

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES BUILDING USER SATISFACTION ANALYSIS TOWARD NEW ULM BANJARMASIN BUILDING IN 2020

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ABSTRACT

The building is a physical form of the results of construction work that has a function as a place for humans to do activities. Every building that is built naturally has its own functions and uses. The ULM Banjarmasin building that has been built has finished its implementation period, where the maintenance period starts from the date of the first handover (PHO) for 12 months. But there is an agreement from the owner and the contractor where the building is used during the maintenance period in the trial period with a loan system that is operated during the maintenance period. When the function of the building is in operation, complaints of damage occur. Complaints about the damage in the form of building defects, some rooms have leaked, as well as the walls and floors that have cracked. In addition to dealing with physical damage to buildings, damage also occurs in facilities used by building users. These complaints trigger the dissatisfaction of building users during the usage period.

This study aims to analyze user satisfaction with the new ULM building. This study is specifically for users of the building with 36 respondents who can be represented by students and staff employees. The analysis used is the Customer Satisfaction Index (CSI) of 77% can be concluded that the user was satisfied during the use of the building in the maintenance period of the new building. Furthermore, with the Importance Performance Analysis (IPA) analysis, there are 7 variables that become the main priority in their subscription, which needs to be improved, i.e. there are pictures or floor plans of each building to get to the room to be obtained the results of satisfaction, quality of walls, sanitary and toilet accessories, roof / ceiling quality, fast and responsive in making repairs, sensitivity in complaints, friendliness and courtesy in repair services.

Increased building user satisfaction is to tighten supervision of its workforce so that it can work optimally to prevent re-work and the need for training in operation of new buildings so that no damage is caused by the user at least minimizing the damage happens so users are satisfied as desired. Overall it can be concluded that the building user is satisfied.

Keywords: *Building; Satisfaction; Building Users; Customer Satisfaction Index (CSI); Importance Performance Analysis (IPA).*

I. INTRODUCTION

The building is a physical form of the results of construction work that has the functions and uses of each needed in accordance with the purpose of the building. This is of course intended so that the building can function properly and provide facilities to carry out daily activities. The construction of new buildings located at Lambung Mangkurat University in 2018 consists of 12 buildings and infrastructure in Banjarmasin and Banjarbaru areas. Currently Lambung Mangkurat University has a new lecture building with a magnificent design so that it has an appeal for students who want to study in higher education. Owned buildings consist of lecture halls, laboratories, offices and multipurpose buildings.

Even though during operation, maintenance has taken place. With the condition of the new building and directly used by the user is very influential where the building can not be used. There is an agreement between the parties so the building can be used during the maintenance period.

Based on observations of the construction of a new building project at the University of Lambung Mangkurat, there were several complaints of damage that occurred during the use of the building during maintenance. Complaints of different damage occur not only one new building but various other buildings and complaints of damage are also different. When the function of the building is operated in the new building, complaints always arise. Complaints of damage in the form of building defects, the quality of equipment that can not be used and humaneror (HR) or the lack of understanding of the operation of the building, resulting in short-term or long-term damage. Damage that appears in part of the ceiling in some rooms that have leaks, as well as the walls and floors that have cracked. In addition to dealing with physical damage to buildings, damage also occurs in facilities used by building users. These complaints triggered dissatisfaction among building users.

This study tries to answer the question to what extent the satisfaction of building users on the use of new buildings is operated and provide recommendations to the service provider or the building user if there is no satisfaction from the user of the building usage. Furthermore, to answer the factors that influence the satisfaction of new building users and provide solutions if there are dissatisfaction of building users during building use, a study was conducted to answer the above problems using the Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA) methods as an analysis method. satisfaction, determining problem indicators and drawing conclusions.

II. RESEARCH METHODS

This research was conducted directly in the form of an interview with the relevant contractor. To obtain information related to the problem of this study, field observations were carried out before conducting this research and distributed questionnaires randomly to 36 respondents both students and staff of building users. Literature study is done by studying theories and information about building user satisfaction with the new ULM Banjarmasin building with the Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI) methods that can be used to analyze the problems involved in the discussion of this study.

