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Towards Safe Cities & Resilient Communities

13 & 14 SEPTEMBER 2018
IMPIANA HOTEL, IPOH, PERAK

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**WORKPLACE REFORM WITH CHANGING
MANAGEMENT THROUGH THE USER PARTICIPATION
WORKSHOP: THE CASE STUDY OF SEIYO CITY OFFICE**

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Abstract – In this paper, we describe about workplace reform aimed at improving productivity of General Affairs and Policy Planning department of Seiyo office, by changing management through the user participation workshop at 4th floor of Seiyo city office, and about the changes of workplace reform. The purpose of this research is to find the changes that are worker's behaviour and worker's awareness of workplace by workplace reform. We surveyed changes, worker's behaviour and worker's awareness of workplace, by workplace reform at 4th floor of Seiyo office as one case. At workplace reform, in order to create a place where new work style can be practiced, we conducted the user's participation workshops with workers 6 times. Through the conducted workshops, concept of work style and plan of renovation were proposed. In addition, we surveyed two methods of questionnaire survey and observation survey three times: before the workplace renovation, 3 months after the renovation, and 1 year and 3 months after the renovation. In the questionnaire survey of 3 months after the renovation, it shows that the opinions of the workers were divided between pros and cons against workplace reform. However, the survey of 1 year and 3 months after the renovation shows that almost all workers were satisfied with the new environment. In addition, we found that a positive correlation between participation rate of workshops and in satisfaction increased. The findings suggest the importance of workshops for workplace reform. In the Observation Survey, it shows that the workers selected a place freely where they can work comfortably after workplace reform. For example, they work in refresh space. In addition, the survey suggests that the floor became lively from the rise of the conversation participation rate. Also, as features of work style, after workplace renovation, it suggests that they become conscious of the work style they clearly differentiate between short intermittent works separated by conversation and phone and personal work on concentration.

Keywords - Workplace, Participatory design, Workshop, Change management, Behavioral Observation

1 INTRODUCTION

The number of workplaces by participatory design is increasing (Wang et al., 2014). However, there is limited research that investigate from comprehensive (subjective and objective) perspective. There is only one case that examined the degree of satisfaction of the office (New Office P. A., 2016, p.214-237). Therefore, in this study a case study on workplace reform with changing management of the 4th floor of Seiyo city office was used. We aimed to comprehensively survey the influence of workplace reform on worker's work style (awareness and behaviour), using a questionnaire and behavioural observation survey. In addition, "change management" means that work style changes occurring by deeply participating in the process of workplace design. The workers deepen their understanding of each goal, organizational goals, business style that keep changing the awareness about their work contents and style through participatory design (New Office P. A., 2014, p.255-256).

2 LITERATURE REVIEW

An effectiveness of participatory design is user can take ownership of own workplace (Wang et al., 2014). Furthermore, when thinking design is not made for public, but for certain identified people, participation indirectly made the process of design more effective (Kumazawa et al., 2008).

In workplace, there is correlation between conversation satisfaction and employee's productivity (Midorikawa et al., 2010). Moreover, effectiveness of conversation and productivity by change of layout has been conducted (Okamoto et al., 1999; Numanaka et al., 2015). When evaluating productivity, communication is one of the important factors (Okamoto et al., 1999). In addition, satisfaction of conversation improves employee's productivity. Based on these research there is correlation between conversation and employee's productivity.

3 SUMMARY OF WORKPLACE REFORM

3.1 Background of Workplace Reform

Along with the recent declining working population, it was an urgent task to raise productivity. Even in Seiyō city, Ehime, Japan, the population and staff are expected to decrease dramatically from 2013 to 2040 (Intelligent Productivity Research Committee, 2012). It shows a possibility of financial collapse by the allocation tax being reduced. Therefore, we aimed to improve the productivity of workers by creating a workplace where they can practice better work style, through workplace reform by changing management through the user participation workshop.

