

Article

Rendering Affective Atmospheres: The Visual Construction of Spatial Knowledge About Urban Development Projects

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Abstract

Renderings are digital visualisations of urban development projects in the field of urban design that aim to create spatial knowledge about future-built urban environments, which we also refer to as imaginaries. In our contribution, we ask how visual artists design renderings, how they try to influence spatial knowledge about future urban spaces, and in which processes renderings are produced. Using the cases of the Eko Atlantic City project in Lagos (Nigeria) and the Hudson Yards project in New York City (USA) as examples, it will be shown empirically how specialized visual artists try to make urban development projects appear convincing and appealing. The analyses show that visual artists particularly use design elements such as photorealistic aesthetics and lighting to make the presentations of the planned building projects desirable. They also attempt to make them appear coherent in their built environment by digitally collaging different imaginary elements. Interestingly, only a limited number of image types are used. They can nevertheless put the imaginary space of the planned building projects in a positive light, create pleasant affective atmospheres, and appeal to a wide audience. By visually constructing imaginaries about urban development projects and thus influencing the subjective spatial knowledge of stakeholders and a broader public, renderings develop power. The constructed—and widely shared—imaginary space can guide investment and influence planning processes and the materialization of the built project.

Keywords

digitalization; Lagos; New York; spatial imaginaries; urban design; visualizations

Issue

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1. Introduction

Glass skyscrapers glow at sundown, happy young people are shopping, the traffic is flowing, and the parks are green and bright. In architectural visualization, photorealistic digital images—so-called “renderings”—have become the most prominent way of envisioning future urban spaces (Rose et al., 2014, p. 386). During all stages of the planning processes, these digital (architectural) visualizations are produced in ever-increasing quantities. In this article, we investigate the renderings of two large-scale urban development projects: Hudson Yards

in New York (USA) and Eko Atlantic in Lagos (Nigeria). In these projects—as in many others around the world—renderings are used to create positive perceptions of the future-built environment among stakeholders and the broader public.

Renderings are aestheticizing digital visualisations that have become possible in the context of digitalization processes in urban planning and design. They have become increasingly common in the meantime and have changed the way urban development projects are visualized and communicated (see Christmann et al., 2020). To better understand how renderings can influence the

spatial knowledge of stakeholders (such as potential investors, tenants, the public, etc.), it is important to ask how renderings are designed, in which processes they are produced, and how they construct commonly shared visions of the urban future. As they address a wide range of different stakeholders, take into account different levels of reference (e.g., local and global, public and private, etc.), and intend to appeal to and convince viewers of planned urban transformations, these digital images have to fulfil very complex tasks. Furthermore, the production of renderings entails numerous challenges, not only in technical terms (it requires certain digital tools and specialists) but also in economic terms (it is cost-intensive) and political terms (it requires navigating a complex political field with potentially conflicting rationalities). Against this background, a closer analysis of the way renderings are designed and what spatial knowledge about urban futures is visually inscribed promises insights into the affective “legitimations” they contain for the particular planning project. Central to our understanding is the term “spatial knowledge,” which we understand as the viewers’ knowledge about future-built urban environments developing through the perception of visualizations in renderings and resulting in ideas of the structures to be built; this is why we also refer to them as imaginaries. In this sense, we will speak henceforth in an abbreviated form only of spatial knowledge or imaginaries. Typically, this knowledge is evoked by highly specialized visual artists by digitally constructing, visually expressing, and atmospherically designing the planned built environments.

Although previous literature has found that the use of renderings has increased significantly, there is still a great need for research. Existing studies so far have mostly made assumptions about the functions of renderings. For example, Watson (2020, p. 35) writes that these “new forms of [mediatized and digitalized] communication have the main aim of promoting up-market real-estate developments to potential buyers of land and property.” Typically, statements about the goals, structure, and functions of renderings have been derived from planning scholars’ own experiences and from expert interviews rather than analysing renderings as visual data. Additionally, the few studies that present image analyses do so in an illustrative manner, that is, without systematically analysing the visual data within the framework of an empirical research design and with concrete visual methods. Rather, the authors formulate critiques about renderings as a tool in planning discourses for selected neo-liberal developments (e.g., Aspen, 2013) or use them illustratively for critical investigations of urban forms (e.g., Easterling, 2014). Other authors study renderings by using a variety of single images from different urban development projects (e.g., Watson, 2014) or from one visualization office (e.g., Houdart, 2008; Rose et al., 2014; Stenslund & Bille, 2021). Furthermore, some studies focus on certain design elements that explain the specificities of renderings (e.g., Houdart,

2013; Nastasi, 2016; Rose & Willis, 2019; Ross, 2012; Smitheram et al., 2018).

