citizens are exposed to the noise of traffic day and night. My suggestion would be to enclose this section of the city motorway by means of a dome construction. The resulting dome surfaces, which are ideally aligned to the south, can be equipped with photovoltaic modules and be used to convert the free solar energy into electricity. Here in the middle of the city, there is enormous potential for regenerative energy feeding, where electricity consumers also live. The free fed solar energy could even recover a part of the building costs on a long-term basis. This would be a technically feasible solution, which protects the residents from noise while at the same time conserves our regenerative energy supply. One must only possess the courage and the determination to make this conversion possible. As a short-term measure, I propose to limit the speed on the inner-city urban motorway to 60 km/h for noise protection reasons.

(Source: https://mein.berlin.de/mapideas/2018-01854/)

Figure 6. Roofing the motorway (authors' own translation). Edited by the authors based on images from the 'meinBerlin' platform.

tion at the Bundesplatz, which has annoyed a number of other participants on the e-platform. The description of the sketch also includes some special features worth mentioning. In addition to a brief explanation of the noise problem, the citizen also gives a short explanation of the sketch. The citizen illustrates that the concept aims at reducing noise on the one hand. On the other hand, however, an essential aspect is the sustainable construction of a photovoltaic system, which could be used as a cost-effective energy supplier in the future. She interestingly links these thoughts with the final appeal that one just "must have the courage and determination to implement this." Relevant for our analytical purposes, however, is the fact that in this drawing, noise cannot be represented either. Material references are accounted for, including the roof or the walls, which symbolically 'appresent' (Schutz & Luckmann, 1989) noise and make the phenomenon more or less 'tangible.' The drawing itself proposes and imagines a possible future using the included design of a sustainable built-environment.

6. Conclusion: Sensorial Construction of Noise Spaces within e-Participation

In this article analysed how visualisations are used communicatively within e-participation formats and how spatial knowledge is produced by the participants involved. We used the case of an e-participation platform and a specific process in Berlin, which was concerned with the topic of noise protection.

Previous examples demonstrated how citizens produce spatial knowledge using visualisations and otherwise making their corporeal perception of their world visible to planners as well as affected members of the participating public. The knowledge shared is largely anchored in the participant's life world; that is, their neighbourhood and the immediate physical environments. This local knowledge has spatial dimensions and situated as well as bound to certain physical spaces.

We observed how citizens offered detailed descriptions of their acoustic perceptions in spaces of urban life when asked to do so for urban planning purposes. We saw how they expressed their perceptions within the context of a digitised communication space constituted in the e-participation platform, and more so, how they described their experiences with Berlin's noise spaces. For the participants who used visualisations to convey their experiences, we can show that the use of visual devices was employed to transcend the boundaries and limits of the platform's available communication possibilities; that is, where written comments on noise spaces became insufficient at adequately characterising what was being experienced by the participants. The study also revealed that participants were not only willing to indicate their experiences with noise spaces, but some even proposed solutions. In the process of (visually) communicating their substantial solutions, citizens expressed the expectation that their everyday circumstances should be changed and, in some instances, suggested how to go about doing so. In this respect, the communication conditions of the e-platform have activated creative processes. Through the visual proposal of solutions on the digital platform, participants expanded the spatio-temporal limits of their 'zone of operation' (Schutz & Luckmann, 1974, pp. 41–45) and thus attempted to make a lasting contribution towards a better urban future although they are laypersons.

Lastly, it must be mentioned that the planners' final report on the 'Report Noise Sites!' project only referenced the participants' written comments; it did not include accompanying visual expression. Therefore, the technical means and communication possibilities of the e-platform have not been fully utilised. In this respect, the 'Report Noise Sites!' project represents unmet promises of the e-participation scheme used in the participatory planning process (see Section 2). As with many analogue participation processes, it is mainly local knowledge transfer and citizen consultation that has been organised on the platform. Thus, Arnstein's (1969) ideal of participation was not adequately adopted in the online survey. But it would be a misplaced criticism to conclude that the participants' visualisations were not considered, perhaps for practical or technical reasons, or that this kind of 'data' had no pragmatic relevance to the survey.