3.2 Workplace Reform Policy and Flow

The goal is to make it possible for workers to practice how to improve the productivity of the whole Seiyō office by workplace reform. In this case, we aim for productivity improvement which depends on the 2 policies for the General Affairs and Policy Planning Department (hereinafter, referred to as "GAPP"). Which are 1) Reduction of cost by improving the efficiency of routine work. 2) Improving quality of output by creating innovation, realizing ideas to solve various problems, making Seiyō city attractive. As a flow of this case, first, we conducted survey and workshops (WS1, 2, 3) to grasp the current situation and the ideal. Next, based on those results, we proposed and changed the new work style and new layout. Furthermore, we held workshops (WS4, 5) to think about the way of improving productivity. Finally, in order to evaluate the effectiveness of workplace reform, we surveyed for 3 months after the renovation and it was 1 year and 3 months later the improvement of the productivity was completed.

Table 1 Outline of workshops

	WS1	WS2	WS3	WS4	WS5	WS6
Schedule	2016/4/14 13:00~18:30 2016/4/15 9:00~12:00	2016/5/25 9:00~12:00	2016/5/30 13:00~17:00 2016/5/31 9:00~12:00	2016/10/19 13:00~17:00	2016/11/8 13:00~18:30	2016/11/9 9:00~12:00
Participant	· GAPP (15) · Other 11 divisions (11) Total 26 people	· GAPP (7) · Other 8 divisions (8) Total 15 people	· GAPP (9) · Other 10 divisions (10) Total 19 people	· GAPP (25) · Other 1 division (1) Total 26 people	· GAPP (27) Total 27 people	· GAPP (23) Total 23 people

purpose	<ul style="list-style-type: none"> · Make yourself a reform. · Grasp the current situation and share recognition of each worker. 	<ul style="list-style-type: none"> · Bird's eye view of own work and reconsider value. · Sharing of ideals of city hall and future policies. 	<ul style="list-style-type: none"> · Sharing current problems and solutions (by way of work, space). · Determination of the policy of reform. 	<ul style="list-style-type: none"> · Think about new ways of work style toward improving work efficiency. · Imagine how to work in the new workplace 	<ul style="list-style-type: none"> · Notice the necessity of improving productivity. · Have an awareness to change work style to date. 	<ul style="list-style-type: none"> · Think about the workplace operation method to realize a new work style.
Overview	<ul style="list-style-type: none"> · Lecture(about 2.5 h) · Case introduction / comparison · "Good point" and "Bad point" · Depth interview · Scenario writing 	<ul style="list-style-type: none"> · Tour of the latest workplace case · Business model campus · Work style Concept creation 	<ul style="list-style-type: none"> · Modification of Work style Concept · Case study of workplace space · Pattern Language 	<ul style="list-style-type: none"> · Review of work using diary survey · Scenario writing (New workplace version) 	<ul style="list-style-type: none"> · Lecture (about 2 h) · Troubleshooting for improving work efficiency Brest 	<ul style="list-style-type: none"> · Develop ideas for becoming cross-division organization · Establishment of operational rules at the new workplace

4 RESULTS OF THE WORKSHOPS

4.1 Work style Concept

Through the first half workshops (WS1-3), we created work style concept as a policy of workplace reform by making Seiyo city office and Seiyo city as ideal. As a result, the work style concept was made "ChangeSeiyo!" and the sub concept is "challenge", "connect" and "enjoy". By having the concept, the workers aim at improving the work style and aim to be a workplace where they can work challengingly as well as improving citizen service. As result, the Concept meaning changes able to make Seiyo city more attractive.

4.2 Content of Layout Suggestions

We designed workplace layout that can embody sub concepts (challenge, connect and enjoy) of the work style concept, and encourage new work style (Fig.1). The concept of the layout is "Choose a place depend on mode that is based on work style concept according to your schedule", and the layout is based on the team address system. The team address system is our original seat system. An island for each division (number of seats is smaller than the number of people) and non-territorial seats are prepared, and workers who could not sit on the division's islands will automatically sit non-territorial seats with workers of other divisions. However, the General Affairs Division only fixed the seat system. In addition, we set up six modes (team · concentration · welcome · discussion · play · share) and made space based on each mode. By having various meeting spaces are made and we aimed to promote collaboration among staff according to the number of people, mood and purpose.