Our article addresses this gap based on the following research questions: How do visual artists design renderings? I.e., what are important (atmospheric) design elements? What spatial knowledge (or imaginaries) about building projects do renderings propose visually, and how do they attempt to influence spatial knowledge about future urban spaces? In which processes are renderings produced? From a methodological perspective, we combined social scientific methods with empirical research methods from urban planning and design to analyse an extensive database of renderings from the two urban development projects mentioned above (see Section 3). We focused our analyses on the renderings produced in the two cases, as only in this way is it possible to understand the complexity of image production *within* a case and to draw conclusions about similarities or differences *between* cases.

The article is organized as follows: In Section 2, we report on a conceptual approach to the digital-visual construction of imaginary spaces and on the state of the art in research on renderings. In Section 3, we describe the two case studies and the methodological research approach in detail before presenting our empirical results in Section 4. We focus on three key aspects of the construction of affective atmospheres in renderings that are used to create imaginaries of planned urban spaces: the design elements of photorealistic representation and lighting, the production process of digital collage, and the homogenisation tendencies across the rendering production. Finally, in Section 5, conclusions are drawn about the influence of atmospheric renderings on spatial knowledge regarding urban development projects.

2. Previous Research on Renderings and the Digital-Visual Construction of Imaginary Spaces

In the title of our contribution, we speak of the visual construction of spatial knowledge about urban development projects, because commonly shared imaginary worlds of future urban spaces or specific building projects can be considered to have emerged in the context of communicative processes (see Knoblauch, 2019), especially through (digital) visualizations, such as in renderings. From a theoretical perspective, we draw on the concept of Christmann et al. (2020, pp. 2–4), which combines three theoretical approaches: The first one is that of mediatization and digitalization (Hepp, 2020), which states that people have been increasingly exposed to media and technologies, both analogue and digital, and that, as a consequence, the increased usage and experience of these novel tools has catalysed changes in human behaviour, particularly the way professions, individuals, or communities work and communicate. It is believed that such changes may also have influenced the organisation of our social world, our living environment, and even spatial arrangements. The second approach is a phe-

nomenological perspective on visualization (Christmann, 2008), pointing out that visualization must be conceived of as a depiction of objects. From this perspective, the visibility of the object not being present is actively produced by the creator(s) of the visualization (e.g., a photographer, a designer, or a visual artist) through particular visual means (e.g., a camera, design software, or atmospheric elements) and also by the viewers, because by deciphering visualizations, activating knowledge and imagining future-built spaces, they become an integral part of the visual process. The third approach is that of communicative constructivism (Knoblauch, 2019), which suggests that depending upon the kind of social actors as well as the means of communication involved, communicative action contributes to the social “construction” of (respective) commonly shared “realities.” When applied to spatial processes, this means that (visual) communication must be understood as a fundamental element in the construction of (past, present, or future) spaces. The approach can explain how imaginaries can emerge, how they are communicatively negotiated, and how they can thus shape visions of urban futures, as well as the will to materialize them.

Urban planning is always directed towards the future. Accordingly, in renderings, as in most visualizations in the context of urban planning and design, the urban spaces that are visualized are situated in the future. We call these spaces “planned spaces” and the spatial knowledge about future urban places—as already said—“imaginaries” or “imaginary spaces.”

Interestingly, how the perception of spaces is specifically influenced by atmospheric elements inscribed in the already built or designed environment has been discussed in social and spatial theory. For example, Löw (2016, p. 172) points out that spaces each have their own “potentiality that can influence emotions” and that this potentiality is created by atmospheric elements—or, put simply, by “atmospheres”—in the design in the sense of aestheticizations, which are understood as design elements that appeal to viewers emotionally. According to Löw (2016, p. 173), atmospheres make it possible to emotionally experience not only individual spatial objects but also entire spatial ensembles (e.g., architectural complexes).

These considerations can be applied to renderings, as the design of future-built spaces typically includes elements in the sense of aestheticizations. Typically, renderings digitally construct and anticipate the possible shape of future environments. In doing so, they create a social reality in the sense of socially shared imaginaries.