From an analytical and practical perspective, this article recommends a reflexive consideration of visualisations in participatory urban planning. There is an observable tendency in planning processes to apply professional visualisations which is being reinforced and shaped by the use of digital tools. Against this background, the 'aesthetic quality' of images produced by laypersons may at first glance appear to be of 'inferior' quality. However, our findings show that images and visualisations from residents should not be simply understood as illustrations to be ignored at worst, or as 'nice' embellishments to enrich the applied (new) participation methods of planners, at best. With our study, we wanted to show the value of taking a closer look at the citizens' submitted visualisations in order to better understand how they visually express perceptions of their environment as well as their needs with regard to future urban spaces. In studying their visual descriptions of noise, we found that they even 'appresented' phenomena through the visual mediation of the 'non-displayable.' We argued that the methodological approach applied in this article can facilitate a reflexive sensitisation of planners for the creative abilities, the everyday competencies of sense-making (ethnomethods) and in sum the 'communicative actions' (Knoblauch, 2019) of citizens who draw attention to distinct problems and present potential solutions for urban futures.

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Conflict of Interests

The authors declare no conflict of interest.

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Article

Participatory Urban Planning: What Would Make Planners Trust the Citizens?

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Abstract
Based on the critical stance of citizens towards urban planning, growing attention has been directed towards new forms of citizen participation. A key expectation is that advanced digital technologies will reconnect citizens and decision makers and enhance trust in planning. However, empirical evidence suggests participation by itself does not foster trust, and many scholars refer to a general weakness of these initiatives to deliver the expected outcomes. Considering that trust is reciprocal, this article will switch focus and concentrate on planners' attitudes towards citizens. Do urban planners generally think that citizens are trustworthy? Even though studies show that public officials are more trusting than people in general, it is possible that they do not trust citizens when interacting with government. However, empirical evidence is scarce. While there is plenty of research on citizens' trust in government, public officials trust in citizens has received little scholarly attention. To address this gap, we will draw on a survey targeted to a representative sample of public managers in Swedish local government (N = 1430). First, urban planners will be compared with other public officials when it comes to their level of trust toward citizens' ability, integrity and benevolence. In order to understand variations in trust, a set of institutional factors will thereafter be tested, along with more commonly used individual factors. In light of the empirical findings, the final section of the article returns to the idea of e-participation as a trust-building strategy. What would make planners trust the citizens in participatory urban planning?

Keywords
citizen participation; e-participation; new urban agenda; planning practice; smart cities; trust in planning; urban planners

Issue
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1. Introduction

Urban planning needs to undertake a process of transformative change to foster economic growth, social cohesion and environmental protection in line with sustainable development goals (United Nations, 2015). This will require, among other things, public support and trust. The problem is that the politics of today is characterized by a general lack of trust and, according to Swain and Tait (2007), there is a specific 'crisis of trust' in planning. Contemporary planning is identified as mistrusted for its bureaucratic nature, its incapacity to understand and work for citizens, and its bias towards business interests (Tait & Hansen, 2007).

In the pursuit of trust, new forms of participation proliferate in urban governance. Democratic innovations (Smith, 2009), co-production of services (Alford, 2009), and participatory planning (Innes & Booher, 2004) all represent popular initiatives for promoting direct citizen participation in policy-making. With help of new information and communication technologies, the methodological quality of these initiatives has improved significantly

over recent years, which has made the enthusiasts believe that they now have the means of rebooting democracy, creating at least a partial antidote to illiberal populism, and increase trust in government.

Recent empirical evidence suggests participation has the ability to restore citizens' trust (Wang & van Wart, 2007). If citizens have positive experiences with participation, they seem to increase their trust in government. However, the argument that participation leads to trust assumes that participation is effective and satisfying, which is still rarely the case. More often than not, process dissatisfaction seems to feed vicious (instead of virtuous) circles of trust (Åström & Grönlund, 2012; Åström, Jonsson, & Karlsson, 2017).

Citizen participation is more than technology and methodology. Success is highly dependent on the attitudes of public officials (Liao & Schachter, 2018; Moynihan, 2003). Most public officials support the principle of participation, but it is less clear to what extent they are willing to risk experiencing negative outcomes in reality. As all forms of collaborative governance, new forms of participation include risk-taking and therefore depend on mutual trust between collaborating actors. Plenty of research has investigated trust from the standpoint of citizens, aiming to explain citizens' trust in government. Yet, very few scholars have explicitly studied how public officials think about the relationship with the public, the extent to which they trust citizens, and why (Moyson, van de Walle, & Groeneveld, 2016; Yang, 2005). If "trust begets trust, while distrust begets distrust" (Levi, 1998), this is a serious lacuna.

The aim of this article is to expand knowledge about urban planners' trust in citizens: Do they think that citizens are trustworthy? What individual and institutional factors influence their trust in citizens? What would make planners trust the citizens in participatory urban planning? To date, empirical research has primarily emphasized individual micro-determinants of public officials' trust-perceptions. These include personality traits and the general propensity to trust other people. As the review of Moyson et al. (2016, p. 15) shows, institutional determinants of public officials' trust have yet to be systematically examined. We will take institutional theories of trust as a point of departure and test how institutional factors shapes urban planners' trust in citizens.