The data collection stage is very important, the data is carried out to solve existing research problems. The collection of data obtained in the form of primary data and secondary data, where for primary data is the result of a questionnaire distributed with 36 respondents and conducted interviews directly about the problem of the level of satisfaction of building users that occur during the use of building use in progress. For secondary data in the form of data during the maintenance and distribution of questionnaires to new building users with the sampling method by giving questionnaires directly to new building users.

After the questionnaire has been collected then it is tested for validity and reliability to measure whether the questionnaire can be declared valid and reliable. If the questionnaire is valid and reliable, then the questionnaire can be continued. If it is invalid and reliable, then the questionnaire must be rearranged, either by replacing invalid questions or replacing questionnaire questions.

To find out the level of building user satisfaction with new building users by calculating the customer satisfaction index (Customer Satisfaction Index), using the following formula:

$$CSI = \frac{WAT}{HS} \times 100 \dots\dots\dots \text{(Equation I.1)}$$

The next stage is to analyze using the Importance Performance Analysis (IPA) to determine the factors that must be corrected and must be maintained. The formula used in Importance Performance Analysis (IPA), namely:

$$\bar{X} = \frac{\sum Xi}{n} \dots\dots\dots \text{(Equation I.2)}$$

$$\bar{Y} = \frac{\sum Yi}{n} \dots\dots\dots \text{(Equation I.3)}$$

Information :

\bar{X} = Average level of satisfaction / performance

\bar{Y} = Average score of importance

Xi = Score of satisfaction level assessment

n = Number of respondents

To plot the results of the analysis of the level of satisfaction and importance of each of the variables into a cartesian diagram which is divided into four quadrants, namely quadrant A, quadrant B, quadrant C and quadrant D. After getting the results of the analysis then proceed to plot the results into a Cartesian diagram so that it can be known what factors must be corrected and must be maintained. For Quadrant 1 factors that are considered important but customers feel unsatisfied and need priority to be increased again. While for Quadrant 2 these factors are considered very important need to improve performance, because customers are less satisfied. Quadrant 3 contains low priority, the user does not prioritize the improvement will be farit's better to get better results to get good results. Quadrant 4 factors that are considered not too important but very satisfying and tend to be excessive, so these factors do not need to be considered and attention should be directed to Kudran 2

III. RESULT AND DISCUSSION

This research was conducted 36 respondents of building users in the new ULM Banjarmasin building. Testing this sample is done by validity and reliability while the methods used to conduct this research are Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA). After the questionnaire is collected to find out the validity, it is followed by a validity and reliability test. Validity Test was conducted with 36 respondents including staff employees or students. From the calculation results obtained using SPSS 23 statistical data processing software is obtained.

Table 1. Data of Tests of Validity of Importance Using SPSS Software 23

Variable	X	Y		r-tabel	Information
1	0.705	0.729	>	0.3291	Valid
2	0.616	0.669	>	0.3291	Valid
3	0.640	0.643	>	0.3291	Valid
4	0.549	0.726	>	0.3291	Valid
5	0.418	0.712	>	0.3291	Valid
6	0.487	0.750	>	0.3291	Valid
7	0.369	0.833	>	0.3291	Valid
8	0.702	0.786	>	0.3291	Valid
9	0.637	0.807	>	0.3291	Valid
10	0.627	0.807	>	0.3291	Valid
11	0.500	0.790	>	0.3291	Valid
12	0.647	0.635	>	0.3291	Valid
13	0.462	0.611	>	0.3291	Valid
14	0.636	0.746	>	0.3291	Valid
15	0.638	0.794	>	0.3291	Valid
16	0.538	0.747	>	0.3291	Valid
17	0.430	0.833	>	0.3291	Valid
18	0.496	0.748	>	0.3291	Valid
19	0.482	0.758	>	0.3291	Valid
20	0.469	0.842	>	0.3291	Valid

In the results of the validity of the level of satisfaction and importance of the correlation results greater than rtable is 0.3291 with correlation probability value [sig. (2-tailed)] <of the significant level (α) of 0.05, the results of the questionnaire are valid.