Incidentally, it was Böhme (2006) who once proposed the concept of atmosphere and influenced Löw’s (2016) spatial theory. Böhme (2006, p. 16) has become very important to this strand of spatial research because he has explicitly emphasized that atmospheres are always spatial in nature and can be *manipulated*, especially by design and art professionals.

Visual artists seem to be very aware of this, for what they are trying to achieve with the help of specific atmo-

spheric elements in renderings—and this will become clear in the empirical analyses in Section 4—is not only the visual creation of a future ensemble of individual objects but also of a coherent, emotionally appealing, and imaginary space.

In their study about renderings designed for architectural competitions, Smitheram et al. (2018, p. 276) found that “architecture, here, is desired for its atmospheric qualities to stage and to amplify affect.” The authors were able to show that, in this context, the requirements for renderings were not only to visualize architecture but, at the same time, to convey meaning and emotion, while in contrast, earlier forms of architectural visualization consisted more of line drawings depicting “shapes, objects, symbols” and expressing “monumentality and power” (Smitheram et al., 2018, p. 276). Other authors have also clearly formulated that the intention behind the production of renderings is to create “affective atmospheres” with visual means (Anderson, 2009; Degen et al., 2017) that can generate positive affective perceptions of certain urban development projects among the public. Renderings are intended to appeal positively to as broad an audience as possible, which is why visual artists try to find the lowest common denominator. To achieve this, they produce imaginaries of planned urban spaces in a particular way that is similar to that described by Ash (2012, p. 6) for video game development: “Although the affects a particular technological system can produce can never be fully determined by its designers, these designers can produce systems that attempt to narrow the possibilities for the kinds of affective responses that are generated.”

What is also discussed in the literature and seems to be of particular importance for renderings is that digital images and the constructed imaginary spaces should not be seen as something static but as something that evolves in a dynamic process. Rose et al. (2014, p. 401) note that digital images created in planning processes are characterized by high “mobility, multiplicity, and mutability” and that they can be easily (re)produced and (re)circulated (see also Hoelzl & Marie, 2015; Houdart, 2008; Koreitem, 2019; Rose & Willis, 2019; Stenslund & Bille, 2021). These considerations were central to us and had a significant influence on the research design, for if one wants to examine renderings in the context of the construction of affective atmospheres and the creation of spatial knowledge about urban development projects, this suggests that it is not enough to simply analyse individual images; rather, it is necessary to take the dynamic construction process of affective meanings and knowledge seriously and to focus on the development of image production over time and in the context of the overall planning process.

A very different strand within the research field is the debate about the so-called authenticity economy (Banks, 2020; Zukin, 2010), in which (visualizations of) authentic-appearing aesthetic architectures are seen as having the role of adding extra value to real estate deals. Approaches from the field of political economy similarly

emphasize the importance of images. Rapoport (2015), for example, refers to the Global Intelligence Corps, an industry of architects, planners, engineers, and consultants from the private sector who play an important role in disseminating planning models and globally transporting a “modernization myth” (Healey, 2013, p. 1511) about the universal necessity of development in material and economic terms. In addition to their authority as experts, it is the ability of the CGI actors to “use images and experiences to persuade and seduce” (Rapoport, 2015, p. 321) that mobilizes planning ideas. Against this backdrop, visual artists can be considered part of the Global Intelligence Corps actors, which Rapoport (2015, p. 308) refers to as an “elite group” occupying a powerful position in planning processes and having a strong influence on the “shared construction” (Humphrey, 2020, pp. 10–13) of speculative processes—not least because influencing knowledge about future spaces is an integral part of speculation in urban development projects.

Interestingly, people outside the planning and architecture industry, in particular, have positive affective responses to urban spaces visualized in renderings (Llinares & Iñarra, 2014), at least in comparison to more abstract forms of visualization (Woodcock et al., 2012), even if they cannot afford to live in the proposed, often very exclusive locations (see Hendawy & Stollmann, 2020, p. 55). One of the reasons given is that photorealism has become increasingly refined in digital image production (see Schillaci et al., 2009), which now makes it possible to create very realistic and authentic atmospheres. Consequently, this accuracy or realism is increasingly sought after by visualizers, planners, and their clients (see Downes & Lange, 2015). However, when considering renderings, the latter perspective would disregard the fact that they are precisely not an exact depiction or realistic representation of planned building projects; rather, they are a deliberate construction of certain atmospheres in which the design element of “realism” is used strategically. This aspect is recognized by only a few social groups, such as urban activists (see Woodcock et al., 2012).