This article utilizes a survey that targeted a representative sample of public managers in Swedish local government (N = 1430). The first section presents the theoretical framework, which ends with two hypotheses related to public managers' trust in citizens. After having introduced the research context and the data, the article continues with the empirical analysis. First, we compare urban planners with other public officials when it comes to their level of trust toward citizens' ability, integrity and benevolence. In order to understand variations in trust we subsequently test a set of institutional factors, along with the more commonly used individual factors. In light of the empirical findings, the final section of the article returns to the idea of e-participation as a trust-building strategy. What would make planners trust citizens in participatory urban planning?

2. Trust in (and by) Urban Planning

Lack of trust in government institutions has become an increasingly discussed issue in both popular and academic literature. The activity of planning is no exception. Contemporary planning is identified as mistrusted for its bureaucratic nature, its incapacity to understand and work for citizens, and its bias towards business interests (Tait & Hansen, 2007). In citizen evaluations of various policy areas in Swedish local government, planning ends up last. Only four out of ten Swedes are satisfied with how urban planning is conducted (Holmberg, 2018).

According to Tait and Hansen (2007), the practice of planning is particularly demanding in terms of trust. This is because planning, on the one hand, is framed as working for the public interest. Common good is a central principle in planning theory and a key justification of planning. On the other hand, planning is an inherently political activity, deciding "who gets what, when, how" (Lasswell, 1936) among a plurality of competing interests. Planning, therefore, often generates disputed outcomes that are criticized from various groups. In recent years, there has been an increasing critique aimed at the 'technical expert' because experts, as planners, have defined the public interest by applying preferred planning principles. However, in promoting particular principles as if they were universal values, planners must elevate some values while downgrading others. As the boundaries between technical knowledge and political values are often blurry, the idea of technical expertise is increasingly questioned. Does planning actually work for the common interest? Should we actually trust planners?

Against the backdrop of this kind of critique, attention has shifted from public interest as a substance to public interest as a process (Dzur, 2008). If planners cannot define the public interest themselves, perhaps they should focus on helping citizens to search it out instead? New information and communication technologies has made this much easier in recent years by enabling new forms of communication and by making information gathering much easier, without the physical limitations of place and time. E-participation is often a digital version of pre-existing practices, such as e-voting and e-petitioning. However, it also opens up truly innovative ways of engaging in urban planning, such as in collaborative mapping and place-based participation, where a combination of mobile technologies and geographical information systems are used (Le Blanc, 2020). Besides from making voice possible for more people, tools to visualize ideas, proposals and real-time changes in indicator metrics can help making citizen participation both more informed and meaningful (Salter, Campbell, Journeay, & Sheppard, 2009).

While new forms of participation proliferate in urban governance, government perceptions of e-participation

are difficult to evaluate (Åström, 2019; Åström, Granberg, & Khakee, 2011). Usually there is a gap between policy intentions, including ideological arguments of participatory planning, and actual initiatives, speaking the language of more limited modernization. This gap was debated in relation to the participatory movement in the 1960s (Arnstein, 1969), and is highly debated also in relation to the New Urban Agenda of 2016. While the New Urban agenda put a lot of emphasis on Smart City initiatives and citizen participation, there has been a lot of criticism of government and corporate interests in delivering e-services and new opportunities for participation (Cardullo & Kitchin, 2019; Shelton & Lodato, 2019). Also, this has been accompanied by empirical analyses showing that e-participation initiatives have usually failed to deliver expected benefits (Le Blanc, 2020).

Considering recent developments in innovative tools, the main barriers for effective e-participation can hardly be looked for in the lack of advanced technology (Falco & Kleinhans, 2018; Royo, Pina, & Garcia-Rayaldo, 2020). A combination of institutional and individual factors is probably more important for the success and failure of e-participation initiatives. At this interface, this article will specifically look into role of planners' trust in citizens. According to Senecah (2004), trust is overwhelmingly the most commonly identified missing element in participatory processes. Plenty of research has studied trust from the standpoint of citizens, aiming at explaining citizens' trust in government and how citizen participate in politics. Yet, very few scholars have explicitly studied how public officials think about their relationship with the public. As is the case for all forms of collaborative governance, however, participatory planning is dependent on mutual trust between the collaborating actors. The introduction of new forms of participation not only requires active citizens, but also an openness to citizens' initiatives and suggestions. Trust by public officials, not only in public officials, influence the outcome (van de Walle & Lahat, 2017).

