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SMART ALREADY

Revisiting the Smart City Through the Lens of Norms and Rituals

By Tung Chen

Smart cities are defined by their use of digital technologies—sensors, data analytics, and AI—to optimize urban systems. Algorithms are frequently depicted as the primary driving force behind the management of smart cities. They support prediction and automation, creating badges in government reports to showcase better performance related to electricity, waste, or traffic management (Son et al., 2023).

Despite these benefits, awarding badges has reduced 'smart city' to a rhetorical label for attracting investment (Lewis, 2024). Some even argue whether such badges are indicative of technological progress or mere usage for marketing purposes (Iain, 2002; Maček et al., 2019). Overemphasizing algorithms risks turning urban design and planning into a variation of high-tech startups, with far more priorities placed on technology and growth than social equity, a puzzle not easily solved by algorithms (Ruijer et al., 2023).

The dominant discourse surrounding smart cities equates urban intelligence with deploying digital technologies—automated systems, sensor networks, and real-time data analysis—to optimize urban management. This framing often sidelines social complexity, historical practices, and local knowledge in favor of reductive metrics. As Easterling notes:

“In fictions about the ‘smart city,’ the automated vehicle is also now a stock prop—a data-gathering machine for a world in which data is treated as the only information of consequence... Urban softwares attempt to explain complexity in ways that reduce that complexity or make ownership of the city available to those who can pay for the data.” (Easterling, 2021)

While dressed in the language of decentralization and openness, these visions of the future often concentrate control in digital platforms and algorithmic governance. Despite the technocratic vision of the movement, what is foregrounded here is the integration of smart cities with social practices. In response, this paper explores an alternative trajectory for smartness that builds upon embedded norms, rituals, and human-centered design.

As planning agencies grapple with these issues, some projects—like Quayside Toronto—have begun oscillating between purely algorithm-driven solutions and a holistic model. Quayside Toronto 1.0 was initially conceived as a smart city that relied on real-time data to address sustainability, resource management, and economic growth. It began with integrating data from autonomous vehicles, heated sidewalks, and extensive sensors to create a digital twin that assists in optimizing the built environment (Sidewalk Toronto, 2019). While the digital twin can optimize many urban systems, its impractical application to replace all urban systems highlighted a critical flaw in a digital utopia: the lack of social interaction and community well- being (Bibri, 2022).

The 1.0 model acknowledged that technological solutions alone cannot address all urban challenges, thus, the shift from Quayside 1.0 to 2.0 occurred. The 2.0 model integrates green spaces, affordable housing, and ecological management alongside technological solutions (Jacobs, 2022). This realization was becoming one of the levers in the transition, and planners sought to blend efficiency driven by technology with human-centered design (HCD). In this instance, HCD is moving ideas about design to think primarily about the user’s needs, behaviors, and cultural values, as opposed to efficiency via technology. In practical terms, this means designing smart systems that support or evolve from the current social practices instead of replacing. Questions then appeared around whether data still plays an essential role in defining what makes a city “smart.”

Sidewalk Toronto's shift highlights that being "smart" can be achieved in various ways. Neither green space nor housing strategies are new approaches to smartness.

Are cities like Baghdad in the medieval period demonstrating sophisticated systems for water management, with advanced irrigation and public water supply systems that were crucial in the hot, arid climate, smart? Are cities like Medellín, where the markets are not just places to buy produce but serve as hubs for social interaction where residents share meals, recipes, and cultural traditions, smart? Are many historical cities already smart without relying on data-driven efficiency? Is it feasible for all cities to amplify cultural and behavioral practices that foster a collective sense of humanity and that these practices ultimately define the smartness of the city?

At its core, HCD in a smart city is about collective intelligence, first and foremost, rather than technology for its own sake. Human-centeredness asserts that we must prioritize human needs and values above machines, no matter how advanced, and retain awe for the imagination and creativeness that only humans possess (Cooley, 1989). Within the context of smart city development, this principle involves identifying and adding to the existing intelligence in the urban system instead of imposing technology that has the potential to annihilate beneficial social practices.

Various discussions emphasize the importance of cultural and behavioral practices in revisiting the definition of a smart city. Goh (2015) suggested that the implementation of technological governance should be decentralized to reduce the chance that total technology may reinforce existing power structures rather than democratize urban spaces. Similarly, Ravetz and Miles (2016) focus on collaboration across complex sectors to co-create cultural, social, emotional, and ethical values, which can be integrated into everyday governance rather than relying solely on data- derived scientific facts. Anthopoulos's study (2017) on ten smart city cases underscores a significant gap between marketing-driven visions and real-world implementation challenges. Greater attention has been devoted to the current unstable attitude toward the data-centered model and to seeking a new lens to enhance the current model of a smart city.