All of this suggests, as Christmann et al. (2020, p. 4) have put it, that “communicative practices of visualizing 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.” As mentioned in the introduction, this type of research is still needed, and our investigation will be able to contribute to it.

Having discussed the relevant concepts and studies in the research field, in the following section, we will present our cases: the two urban development projects, the data basis, and our methodological design.

3. Case Studies and Methodological Design

As part of our study, we examined two large-scale urban development projects driven by private parties and of great importance in their respective cities. Eko Atlantic

City is a project planned for an area of about 25 km² in the Atlantic Ocean off the coast of Lagos, Nigeria. The new city is planned to be an economic and financial centre with residential and commercial uses, including its own infrastructural facilities. The project is controversial because of concerns about coastal erosion, displacement of people from the adjacent shoreline, and the development of luxury residential and commercial high-rise buildings that some criticize as unsustainable (Ajibade, 2017; Fernelius, 2020; Oyediji, 2015). Even though construction seems to be on hold, there is a lot of idealistic and financial support from private companies and government institutions in Lagos and around the world. Not much has been built in comparison to what is shown in renderings.

Hudson Yards is a project developed on the Far West Side of Manhattan in New York, USA. It is located at the northern end of the famous Highline Park and is part of the overall development of the former industrial area. Although it is much smaller (about 11 ha), it is a major development for the dense neighbourhood in Manhattan. The new neighbourhood was planned to accommodate large office spaces, a shopping mall, an event centre, and residential units; each building was designed and built by renowned architects. Estimated to cost about \$25 billion (Tyler & Bendix, 2019), construction is challenging because it is built on the still-active railroad tracks to Penn Station, with high-rise buildings over 70 stories tall. The project is controversial due to these buildings’ heights, financial support from city government programs, and a lack of affordable housing (Capps, 2019; Halle & Tiso, 2014; The Municipal Art Society of New York, 2017). The first phase of the development was completed.

These two urban development projects have been chosen because they are clearly part of the large-scale, privately financed, and speculatively driven developments that are included in a worldwide political-economic tendency towards “speculative urbanism” (Sood, 2019). Both are the largest development projects in their respective cities, driven by global actors of finance and development and targeted at large companies and the global middle class. Furthermore, these two cities are important hubs for the symbolic and actual renegotiation of urban environments today. New York, on the one hand, is seen as an ideal symbol of global cities around the world. Lagos, on the other hand, is a rapidly growing megacity that has not yet been investigated as much, but it faces fast and radical changes in its urban structure. Eko Atlantic and Hudson Yards have been planned and partly developed approximately at the same time with similar importance as supposedly model projects. As such, they have attracted international attention and have produced a large number of renderings that were published and circulated worldwide.

In an extensive search process, 687 renderings of the two megaprojects (318 of Eko Atlantic and 369 of Hudson Yards) were collected online in 2019–2020.

All renderings showing one of the two megaprojects were saved and, if necessary, further similar images were collected (e.g., new versions of the same rendering). The focus was on architectural and urban planning views, while interiors were excluded from the analysis. Using the open-source software digiKam, we then wrote information about publication dates, image producers, locations, and content of the images into the metadata.

Typically, most visual methods are concerned with either interpretive analysis of individual images (e.g., in the social sciences) or with quantitative and computational analysis of large collections of images (e.g., in digital art history). To grasp the urban dimensions of this extensive image material, our methodological approach builds on sociological visual discourse analysis (Fegter, 2011; Renggli, 2014; see also Christmann, 2008) but incorporates methods of urban design. Graphic methods from design disciplines and visual methods from discourse analysis are well suited to investigate renderings as a form of architectural visualisation. To our knowledge, this approach is new and has not been applied before.

The image analyses were supplemented by qualitative expert interviews (Mieg & Oevermann, 2015) with visual artists employed by a variety of clients in the USA and internationally. Four interviews were conducted, of which two had worked directly on the Hudson Yards project. The interviews allowed us to verify our findings of the production process and the imaginaries proposed in the images, but the focus of this study was on image analysis.

