DESIGN FOR ADAPTATION

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Editor
Amy Lazet, College for Creative Studies

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Detroit 2022

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CONFERENCE CHAIR WELCOME

Dear conference attendees,

Climate change is a complex, multidimensional issue where physical hazards and social and economic drivers interact. For these reasons, climate change is deeply intertwined with global patterns of inequity. While the human tendency to adapt reactively is well-known, we believe that proactive adaptation is now necessary to avoid far more impacts of climate change, and we believe that adaptation plays a crucial role in reducing communities' exposure and vulnerability.

In the last two centuries, we have entered the Anthropocene. We are removed from the evolution of the Homo sapiens by 10,000 generations, yet the five generations of the twentieth century have used fossil resources at unheard-of rates while accumulating waste and creating irreversible pollution in the air, water and soil. This is a challenge for humanity and civilization.

This challenge is enormous and has multiple dimensions, from the political, where choices can no longer be based solely on the criterion of our short-term interests, to the economy, we must abandon blind growth. The ethical dimension is where we should apply the macrocosm in the microcosm of our desires. The symbolic dimension is where we need to break the "always positive" archetypes of the individual's "material success." The list of dimensions is long and includes the arts, where we must explore other modes of reality and imagine revisions and redesigns.

If anything is clear, however, it is that climate change will not be neutralized in the course of our lives.

This necessary transition will have costs and require us to make sacrifices. Even if economists think the market will solve everything, energy and food insecurity is already a reality that plagues evermore people worldwide. People will be forced to migrate; animals will go extinct; new parasites will arrive in new areas; through various pathways, climate change will exacerbate existing health threats or create new public health challenges. We must return the human condition to the center of our future projects.

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CONFERENCE CHAIR WELCOME

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This challenge will require a team effort; just as science needs philosophy and design will need ethics, we need more stakeholders at the table. Will we be able to forge other paths? We hope so. Which ones? Nobody knows yet, but maybe the solution to the impacts of climate change lies within the Earth, our minds and our capacities.

Let's take tangible steps to prepare and respond to the greatest threat to humanity and beyond. Here at the Cumulus Conference, you will be introduced to innovative ways of training the next generation of designers, learn how everyday materials can play a role in helping laypeople recognize their impact on the environment, and see new ways of bringing the climate crisis to the public's attention.

We hope you return home with profound memories, new knowledge and inspiration for your work. Have a great conference, and welcome to Detroit!

Maria Luisa Rossi
Conference Chair
Chair and Professor
MFA System Design Thinking

CUMULUS PRESIDENT'S MESSAGE

Design for Adaptation in the Complexity

The 2022 Cumulus conference in Detroit at the College for Creative Studies is the second in the U.S. in more than 30 years of history and the first after a long global pandemic, which made us rethink how we meet, network and disseminate globally in new, creative ways. Accordingly, the topic selected revolves around the concept of adaptation, which is one of the properties of any complex system to survive and grow under the pressing global challenges, such as global warming, while reducing vulnerabilities and fostering resilience. As the call points out, climate change consequences are impacting not only our environment but human rights, poverty, inequity, global food security and health. They are calling for rapid action and adaptation. Such an emergency, without precedent, requires bold and creative thinking.

Along with three days of paper presentations, panels, keynotes and working groups, the conference sent a clear call to action to the large global design community to explore sustainable and equitable solutions: we are living in a time of emergency and at the same time of complexity, which needs bold ideas and actions, where every single element may interact to each other and the whole at different levels, without any linear predictions. The good news is that a property of a complex system is adaptivity, which means it can adapt to its surrounding environment when it is composed of many elements in a network of actions and feedback in a dynamic state.

All living and social systems are considered complex adaptive systems, from ant colonies to the stock market, from the biosphere to ecosystems, from the brain to social networks, and from technological to communication systems, therefore falling into the broad and increasingly widespread transdisciplinary cognitive paradigm developed with complexity theories in its ability to describe nonlinear systems, such as biological, ecological, financial, economic, medical and healthcare, and social systems.

What is the future of the cities? How do we combine local and global solutions? Where are the flows of migration going? What is the role of the citizens, the communities and the people? How can we develop equitable solutions to ensure access to life-saving resources? How can we foster technological innovation safeguarding access and inclusion at every social level?

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CUMULUS PRESIDENT'S MESSAGE

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Since Detroit is a UNESCO City of Design, it was the ultimate location to convene globally for sharing knowledge, research, projects and practices responding to the urgent challenges emerging from the environment and society. Additionally, Detroit is speaking a long story of technological, economic and social transformations, which are noteworthy for the design.