In the decentralized, collaborative, and situated contexts mentioned above, cities and discourses embody an intersection where daily life, history, and commons converge to produce effective solutions tailored to local needs. These practices are deeply embedded in norms or rituals, structuring city operations independently of data and algorithms. This study, therefore, argues that while data-driven approaches are crucial for optimizing urban systems quantitatively, the term "smart city" must reemerge to acknowledge and integrate existing intelligence—those norms or rituals that are already smart within the city—thereby coauthoring a holistic model of smart cities qualitatively.

How can norms or rituals in cities be leveraged to facilitate the re-emergence of smart cities? The following two different cases illustrate the answer to this question. The first case is the dabbawala in India, which introduces smartness in adaptive logistics. The second is the smartness of the circular economy aimed at building a net- zero town in Kamikatsu, Japan. The two cases outline the speculative boundaries created by autonomous networks that algorithms find difficult to interpret. Examining them together reveals two conceptual terrains for unfolding smart city projects: one where norms and rituals run parallel to smart cities, but have the same ability to fulfill common goals, and another where the revisited smart city embraces the benefits already derived from norms and rituals.

SMARTNESS IN ADAPTIVE URBAN LOGISTICS

The dabbawala, a worker in Mumbai, India, responsible for lunchbox delivery, has been a cornerstone of the city's logistics since 1890. It was established to meet the demand of workers who preferred home-cooked meals over restaurants, which primarily offered British cuisine at the time (Pathak, 2010). Every day in Mumbai, 175,000 lunches are delivered through this system (Date, 2006). This is comparable to imagining that about one-eighth of the population of New York's central business district utilizes this service to order lunch. Despite this large volume and the highly complex streets and urban structures of Mumbai, they can still deliver lunchboxes accurately and efficiently. This success stems from a simple coding system that has been in use for many years and has become a standard that no modern technology can replace.

Unlike a barcode or digital map typically used for delivery nowadays, the dabbawalas employ a coding system on lunchboxes that indicates their origin and destination, including the resident station code, resident station pick-up group code, and destination station code (Patel & Vedula, 2006). These symbols are composed of geometries, letters, and colors. By interpreting this simplified information, a dabbawala can recall the remaining information from memory to identify the destination of the lunchbox. Excessive coding, such as providing a full address or a barcode, can hinder a dabbawala's ability to recognize the information quickly (Pathak, 2010). This situation is reminiscent of a major IT failure that caused airport logistics to come to a standstill (Satariano et al., 2024). It raises the question of whether every city requires such complex coding solutions. A coding system developed through established norms could more effectively support urban logistics. Despite not relying on advanced digital technologies, this human-centered logistics service operates efficiently and has become an essential part of daily life in the city.

The smartness of the dabbawala is also reflected in other forms of adaptability. In terms of mobility, modes of non-motorized transportation, like trains and bicycles, are used alternatively for deliveries. The delivery might begin with a walk around the neighborhood to collect an average of 30 lunches and send them to a train station. At the station, the lunch boxes are loaded within 40 seconds at major stations and 20 seconds at interim stops (Cousins, 2023). A tight schedule helps everyone stay on the same page and promotes discipline in what might otherwise be a chaotic environment. Suppose a dabbawala arrives late with lunchboxes at the station. In that case, everyone notices this situation immediately, and alternative arrangements must be made to transport those late lunchboxes to another train (Thomke, 2012). During the last mile of delivery, when cycling, information regarding congested areas is rapidly circulated among the delivery men so that they may avoid those areas (Chakraborty & Hargude, 2015). The team coordinates effectively and moves fluidly through Mumbai's traffic jams and pedestrians, adapting to any delays.

In addition, the dabbawalas utilize empty lunch boxes to transport fresh raw materials from farmers to households. The empty lunch boxes are returned to their origin in a similar yet opposite manner by 5:30 PM. If there is a request, the delivery man will stop at a wet market to get food. An additional fee is added to the original fee of about 400 or 500 rupees, or $7 to $9, per month (Thomke, 2012). Through this approach, the dabbawalas assist local farmers and facilitate access to various ingredients (Babu, 2018). Cooking meals at home with ease, in turn, helps preserve regional food cultures (Roncaglia & Arnone, 2013). This unique aspect is often overlooked in contemporary smart city models. The dabbawalas builds community relationships, showing a way of working together that is different from a smart city focusing on technology more than cooperation between people.

