

The differences between the worldwide certification system and the Japanese local system for well-being and usage practically

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Abstract. The aim of this study is to identify the difference between WELL Building Standard (WELL) and CASBEE-wellness office (CWO) for well-being and to provide a key to apply them effectively. The research methodology can be summarized into two steps. The first step is to compare the WELL and CWO to identify the strengths of these certifications. The second step is to conduct interviews with construction firms which obtain WELL certification and CWO, suppliers, and a consultant which provide these certifications. The results of the investigation show that WELL is focused on both building environment and services. On the other hand, CWO affects buildings more than services for workers. In addition, according to the results of the interviews, CWO has not been introduced by owners because the effects of the certification have not proven. The effects of CWO should be obvious just as they are in WELL. If the thresholds of CWO are fixed, the certification should be used as the well-being certification that affects buildings strongly in the first step when the project starts. We concluded that both certifications will be utilized effectively by using their strengths.

1 Introduction

Work styles have been paid much attention all over the world in recent years since well-being at the workplace is the crucial factor to worker's health, productivity and safety etc. Moreover, the Ministry of Health in Japan promotes "Act on the arrangement of related acts to promote work style reform" [1]. For this reason, several work styles have been proposed and conducted such as Activity Based Working for mental health and productivity of workers [2]. In addition, COVID-19 is affecting our life and forced us to change our life style differently. Hence, the worth of the building should be reconsidered. While some certification systems have been established to secure the quality of healthy environment of buildings, project owners must apply different certifications based on their purposes.

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WELL Building Standard (WELL) [3] is one of the very recognized certification systems established in the US in 2014 to evaluate building environment, human health and well-being. The building can enhance worker's productivity related to the projects because the environment of a building is supported by the latest scientific research. The first version was revised in 2018 as v2 pilot and the pilot version was used as a reference in this paper. The v2 pilot consists of 10 concepts (Air, Water, Nourishment, Light, Movement, Thermal Comfort, Sound, Materials, Mind and Community) which are of importance for health. Each concept consists of features likewise and are either precondition or optimization. The projects have to fulfill all precondition and obtain more than 40 pts. The level of the certification depends on the points. There are 237 parts in the v2 pilot targeted in this paper except "V01 part1 Design Active Buildings Communities" and "T09 part3 Support Outdoor Nature" because these parts require achievement of other parts.

CASBEE-wellness office (CWO) [4] is a local certification system used in Japan for wellness offices established in 2019 and adopts a self-assessment system. The contents of the certification are expanded to certification of CASBEE in terms of health promotion and productivity. It consists of five concepts (Qw1.Health and Comfort, Qw2.Convenience, Qw3.Safety, Qw4.Operational Management and Qw5.Program). Each concept has separate parts, and all parts are evaluated in it. All 60 parts are the targets in this paper.

Little attention has been paid to well-being certifications in building engineering field and there is no thesis to compare the most applied certification system with local certification systems. Recent studies have explored effectiveness of wellness [5] and the possibility of existing buildings to obtain the certification without repair work [6] are discussed. In addition, the potential of using Building Information Modeling (hereinafter referred to as BIM) has explored and a rating analysis system for WELL is created. For example, a methodology framework to combine BIM with WELL is proposed [7]. However, little attention has been paid to discuss the system of the well-being certification systems and characteristic of these certifications.

Therefore, this study discussed the differences between WELL and Japanese local certification system CASBEE-wellness office and proposed a way to choose certification systems for purposes in accordance with the application and revision of the Japanese local certification instead of as a backwards compatibility of WELL with the same contents. This study aims to improve well-being for workers in buildings by comparing the certification and explain how the certifications are used. Criteria for comparison include whether the parts have thresholds and whether the workers have the option to choose the purpose and number of each function. Clear distinction was found through the comparison.