Examining how public officials' trust in citizens vary is a surprisingly recent phenomenon that has been limited to a small group of researchers. In a ground-breaking study, Yang (2005) built a model to explain public officials' trust in citizens. Drawing on a survey of 320 public officials, he found that the general propensity to trust is a critical factor explaining officials' trust in citizens. This result was more or less confirmed by Vigoda-Gadot, Zalmanovitch, and Belonogov (2012) as well as by Lee and Yu (2013). While other individual factors have been tested, such as gender and age, "most studies fail to detect any effect of officials' individual characteristics on their trust towards citizens" (Moyson et al., 2016). Thus, the general idea seems to be that trust in citizens is embedded in officials' general propensity to trust others.

3. Institution-Based Trust

The division between micro- and macro-sources of trust has been around for a long time in organizational trust research. Yet, Bachmann argues that most studies consider trust to be micro-level phenomenon created by contacts between individuals (Bachmann, 2011). Usually trust is theorized as a psychological phenomenon, while macro-level factors, like institutions, are considered less important. In contrast to this de-contextualized understanding of trust, Bachmann argues that "institutional-based trust, i.e., trust that constitutively builds on institutional arrangements, deserves more attention than is currently granted by large parts of the trust literature" (Bachmann, 2011, p. 206).

While trust is a relational phenomenon, institutional theories of trust emphasize that relations between individuals develop in particular contexts where the level of environmental uncertainty influence trust building. In other words, planners trust in citizen is likely to depend on the prevailing institutional arrangements and structures that underlie urban planning. One way in which institutional factors may facilitate planners' trust in citizens is by reducing the risk of the planner, making it easier for him to grant trust to citizens. Besides, public officials may trust citizens because they identify with a common political institutional space which makes most citizens worthy of being trusted. In either case, political institutions have "a formative function" (Offe, 1999).

There have been a few attempts to link public officials' trust in citizens to various institutional factors. Vigoda-Gadot et al. (2012), for instance, showed that perceptions of citizens' trustworthiness are linked to perceptions of 'organizational politics.' Officials considering their colleagues to be self-serving and self-interested, at the expense of other colleagues and the organization as a unit, tend to trust citizens less. That trust is held because of structural relations is also indicated by Ivacko, Horner, and Crawford (2013), who showed that public officials working in city and township administrations are more likely to trust citizens than those working in village or county administrations. While manifesting itself in interpersonal relationships, this suggests that trust in citizens is related to institutional factors.

Twenty years of e-participation research have shown the critical importance of having a strong connection between participatory initiatives and decision-making bodies. When citizens feel that e-participation processes are disconnected from decision-making, the result is often a decreasing trust in public institutions (Le Blanc, 2020). For urban planners, with the task to structure public participation and channel public demands into decisions, decision-making arrangements is a key institutional context. In the public administration literature, few questions are as vexed and enduring as the relationship between politics and administration within policy-making. In this article we will therefore empirically explore two aspects of politico-administrative relations and their relationship to planners trust in citizens. The first is political power. The second is political trust.

Political power can be seen as an instrument for reducing uncertainty. If planners have a great deal of polit-

ical power, we may therefore expect that this will spill over into their attitudes towards citizens in a positive way. Powerful planners are more in control and can probably better protect themselves if trust in citizens is misplaced. By contrast, planners who lack power may not always afford trusting the citizens and risk the negative consequences that may follow. For similar reasons it is probably important for planners to trust their politicians to stick to what they have communicated and prioritized, as well as to refrain from blame and responsibility avoiding behavior (Grön & Salomonsen, 2019). For these reasons, we suggest that political trust is positively related to trust in citizens.

Other institutional factors that may reduce the risk for planners, which we will put to an empirical test, is trust in institutions and administrative capacity. Just, accountable and effective institutions may shield from risk and reduce uncertainty (Levi, 1998), and administrative capacity is important for effective policy implementation. Costly citizen participation processes may pull resources away from the planning mission and reduce on-the-ground results, while poor performance may backfire and create more distrust towards government. The availability of resources needed to engage with citizens is therefore expected to reduce risk and increase trust in citizens. Two overarching hypotheses are tested:

1. Institutional factors are significantly associated with planners' trust in citizens when individual factors are controlled for.
2. Institutional factors that increase the degree of environmental certainty, such as power, capacity and political and institutional trust, are positively related to trust in citizens.