Against this background, the concrete work steps were as follows: As a first step, we created a project timeline for each urban development project, which contains information on (planning) actors, important project phases, and events from the first competitions or master plans to the end of construction. On this basis, we were able to temporally classify the collected images of the image database and to examine the progressions, as well as changes, in the image production and visual communication processes of the two projects. In a second step, we investigated the image database (i.e., we analysed the rendering collection as a whole). By grouping similar images, we were able to identify recurring image types for each case. The results of this process will be discussed at the end of Section 4.

Finally, in the third step, we performed single-image analyses (e.g., Raab, 2012) on renderings that were framed as key visuals by interview partners or published many times throughout the timeline and in a variety of publication formats. This was done, among other things, in interdisciplinary data interpretation sessions (see Mélix & Singh, 2021).

Overall, this methodological design proved useful. It allowed us to analyse the processes of image publication, specific design elements of the images, and the different types of images used. Thus, we were able to explain the three main elements of the creation of affective atmospheres in renderings and how they

develop the power to convey specific imaginaries about future spaces.

4. Findings: The Construction of Affective Atmospheres in Renderings

In the following sections, we will report on the key findings of our investigation based on a few selected data examples from the image database and the interviews. We will show how affective atmospheres are constructed in renderings on three levels: (a) through the atmospheric design elements of photorealism and lighting (Section 4.1), (b) through the phenomenon of digital collage in the production process (Section 4.2), and (c) through the use of a limited number of characteristic image types (Section 4.3). It will become clear throughout the analysis how these distinct levels of the creation of affective atmospheres are used to convey an impression of coherence, completeness, and feasibility of the urban development projects.

4.1. Atmospheric Design Elements: Photorealism and Lighting

A consistently evident central design element and typical feature of renderings is their photorealistic aesthetics. This photorealism is mainly achieved by elaborately and digitally generated lighting effects. The following rendering is an example of how a realistic impression is constructed (see Figure 1). It shows an elevated view of Hudson Yards, with a bird's-eye view of the existing older brick buildings in the foreground. Lighting situations are constructed to be as convincing as possible. The sky and surrounding buildings are reflected in the glass facades of the proposed high-rises. A slightly cloudy sky indicates rays of sunlight coming from the left, which are reflected on the bright sides of the glass towers. All these measures serve to visually integrate the planned buildings into the already existing urban fabric, while their novelty is only apparent through their height and geometric prominence in the picture frame (see also Mélix & Singh, 2021). This made the entire ensemble look deceptively real as if it had already been built in this form. The visual construction conveys the knowledge that the project was feasible and has already been successfully completed. Due to the radiant and shiny effects, the new buildings stand out in an impressive way from the comparatively less prominent older buildings, which, at the same time, enhance the entire ensemble. An impressive atmosphere is sought after so that viewers can potentially develop shiny and pleasant imaginaries of the proposed built environment.

In the context of digitalized architectural visualization practices, such as renderings, lighting plays a central role in the construction of spatial atmospheres and enables the viewer to engage with them affectively (Böhme, 2006, p. 103; Rose & Willis, 2019). Against this background, the task of visual artists is to visualize light as



Figure 1. A rendering of Hudson Yards in Manhattan. Source: Klayko (2012).

we can perceive it in reality, namely through certain colours, reflections, shadows, etc. As one visual artist said in an interview:

For me, it was a lot about—it’s about light. No one will—no client will tell you you should light it exactly this way or that way or how much warmth you gonna get, and for me, personally, it is a lot of that individual freedom [while rendering]; it’s actually how you manipulate light or understand light. (KL, interview, October 23, 2019)

In fact, on a technical level, much effort has been put into the development of lighting engines in recent years. This is reflected in the term rendering, which originally refers to the way a computer calculates 2D or 3D images from a dataset. Today, an experienced visual artist has the means to manipulate the lighting of a visual representation to a high degree and, thus, achieve the desired look of an image (of architecture), as the following interviewee explains: “As far as, like, reflectivity and stuff we try to be very real, we’ll push it to the best-case scenario” (RL, interview, October 31, 2019).