Moreover, the partnership developed by the College for Creative Studies for the conference with the Association of Independent Colleges of Art & Design (AICAD) gave participants coming from all over the world a broader view to design education in North America.

The memory of such a rich experience is included in the following volume, which is not only speaking about the conference proceedings, but furthermore, it is celebrating our large global Cumulus community through its common values around open exchange and knowledge sharing.

Finally, we were back in presence!

Lorenzo Imbesi
Full Professor, Sapienza University of Rome
President, Cumulus Association

EXPLORING A NEW MODEL OF GREEN RETAILING: COMMERCIAL BRANDS PARTNER WITH MULTI-STAKEHOLDERS TO BUILD A SUSTAINABLE RETAIL ECOSYSTEM

Jingwen Tian[1], Tanhao Gao[2], Xiaotong Zhang[3], Hongtao Zhou[4]

[1] *College of Design and Innovation, Tongji University*
Tianjingwen0120@gmail.com
[2] *College of Design and Innovation, Tongji University*
yiguandoujiang@gmail.com
[3] *College of Design and Innovation, Tongji University*
xiaotongzhangwood@qq.com
[4] *College of Design and Innovation, Tongji University*
lifeisfurniture@gmail.com

Abstract
Due to the prominence of climate change and ecological adaptation issues, more and more companies are emphasizing the circular economy concept under the framework of sustainable development. However, most of them are studying sustainability from product production and raw materials. This paper, however, examines a coffee brand that has created its first eco-friendly experimental store in Shanghai. It also introduces how it uses brand influence to connect multiple stakeholders, including designers, to spread the concept of sustainability and create a more adaptive green retail model. As we all know, the root cause of unsustainability in the Anthropocene is the lack of sustainability in human social development itself. Therefore, if we want to achieve maximum sustainability in the Anthropocene and the development of new sustainable materials in the field of science and technology, we need to influence people's thinking and lifestyle to adapt to the changing earth.

In this paper, we analyze the contribution of a new sustainable retail business model and operational framework to climate change mitigation through a study of a coffee brand's new retail pilot store. The retail store's sustainable business model framework is based on four main aspects: 1) complete recycling of waste materials to extend their life cycle; 2) reduction of environmental impact through product development and renewal of packaging materials; 3) collaboration with designers to develop a sustainable co-creation workshop system; and 4) development of a "green store" assessment system that covers the entire life cycle with audits and certifications in eight key areas, including energy conservation, water consumption management, and waste disposal.

The coffee brand hopes to build a sustainable new retail network that adapts to the current development. The new retail business in a point of distribution impacts

people's lifestyles, thus promoting the adaptation of the whole society and achieving more sustainable development.

Author Keywords
Green retail systems; sustainability; business models; co-creation; adaptive design.

Introduction

Ecological Impacts Since the Anthropocene

The Anthropocene is a potentially revolutionary concept, not only because it has become synonymous with the unprecedented global environmental impact of humanity, but also because it has long guided the fundamental scientific, social, and academic framework of Western intellectual thought. Philosopher of science Latour (2014) points out that it subverts a traditional notion of an external objective world devoid of human beings because human action is visible everywhere. These statements underscore the need to assess how we understand human social action on a planet transformed by humans, particularly about the historical relationships between humans and other organisms and the material processes and related discourses that shape the environment (Bauer & Ellis, 2018).

> Human activity has transformed between a third and a half of the land surface of the planet; many of the world's major rivers have been dammed or diverted; Fertilizer plants produce more nitrogen than is fixed naturally by all terrestrial ecosystems; Humans use more than half of the world's readily accessible freshwater runoff. (Crutzen, 2002, p. 23)

The Arctic ice sheet is receding, and the polar climate is changing rapidly; the Antarctic ice cap appears to be receding with it soon. The potential for massive disruption has accelerated recent discussions about the Earth's temperature and the sustainability of anthropogenic interventions explored (Burns & Strauss, 2013).

The Anthropocene era has introduced sustainability considerations in a new direction which requires not only adjusting social systems to the limits set by the biosphere but also recognizing the boundaries of the planet. Climate change, droughts, fires, food insecurity, water scarcity, and the resulting social unrest are urgent signs of the Anthropocene era (Hoffman & Jennings, 2015). When we are backcasting at these unsustainable phenomena, we find that the root cause of most of the chain reactions caused by environmental pollution is human behavior and perception.