4. Data and Measurements

4.1. Data

Public managers are largely responsible for designing, implementing, and making use of the results, and so they largely determine the outcome of government initiated participatory processes (Liao & Schachter, 2018; Moynihan, 2003). In Swedish local government, there are about 31,000 public managers. To examine their attitudes towards citizens, a random sample of 3,000 individuals—registered as managers and employed by a Swedish local government—was made from the occupation register. Statistics Sweden made the sample and facilitated the data collection by way of a broad survey in 2018. The survey included questions and statements related to 25 themes in which one theme measured public official's perceived trust in citizens. The response rate to the survey reached 48% (1,430 responses).

Among the 1,430 public managers in the data base, 32% are men and 68% are women, which illustrates the major changes that have taken place during last couple of decades when it comes to leadership and gender in Swedish local government (Johansson, Lindgren, & Montin, 2018). Not long ago, these numbers were reversed. About half of the respondents were 55 years of age or older and the non-response analysis revealed an underrepresentation of managers under the age of 35 (response rate of 24%). Most importantly for this study, 80 respondents (or 6%) were city planning managers. The other managers included school managers (29%), preschool managers (15%), elderly care managers (15%), social work managers (18%), managers at technical departments (8%) and central administration (9%). The relatively small number of city planning managers is a limitation of the study, which reduces the statistical power of our tests. Large samples tend to give more reliable results, while small samples often leave the null hypothesis unchallenged.

4.2. Measurements

Regardless of the underlying perspective (micro or macro), 'confident expectations' and 'a willingness to be vulnerable' are important aspects of definitions of trust. According to Rousseau, Sitkin, Burt, and Camerer (1998, p. 395), "trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of another." Following Yang (2005), this article sees 'trust' as based perceptions of competence, benevolence and integrity. Competence refers to skills and competencies that enable citizens to have influence within a specific domain. Benevolence and integrity take up the intentions of the trustee; the intention to do good to the trustor, aside from egoistic motives.

The dependent variable was measured via six items, which were assessed with the question: Citizens I interact within my work are generally: (1) reliable, (2) sincere and honest in their contacts with the local government, (3) well aware of local government affairs and current issues, (4) knowledgeable of how the local government organization works, (5) committed to change and improve the municipality, and (6) more concerned about what benefits the municipality as a whole, than what benefits them personally. The Likert-type scale varied between 0 (strongly disagree) to 3 (strongly agree). Cronbach's alpha was .748, which is an acceptable level of reliability of this measure as a dependent variable. All measurements used are summarized in Table 1.

5. Empirical Results

5.1. Planners' Trust in Citizens

Empirical research indicates public officials strongly support the idea of citizen participation in the abstract. However, it also indicates their orientations in practice are less attuned to abstract normative goals than to concerns with concrete instrumental costs and benefits (Åström & Granberg, 2007; Liao & Schachter, 2018). Potential benefits include making the work of govern-

Table 1. Operationalization and measurements.

Concept	Operationalization	Variable	Scale
Trust in citizens	Assesses how the respondents perceive citizen's integrity, knowledge and benevolence	Additive Index based on six items. Scales ranging from 0 (strongly disagree) to 3 (strongly agree)	0–18 α: .748
Social trust	Measures the extent to which respondents think that "most people can be trusted"	Single item. Scale ranged from 0 (do not agree) to 3 (strongly agree)	0–3
Trust in institutions	Measures the respondents degree of trust in the Police, Courts, Government, Local governments, Parliament, Local councils, Health care, Political parties, School, Press, EU-commission, Universities, County Administrative Boards	Additive index based on 13 items. Scales ranging from 0 (strongly disagree) to 4 (strongly agree)	0–52 α: .875
Political trust	Assesses the respondents view of local politicians and parties	Additive index based on four items. Scales ranging from 0 (do not agree) to 3 (strongly agree)	0–12 α: .751
Administrative capacity	Assesses the respondents view of workplace conditions	Index variable based on 11 items. Scales ranging from 0 (do not agree) to 3 (strongly agree)	0–33 α: .822
Power	Self-reported measure of the respondents' power in local government	Single item. Scale ranged from 0 (very weak) to 5 (very strong)	0–5

ment more acceptable to citizens and promoting more effective decision-making. Potential risks and uncertainties are associated with time, money, and other resources that can be used otherwise, and also with the possibility that citizen participation may exacerbate conflicts or result in undue influence of uninformed individuals and become ineffective for such reasons. For the implementation of participatory planning, this implies that lower degrees of trust in citizens may lead to reduced risk-taking, less involvement and less citizen control. Correspondingly, higher degrees of trust should be expected to increase risk-taking and motivate steps up "the ladder of participation" (Arnstein, 1969).