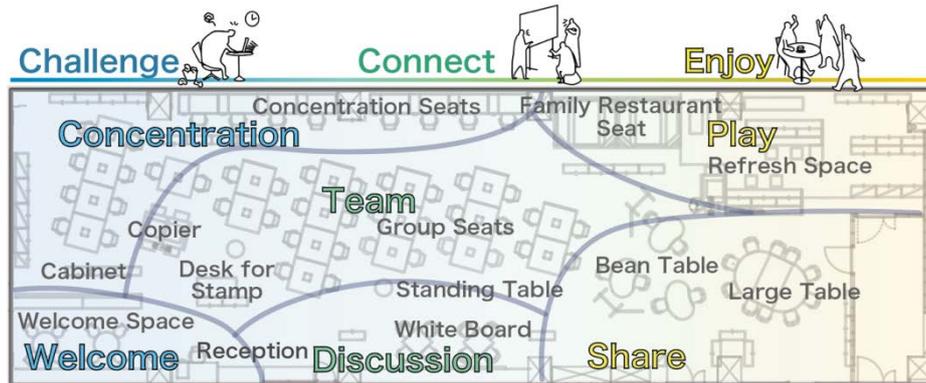


Fig.1 Proposed layout

5 EVALUATING THE EFFECT OF WORKPLACE REFORM

In this case, we evaluated the effect of workplace reform from the two viewpoints; questionnaire survey and behavioural observation survey. The effect evaluation was conducted 3 times before the renovation, 3 months after the renovation, and 1 year and 3 months after the renovation. In the following, it is abbreviated as BEFORE, AFTER1, AFTER2.

5.1 Questionnaire Survey

In the questionnaire survey, 30 items are related to the surrounding of seat, conference room, tools, etc. were evaluated in 6 ranks from 1 to 6 on 2 axes; satisfaction and influence, on work. (Tables 2&3).

Table 2 Summary of questionnaire survey

Item	Survey on satisfaction level of workplace environment and degree of influence on work
Term	BEFORE: 2016/5/25~2016/6/1 AFTER1: 2016/2/23~2016/03/03 AFTER2: 2018/03/30~2018/04/11
Target	Seiyo city office workers (35 to 42 people)
Method	URL distribution mail using WEB questionnaire

Table 3 Questionnaire survey items (some excerpts)

1. The size of the desk	4. Ease of concentration of work at the desk
2. Desk storage capacity (withdrawal etc.)	5. Ease of conversation with people around me at my seat
3. Comfort of office chairs	6. Ease of refreshing at your desk

5.1.1 Simple Tabulation

Changes of the degree of satisfaction on each item for the workplace environment and the degree of influence of work (6 grades) are shown in Fig.2. AFTER1, positive and negative reactions to the new workplace environment appeared extremely, and items were scattered at both ends of Fig.2. However, in AFTER2, these gathers together as one cluster and most items of satisfaction level raised. Especially item "meeting space" of satisfaction level is greatly raised. By setting up various kinds of meeting space, it is possible to choose a place according to the mood and situation. It seems that the cause increases the satisfaction level.

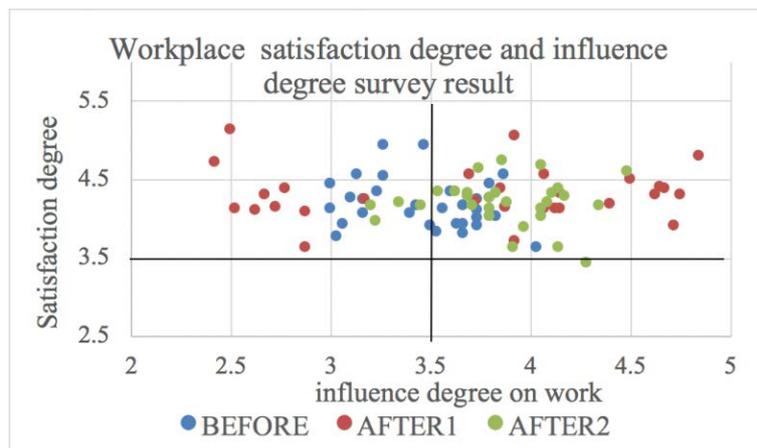


Fig.2 Workplace satisfaction degree and influence degree

5.1.2. Relationship with workshop participation rate

A strong positive correlation is found between the degree of participation (as shown in Eq. (1)) in workshops and the degree of increase in satisfaction with the workplace (Table 4). It suggests that the higher the participation rate is in workshops, the higher the degree of satisfaction increases a trend.