2 Methodology

This study analysed the components of the certification systems and advantages of each certification to be applied. Thus, the methodology can be summarized into two stages. In the first stage, the certifications are analyzed to identify the advantages comparing the certification systems such as forms of elements (tangible/intangible). Three analyses were conducted in this stage. These analyses are on the forms of elements, whether the parts have thresholds or not, and options for workers to adopt the contents of the certification. In the second stage, interviews with construction firms, a supplier and a consultant regarding the certifications were conducted to apply these certification systems in a practical stage and to identify differences between WELL and CWO.

2.1 Advantages of the certification systems

2.1.1 The affection of certifications for real estate

The certification systems consist of two elements of chattel parts and services for buildings and workers or real estate parts for buildings. The factors should be considered because it affects the worth of the building and have to be registered to Ministry of Justice [8]. The ratio which calculated the number of the parts for real estate divided by the number of total parts can explain the focus of the certification systems. Both certification systems are for well-being of workers in a building. However, there is a possibility not to focus on the building materials or the building performance even if the certification is to be applied to the buildings, because the certifications provide much more value to worker's health and well-being. Thus, the ratio of the parts for real estate can explain the characteristics depending on the certification.

2.1.2 The morality of the certifications

All parts of the certifications should provide a suitable environment for worker's health and well-being. In case that the parts do not have thresholds, the effectiveness of the part may not work properly. In addition, threshold is one of the systems to reduce the arbitrary judgement and predictability problems [9]. Thus, some parts need to have thresholds in order to provide expected effectiveness in a project. In this analysis, the parts were classified on whether the parts have thresholds. The part is considered as having thresholds if the requirement prohibits something such as "X05 part 1 Manage Hazardous Materials".

2.1.3 The flexibility of the certifications for workers

WELL is the most applied certification systems for workers health and well-being in the world. Therefore, there are parts of WELL which should be universal and workers should have the options to apply. Even work environment of seat selection affects satisfactions of workers [10]. In addition, local certification system CWO focuses on Japanese work life and improves CASBEE in terms of creating knowledge. There is a possibility in CWO for being inflexible for workers. In the analysis, the parts were classified whether workers can choose to apply the contents of the part or not. For instance, "W01 part 1 Meet Sediment Thresholds" is the thresholds for water of human consumption. These parts are classified as compulsory parts. "V02 part 1 Support Visual Ergonomics" is the requirement to place adjustable computer monitors which workers can change the monitor heights. These parts are classified as optional parts.

2.2 Interviews with construction firms, supplier and a consultant

There is no study to compare the well-being certifications. Therefore, the certifications should be compared first. In the other hand, there are a few projects which obtain the certification. The certification has to be discussed in a different mean because the certification may have problems which project owner cannot apply. For instance, 198 cases obtain LEED in Japan [11]. However, the projects being certified WELL including precertified projects are still 128 cases [12]. There can be possibility the well-being certifications are not known by projects owners in japan or these have critical problems from owner side [13]. In this step, interviews are conducted to explore the problems and how building owners distinguish these certifications practicality. The numbers of three

group are 2 people from construction firm A, 4 people from construction firm B, 2 people from a supplier and 1 person of consultant. The main questionnaire in the interviews consisted of four questions shown as below:

- (1) What are the parts which project owners want to choose and would not like to choose in the certifications?
- (2) What are the factors that the owners decide to choose either WELL or CWO?
- (3) What are the differences between green building certifications LEED with CASBEE and WELL with CWO?
- (4) What is the effectiveness to obtain well-being certifications?

This is the first study to compare well-being certification system. Therefore, the interviews have to include contents to make sure the differences of certification systems. First of all, WELL is the certification which the projects owner can choose the parts to apply. However, CWO is the certification which all parts are related to the final score. In addition, some additional questions were discussed related to the above questions. The questions are related to the possibility if CWO will be used in Japan more than WELL and how it should be fixed to be used.

