RESEARCH ON "VALUE-UP MANAGEMENT" FOR EXISTING BUILDINGS: PART 1 A STUDY ON THE LEVEL OF OCCUPANTS AWARENESS OF CERTAIN GOVERNMENT BUILDING CONCERNING EVALUATIONS FOR CLEANING QUALITY

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ABSTRACT

The aim of this research paper is to obtain insights required for the study of Value-up Management for existing buildings. The subject of the research is office buildings. Specifically, a survey on interior environment evaluation from the occupants' perspective is implemented for a particular building, and the results are used to clarify what the occupants focus on when evaluating interior environment. The questions in the survey on interior environment evaluation are divided into three groups: (1) questions on the area around one's own desk; (2) questions regarding the office; (3) questions on the building and surrounding environment. The survey assesses the level of importance and level of satisfaction for each question. The survey respondents are 104 occupants of government buildings. The results show that "Questions regarding privacy", "Questions regarding storage space", and "Questions regarding desk brightness" are evaluated as items of high importance, indicating that occupants desire a highly productive environment. "Questions regarding cleanliness" were also regarded as important, showing that the building cleaning management plays an important role in Value-up Management for existing buildings.

Keywords: Cleaning Management , Evaluation of Environment, Government Office Buildings, Value-up Management

1. INTRODUCTION

The current area of government office buildings in Japan is 52 million m^2. In the future these office buildings will need to be efficiently managed while at the same time enhancing their value as assets.

Under such circumstances, Facility Management (referred to hereafter as FM) is being adopted as the maintenance management method for government office buildings.

The objective of FM is to strike a balance between quality, finances, and supply. To achieve this balance, improvements must be constantly implemented using the PLAN, DO, CHECK, ACTION cycle.

User Satisfaction is adopted as a metric to measure quality. In order to maintain a constantly high user satisfaction level, it is necessary to repeatedly implement improvements that are based on user demands throughout the life cycle.

In past research[1], the authors have divided contracted maintenance costs into the categories of " Maintenance and Inspection Costs" and " Safety and Cleaning Costs", collecting analytical data on each. In doing so we have identified that costs for contracted maintenance related to cleaning account for the majority of "Safety and Cleaning Costs". Therefore the reduction of costs related to cleaning maintenance should also lead to the optimization of finances and supply.

However, past studies[2,6] have only focused on air quality management. So no research has discussed cleaning quality based on evaluations by users. There is a wide variety of metrics used to evaluate interior environments.

The aim of this paper is to clarify how important, of all the metrics used to evaluate interior environment, an evaluation of cleaning quality is to building occupants.

2. OUTLINE OF SURVEY

2.1 Outline of Buildings

Two government office buildings were surveyed, and the outline of the buildings is shown in Table 1. Building ①was built 51 years ago, has six floors above ground and one floor underground, and a floor area of 19,208.87 ㎡.Building ②was built twenty-three years ago, has twenty floors above ground, and a floor area of 30,630 ㎡. The number of occupants of buildings ① and ② combined is approximately 900 people, and the number of visitors to these two buildings combined in one day is around 1,700 people.

Table 1: Overview of Buildings

Year completed		①Feb.1956	②Sep.1984
Stories		①6stories above ground 1story underground	②20stories above ground
Floor area (㎡)		①19208.87	②30630
Construction		RC	
Number of occupants		900	
Number of visitors		1700	
Finish	Office work room/Meeting room	Polyviny chloride tile	
	Corridor	Polyviny chloride sheet	
	Entrance (in side)	Granite	
	Entrance (out side)	Granite	
	Rest room	Mosaic tile	

2.2 Outline of Questionnaire Survey

A questionnaire survey of the building occupants was conducted in August 2006. The number of questionnaires distributed was 120, with 104 respondents. The response rate was 86%.

The questionnaires were comprised of six pages of 99 questions in total. The questions were divided into (a) questions regarding attributes and (b) evaluation of interior environment. The details of (a) and (b) are as follows.

(a) Questions regarding attributes

- Attributes of respondent (gender, age, job type, title, number of years in job, interest in cleaning quality)
- How time is spent in government office building (place where lunch is taken, smoking, form of work, frequency of trips outside the building, frequency of receiving visitors, frequency of computer work, frequency of meetings, frequency of searches for old documents, frequency of visits to other departments)

(b) The items in the Interior Environment Evaluation are shown in Table 2.