The participation degree in the workshop for each division is x as follows when the number of participants in the workshop of the division is n , the total number of workers in the division is m and the total number of times of workshops is k .

$$x = n/m * k \quad (1)$$

In addition, in AFTER1 the trend is particularly noticeable, and in AFTER2 the lower the participation rate is, the higher the satisfaction increases (negative correlation) as shown in Table 4. From this it can be expected that workers who joined the workshops can easily adapt to the new workplace. As It can be inferred that they experienced the element that was actually reflected in the layout.

Table 4 Correlation between participation rate of each workshop by department and degree of satisfaction of each item

		Appropriate area is secured for the workplace	High workplace design	Ease of taking out necessary documents such as shared lockers
AFTER1	Average value (change amount)	3.13(-0.58)	3.53(-.004)	1.93(-1.07)
	Correlation coefficient	0.87	0.88	0.75
AFTER2	Average value (change amount)	3.56(0.42)	4.00(0.47)	2.78(0.84)
	Correlation coefficient	-0.52	-0.52	-0.58

5.2 Effect Evaluation Using Behavioural Observation Survey

In order to grasp how to work from an objective viewpoint, we conducted behavioural observation survey of workers working at the target floor. Table 5 shows the summary of the survey.

Table 5 Summary of behavioural observation survey

Item	<ul style="list-style-type: none"> · Time and place sitting · Conversation time and opponent and place · Time on the phone
Term	BEFORE: 2016/10/18PM•10/20AM AFTER1: 2017/3/8PM•3/9AM&PM•3/10AM AFTER2: 2018/3/19PM•3/20AM&PM•3/21AM

	(AM: 9:00-12:00 PM: 13:30-17:15)
Target	Seiyo city office 4th Floor General Affairs and Policy Planning Department Working Floor
Method	Fixed point observation was done by an investigator by visual observation. Recording was done with precision of 1 min, and the researcher entered the record result in the format. In addition, for actions carried out within 1 min, we regarded as actions performed for 30 sec for convenience and recorded.

5.2.1 Average number of people stayed

Table 6 shows the average number of people staying per day for each survey. Only BEFORE is 11.6 people, which is more less 12 than AFTER1&2. As a result, the existence of a meeting during the investigation time can be considered. In the case of a meeting during the survey time, In BEFORE, it had been held in a conference room where is not covered by the survey. However, in AFTER1&2, space was set up to allow holding conferences in the working floor by changing layouts. Therefore, in AFTER1&2 the average number of people staying seemed to increase.

Table 6 Average number of people staying per day for each survey

		Average number of people staying per day for each survey		
		BEFORE	AFTER1	AFTER2
All Divisions		11.6	24.1	28.4
Division	General Affairs Division	5.8	9.2	8.0
	Town Planning Promotion Division	2.8	5.4	6.8
	General Policy Division	1.4	3.3	8.9
	Finance Division	1.7	6.2	4.6

5.2.2 Usage time by location

Fig.3 shows the usage time by place per day and the rate of change from AFTER1 to AFTER2. Both AFTER1 and AFTER2, Group Seat shows the longest usage time, followed by Concentration Seat. In addition, the change rate showed an increase in the usage time in the Refresh Space, the Welcome Space, the Copier, and the Family Restaurant Seat. In the Refresh Space and the Family Restaurant Seat, scenes of personal work and light talks were observed, and it seemed that the usage time has increased since workers started to use various ways between AFTER1 and AFTER2.