At the same time, however, there seems to be an ambivalent attitude toward what counts as realism in the profession. Some visual artists concede that renderings can be quite sober, but they also allow room for creative atmospheric interpretation. One of our interview partners says: “A lot of times I think, especially in privately developed projects, you sort of wanna push it to the shiny, like, perfect aspect rather than to reality” (KL, interview, October 23, 2019). However, there seems to be some pressure from clients, especially developers,

to produce realistic views and lighting. Another interviewee described this as follows:

In the last, let’s say five to 10 years, it has become a lot more stick with reality...because I think images are so prevalent now that they don’t want buyers and people...to be let down because they show up and say like “This is not what we thought we wanted.” (RL, interview, October 31, 2019)

This shows that developers often ask to see a future building project from the same perspective and light as it would be in the finished built condition so that they can avoid disappointment and criticism after completion.

Nevertheless, the following is true for the example analysed here, as well as for the other renderings examined: The constructed photorealistic space in renderings avoids references to uncertainties, conflicts, speculations, or possible alternative futures that are usually part of planning processes. Because carefully lighted renderings are marketing tools commissioned mostly by developers, they don’t show the speculative character of planned urban environments. Therefore, we argue that the lighting factor is an atmospheric design element that is central to creating a realistic impression and imaginarily suggests the feasibility of the depicted building project while trying to please or impress viewers.

In the next subsection, we leave the level of the photorealistic image surface and direct our attention to another significant feature: the digital collage, which typically takes place during the production process of renderings.

4.2. *The Image Production Process: Digital Collage*

This subsection is about the dynamic process of digitally creating an atmospheric collage in renderings. Let’s assume at the outset that the technique of collage in digital images can convey imaginaries of coherence with regard to the atmospheres and functions of new urban places, and let’s start again with the analysis of an exemplary rendering.

Figure 2 shows a promenade along the planned marina of Eko Atlantic City. Many desirable elements of urban life for the middle and upper classes are gathered in the image. People are shopping, they have some leisure time, and they are generally quite young. There are trees, clean surfaces, good weather, etc. You can see the buildings glowing and shining; warm yellow light emanates from the first floors and surfaces and shines and reflects in the water, where expensive pleasure boats can be seen in the background.

The rendering thus gives the impression that the overall social and built environment is harmonious and works well on a functional and atmospheric level. This impression is created through a careful and deliberate selection of visual elements. Visual artists digitally and selectively place people, buildings, plants, materials, cars (or no cars in this example), and other elements into imagined urban environments. Social configurations are created and tested (Houdart, 2008, p. 48), and the renderings contain a series of deliberately chosen inclusions and exclusions, institutional and social structures (Degen et al., 2017), and a particular (Western) view of modernist cities (Watson, 2020). These are visually synthe-

sized on the image plane to create coherent visions, as the following visual artist explained:

You don’t want them to—you really wanna control how things are perceived, and you don’t want to go beyond that. And you want to limit the imagination as much as possible. As much as you open the imagination, you also wanna very close down that imagination. And I feel that’s where the true power of rendering is. (KL, interview, October 23, 2019)

This is to say that no other possibilities or alternatives to the depicted social and built environments are supposed to be imagined on the basis of the rendering.

Visual artists actively seek a perfect balance and visual unity between potentially conflicting systems, as expressed in the following statement: “You know, usually the influence comes in what’s not shown....That’s where most of the influence is because they don’t want people talking about something” (RL, interview, October 31, 2019).

In this context, our analyses furthermore revealed that because of this social complexity, the aspects that are atmospherically inscribed in renderings via digital collage are typically constructed in a collaboration between visual artists and architects, developers, and sometimes other actors as part of a longer planning process. As some visual artists described, integrating various stakeholders within the different planning phases and incorporating their points of view into the image construction were crucial for the rendering and, ultimately, the building project to gain reality in everyone’s eyes.



Figure 2. A rendering of the marina for Eko Atlantic. Source: BBB International (2014).

Many visual artists even found the process of image production to be full of friction, in which they had to act as integrators and translators of diverse spatial knowledge.

As part of the production process and ongoing communication with clients, renderings are constantly revised to translate the respective (new) requirements into the images: “It’s a lot of guessing, but after you do [it] a few times, you sort of, depending on the clients and the audience, you sort of get a better sense of it over time” (KL, interview, October 23, 2019). While the visual artists create coherent atmospheres in the renderings, they also allow room for interpretation and play with atmospheric elements. Despite—or perhaps because of—the complex process of the social construction of the rendering, however, the image retains its imaginary character: “So it is kind of guesswork anyway, so any image that you see of Hudson Yards at any time, unless the building has been built already, there’s no 100% sure exactly what it’s gonna look like” (VH, interview, October 21, 2019).

