

Smart Offices to Achieve Workstyle Transformation

INTRODUCTION

“Smart offices” that utilize the latest technology to create a comfortable working environment are attracting attention, whether it be to arrange workspaces and equipment in an optimal manner according to the flow of employees, or to identify people with sensors and automatically adjust air conditioning and lighting to the optimum temperature and brightness. Smart offices not only aim to improve operational efficiency by creating a comfortable working environment for employees, but are also effective in securing excellent human resources by making them want to work in such an environment. For those in charge who are considering opening a new office or renovating their office, it is a kind of work style reform that they may want to actively work on.

CONTENTS

Smart offices for comfort and productivity	02
The growing smart office market.....	03
[Asking an expert] Employees picking the work environment...04-05	

Aiming for offices adapted to hybrid work.....	06
Layouts where employees can naturally interact	07
Automatic adjustments to lighting and temperature	08

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1. Smart offices for comfort and productivity



The spread of COVID-19 that occurred in 2020 has forced the world to review the way their offices work. The impact has been particularly significant in the Asia-Pacific region, with more than 60% of respondents in Singapore and Australia saying in a survey*1 conducted by NNA Inc. in April 2023 on Japanese expatriates (Figure 1) that their offices had implemented telework. The percentage was quite high compared to those of many other Asian countries, which were around 10 to 30%. On the other hand, according to the Ministry of Internal Affairs and Communications' Reiwa 3rd year edition of the "White Paper on Information and Communications"*2, there was not much change in the United States and Germany, partly because the telework rate was already high before COVID.

It is also pointed out that an increasing number of companies are setting up business bases other than their existing offices and relocating and dispersing their headquarters due to COVID. The newly established business bases are called satellite offices or remote offices, and are intended to improve operational efficiency and be used with telework.

Useful for securing excellent employees

The movement to introduce the latest equipment and implement smart offices doesn't stop with satellite offices. There is a movement to introduce it at major offices in Japan and even at overseas sites. When you think of a smart office, you may strongly associate it with utilizing IT technology, but this is not necessarily the case. Efforts utilizing the latest research in architecture and ergonomics to devise designs that enable comfortable and healthy work environments can also be said to be smart offices.

For example, based on the results of analyzing the flow of employees in the office using AI technology, one could optimize the layout of workspaces, communication spaces, and kitchens. Another type of implementation that has begun is making use of recently released small sensors to detect the number of employees in the office and where they are located in order to automate the turning on and off of and dimming of lights.

Creating a comfortable and healthy office environment motivates employees. Smart offices can be expected to improve productivity and operational efficiency, which in turn leads to an increase in the profit margin of the company. In recent years, it has become difficult to recruit excellent human resources due to labor shortages, and smart offices that make their company look more attractive than other companies are effective in terms of securing human capital.