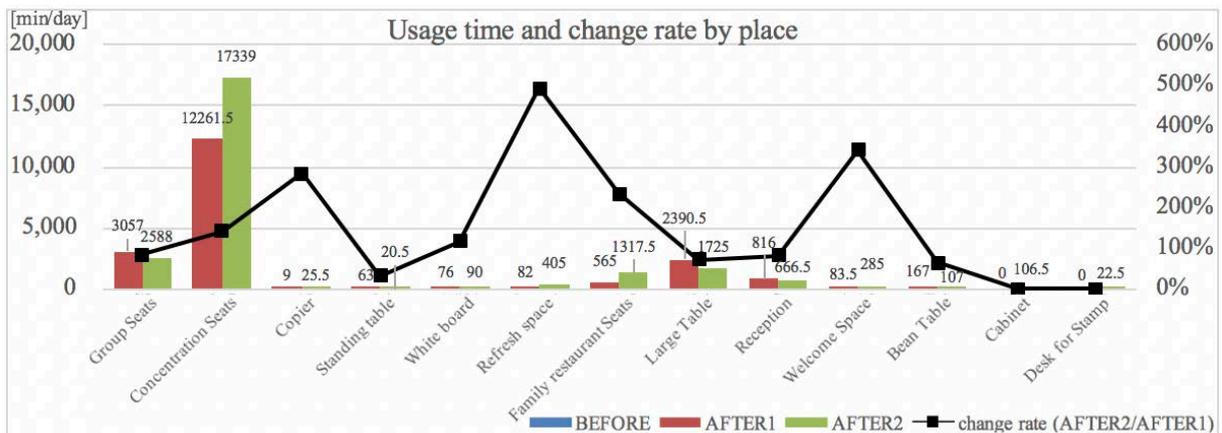


Fig.3 Usage time and change rate by place

5.2.3 Conversation participation rate

Figure 4 shows the average conversation participation rate per day for the entire floor and for each division. The above conversation participation rate is calculated by calculating the ratio of the number of participants in the conversation among the workers who stayed in the scope of the survey as a 15-min average. As a result, the conversation participation rate of AFTER1&2 is increasing in all cases compared to BEFORE. In all cases, increase is confirmed from BEFORE to AFTER1, and in the General Affairs Division it is only 1% increase, but in other divisions it shows a remarkable increase of 9% to 18%. Also, the change from AFTER1 to AFTER2 is divided, only 5% in the

General Affairs Division. However, in other divisions it shows a decrease of 2% to 5%. From this, the General Affairs Division only shows a different movement from other divisions. As a factor, it is conceivable that only the general affairs section adopts the fixed seat system due to the difference in working system.

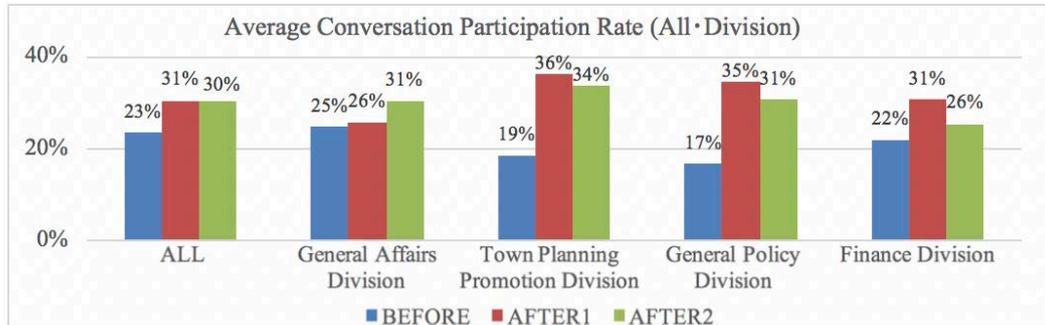


Fig.4 Average Conversation Participation Rate (All Division)

5.2.4 Distribution of conversation time length

Fig.5 shows the histogram of the length of conversation time per 1 day by survey. The figure shows that the conversation is the most numerous for 0.5 min, followed by 1min, 2min, 3min in order, and the shorter the conversation time overall, the more the number of conversations tends to be. In addition, the number of conversations by AFTER1&2 is increasing more than BEFORE. This is presumed to happen due to the increase in conversation participation rate and the number of people staying on the floor.