In order to understand these dynamics, we need to explore planners' and other public officials' trust in citizens. To what extent do planners and other public officials trust citizens? Table 2 compares city planning managers with other managers when it comes to their level of trust towards citizens' integrity, ability and benevolence. Their perception of integrity, measured by the per-

Table 2. Public managers' trust in citizens (percentages that agree).

	City planning managers (n = 76–79)	All other managers (n = 1260–1313)	Cramer's V
Citizens I interact with in my work are generally:			
1. Reliable	82	83	.004
2. Sincere and honest in their contacts with the local government	79	79	.005
3. Well aware of local government affairs and current issues	49	39	.048
4. Knowledgeable of how the local government organization works	22	21	.002
5. Committed to change and improving the municipality	62	45	.076*
6. More concerned about what benefits the municipality as a whole than what benefits them personally	13	16	.021
Trust in citizens index (high)	50	48	.009

Notes: N = 1359–1381; Scale ranged between 0 (strongly disagree) to 3 (strongly agree). Cramer's V used for percentages that agree.

ception that citizens are reliable, sincere and honest in their contacts with the local government, seems to be high. About eight out of ten city managers agree that citizens have integrity. In relation to ability and benevolence, fewer respondents were positive. Among the city planning managers, less than half agree that citizens are aware of local government affairs and current issues, and less than one in four agree that citizens are knowledgeable of how the local government organization works. In relation to benevolence, more than half agree that citizens are committed to change and improve the municipality, but only 13% think that they are more concerned with what benefits the municipality as a whole than what benefits them personally.

The results presented above are interesting if we consider that public officials' social trust is usually very high, especially in high-trusting countries like Sweden. As van de Walle and Lahat (2017) show, public officials generally have more social trust than non-public officials, and the public officials in Sweden are among the most trusting in Europe. Clearly, our results signal a less encouraging picture. Even though public officials are more trusting than people in general, the results indicate that far from everyone trusts citizens when interacting with government.

Arguments against citizen participation (Irvin & Stansbury, 2004) often state that citizens are not qualified to participate directly in policy-making, because they lack commitment and competence or because they are merely looking after their own shortsighted interests instead of long-term community interests. Accordingly, planners who believe that the public lacks the ability to understand their actions and current issues are probably less enthusiastic to hear the public's thoughts. Planners who believe that the public care more about themselves than their community can likewise be expected to have a decreased willingness to make themselves vulnerable to the public.

In relation to the debate over the specific crisis of trust in planning (Swain & Tait, 2007), it is also interesting to note that city planning managers do not trust citizens less than other public managers. There is no statistically significant difference between planners and other public managers, except when it comes to the perception of citizens' commitment to change and improve the municipality (which is higher). However, this does not mean the institutional context is unimportant.

5.2. Explaining Variations in Trust

Is it that public managers' trust in citizens mainly reflect their social trust? Or, are institutional factors more important for understanding managers' propensity to trust citizens? In order to test the effects of the selected variables, we specify four models. Besides from separating city planning managers and all managers, two of the models (1 and 3) only estimates the effect of social trust, while models 2 and 4 also includes the institutional factors.

In Table 3, our models on all managers' (3 and 4) show that institutional factors have a significant effect on trust in citizens and that this effect is stronger than social trust. While previous studies indicate that trust in citizens is part of an individual's general willingness to trust others, the results indicate that this is so only as long as institutional factors are not taken into consideration. Furthermore, Table 3 shows that all institutional factors have significant effects on trust in citizens. Returning to the underlying expectations outlined in the previous sections, it appears reasonable to conclude that the assumptions are largely being met by our data. The institutional context matters for public managers' trust in citizens.

Our models on city planning managers show a similar pattern, even if we cannot be quite as sure that the relationships in our sample also exist in the larger population of city planning managers. Only one variable is statistically significant in model 2: political trust. Given the generalizable results in model 4, there is however little reason not to believe that power, institutional trust and the assessments of administrative capacity also play a role for planners. Our models on city planning managers rather indicates that the overall effects of the institutional factors are stronger among the planners than all managers.

The variables that have the highest impact on trust in citizens in our models are political trust and political

Table 3. Explaining public managers' trust in citizens (standardized Beta).

	City planning managers		All managers	
	Model 1	Model 2	Model 3	Model 4
Social trust	.204	–.067	.145***	.020
Institutional trust	—	.124	—	.116***
Capacity	—	.153	—	.106***
Political trust	—	.371**	—	.144***
Political Power	—	.200	—	.158***
City planning (dummy)	—	—	—	.015
N	75	68	1329	1187
R2 (Adjusted)	.030	.278	.019	.130

Note: Hidden controls for gender, age and municipality size.