3 Results

3.1 Advantages of the certification systems

3.1.1 *The affection of certifications for real estate*

The results in parts for buildings on WELL are explained in Table 1. A percentage of the parts for real estate is calculated by the number of parts for real estate divided by total number of the parts in the concept. The percentage to be consistent with the building in the chart of Community which supports access to essential healthcare, workplace health promotion and accommodations for new parents was the lowest, and the percentage of Water which covers aspects of the quality, distribution and control of liquid water in a building was the highest. The concepts with higher percentage can be explained as being affected by the building environment. WELL can be mentioned as the certification which affect services both in building and in the workers life rather than which affect the buildings since the of the total percentage calculated by the total number of the parts for building divided the number of total parts was 44%.

The results on CWO are explained in Table 2. The percentage of the concepts fluctuates. However, the average percentage on CWO is 70% which indicates CWO affects a building strongly calculated by the total number of the parts for building divided the number of total parts. The lowest percentage is 0% Qw5 shows the concept depends on services completely, and the highest ratio is 90% in Qw3. These concepts explain that this certification system distinguishes the parts in terms of whether they affect the building or services. Therefore, the focus of the parts is different depending on the certification systems. The owners applying the systems should decide which certification is better for the project.

Table 1. The affection for building of WELL

	Air	Water	Nourishment	Light	Movement	Thermal Comfort	Sound	Material	Mind	Community	Total
Real Estate	23	18	3	9	11	11	10	9	5	5	104
Chattle and Services	4	1	20	5	14	2	4	17	21	38	126
Monitor	2	2	0	0	1	2	0	0	0	0	7
Total	29	21	23	14	26	15	14	26	26	43	237
Percentage	79%	86%	13%	64%	42%	73%	71%	35%	19%	12%	44%

Table 2. The affection for building of CWO.

	Qw1 Health and Comfort	Qw2 Convenience	Qw3 Safety	Qw4 Operational Management	Qw5 Pprogram	Total
Real Estate	26	3	9	4	0	42
Chattle and services	6	2	1	6	3	18
Monitor	0	0	0	0	0	0
Total	32	5	10	10	3	60
Percentage	81%	60%	90%	40%	0%	70%

3.1.2 *The morality of the certifications*

The results are shown in Tables 3 and 4. The average percentage of the parts of WELL providing thresholds is 70%. The percentage of the first eight concepts of WELL was 60%. However, the other percentage of two concepts (Mind and Community) are below 60%, especially the percentage of the Mind concept is low. As we mentioned, the Mind concept is regarded to mental health. Thus, the low percentage indicates it is difficult to promote mental health when the parts have thresholds.

The result of the CWO is shown in Table 4. The average of the total was 72%, and the percentage of all concepts were over 60%. Most of the parts have thresholds. However, how the thresholds are decided is not clear. In the other hand, all the thresholds in WELL are proven by some thesis. The thresholds of CWO is required to be proven by thesis as well as WELL to be a more clear certification.

Both certifications provide thresholds over 70%. Thus, the selection of well-being certification between WELL and CWO must be clarified based on the usefulness and effectiveness of the certification.

3.1.3 *The flexibility of the certifications for workers*

The result of WELL is shown in Table 5. The ratio of all parts is 45% which shows almost half of the parts provide options for workers. The Mind concept provides the most options because it affects the mental health of workers. Therefore, the workers can choose the options depending on their situation and environment. On the other hand, the ratio of the Sound concepts is the lowest. The concepts consist of a lot of parts which require installation of materials for noise management.

The result of CWO as shown in Table 6 is almost the same as the result of WELL. The total percentage is 40%, only 5% less comparing with WELL. The percentage of each concept is different. Each concept can be considered depending on the concepts for selection by the workers. Especially the concepts of Qw2 and Qw5 provide options to workers for their use.

From the methodology, the results show both certifications provide the options for workers and environment which affects well-being of workers.

Table 3. Molality of WELL have thresholds.

