Sustainable Workplace in Kyoto – ‘Kyo-sei’ in Society 5.0

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Abstract. At Takenaka Studio in Singapore University of Technology and Design (SUTD), as a design workshop of the faculty of Architecture and Sustainable Design, I selected the area in the middle of Kyoto, Japan for the projects to design today’s ‘sustainable workplaces’. While examining the current situation of the city as well as the urban structure and context from old age, the students gave forms to a space to work/live together in Kyoto of today and proposed several new ways of co-working/living in Society 5.0, where the co-existence of diversified population is essential and we’ve tried to achieve not only SDGs 11: Sustainable cities, but also 3: Well-being for all ages as well as 9: Resilient infrastructure for fostering innovation.

1. Introduction
“Kyoto is facing an acute shortage of office spaces” according to the Nikkei Newspaper Online on June 17th, 2019. A rapidly growing number of inbound tourists to Kyoto, the old capital has demanded the urgent securing of hotel rooms, which has been, in fact, suppressing the new opportunities of office development, undermining the potential of the city for business competitiveness. According to the article, the vacancy rate for office rental properties in Kyoto was 0.5% in the fiscal year ended March 31, 2019, which was lower than cities such as Tokyo (0.6%), Osaka (1.3%), and Kobe (1.7%).

‘Kyo-sei’ is a Japanese word meaning Symbiosis/Co-existence, redefined by Architect, Kisho Kurokawa around 1960 based on the Buddhism understanding of Co-living as well as the biological term, Symbiosis. Kurokawa was predicting sixty years ago that the Age of Machine in the first half of 20th century was shifting toward the Age of Life in the 21st century. [1]

In 2016 the Japanese Government coined and published the concept of ‘Society 5.0’ as future society that Japan should aspire to. It follows the hunting society (Society 1.0), agricultural society (Society 2.0), industrial society (Society 3.0), and information society (Society 4.0). Society 5.0 is expected to achieve a high degree of convergence between cyberspace (virtual space) and physical space (real space). While Industry 4.0 is dealing with the future of industry, Society 5.0 is more focused on Human-centered society. [2]

At our studio the students were instructed/encouraged to consider a workplace in today’s Kyoto, which should show the understanding of a place for co-working/co-living for the people of different generations, yet with sustainable setting with the view of changing circumstances in the old capital. Here the students needed to consider not only tourism but also business environment with the view of future cities where real and virtual relations are both working.
2. Approach and investigation

The students (sixteen in all, in twelve different groups) at the studio carefully located their suitable sites for their design challenges and developed their solutions to the problems that they found in their surveys.

2.1. Site in the centre of Kyoto

The selected area for the sites of the workshop is the center of Kyoto where a lot of tourist attractions are located. It is also the area of mixture of developed cityscape and the natural scape of the Higashiyama Mountains. (See figure 1.)

2.2. Reference projects

As a part of workshop, the students visited some reference buildings in Kyoto and Osaka, which represent old and new 'sustainable' buildings in Japan, and learned several practical approaches to sustainable workplaces.

2.2.1. Chochiku-kyo. Architect, Koji Fujii designed and built his own experimental house in the suburbs of Kyoto in 1928. The house is an advanced green building that considers environmental design almost at the first time in the modern age of Japan. (See figure 2.)

2.2.2. Mido Building. The Osaka Main Office of Takenaka Corporation, built in 1965, had an intensive renovation works recently and revitalized as innovative working places that fit the needs of current co-working environment. (See figure 3.)

2.2.3. Abeno Harukas. The building complex completed in 2014 is not only the highest skyscraper in Japan, but a remarkably green building with a lot of green features. Just like the above-mentioned Chochiku-kyo, utilizing nature (natural lighting, natural ventilation) is the key to the environmental design. (See figure 4.)

2.3. Lectures

In the course of workshop, several lectures were given to provide the students with some practical ideas on the issues of sustainable workplaces.

2.3.1. Sustainable buildings. Chochiku-kyo and Abeno Harukas, the oldest and one of the latest green buildings in Japan were the subjects of detailed explanation on the sustainable design and engineering.

2.3.2. Workplaces. Several projects of Activity-based working (ABW) environment with the ideas of 'communication and collaboration' have been introduced, explained and discussed. Programming and Space structure planning were referred and suggested to consider deeply.

3. Projects

While respecting the local/historical context and proposing new modality of workplaces in the city centre, the projects illustrate a variety of solutions to the issues of cultural society with the attractions of both tourism and business. The projects of the students have been developed to be finally categorized into three directions. They were being consolidated into the following three topics:
- To conserve and to transform the existing built environment
- To revitalize unused/disused space
- To invent new Architectural morphology to utilize unusable sites

3.1. To conserve and to transform the existing built environment - A and B projects
The projects by Ms Varshah Gunasagar (A project: See figure 5.) and Mr Ryan Teo Jun Yan (B project: See figure 6.) are in this category. To conserve the existing block(s) of traditional shop houses and to transform into new co-working/co-living spaces.

![Figure 5. A project.](image)

For the both cases, the students kept the existing structural frame works and brought into additional elements that will transform the existing spaces into new vivid spaces.

3.2. To revitalize unused/disused space - C and D projects
The projects by Ms Liang Xiuling Cloe (C project: See figure 7.) and Ms Chong Kar Wei + Ms Michelle Gouw (See figure 8.) are categorized in this scheme. To revitalize unused/discussed spaces and to create new structures to give new viewpoints to the sites are the aims of the proposals.

![Figure 6. B project.](image)

![Figure 7. C project.](image)
For the both projects the new structures are non-contextually added to the existing spaces but revitalizing the imagination of the users who have known the existing situation well.

3.3. To invent new Architectural morphology to utilize unusable sites -E and F projects

The projects by Ms Chen Yu-Hsuan Michelle + Ms Ong Hui Sin (E project: See figure 9.) and Ms Low Si Hong (F project: See figure 10.) are here. To invent new configurations with which unusable sites are utilized. The unusable site such as a cemetery has become a big open space, above which a huge structure is floating. In order not to disturb the existing yard, the supporting structure were carefully designed and even the natural lighting situation was simulated so that the impacts of this new structure to the circumstances will be minimized. Over the stream of the Kamo River the bridge-like structure was proposed. It will serve as an uncommon workplace and connect the both side of the river.

4. Conclusion

As I reported in WSBE17, it is essential to offer a rich and varied living/working space and quality environment not only reducing environmental burdens. To create a “sustainable society”, this idea should apply not only to individual buildings, but to district or town scale planning.

“The understanding of the built environment can hardly be separated from that of its inhabitants, whose interests, needs, attitudes and expectations vary from case to case and often change due to growing influences of technological progress, globalization, ideologies and consumerism.” [3] The created projects here showed intriguing challenges, the thoughts of which can surely be applied to any other cities in South-east Asian countries with locally adapted/refined approaches.

References
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[2] Hitachi and UTokyo Joint Research 2018 Society 5.0, 001-005
[3] Hee, L and Trivic, Z with Viray, E and Boontharm, D 2012 FUTURE ASIAN SPACE - Projecting the Urban Space of New East Asia, xxvi