Since the dabbawalas operate within an adaptive system where norms support one another, and these norms are deeply ingrained, no system has yet been able to replicate or replace the dabbawalas. The dabbawalas exemplify the need to examine whether systems are in place to avoid unnecessary complexity or conflict with technocratic management. Alternatively, if a supportive approach is adopted, it should leverage data-driven solutions to refine the subtleties of norms in pursuit of long-term sustainability. One notable transformation underway is using data analytics to expand the customer base and increase revenue through targeted advertising (Sethi et al., 2014). Both social and technological practices underpin the dabbawallas. This low- tech method has achieved peculiar efficiency and emphasizes the importance of Human-Centered Design.

SMARTNESS IN RITUAL-BASED CIRCULAR ECONOMY

Kamikatsu is making history as the first town in Japan to strive for zero waste. Similar to the dabbawala system, Kamikatsu's method of handling waste highlights how important social practices are in creating smarter and more resilient urban environments. The town's commitment to waste management began after stricter environmental regulations forced the closure of its incinerators, leaving residents with no viable option for disposing of their trash. Since then, Kamikatsu has adopted a comprehensive recycling system that requires residents to separate their waste into 45 categories, ranging from not merely a broad category of paper, glass, and metal, but a detailed sorting of milk cartons, brown glass bottles, lighters (Zero Waste Academy, n.d.). The recycling system not only aims to promote sustainability but also to offer a model of circular economy that prevents the town's decline. Kobayashi (2021) said the following:

With the shrinking of rural Japan, governmental incentives like 'relocation grants' are used to attract people. These are not sustainable. We concluded that the only unique aspect of Kamikatsu is 'Zero'. We thought there was no better way than to use this as a 'brand', to revitalize the town. (translated by author)

The emergence of this aspect of 'Zero' is not sudden. The idea of zero has long been deeply rooted in the awareness of Japanese people through rituals (Siniawer, 2014). What is unique is that the ritual assists in the formation of the town. Two rituals that illustrate this connection are Satoyama (sustainable landscapes) and Mottainai (avoiding waste). Mottainai is exemplified in Kamikatsu's zero-waste system, which operates based on collective involvement and a deep respect for natural resources. Residents actively bring their waste to the Zero Waste Center and sort it themselves to follow the spirit of Mottainai. Items that can be reused are then put into the Kuru Kuru shop—a free exchange place where people can take what they need without any monetary exchange (Lee & Inuma, 2022).

On the other hand, Satoyama often represents a larger area, including adjacent ecosystems, which is not dissimilar from the French term terroir. It gives a sense of remorse over the wastefulness that can destroy local ecosystems and ultimately impact the food supply. In Kamikatsu, Satoyama's value lies in educating people on how and what we consume. In the town's hostel, there are no trash cans in the rooms. Guests are suggested to take the waste generated from their residences to the recycling center. In addition, guests cut the soap themselves upon check-in to decide the amount they need. The carpets in the room are made from used jeans. The reflection that the town offers is not merely about how many categories we can sort items into, but rather how these items shape our lifestyle—and how they might be connected to nature. Both rituals ultimately foster a collective environmental awareness rooted in cultural values and communal practices, unconsciously yet differently aligning with the goal of a general smart city that addresses sustainability, resource management, and economic growth.

It could be argued that the recycling and upcycling model in Kamikatsu, which resembles a model of circular economy, can be achieved with technology nowadays. This is not opposed, but the key point is the sense of cohesion that rituals bring to the residents. Can smart cities, with their waste management systems, offer the same level of cohesion to encourage collective action?

Stepping outside the town offers the opportunity to observe how similar waste management practices are developed elsewhere. Some ideas are better waste collection routes that ensure trucks only go to bins that need emptying to cut down on fuel use, traffic jams, and pollution (Vu & Kaddoum, 2017). Other research suggests using smart trash bins with sensors, image processing, and spectroscopy to help sort waste in an automated manner (Huh et al., 2021). While these are effective models, the question remains: can they be adapted to smaller, aging, remote towns with limited funding for advanced systems? Will such technological solutions inadvertently erode the very community bonds that make these towns unique?

