Urban Strategies

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A case study-driven inquiry into interactive spaces and shared urban places.

SMART CITIES AS DIGITALLY AUGMENTED SPACES

Cities that are labeled as smart are hybrid spaces that consist of materials and digital information. They are inhabited and occupied by contemporary tech-savvy subjects; they rely heavily on the technological constructs of monitoring, actuation, computing, geo-localization and networking; and they are closely connected to the temporalization of space and democratization of knowledge about spatial dynamics.

The premise of Smart Cities as an intellectual project is that the new technological thinking about spatial design goes beyond human-machine interaction into the slightly expanded realm of sentient, responsive, and interactive inhabitable spaces and shared urban places. A smart city is populated with technologically enhanced artifacts that provide an interface between the two parallel systems that constitute the contemporary subject’s reality: the physical world of material constructs and the virtual world of digital information. In designing for digitally enhanced smart cities, the central focus has shifted from the spatial allocation of substance, to the temporal allocation of non-substance or information. This allows for a cross-format mediation that can go both ways: if the space or artifact is designed to provide a platform for translating a series of 0’s and 1’s to durational phenomena perceived by a sensory faculty, what is at hand is a machine that orchestrates an affective, corporeal experience based on digitized information. If the space or artifact is designed to provide a platform for translating patterns of the presence and absence of material entities to a series of 0’s and 1’s, any sensory, affective experience can be translated to a digital file that can be stored, retrieved, and shared via a network.

Another fruitful branch of digital augmentation to explore is its applicability to hi-tech art installations, where spatial mise-en-scènes are provided for the collective amazement of the audience and the demonstration of technological feats. Digitally augmented art exhibitions may be organized
“Makr Shakr”, a project developed by MIT SENSEable City Lab and Carlo Ratti Associati in collaboration with Bacardi and Coca Cola, is an example of a digitally enhanced installation that is demonstrative of technological feats and mediates social encounters among those who choose to participate in the piece. It is a new robotic bartending system that allows users to create, in real-time, personalized cocktail recipes through a smartphone application and transform them into crowd-sourced drink combinations.

“Makr Shakr” is a social experiment that looks at how people might embrace the new possibilities offered by digital manufacturing. The cocktail creation is assembled by three robotic arms, whose movements, visualized on a large display positioned behind the bar, mimic the actions of a bartender. Around a piece that is communicating the designer’s concept, while the audience act as passive spectators or bystanders witnessing the dynamics of the piece. In another variation, a space is created around a piece and one member of the audience interacts with it, while others maintain the roles of spectators. In a different version, the space is created in the virtual or digital terrain of connections among wireless devices that are used both as input and output terminals, to control the digitally enhanced piece.

Moreover, digital augmentation scenarios can re-examine the notion of monitored spaces, especially in publicly shared or semi-privatized civic spaces, where surveillance technology is reconsidered not as means of exacting socio-political control over individuals’ actions and behaviors, but as a possible platform for acquiring and analyzing data from complex, large-scale processes over time. In thinking of the space of a smart city as augmented, the designer explores ways to supplement physical environments with non-substantial architectures of spatially well-situated and geo-localized information that modify and enhance their perception and performance. The representations of this data have great potential to make sense of what is happening in publicly shared spaces at the macro level of management and design strategies. On a micro level, once such information is fed back to the individuals who are part of a monitored crowd, they are endowed with real-time consciousness about events and dynamics of the space, which allow them to make well-informed decisions. This is the main aspect of the democratization of space in smart cities: the transparency of urban processes and spatial dynamics to all those affected by such processes. Examples of such practices are context-aware, location-based wireless services that provide subscribers with access to real-time information about the dynamics of the city including traffic, weather condition and ongoing cultural events.

In any of the scenarios, the first question among the many that come to mind, is the future of physical space as we know it. With all the possibilities offered by digital augmentation technologies, it seems that built space cannot be envisioned and examined only in terms of its constitution in bricks and mortar, but also in terms of bits of information and strings of machine-readable code. Under these circumstances, are we moving towards the dissolution of physical space and the end of the designing of physical space, or are we moving towards a reinforcement of the physical space through enhancing its logics of operation with digital and telecommunication technologies? The augmented space matters, and it opens up to plethora of possibilities for spatial practitioners, but what about the more ordinary, traditional spaces of habitation?
Furthermore, in digitally augmented spaces the goal is not only to put together atoms, but also bits of information. Hence, there is a need to examine the relationship between the design procedure of the ordinary, physical spaces, and that of digitally augmented spaces. The question is whether putting together bits and putting together atoms can follow the same process and pattern of conception and the same logic. Are their natures the same, or is there a fundamental difference in the process of design once we think of the space as augmented? Might they be complementary? Does it mean that the architect is going to be schizophrenic, designing physical space half the time, and the augmented digital layer the other half?

Moreover, how do the design possibilities afforded by thinking of space as augmented impact the traditional division of labor amongst disciplines categorized as spatial practices? Who, ultimately, is the designer of an augmented space? Would designing such spaces become a cross-disciplinary professional activity? The question at hand is the factual division of labor, and whether, professionally speaking, people who put together atoms are different from people who put together codes and bits of information. If so, who would take the lead in the process? Would the architect be working with an “augmenting engineer”? Or, would digital augmentation services become part of professional services offered by the architect? When it comes to digitally augmenting the space, what are the disciplines involved, and who does what? If a multiplicity of disciplines is to be involved, how can we build a common platform of effective and efficient collaboration? What is more, how would the process differ when the subject at hand is not augmenting an existing context, but designing and creating a digitally augmented context from scratch?

The designers of smart cities need to acknowledge and come to terms with three main factors in order to be able to envision thoroughly augmented, smart urban spaces. First is the fact that digitally enhanced objects of mediation – sensors, actuators, and interactive digital surfaces – are added to the palette of possible material entities that can and should be incorporated in the spatial composition. Second is the fact that the task of the designer is not limited to the production of space, but also takes into account the scenarios to be accommodated within the space. I define this as designing for the consumption of space. Third is the fact that digitally augmented spaces are not inert and fixed, but should be capable of adapting to new desires and needs, goals and conditions. In this manner, the space becomes an intelligent human artifact, a true cybernetic system which, given the right technology and the appropriate vision, can guide the human race in its quest for more sustainable modes of habitation.

Smart cities are executed with the vision of adaptability, efficiency, and optimal operation through their ability to register the emergent conditions in their context, and to cybernetically evaluate real-time information about these conditions. Therefore, they acquire optimal performance based on the analyzed information. Hence, although digitally augmented spaces and architectures respond to concerns about function, structural durability, and aesthetic desirability, the focus of designing such spaces shifts to the issue of performance. After all, a city capable of self-adapting to new conditions is not there to merely endure, but to “perform” with efficiency. In the end, a smart city is a performative city, and given the right technology, the limits to how performative it can be is the limit of the imagination and the desire of its architect/designer, who is still the one responsible for envisioning and realizing this type of space.