The Rise of the Circular Economy

The Concept of Circular Economy

The circular economy is literally understood as the economy of recycling and regenerating materials, which essentially belongs to the economic model of resource recycling (Chen, 2018). In general, the circular economy concept aims to improve the efficiency of resource application and achieve reuse while not destroying the laws of natural environmental development so that all kinds of material energy can operate naturally.

In the specific application process, introducing the concept of the circular economy can help people accelerate economic development while minimizing the damage to the

ecological environment and ensure the synergistic development of social economy and ecological and environmental protection (Liu & Wang, 2021). Therefore, the role of the circular economy can make the socio-economic development present the development form of "resource-product-renewed resource," which effectively reduces the waste of resources, improves the efficiency of resource utilization, and does not have an enormous impact on the ecological environment in the process (Zhao & Wang, 2021). The concept of the circular economy and the concept of recycling are the most critical factors in developing the circular economy. Therefore, it can be seen that the circular economy concept is consistent with the concept of sustainable development, and it can guide the future retail industry to be greener.

The Need for a Circular Economy

Urbanization and climate change require cities to find new pathways to a sustainable future so that urban environments may accelerate the shift to a circular economy. Additional acts of commitment are reflected in multiple actions by citizens to address climate change and to ensure progress towards a circular economy by contributing to waste reduction, increased eco-shopping, increased environmentally friendly transportation, or reduced domestic energy. Therefore, considering the need to change citizens' attitudes toward climate change, much must be done to effectively address climate change and lay the foundation for a circular economy (Davidescu et al., 2020).

In the context of urbanization and excessive pollution, circular economy principles are becoming increasingly important and necessary in the path toward sustainable development. The circular economy implies reducing, reusing, remanufacturing, and recycling materials.

The Impact of Education on Sustainability

Education is not only a fundamental guarantee for technological progress but also a meaningful way to raise public awareness of environmental protection and scientific development concepts. Education on the environment and sustainable development can directly influence the lifestyle and consumption behavior of the educated (Sun & Wang, 2017). As the world pays close attention to achieving sustainable development, the "circular economy" is emerging and becoming an important goal in repositioning the global economy and society. Sustainable development is embedded in education and learning, leading to changes in human behavior, thus creating a sustainable society for all. Therefore, using education as a means of communication to introduce the concept of sustainable development to the general public can effectively lead to the establishment of greener lifestyles and habits, thus promoting sustainable development in society (Wang & Jing, 2015).

Framework Building for the New Green Retail

The coffee brand studied in this paper is committed to making visible actions for sustainability and has a simple vision: to grow sustainable coffee, operate sustainably, and strive to be a resource-active company that gives back more to natural resources than it uses. The sustainability strategy is implemented through four action paths: quantifying, reducing, engaging, and offsetting (Figure 1). The company has set a primary goal based on science to reduce carbon emissions, water use, and waste emissions by 50% each by 2030. In 2021, the brand combined the three goals of "reducing carbon footprint, water

waste, and waste" with a sustainable lifestyle and, after more than 500 days of preparation, opened its first Green Experimental Store in Shanghai. The store explores a new model of recycled green retail and encourages more customers to join in a more sustainable lifestyle. The store is designed and built, operated daily, and experienced by customers throughout its life cycle, with sustainable concepts and initiatives running throughout.

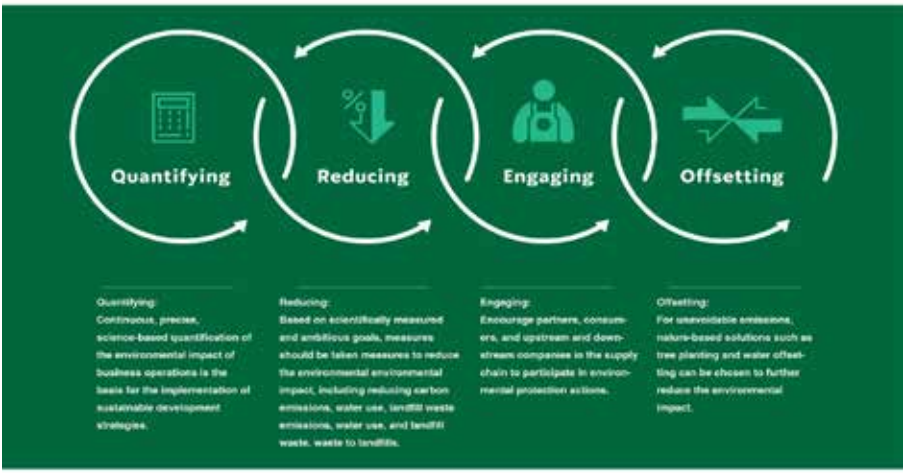

Figure 1. The sustainability strategy is implemented through four action paths.