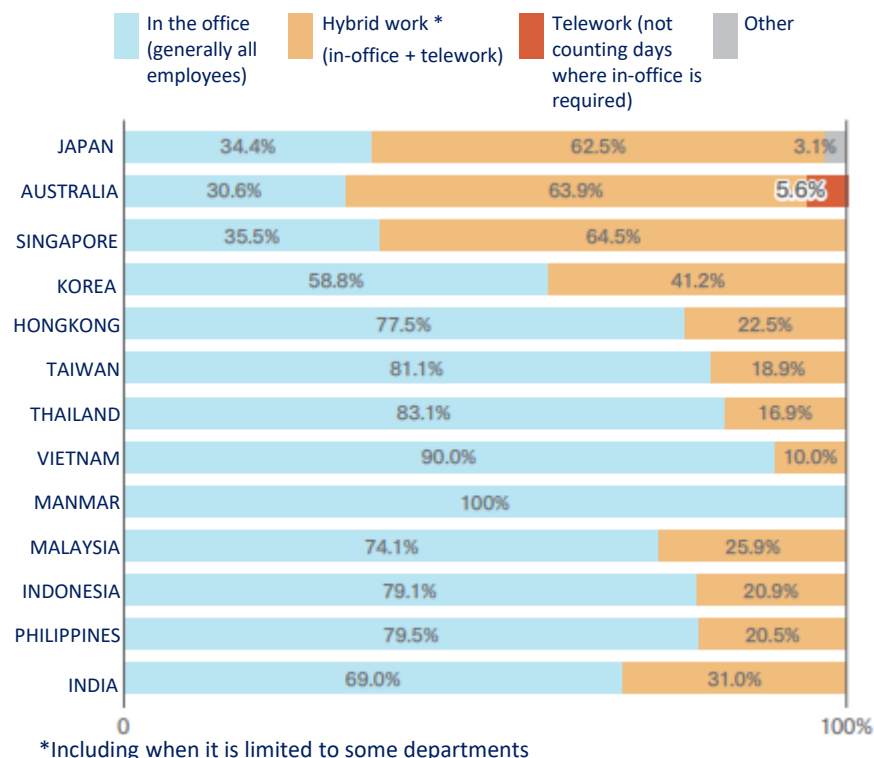


Figure 1: Results of survey of Japanese expatriates in the Asia-Pacific region about their work schedules in April 2023 (Source: NNA POWER ASIA, Inc. article dated May 8, 2023)

2. The growing smart office market



Will the momentum for the introduction of smart offices continue in the future? A global smart office-related business market size survey*3 conducted by Global Information Co., Ltd., predicts the market will grow from the US \$35 billion (approximately ¥5 trillion) of 2021 to US \$73.8 billion (approximately ¥10.4 trillion) in 2027, at a CAGR of 13.14% between 2022 and 2027 (Fig. 2).

The company points to two events as the main factors driving the smart office market in the future. The first, of course, is the move to improve operations by introducing innovative solutions that leverage the Internet of Things (IoT) and better software solutions that are more cost-effective and reliable. The other is the corporate social responsibility for carbon neutrality, which is a move to improve equipment such as lighting and air conditioning to minimize energy consumption, and to introduce renewable energy.

Forward-thinking office improvement to improve employee productivity

According to the White Paper on Information and Communications of the Ministry of Internal Affairs and Communications, IT-related systems that were widely introduced in 2020 with the spread of COVID were mainly mobile devices such as laptops and tablets, network equipment for accessing internal information from outside the office, communication tools such as Slack, groupware for sharing internal information, and remote video conferencing systems such as Zoom*4.

However, the results of this survey come at a time when many companies were forced to introduce telework due to the pandemic, and these IT-related investments did not necessarily lead to improved employee productivity. For example, according to the FY2020 Annual Economic and Fiscal Report*5 compiled by the Cabinet Office, 51% of respondents said that their work efficiency and productivity had declined due to the impact of COVID, while 10% said that they had improved. As analyzed in the same report, it was a "backward-looking" investment that lacked awareness of operational efficiency.

On the other hand, according to the results of a survey conducted from FY2016 through FY2018, before the outbreak of COVID, companies that voluntarily introduced telework increased their productivity by 15 points compared to companies that did not. In other words, "forward-looking" investments can certainly lead to increased employee productivity. Of course, investing in smart offices after COVID should also lead to improved productivity so that employees can work comfortably. From now on, we will likely see a period where companies compete to see how they can build smart offices that will lead to improved competitiveness and work style reforms.