Therefore, the notion of a supportive approach emerges again, resonating with Mumbai's dabbawala. One of the pilot projects in Kamikatsu tests a deep learning model to better assist in sorting waste (Iiyama, 2017). The new zero-waste center designed by architect Hiroshi Nakamura has exhibition spaces and workshops focused on integrating technology and traditional Japanese customs (Mun-Delsalle, 2020). While rooted in local tradition, Kamikatsu's zero-waste model echoes a growing global movement toward decentralized, low-tech sustainability practices, offering insights for rural towns worldwide.

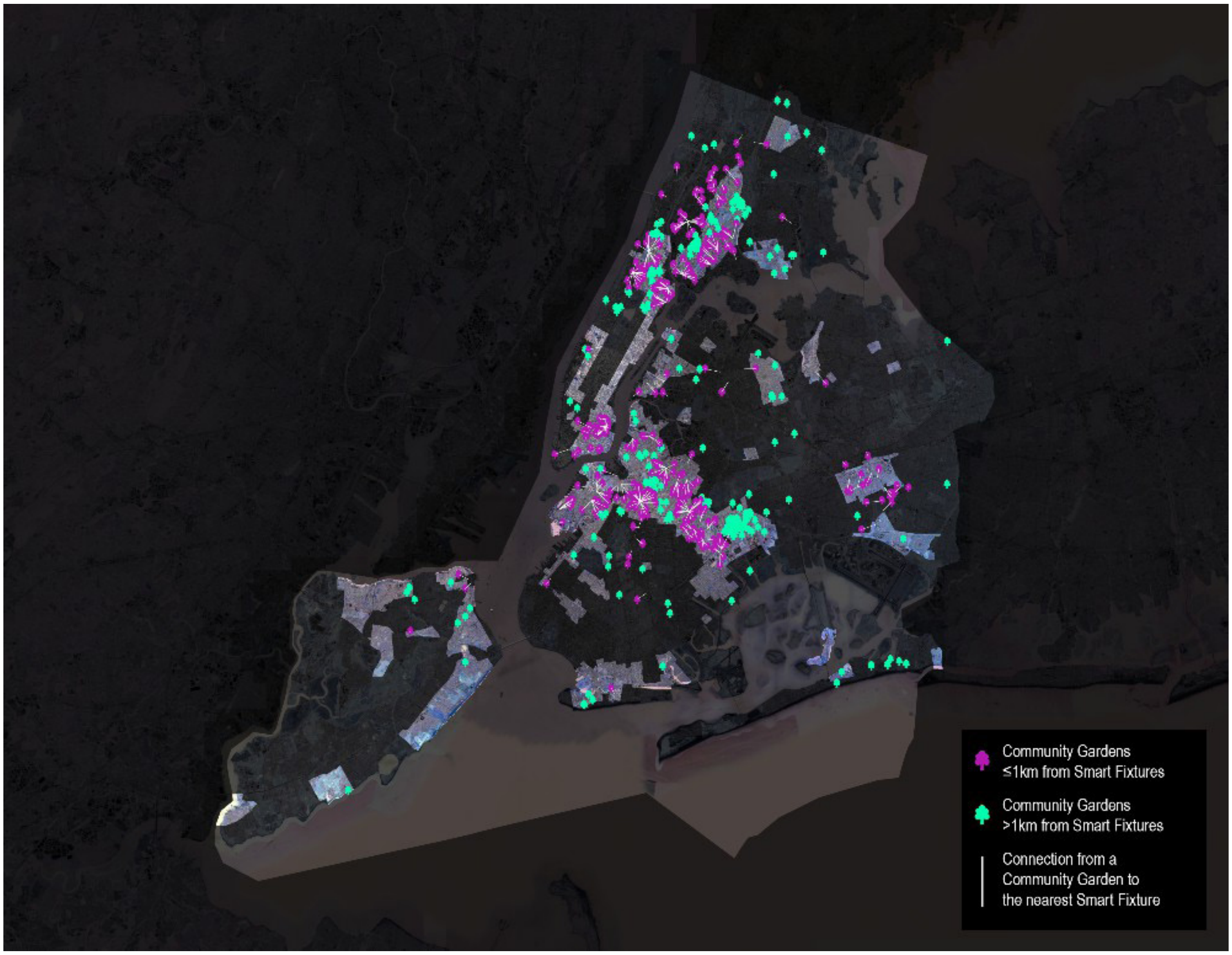
Networked systems are key in this regard. The networked system, serving as the structure of these two cases and also constructed by them, should be acknowledged as areas that address the shortcomings of algorithms to find a better balance. For example, learning from Dabbawala and Kamikatsu makes the networked system evident that entities (nodes) and relationships (edges) are combined into systems that foster interactions among community members, provide flexibility, and create autonomy. The strength of these networks lies in their social and cultural dimensions. Unlike purely technological interventions, systems of norms and rituals prioritize interpersonal relationships. They are not only conventionally sustainable but also vital to maintaining so-

cial cohesion. They form the foundation of a place's identity, one that no digital twin can replicate. By integrating agencies from these networked systems, smart cities can reconcile data-driven infrastructure with lived experiences and cultural vibrancy.