The sustainable framework for the first green retail pilot store in Shanghai is based on four key aspects:

1. Recycling waste materials and extending their life cycle.
During the design and construction phase, the project team set an initial goal of ensuring that approximately 50% of the store's construction materials were expected to be recycled (Figure 2), upcycled, or degraded in the future (i.e. when the store was demolished or renovated). To achieve this goal, the project team used the RESET Materials Standard[1] as a framework for quantification and review. It uses a recycling strategy that includes a new modular design for the store's entire bar and back area, which can be disassembled and assembled as needed. If the store is remodeled in the future, the old modules can be "re-installed" in other stores. At the same time, the store uses a lot of recycled building materials. For example, solid wood coffee tables from other stores were recycled and composted to make door handles, bar tops, steps, and other facilities for the Green Retail Experimental Store.

The green apron worn by the barista is made from recycled PET bottles that are cleaned, processed, and recycled into polyester chips, yarn, and fabric and finally processed into a unique eco-friendly apron. This recycling program not only reduces the amount of waste generated from PET bottles but also reduces energy and resource consumption and the product's carbon footprint compared to traditional textile processes. A green apron can reduce greenhouse gas emissions by approximately one kilogram over its lifetime.

It is also the first coffee store in China to recycle 100% of the coffee grounds in the store. The coffee grounds are composted and used as organic fertilizer for crops and shopping mall gardens. Moreover, some coffee grounds are also used as raw materials for straws, food packaging, and store furniture.

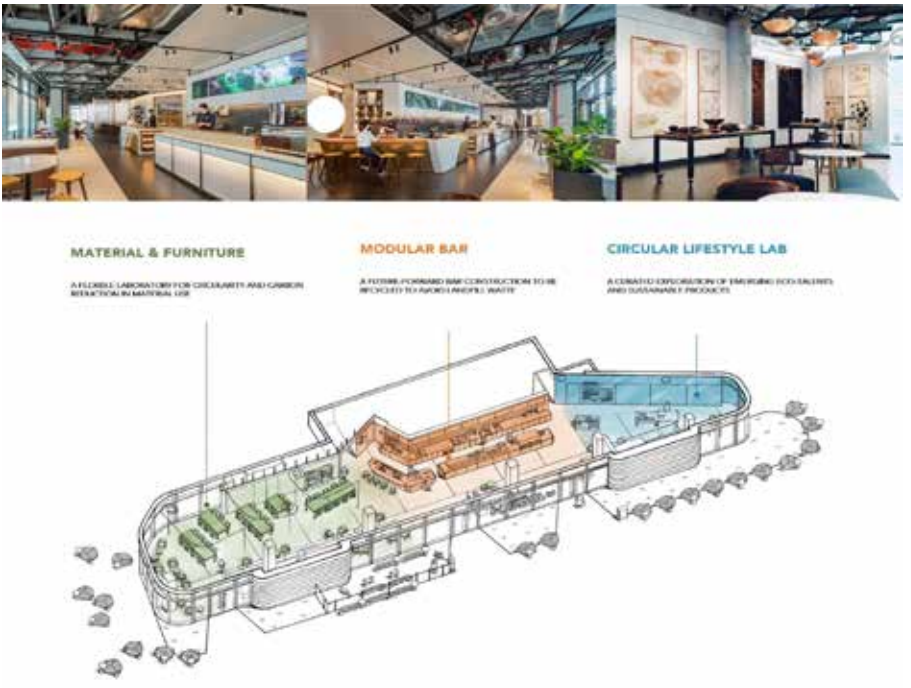

Figure 2. Interior layout of the new retail coffee shop.

2. Reducing environmental impact through product development and updating of packaging materials.

More than 50% of the food and dairy-based beverages in the coffee shop will be replaced with plant-based ingredients, and oat milk will be the default for dairy-based beverages. The store is also introducing fifteen new plant-based meal options, including various baked goods, sandwiches, and cakes, giving customers a richer taste and more sustainable consumption. Each oat milk chocolate muffin is estimated to reduce greenhouse gas emissions by sixty grams compared to conventional muffins containing animal fats and oils, equivalent to an electricity saving of 0.1 kWh.

Guided by the need to reduce plastic waste and promote a recycling lifestyle, the coffee shop has launched a reusable to-go cup and is encouraging dine-in customers to use store cups or bring their cups as much as possible to reduce the consumption of disposable tableware. All of the coffee brand's stores have stopped using plastic straws, reducing plastic use by approximately 200 tons per year. This includes the introduction of biodegradable lunch boxes, reusable plastic cups, and merchandise made from recycled disposable beverage containers.