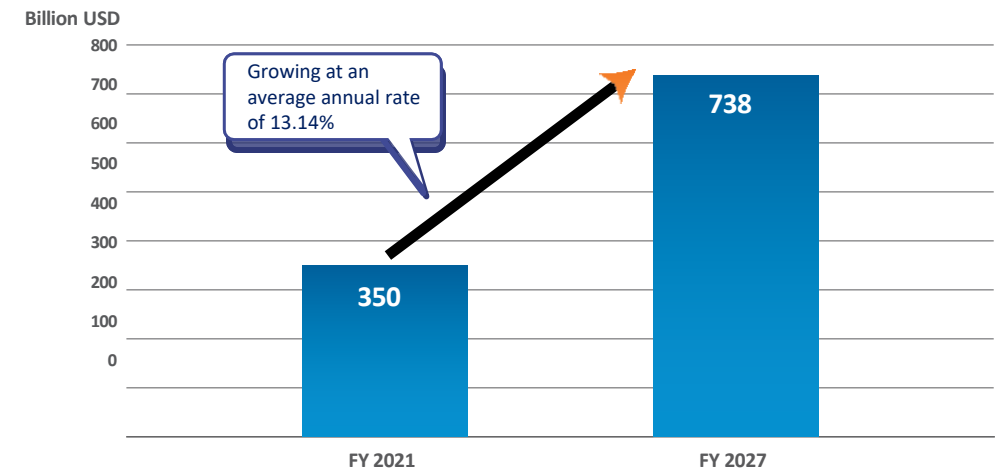


Figure 2: Global Information Co., Ltd. forecasts that the global smart office market will grow from US \$35 billion in 2021 to US \$73.8 billion by 2027 (Source: Global Information Co., Ltd.)

3. Ask an expert Employees picking the work environment



As the world increasingly introduces smart offices, what should we do with our offices? We asked Professor Shinichi Tanabe of the Department of Architecture at Waseda University, who has specialized in the study of indoor environments for many years with the aim of creating a comfortable and healthy environment for people, for his views.

ABW allows freely choosing a place where one can work comfortably

When thinking about the future of the office, Professor Tanabe recommends the concept of "ABW (Activity-Based Working)."

— ABW is a system in which employees can freely change their work location according to their work content and mood. It is often thought that it is the same as a free address system, but it is not. A free address system, which focuses on reducing used space, may result in employees having to sit in places they don't want to, which may not lead to an improvement in work efficiency. With ABW, you can work not only in the office, but also from your home, a café, a satellite office, etc. Communication can be done in the office, booths can be used when you want to concentrate, and cafes can be used when you are thinking about new projects. In this way you can choose the environment based on the kind of work. It is not efficient to carry out all the various intellectual production activities in a one-size-fits-all office. We need to think about the workplace scientifically.

The form of the office varies depending on the country and region of the world. In Asia, it was common to have a large office for each department, and in Europe and the United States, it was common to have a private office with partitions for each employee.

-It may be difficult to suddenly begin ABW, but as a company aiming for a smart office, it is important to analyze your company's business style and design your workplace. There are two main types of work styles in companies: job-type and membership-based. The former is a form that has been adopted mainly by companies in Europe and the United States, and allows employees to work on an individual basis. In the office, in order to improve the work efficiency of individuals, the seats are surrounded by high partitions to prevent noise from reaching them.

If you are a company that focuses on job-based work, you can make your main office more comfortable by introducing private rooms, while at the same time reducing the burden of commuting on employees and improving their work efficiency by setting up satellite offices. When Japanese companies expand into countries and regions where job-based work is commonplace, such as Europe and the United States, it is also important not to impose Japanese ways of work. It is desirable to plan according to the local customs. It is also, however, necessary to take measures to promote communication.



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Graduated from the Department of Architecture, Faculty of Science and Engineering, Waseda University, and completed the master's program at the graduate school of the same. He specializes in indoor environments and has served as an associate professor at the Department of Life Sciences at Ochanomizu University, a visiting professor at the Technical University of Denmark, and the 57th president of the Architectural Institute of Japan. Currently, he is also active as the director of the Advanced Collaborative Research Organization for Smart Society at Waseda University. His focus is on the spread of energy-saving, comfortable, and healthy houses and other buildings using IT technology.



What kind of smart office is suitable for companies that mainly do membership-based work?