DISCUSSION: SMART NEW YORK AND COMMUNITY GARDENS

What if this lens were applied to the current smart city projects? What has been the status quo in the neighborhoods? Have they already been "smart" with norms or rituals? In New York City, one of the strategies under its smart city initiative has highlighted the empowerment of historically underserved neighborhoods. The first map below shows that those neighborhoods largely overlap with smart city features, such as air monitoring stations, street activity sensors, or Link5Gs (Figure 1). With these features in place, the Justice40 Initiative mandates that the city use federal SMART grants to establish 'zero-emission' delivery zones. This aims to aid those communities that have been vic-

Figure 1. Map of smart fixtures in NYC. Illustration by Author



timized by environmental pollution (NYCEDC, 2023). The AI Action Plan also targets improving digital access in underserved neighborhoods, for example, assisting individuals in using AI responsibly through educational programs and workshops. This supports the city's objective to rectify inequalities through its smart city project (NYC Office of Technology and Innovation, 2023). All features are meant to improve these communities and to make them "smarter".

There are probably underlying norms and rituals in these neighborhoods. To show how this relates to the current smart city project, one of the norms in the city, the community garden, is shown in the map below (Figure 2). The community garden in New York City was initiated as a grassroots movement to repurpose abandoned lots during a fiscal crisis. Of 651 gardens, 489 are in underserved communities, representing almost 75%. Community gardens enhance social capital by fostering bonds among neighbors from diverse backgrounds while providing safe spaces for interaction (Shostak & Guscott, 2017). Gardens in the Lower East Side have allowed Puerto Rican residents to grow traditional foods while using the space for storytelling and music (Martinez, 2010).

Figure 2. Map of community gardens and their relation to smart fixtures in NYC. Illustration by Author

The map also reveals that out of 489 community gardens in underserved communities, 311 are within 1,000 meters of smart city features, making up 63%. The spatial adjacency means that the community garden can parallelly serve as an important hub for integrating smart city features while supporting sustainability and environmental management—key goals of smart city projects. For example, Self- seeding Clouds envisions an online ordering system to turn rooftops into community gardens in Harlem (Figure 3). Based on the user's needs or temperature readings from sensors, people can choose different prototypes to construct green roofs (Figure 4 & 5). Under the green roofs, the norms inherent in community gardens continue to exist as rituals. This new layer of technology not only mitigates the urban heat island effect through strategic rooftop layouts but also enables norms and rituals to function, reflecting the social dimension of smartness. That way, smart cities can do not only better with technology in their infrastructure but also create places where people connect meaningfully with the environment and each other.

These two maps and the project are merely the starting point for finding places that might give a chance to test smart city technologies integrated with urban norms and rituals. The smart city should not finally be about simulations and digital twins used in efficient management; this allows designers and planners to rethink the succession and revision of urban norms and rituals with the aid of data. All the cases mentioned, in all likelihood, are not isolated networks in city systems. Tools such as mapping and simulation offer opportunities to build data-assisted systems that encompass these persistent networks that prove difficult to quantify. By fusing urban norms, rituals, and data-driven methods, a new paradigm of urban smartness can emerge to counter the current dilemmas of smart cities. There is no rigid line that says that technology controls city planning and design; rather, all these elements come together bit by bit and interplay like threads weaving into a complex, changing tapestry.

Figure 3 (Top). A new roofscape created by the self-seeding cloud. Illustration by Author

Figure 4 (Bottom). Step one of the self-seeding clouds. Illustration by Author


Hi, where are you ?
Harlem
Risk: Lv.5
HEAT
GREENERY
FOOD...more
← QUIT
NEXT →
So, what do you need ?
S
FRAME SIZE
L
S
Furniture scale
— 2* 2* 2.5 m
M
Building scale
— 4* 4* 7 m
L
Structure scale
— 4* 4* 11 m
Hey, Need help on building this scale ?
NEXT →
How about exterior wall ?
SOLAR PANEL
TREES
VINES
VERTICAL FARMING
CORRIDOR
NEXT →
You will need these.
X 50
X 30
X 27
X 95
X 30
NEXT →
Do you know ?
The temperature in this neighborhood will reduce
0.3 °C
in 20 years because of you!
THANK YOU!
Now You Can Choose
Energy exchange
Discount on your electric bill
Government Grants
NEXT →
SELF-SEEDING
C I T Y
O R D E R
COMFIRMED
The package will be sent to you in 3 days.
Thank you for your contribution to our environment again!
FINISH