Through plant-based food initiatives and the cessation of plastic products, the coffee shop is influencing the lifestyles of its customers, using sustainable living as an entry point and gradually influencing the sustainability of the entire ecology.

3. Coordinate stakeholders and develop a sustainable co-creation education platform for the general public.

For the first time, a co-creation education platform called "CIRCULAR LIFESTYLE LAB" (Figure 2) has been created in the coffee shop, which is open to the public for free. In order to spread sustainable ideas and expand its influence, the coffee company coordinates designers, artists, and doctors in the field of sustainable design as instructors of the co-creation platform. It cooperates with elementary and junior high schools to cultivate sustainable concepts for young people.

The platform is divided into two parts: an in-store sustainable mini art gallery and regular, sustainable public engagement workshops.

- The Sustainable Mini Art Gallery invites like-minded designers and artists to create sustainable-themed works using retail waste such as coffee grounds as the primary material. Artistically, the gallery gives unique meaning to the discarded materials. As customers view these artworks created from waste, they feel the value of discarded items and think about how waste can be reused.
- The Sustainable Public Engagement Workshop (Figure 3) is a co-creation platform established by the coffee shop in collaboration with designers, artists, primary and secondary schools, and other individuals and organizations. The workshops are organized weekly with different themes, but the overall direction revolves around the concept of sustainability and the preparation of waste and biodegradable materials as raw materials for creation. Workshop participants self-register and can personally create usable objects from waste materials during the workshops, such as candles, jewelry, and tableware made from coffee grounds. Through this workshop platform, the public can personally transform materials usually regarded as waste into everyday objects in their lives. With a bit of criticism, this educational platform stimulates the public to reflect on unsustainable behaviors and subconsciously motivates people to see sustainable behaviors as a new trend, gradually changing their lifestyles and consumption concepts.

Figure 3. The Sustainable Public Engagement Workshop.

4. Develop a "green store" assessment system covering the entire life cycle
The coffee brand officially launched the "Green Store" certification system. The brand and authoritative organizations developed the certification system, and the scope of examination covers the entire life cycle of the store.

For audit and certification, as many as forty indicators are focused on eight critical areas with the general categories of energy-saving, water consumption management, and waste disposal. As a new generation of brick-and-mortar store standards for the future, the "Green Store" system not only focuses on traditional store design and construction aspects such as water, electricity, and environmentally-friendly refrigerants, but also focuses on new perspectives related to store operations and consumer experience. For example, indoor noise reduction, indoor air quality, public transportation convenience, reduction of disposable packaging, and healthier and low-carbon plant-based meals reflect the coffee brand's determination to invite more consumers to experience sustainable lifestyles.

Feedback from the Green Coffee Retail Experimental Store
Since the store opened in September 2021, it has received 120,000 visitors and has been disseminated online more than 3.5 million times, radiating to a wide range of people and a large audience. Meanwhile, this project was nominated by the *26th UN Climate Change Conference of the Parties (COP26) and included in the 2021 Business Climate Action Cases.*

Through proactive initiatives to improve the energy efficiency of its stores, the Green Store has been measured to reduce carbon emissions by an additional 15% per year compared to a similarly sized coffee store in 2019. The coffee brand plans to open sixty certified "green stores" in mainland China within the next year and gradually expand to the mainland market, inviting more consumers to join in practicing sustainable lifestyles.

In this way, it will form a new green retail ecosystem that will contribute to the low-carbon development path of the retail industry in China and globally.

Conclusion

Industrialization has accelerated humankind's destruction of the environment, and nowadays, sustainable development has become the primary development strategy for many countries and even companies. Therefore, this paper explores the future direction of retail development by examining the model of China's first green coffee retail store. Although it is only a little coffee shop that makes green action, the coffee enterprise cooperates with designers and artists and builds a perfect business model for a green retail store in terms of construction, user behavior, platform building, and evaluation system. The construction of an educational platform truly influences the sustainable behavior of the public subtly from the perspective of user participation.

The coffee brand hopes to use this green coffee retail store as an experiment to establish a new sustainable retail network and gradually impress the public's consumption concept and sustainable thinking. The brand hopes to promote sustainable and adaptive development of society, drive social innovation, and create well-being for generations of people.

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[1] The RESET Materials Standard is a data-driven standard for collecting and organizing materials data for the built environment.