-Companies like Japan that operate on a membership basis generally use desks for each department in a large room, and low-height partitions. There can be times when it is necessary to be in the same place and sharing tips with each other to do work, and this configuration has the advantage that one can quickly communicate within the team as needed. However, it is also necessary to consider that it can be difficult for individuals to concentrate. Whether it is job-based work or membership-based work, communication is becoming even more important post-COVID. For this reason, there are an increasing number of advanced companies that have installed stairs that directly connect upper and lower floors as well as kitchens on the floors so that employees can have casual conversations while drinking coffee. By increasing opportunities for various employees to come into contact with each other, it is easier to communicate not only within departments but also between departments, and to expand the possibility of planting new seeds of business. This part cannot be compensated for by the current web conferencing options alone.

New technologies transform offices into easily usable and comfortable spaces

Professor Tanabe says that the advantage of smart offices is that they can improve the comfort and health of the work environment using advanced technologies such as AI (artificial intelligence) and IoT, regardless of whether they are job-based or membership-based.

Business format	Job type	Membership type
Summary	Each employee proceeds with his or her work according to a predetermined job. Mainstream in Western companies.	Produce work results through team discussions. Common in Asian companies such as Japan.
Common office types	Private rooms or cubicles separated by high partitions are the mainstream.	Large rooms without partitions or with low partitions are the mainstream.

-Entry control systems with facial recognition and temperature measurement functions are already commonplace. Infrared sensors are being used to automatically turn lights and air conditioning on and off when entering a room, and automatic dimming systems are being introduced to increase the illuminance only where employees are present. This saves on electricity bills without compromising the comfort and health of employees. However, in my research for one year, I looked at the productivity of an office and found that when the room temperature rose by 3 degrees from the comfortable temperature to 28 degrees, the productivity of the work dropped by 6%. Since there are differences in what temperatures are considered comfortable between men and women and between individuals, personal air conditioning has also been introduced.

Professor Tanabe also points out matters to note when setting up a smart office.

-After COVID, I don't think we will return to the pre-COVID state, where face-to-face meetings were the mainstream. I think that convenient tools such as web conferencing and satellite office use will be used more and more in the future. In smart offices, there are many cases where you can meet remotely with members inside and outside the office using a video conferencing system. In this case, an environment with high communication speeds, such as a high-speed line, is required, but it is not enough. Humans also get a wide range of information from the facial expressions and gestures of others. There is a disadvantage that it is difficult to convey detailed nuances with only the video and audio of a typical camera in the current web conferencing systems. As remote communication tools that solve this problem, we are looking forward to the advancement of technologies such as the metaverse (virtual space) where you can see the facial expressions of the other person through avatars.

4. Aiming for offices adapted to hybrid work



What kind of office should you aim for to improve your employees' daily work and working environment? Let's take a closer look at smart offices. In the future there is no doubt that there will be increased adoption of the so-called "hybrid work" style of work, which combines traditional office work in which employees come to the office and telework in which people work remotely, such as from their home or co-working space. It is important to think about smart offices and how they relate to the hybrid work style.

System-level support for ease of work

If you can work under the same conditions for a company anywhere as long as you have a network environment, you become able to shorten your commuting times and stagger your working hours. Various systems have emerged to support these location-independent ways of working. These include tools to compensate for the lack of communication within the team, which is a concern due to not being in the same office. For example, groupware and internal SNSs make it easy to make necessary contact between members of the team, both inside and outside the company. If employees can easily communicate with each other about their daily lives, it deepens their understanding of each other's personalities. If you introduce a video conferencing system that allows employees to see each other in addition to audio, or a virtual office tool, employees can communicate as if everyone is in the office, regardless of where they are located. Not only for meetings, this could also allow chatting as if by each one another's desks, as if everyone were physically in the office. For newly opening offices, one should prepare spaces where voices do not leak to the surroundings in anticipation of the use of video conferencing systems. It is also effective to introduce a system that visualizes the usage status of meeting rooms and the locations of employees. By visualizing meeting room usage, you can manage not only room availability and reservations, but also the frequency of use of rooms. If you can grasp seating information such as who is sitting where even in offices that have introduced free addresses, this will help support hybrid work.