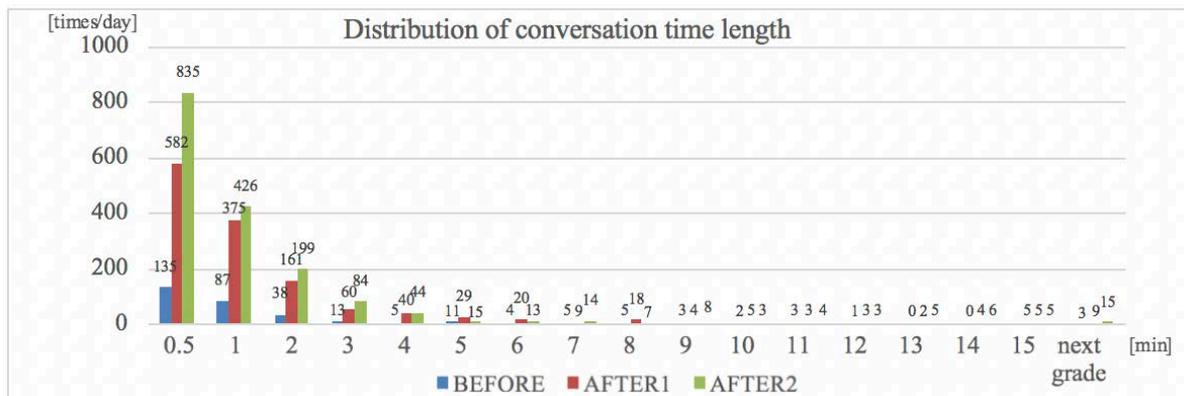


Fig.5 Distribution of conversation time length

5.2.5 Continuous Personal Working Time

We define Continuous Personal Working Time as the time for workers to work on individuals continuously without conversation and phone, and the histogram and increase rate are shown in Fig.6.

In AFTER1& 2, 1 min of work is the most frequent, indicating frequent conversation and phone and short intermittent working. In addition, the rate of increase shows a significant increase from BEFORE to AFTER1&2, with an increase rate of 1 min and 14 min of over 300%. As one of the reasons for this, it suggests that they become conscious of the work style they clearly differentiate between short intermittent works separated by conversation and phone and personal work on concentration.

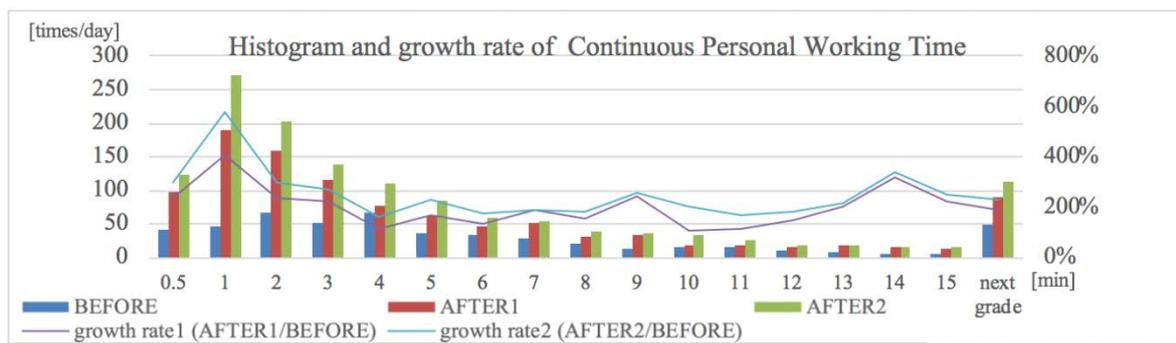


Fig.6 Histogram and growth rate of Continuous Personal Working Time

6 CONCLUSION

We carried out workplace reform through holding of 6 times user participation workshops and layout changes, and analysed worker's awareness of the workplace environment and behaviour change using questionnaire survey and behavioural observation survey.

Through the user participation workshop, we proposed concept of work style and plan of renovation. In the questionnaire survey of 3 months after the workplace renovation, it shows that the opinion of the workers was divided between pros and cons against workplace reform. However, the survey of 1 year and 3 months after the renovation shows that almost all the workers are satisfied with the new environment. In addition, we find that there is a positive correlation between participation rate of workshop and satisfaction. The finding suggests the worth of workshops for workplace reform. In the Observation Survey, it shows that worker select a place freely and work comfortably after workplace reform. For example, they work in refresh space. In addition, from the rise of the conversation participation rate, it is suggested that the whole floor became lively. As a characteristic of the work style for workers to be surveyed are the conversation time and the Continuous Personal Working Time. The longest time for Conversation time is less than 1 minute, the shorter the conversation time, the more the number of conversations tended to show. The Continuous Personal Working Time was similar to the conversation time in a short time. However, after the renovation, they become conscious of the work style. They clearly differentiate between short intermittent works separated by conversation and phone and personal work on concentration.

The research of limitation is the data accuracy of behavioural observation survey. Since we conducted an observation survey visually by investigators, we have the possibility of oversight and mistake of observation.

Finally, as a future research, it is necessary for future papers to clarify the impact of user participation workshops on workers and to study workshop methods that are suitable for workplace reform such as how to organize workshops.

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