Table 2: Internal Environment Evaluation Items (Part1)

A. Regarding one's own desk area

No.	Item description
A1	Many documents can be spread out at the same time on desk
A2	Can use one's own desk area freely
A3	Can obtain required equipment and materials quickly
A4	Storage space is adequate
A5	Not concerned by people moving or people watching you

A6	Not distracted by the sound of people speaking, telephones, or OA equipment.
A7	Desk is adequately bright
A8	One's own privacy is protected
A9	Seat is comfortable
A10	Desk and storage equipment are easy to use
A11	There is space around desk and walkway, easy to use
A12	Can look over the office from one's desk
A13	Can enjoy the view of outside the office
A14	Lighting is not glaring

B. Regarding the office

No.	Item description
B1	Can hold meetings whenever one wants
B2	Can relax over a cup of tea
B3	Meetings and teleconferences cannot be overhead by external visitors
B4	Classified documents cannot be viewed by external visitors
B5	Can speak with people sitting nearby about topics other than work
B6	Have knowledge of what kind of work people sitting nearby are doing
B7	Office is neat and tidy
B8	OA equipment is located close to one's desk
B9	Whole office is bright
B10	Office is clean
B11	Easy to enter and exit the office, move around the office or move to other departments
B12	Internal information is communicated smoothly
B13	Air is clean and fresh
B14	Temperature and humidity are at comfortable levels
B15	Interior design is good
B16	There are elements of nature in the office
B17	Lighting is not reflected on PC screen
B18	Can smoke without bothering others (cigarette smoke is not a concern)
B19	Easy to change the layout
B20	Seating arrangement is clear

Table 2: Internal Environment Evaluation Items (Part2)

C. Regarding the building and surrounding area

No.	Item description
C1	Toilet and kitchen are provided
C2	Short waiting time for elevators
C3	Can take lunch in a relaxed atmosphere
C4	No concern regarding fire safety
C5	No concern regarding crime prevention
C6	Surrounding area is convenient for running errands
C7	Office is conveniently located for transport
C8	Some natural environment in the surrounding area

2.3 Analysis of respondents' attributes and how time is spent in government office building

(1) Attributes of respondents

The attributes of the respondents are shown in Figure1.
For "gender", the ratio of men was extremely high.
For "age", the number of people in their forties accounted for approximately forty percent of the total.
For "number of years in job", the number of people who responded "less than one year" accounted for approximately sixty percent of the total.

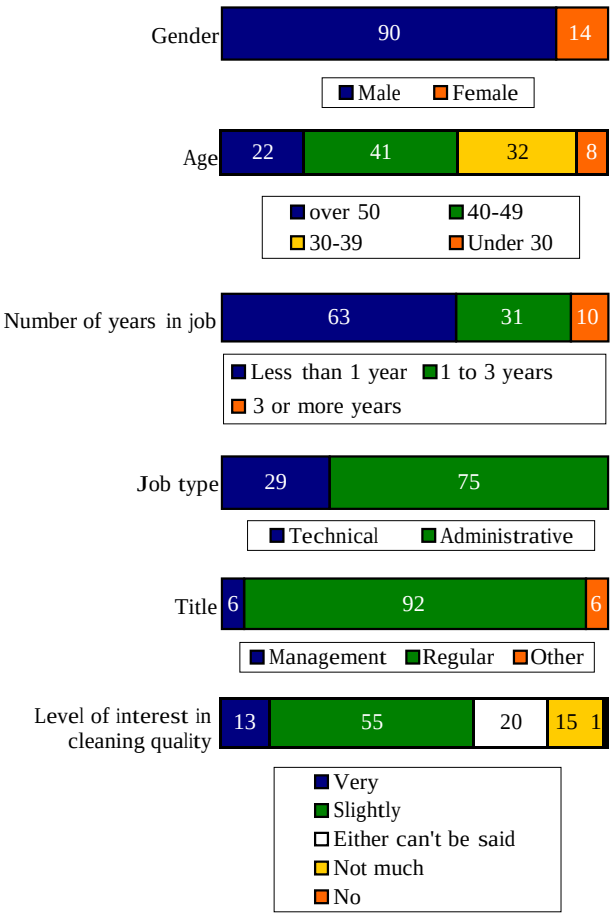

Figure 1: Respondents' attributes

For “job type”, there were more people in administrative jobs than in technical jobs.
For “title”, “regular employee” accounted for around over eighty percent of respondents.
For “level of interest in cleaning quality”, around over sixty percent of people responded “slightly interested” or “very interested”. This demonstrates that building occupants have an interest in cleaning quality.