5. Layouts where employees can naturally interact



At the time of COVID, there was also a movement to reduce costs by preparing a free-address environment on the office floor where employees can freely choose their seats, reducing the need for office space. While these offices work well with job-based work, there is a risk of inefficiency for work where team collaboration is critical. "Free addresses should be introduced on a case-by-case basis, with careful examination of the workflow assigned to offices in advance," says Professor Tanabe.

In a smart office for membership-type work, the main point of work style reform is how to maximize collective intelligence. From this perspective, one could use an AI system to analyze the location information of employees on the floor to identify the flow of people and places where people are likely to gather, and optimize the layout of seats, office equipment, conference rooms, kitchens, etc. This is to create an environment where meetings can be held as soon as employees come up with ideas, and business hints can be born from conversations where people naturally gather and exchange ideas. When one analyzes the locational information of employees on the floor, they may see that "there are conference rooms and meeting spaces that are not used much," says Professor Tanabe.

Depending on the nature of the work and the composition of the workforce, the optimal office layout can often change. To make it easier to deal with these situations, it is a good idea to allow power strips or hubs to be moveable to some extent and not fix them to walls.

Stairs and kitchen in the middle of the floor

As an example of a layout, one can add an inner staircase that connects upper and lower floors and a kitchen in the middle of an office floor to create a space where people can naturally gather, thereby stimulating communication opportunities. According to Professor Tanabe, there is also an increasing demand for restrooms to be installed directly in offices. It is common for offices to have restrooms adjacent to common areas such as elevator halls and corridors, but then you need to go through an entry and exit check every time you go to one. In order to prevent the possibility of forgetting to bring your admission pass and not being able to return to the office, or to prevent the leakage of business secrets, it is preferable to have a restroom in the office area if possible.



6. Automatic adjustments to lighting and temperature



Finally, we will discuss smart offices that make the office work environment more comfortable and lead to improved work efficiency for employees. As part of measures to combat global warming, "Cool Biz" was introduced in Japan in 2005 to set the room temperature of offices to 28 degrees Celsius in the summer. Professor Tanabe was in favor of Cool Biz, but strongly opposed the room temperature setting of 28 degrees Celsius. In fact, there is a case where Himeji City Hall was able to reduce overtime hours when the set room temperature was lowered from 28 degrees Celsius by 3 degrees. "If a company's labor cost is considered as 100, the rent for an office is only about 10 even in an urban center, and the electricity bill required to lower the room temperature by a few degrees is about 1. Energy reductions should be balanced with comfort and health," says Professor Tanabe.

Large individual differences in which temperatures are comfortable

However, what temperature you feel is optimal varies from person to person. For example, an office worker may set the temperature high, and then an employee returning from outside the office lowers it in the evening. Under these circumstances, the best way to achieve the optimal temperature setting for each employee is to prepare separate spaces with normal and weak air conditioning, like on a train. Alternatively, there is the idea of using personal air conditioning that can only be used around individuals, such as setting the room temperature high and using auxiliary air conditioning and fans locally for employees who prefer a lower room temperature. Recently, the development of chairs with air conditioning functions has also progressed. In the future, it will be possible to identify individuals with IC tags and smartphones, and to provide local air conditioning tailored to that person. By automatically changing the color temperature of lights according to the course of the day and helping employees to a healthy biological rhythm, it is possible to reduce the risk of sleep disorders, obesity, diabetes, depression, and dementia among employees. To make your office more comfortable, don't forget about the scenery you see. Humans generally prefer green, so it's also important to make sure that the view from the window contains as much lush greenery as possible. If there are parks or tree plantings nearby, install windows to get a good view of the scenery so that employees can take a break while they work.

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