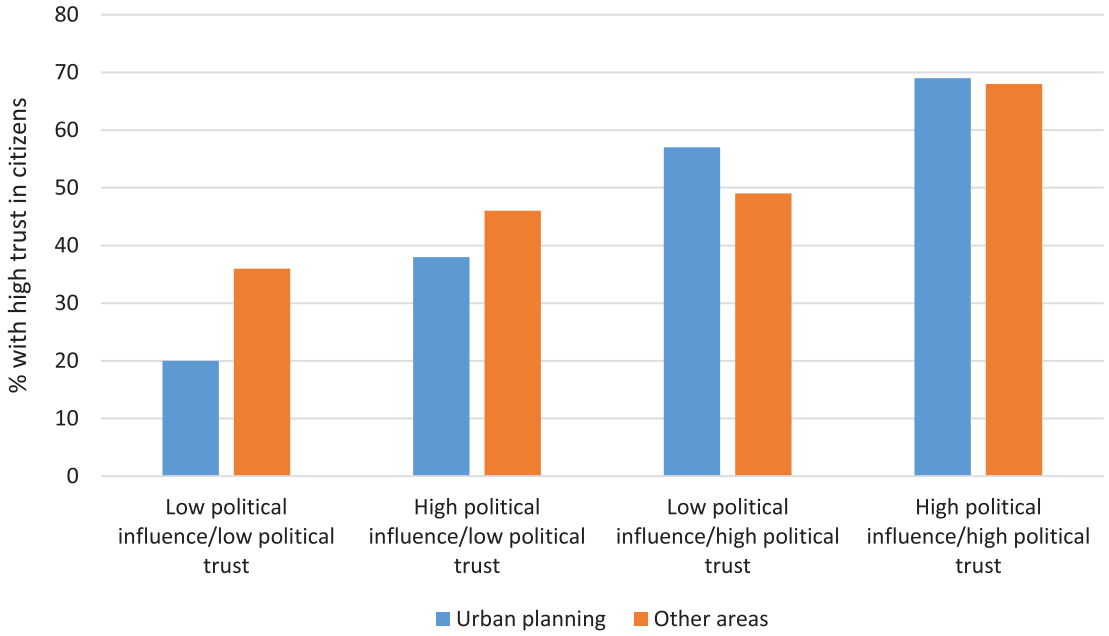

Figure 1. Politico-administrative relations and trust in citizens (percentage high trust in citizens). Source: Own survey results.

power. The more power public managers' understand they have, the more they tend to trust citizens integrity, competence and benevolence. The degree to which public managers trust politicians also affects their trust in citizens. The results underline the overall prominence of politico-administrative relations for trust in citizens. Trust suggests a vulnerability to citizens, which depends on power relations. For city planners, "positioned at the nexus of public and private interests" (Laurian, 2009, p. 369) and highly involved in politics, the relationship with politicians seems to be particularly important.

5.3. Politico-Administrative Relations and Trust in Citizens

How elected politicians and public managers relate and should relate to each other is an old debate in political science and public administration. Policy content and the legitimacy of policy-making is affected by the relative influence of politicians and managers. Compared to other managers, city planning managers are more influential in local politics. While the other independent variable we have tested do not vary between the two groups, there is a statistically significant difference when it comes to self-reported power. At the same time our results indicate that political trust is one of the strongest predictors of trust in citizens, and particularly strong amongst the planners. Against this background, the relationship between the two political variables deserves a closer look.

In terms of the relationship between employer, employee and customer, empirical research suggests that employees treat customers as they themselves have been treated by their organization (Payne & Frow, 2005). This is comparable to what we have found and described here. A linear trend arises in both groups, indicating that more power and political trust increases trust in citizens. When managers have a high level of political influence and political trust, this seems to spill over in their attitudes towards citizens.

As Figure 1 shows, there is a small tendency that trust matters more for planners than for other managers. The red staple is higher than the blue when political trust is low, and the blue is higher than the red when political trust is high. Given the political nature of planning (Tait & Hansen, 2007), city planning managers are an integral part of strategic policy-making and perhaps more dependent on cooperative, trustful relationship with politicians. When public managers gain political influence, they enter the political domain, creating a gray zone between the two. This is what Svara (2006) points out when conceptualizing the relationship between politics and administration as one of complementarity. The essence of a such a relationship is risk-taking by both sides, and thus that public managers become more vulnerable for criticism and blame.