In view of this fluid character of renderings, the atmospheric elements, and the spatial knowledge inscribed within them are constantly changing, as are the suggested spatial imaginaries. A published rendering always represents only one valid compromise between all parties involved at a particular point in time. The ongoing active manipulation of a rendering thus stands in peculiar contrast to the realistic, feasible, and coherent imaginary spaces that are temporarily proposed there. However, this does not seem to detract from the affective atmosphere produced. Rather, it seems that this fluidity multiplies spatial knowledge and inspires creativity to develop atmospheric imaginaries.

4.3. Image Types: Homogenization

A third result of our study is that the comparison of the datasets of Eko Atlantic and Hudson Yards revealed a high similarity in the renderings, pointing to a visual homogenization across the database.

Much has been written about the fact that certain planning models, planning solutions, and even architec-

tural forms can spread widely in global processes, are taken up in a wide variety of places, and become increasingly similar around the world (see Healey, 2013; Park, 2019). Renderings in planning processes reveal a similar phenomenon. While some researchers have described different types of architectures visualized in photographs (Grubbauer, 2008) or types of digital human figures in renderings (Houdart, 2013), analysis of our image database revealed that both projects used a very limited number of image types, with only minor local adaptations. By sketching all renderings according to their framing of architectural elements, use of perspective, and overall geometries (see the explanation of methods in Section 3), we were able to identify 19 image types for Hudson Yards and 18 for Eko Atlantic throughout the database (see Figure 3). While they cannot all be described here, it is important to note that typical ways of representing architectures can be found in our case and that they are very similar in a relevant number of renderings of the two large-scale projects. This is remarkable in that—as is well known from architectural theory (e.g., Jacob, 2018)—the choice of perspective, in particular, exerts a strong influence on the way spaces are perceived and understood.

Despite their visual homogeneity, many renderings proved to be very effective in the discourses about the urban development project in their respective local contexts, as they were widely published and shared. However, it became apparent that it is not only the specific quality of each individual (similarly structured) image that develops a persuasive power but also that this power is due to the impressions created by the large number of renderings produced throughout the planning processes. In interviews, visual artists spoke of trying to create local meaning or stories in a series of multiple renderings:

We could sometimes just say “ok, you want one hero shot, three interiors, one bathroom” whatever and then you just do something, but it’s just so much nicer if you get to sort of make a whole complete story with

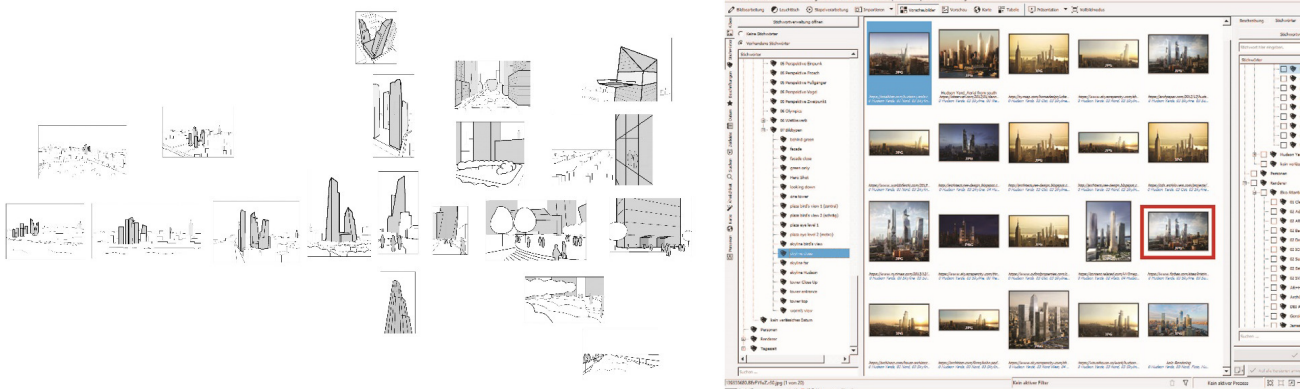


Figure 3. An overview of the image types produced for Hudson Yards (left) and a look into one of the image types of Hudson Yards (screenshot from the image database, right).

it. So we try and sell the story because then when you are making your image it has more meaning to it. (VH, interview, October 21, 2019)

The imaginary space of the planned urban development project is thus developed over time by adding and sometimes changing existing renderings (in this case, between 2007 and 2020). It is not a consistent spatial arrangement but an imaginary space that is constantly evolving, changing, and adapting, reflecting the circumstances of the planning process in many ways. By creating numerous renderings and adding images throughout the planning process, the developers and visual artists strive to create a complete vision of the proposed spaces: “We took so many pictures of the mall that you go and think, ‘Oh yeah, that looks very familiar’” (RL, interview, October 31, 2019).