Thresholds	Air	Water	Nourishment	Light	Movement	Thermal Comfort	Sound	Material	Mind	Community	Total
Yes	25	13	14	13	21	13	11	22	10	23	165
No	4	8	9	1	5	2	3	4	16	20	72
Total	29	21	23	14	26	15	14	26	26	43	237
Percentage	86%	62%	61%	93%	81%	87%	79%	85%	38%	53%	70%

Table 4. Molality of CWO have thresholds.

	Qw1 Health and Comfort	Qw2 Convenience	Qw3 Safety	Qw4 Operational Management	Qw5 Pprogram	Total
Yes	20	4	8	9	2	43
No	12	1	2	1	1	17
Total	32	5	10	10	3	60
Percentage	63%	80%	80%	90%	67%	72%

Table 5. Flexibility of WELL for workers.

	Air	Water	Nourishment	Light	Movement	Thermal Comfort	Sound	Material	Mind	Community	Total
Option	4	3	13	3	23	5	1	2	24	29	107
Compulsion	22	16	10	11	3	8	13	24	2	14	123
Monitor	3	2	0	0	0	2	0	0	0	0	7
Total	29	21	23	14	26	15	14	26	26	43	237
Percentage	14%	14%	57%	21%	88%	33%	7%	8%	92%	67%	45%

Table 6. Flexibility of CWO for workers.

	Qw1 Health and Comfort	Qw2 Convenience	Qw3 Safety	Qw4 Operational Management	Qw5 Pprogram	total
Option	14	5	1	1	3	24
Compulsion	18	0	9	9	0	36
Monitor	0	0	0	0	0	0
Total	32	5	10	10	3	60
Percentage	44%	100%	10%	10%	100%	40%

3.2 Interviews with construction firms, a supplier and a consultant

The interviews were conducted in December 2020 by using zoom or face to face. The interviewee group consists of three firms and one consultant.

- (1) What are the parts which projects owner want to choose and would not like to choose in the certifications?

The specific parts that owners want to choose do not exist. The owners choose the parts which they may acquire the points depending on the projects. However, owners want to avoid the parts regarding cigarette smoking since almost every building have smoking areas and some ordinances ban smoking at public spaces. As for CWO, the owners require to participate in every part of certification. Therefore, there is freedom of choice for the owner to decide which parts they should join.

- (2) What are the factors that owners decide to choose either WELL or CWO?

Owners tend to choose certifications which are applied widely and have an effect to draw investment. The certifications are applied to appeal to stockholders or the stakeholders to show how the companies are innovating their technology not only for their worker's health.

- (3) What are the differences relationship between green building certifications LEED with CASBEE and WELL with CWO?

The relationship between LEED and CASBEE is not equivalent because CASBEE is known only in Japan. The relationship between WELL and CWO is also the same. The effects are not yet proven, and the certification was established newly in 2019. Thus, the certification is unknown yet.

- (4) What is the effectiveness to obtain well-being certifications?

It is very hard to prove the effects of the certifications because there are various factors to indicate worker's health and well-being. Firstly, it is difficult to identify the factors is difficult. In addition, a project owner must decide KPI (Key Performance Indicator) such as personal information to show the effects if they cannot identify the factors. However, the owners avoid handling this information. As a result, the effects are not yet proved.

In the interviews, all interviewees do not wish to apply CWO certification because the thresholds are not clear and firms which obtain the certification cannot appeal to stockholders in Japan. If a firm wish to apply for well-being certification, they should obtain WELL instead of CWO. The parts of CWO should be underscored by evidence based as well as the parts of WELL.

4 Conclusion

This study discussed the strengths of each certification. WELL affects both real estate and services and consists of thresholds which have been proven in previous studies. On the

other hand, CWO affects buildings more than services. However, the thresholds should be proven to be used in Japan. The interviews also indicate the same results in the first step of the methodology. From the interviews, CWO should be fixed to be applied in terms of evidence based. After CWO is fixed, the certification can be applied in Japan because the certification can improve worth of the building in terms of real estate. It is used from design phase of the project because the certification focuses real estate parts of building. It is difficult to obtain CWO after the design of the project is decided and the owner need to spend much money to do it.

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