6. Conclusion

Even though public officials are more trusting than people in general, this study shows that far from everyone trust citizens when interacting with government. As Newman, Barnes, Sullivan, and Knops (2004) reminds us, new forms of participation do not displace old forms of governance but interact with them. This creates opposing imperatives for public managers. They should promote participation from below, but make sure to deliver on goals set from above. They should take part in long-term trust work, but also finish tasks in the short term.

Public managers' relationship with citizens exist in an institutional milieu, where the level of uncertainty influence trust building.

According to the results in this study, planners' perceptions of the institutional context are significantly associated with trust in citizens. Power, capacity as well as political and institutional trust, are all positively related to trust in citizens. When the institutional factors were introduced in the regression analysis, the most important factor in previous research, social trust, lost its significance. When it comes to the specificity of city planning managers vis-à-vis other public managers, the results do not show an overall difference in terms of trust. However, to some extent the results confirm that urban planning is a challenging context. City planning managers perceive themselves as more powerful than other managers, and their trust in citizen seem somewhat more dependent upon their trust in politicians, even though we should be careful drawing too strong conclusions based on our limited sample.

Trust and control are often conceptualized as opposing alternatives to handle risk. For instance, Reed (2001) argues that trust and control are "most usefully conceptualized as analytically distinctive but, but mutually conditioning, elements" (Reed, 2001, p. 202). When public managers have little trust in citizen's integrity, knowledge and benevolence, it is reasonable to think they are taking greater control over the process and makes themselves less vulnerable to citizens. There are plenty of examples of this in the literature. One typical example is that issues containing conflicting interests are avoided, while citizens are instead invited to participate in non-conflictual and non-political issues. It is also common that participatory processes are disconnected from decision-makers, and that the lack of a facilitating institutional landscape hampers their capacity to influence policy. Analyzed from the perspective of Arnstein's (1969) influential "ladder of citizen participation," many of these initiatives are seen as symbolic. As such, they do not share power and they do not build trust in planning.

Smart city initiatives and e-participation are today highly prioritized by city managers and technology companies who are implementing the New Urban Agenda. However, to reap the benefits of smart cities a virtuous loop of participation and trust is necessary. While smart cities hold forth intelligent and highly developed services to citizens, they come at a cost. To realize 'smartness,' large volumes of citizen data must be stored, processed and analyzed. Internet of Things and big data hereby brings vulnerabilities in smart city services, which will demand a great deal of trust by citizens. If citizens do not feel part of these changes, technology can feel imposed rather than inclusive.

According to the critics, too much effort has been directed towards technology in the implementation of smart city initiatives while the participatory element, or even the human element, is largely missing (Levenda, Keough, Rock, & Miller, 2019; Shelton & Lodato, 2019). The smart city has been shaped by providers of big technology and by the mindset of top-down master planning, it is argued. In response to such criticism, some scholars have tried to turn the discussion of 'smartness' from one of 'smart cities' to that of 'smart citizens.' Their recipe is about empowering citizens while using smart technologies and e-participation tools, which would demand a great deal of trust by planners in citizens.

New e-participation tools for visualizing and influencing urban futures will meet a variety of citizens with diverse resources and different motivations. Some citizens are likely to stay passive, regardless of the participatory initiative taken, whereas others are potentially easier groups to engage. Yet, it is interesting to note that there is research indicating that e-participation may attract other citizens than the usual suspects. For instance, Åström et al. (2017, p. 584) show that e-participation tends to "attract some of those with weak connections to formal politics and who feel there is a discrepancy between how democracy should work and how it actually works." This raises a hope that e-participation actually can bring critical citizens back in and increase trust in planning. Yet, the analysis also shows that citizens with a negative predisposition towards planning are more sensitive to any signs of distrust of planner's vis-à-vis citizens; that distrust is easily reinforced.

A number of interrelated trends are thus making trust more important than ever, as well as more challenging in some ways. In relation to Smart City initiatives and the New Urban Agenda this raises a question about what can be done: What can the actors do to enable trust-building? According to institutional theories, the key to stimulating trust—without falling into blind, naïve, misplaced trust—is to employ suitable institutional arrangements or 'safeguards' that help reduce uncertainty among the actors. New forms of participation provide a great opportunity for experimenting with such trust-building arrangements. However, in the past, research and development activities have typically had a one-sided focus, trying to find mechanisms that close the political distance between citizens and governments. This study reveals that we need to also aim for institutional arrangements that close the distance between politics and public administration. When the perceived distance between politics and administration is less, public managers' trust in citizens is greater. When the perceived distance is greater, there is less trust in citizens. Therefore, creating institutional arrangements in which tensions and differences between managers and politicians are handled in a constructive manner is key for any initiative towards participatory planning.

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Conflict of Interests

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