We would like to argue that in this way, an atmosphere of completeness is created for the viewer, as well as the impression of having seen it all and knowing it from all possible angles. Actually, when looking at the entire database of each development project chronologically, one almost has the impression of rotating around and zooming in on the buildings and places depicted. The various identified image types thereby form the patterns, so to speak, of this relational spatial formation.

In the following section, we will conclude by summarizing the key findings, explaining how this is relevant to the scientific debate, and by pointing out the limitations of our study while defining new fields of research.

5. Conclusions

Although more and more urban development projects are making increasing use of renderings as part of marketing strategies, there has not been systematic empirical research that considers image production as a whole. Our study fills this gap by asking what important (atmospheric) design elements of renderings are, in what processes renderings are produced, and how renderings thus attempt to influence imaginaries about future urban spaces.

In this context, we researched renderings as digital visualizations of future building projects by focusing on three main characteristics: (a) a photorealistic aesthetic, characterized mainly by the element of lighting; (b) a digital collage including further atmospheric design elements, which is produced very purposefully, in elaborate processes to create harmonious—social and physical—worlds; and (c) a homogenization of image types that are uncluttered in their number and the structure but able to create comprehensive visual narratives of the planned building projects.

Based on this investigation of image databases, we were able to show in our two cases that affective atmospheres were constructed with the help of the three characteristics described above. Such atmospheres can meet the requirements of developers and other planning

actors while simultaneously appealing to a broad, heterogeneous audience. Particularly through atmospheric design elements, renderings can influence the imaginaries or spatial knowledge that viewers develop in the respective urban planning projects. These design elements are supposed to make the building projects appear not only as pleasant and desirable but also, above all, as feasible, coherent, and complete. This is where we see the main reasons for the widespread and numerous uses of renderings in communication about urban development projects. If renderings for proposed projects can widely and convincingly convey that projects are complete, coherent, and feasible, the corresponding spatial transformations can be better legitimized (see Mélix, *in press*).

It is striking that the phenomena described for renderings were equally observable in both the planning projects studied, despite the very different planning and cultural contexts in New York City (USA) and Lagos (Nigeria) and the iterative nature of the image production process. The aspect of global homogenization has been touched upon by other authors (e.g., Grubbauer, 2008; Mélix, *in press*; Rose & Willis, 2019; Watson, 2014), and we have been able to confirm it on the level of the images and their specific design elements. Only at the level of the digital collage were minor differences evident. There, design elements, such as people, vegetation, or objects, were sometimes adapted to local conditions and visual habits. In addition, visual communication via affective atmospheres seems to be the common choice of architects and developers.

Although our study has allowed us to better understand the process of the digital-visual construction of imaginaries about specific building projects, the study also has its limitations. In the future, we see the following research areas as particularly important.

Since renderings deliberately construct imaginaries of future urban spaces by anticipating not only the built form of these places but also—at the level of digital collage through the inclusion or exclusion of things—by atmospherically co-constructing social worlds, attention will have to be paid to which social worlds exactly these are; for example, what kind of people (in the sense of race, class, and gender) are represented. We were not able to do this in the context of our study, but it would be an important research question.

Another future research question is how renderings—given the power and potential of digital visualizations—will affect the level of internationally circulating planning ideas, especially how they drive homogenization processes in visualizations and possibly even in building itself. This requires a comparison of a much larger number of planning projects worldwide, which was not done in this study.

As indicated in Section 2, renderings can drive speculative processes in the context of large-scale urban developments through the deliberate creation of certain imaginary worlds, which usually play a central role in

speculation. Additionally, renderings present a consensual vision of future spaces, even though affective atmospheres are always ambivalent and are brought forward in a dynamic relational process. This will have to be made more aware of in the future, especially since the speculative and potentially conflictual character of the proposed imaginary spaces remains largely hidden behind the luminous photorealistic surface of renderings.

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Conflict of Interests

The authors declare no conflict of interests.

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