(2) How time is spent in government office building

The way time is spent in the government office building is indicated in Figure 2.
The “smoking rate” was approximately thirty percent. Many of the respondents provided “office” as the place where they take lunch. In terms of “form of work”, the ratio of “individual work” was extremely high. Over seventy percent of respondents answered “frequent” to the questions regarding frequency of “visits to other department”, “searches for old documents”, and “meetings”. In response to the question on the frequency of “PC work”, eighty percent responded “frequent”. Approximately sixty percent of people responded “frequent” for frequency of “receiving visitors”. Regarding trips outside the office, around sixty percent of people answered “almost never”.

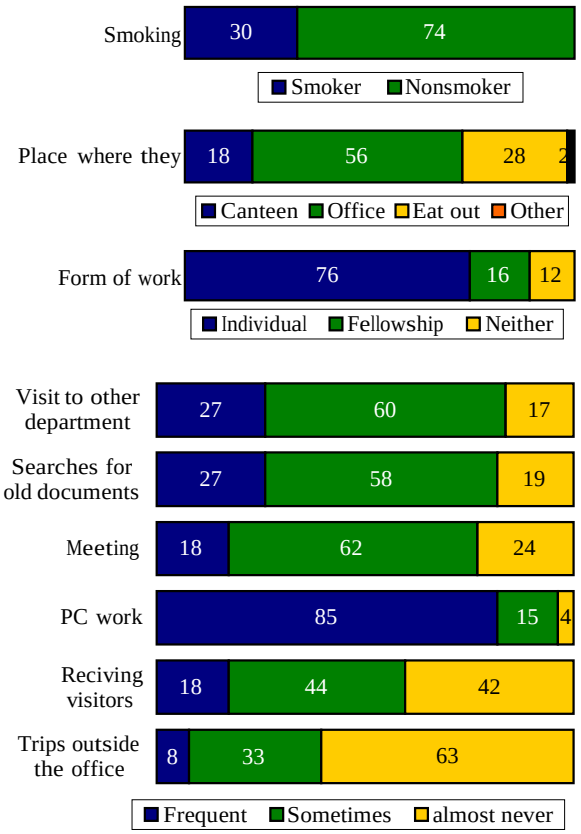

Figure 2: How time is spent in government office buildings

(3) Analysis of Importance and Satisfaction Levels

In this chapter we analyze the relationship between the level of importance of interior environment evaluations and satisfaction level.

In Figure 3, the vertical axis represents level of importance, with level of satisfaction on the horizontal axis. The average evaluation points for both of these for each evaluation item are