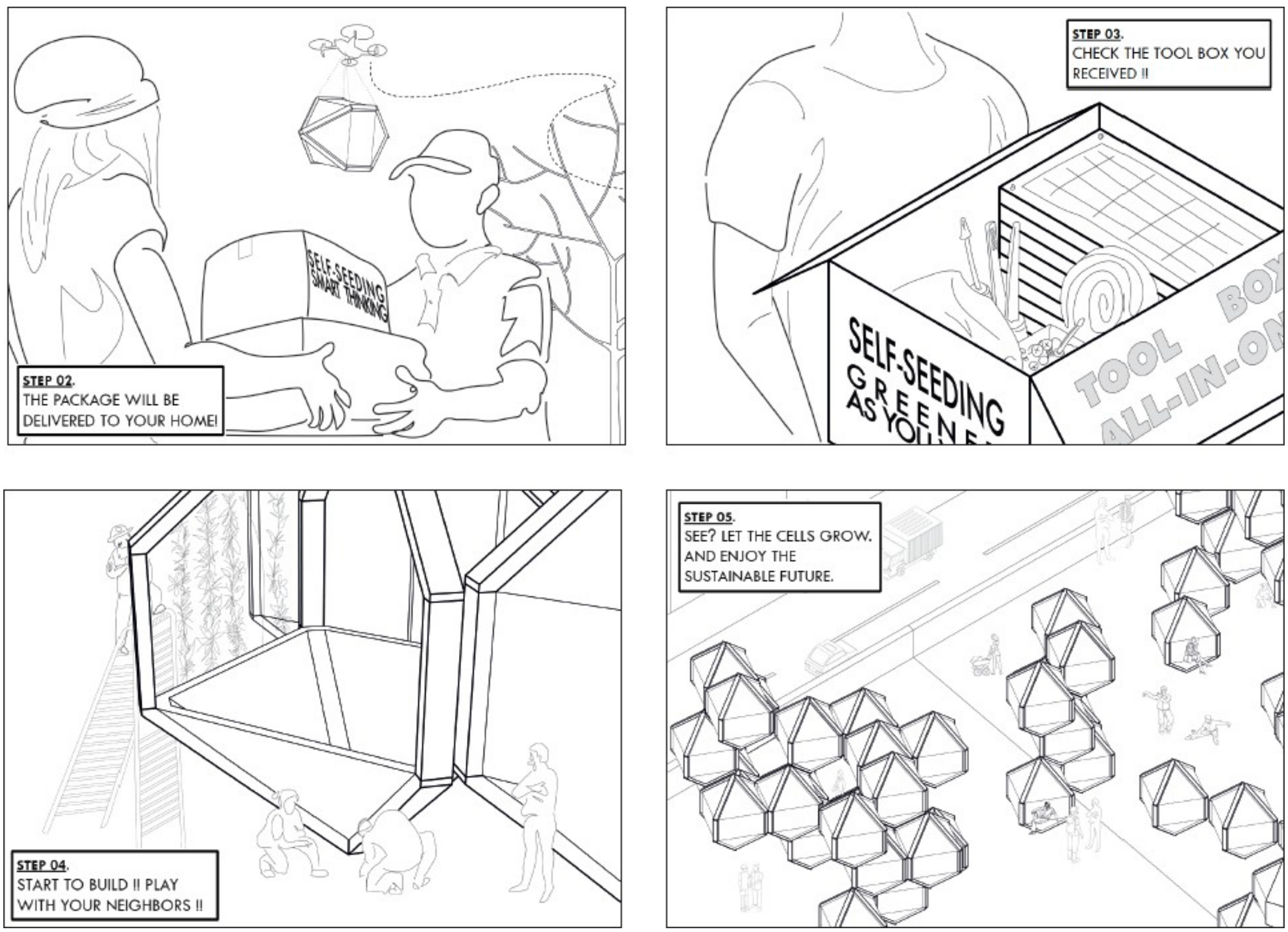


Figure 5. Remaining steps of the self-seeding clouds. Illustration by Author

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