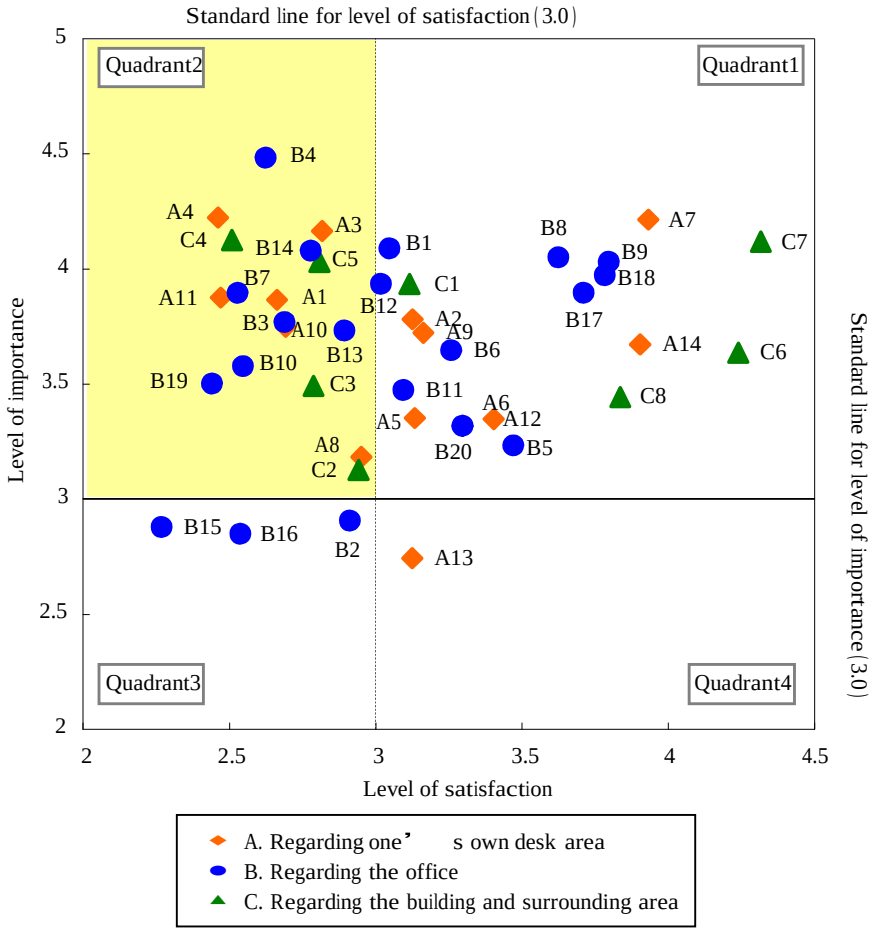

Figure 3: Relationship between level of importance and level of satisfaction

plotted on the graph. The "standard line" indicated by a broken line in the graph shows [3] "Neither". Therefore, using the "standard line" the graph is divided into four quadrants.

The meaning of each quadrant is explained below.

- Quadrant 1: Of the 42 items, both level of importance and level of satisfaction are high.
- Quadrant 2: Of the 42 items, level of importance is high, while level of satisfaction is low.
- Quadrant 3: Of the 42 items, both level of importance and level of satisfaction are low.
- Quadrant 4: Of the 42 items, level of importance is low, while level of satisfaction is high.

Firstly, regarding level of importance, "items regarding privacy" (B4), "items regarding storage space" (A4), and "items regarding desk brightness" (A7) were all evaluated highly.

Next, regarding level of satisfaction, there were low evaluations for "items regarding interior design" (B15, B19) and "items regarding space" (A4, A11).

The items plotted in Quadrant 2 need to be prioritized for improvement. These items are shown in Table3.

Table3 demonstrates that "items regarding ease of use","items regarding confidentiality and cleanliness", and "items regarding safety and relaxed atmosphere" are indicated as items that need to be prioritized for improvement

.

It was also clarified that “items regarding cleanliness” are also plotted in Quadrant 2.

Table 3: Items plotted in Quadrant 2

No.	Item description
A1	Many documents can be spread out at the same time on desk
A3	Can obtain required equipment and materials quickly
A4	Storage space is adequate
A8	One’s own privacy is protected
A10	Desk and storage equipment are easy to use
A11	There is space around desk and walkway, easy to use
B3	Meetings and teleconferences cannot be overhead by external visitors
B4	Classified documents cannot be viewed by external visitors
B7	Office is neat and tidy
B10	Office is clean
B13	Air is clean and fresh
B14	Temperature and humidity are at comfortable levels
B19	Easy to change the layout
C2	Short waiting time for elevators
C3	Can take lunch in a relaxed atmosphere
C4	No concern regarding fire safety
C5	No concern regarding crime prevention

4. CONCLUSION

The aim of this paper was to clarify how important, of all the metrics used to evaluate interior environment, an evaluation of cleaning quality is to building occupants. The results of this study are indicated below.

《Items regarded by the occupants of government office buildings as having a high level of importance》

“Items regarding cleanliness”
“Items regarding privacy”
“Items regarding storage space”
“Items regarding desk brightness”

※ The study has identified that the occupants desire a highly productive space.

Consequently, cleaning maintenance of buildings plays an important role in value-up management of existing buildings.

Previous studies have not clarified the knowledge obtained through this research. Consequently, the results of this study useful in value-up management of existing buildings.

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