Table 2. Case Processing Summary (SPSS23)

		N	%
Cases	Valid	36	100
	Excludeda	0	0
	Total	36	100

Table 3. Satisfaction Level Reliability

Cronbach's Alpha	N of Items
0.873	20

Table 4. Importance of Reliability

Cronbach's Alpha	N of Items
0.957	20

Table 5. Results of Analysis of Calculation of Customer Satisfaction Index

Variable	Average Interest Score (Mean Important Score) MIS	Weight Importance Factor (WF) WF = MIS / (Total MIS) x100%	Average Satisfaction Score (Mean Satisfaction Score) MSS	Weighting Score (WS) WS = WFx MSS
X1	3.75	4.49%	3.94	0.18
X2	4.33	5.18%	4.28	0.22
X3	4.25	5.08%	4	0.2
X4	4.06	4.85%	4.03	0.2
X5	4.06	4.85%	3.97	0.19
X6	4.06	4.85%	3.78	0.18
X7	4.50	5.38%	3.94	0.21
X8	4.47	5.35%	3.56	0.19
X9	4.25	5.09%	4.06	0.21
X10	4.22	5.05%	3.94	0.2
X11	4.25	5.08%	3.86	0.2
X12	4.00	4.78%	3.67	0.18
X13	4.28	5.12%	3.67	0.19
X14	3.89	4.65%	4.17	0.19
X15	4.36	5.22%	3.75	0.2
X16	3.94	4.72%	3.61	0.17
X17	4.44	5.32%	3.75	0.2
X18	4.19	5.02%	3.61	0.18
X19	4.08	4.88%	4.08	0.2
X20	4.22	5.05%	3.78	0.19
	83.61	100%		
Total Average Weight (WAT) Σ Weighting Score				3.87
Customer Statistics Index (CSI) = (Weight Average Total (WAT) / High Scale (HS) * 100%				77%

Based on CSI calculations above it can be seen that the level of satisfaction of respondents of building users to the new ULM Banjarmasin building is 77% and this value is in the range of 0.60-0.80 which means that overall respondents are satisfied and are expected to increase user satisfaction with new buildings better.

Importance Performance Analysis (IPA)

Importance Performance Analysis This analysis is an analysis of visitors' perceptions and expectations of existing conditions using the data from the questionnaire.

Table 6. Total Score of Respondents' Ratings on Level of Satisfaction and Interest

Variable	Mean score	Mean score
	<i>Performance (X)</i>	<i>Importance (Y)</i>
1	3.94	3.75
2	4.28	4.33
3	4.00	4.25
4	4.03	4.06
5	3.97	4.06
6	3.78	4.06
7	3.94	4.50
8	3.56	4.47
9	4.06	4.25
10	3.94	4.22
11	3.86	4.25
12	3.67	4.00
13	3.67	4.28
14	4.17	3.89
15	3.75	4.36
16	3.61	3.94
17	3.75	4.44
18	3.61	4.19
19	4.08	4.08
20	3.78	4.22

After getting the average score (mean), then the score data is described in quadrant form so that any indicators or variables can be sorted out in the four quadrants. Furthermore, the calculation illustrates the position of the level of satisfaction and level of importance by plotting the mean values of each variable that will become the quadrants of the quadrants on the Importance Performance matrix on the Cartesian diagram or the Importance Performance matrix, where the mean satisfaction on the x-axis and the mean importance on the y-axis with the point where the axes (x, y) are obtained the average total value of x was 3.87 and y was 4.18. Cartesian diagram and Importance Performance matrix can be seen, namely:

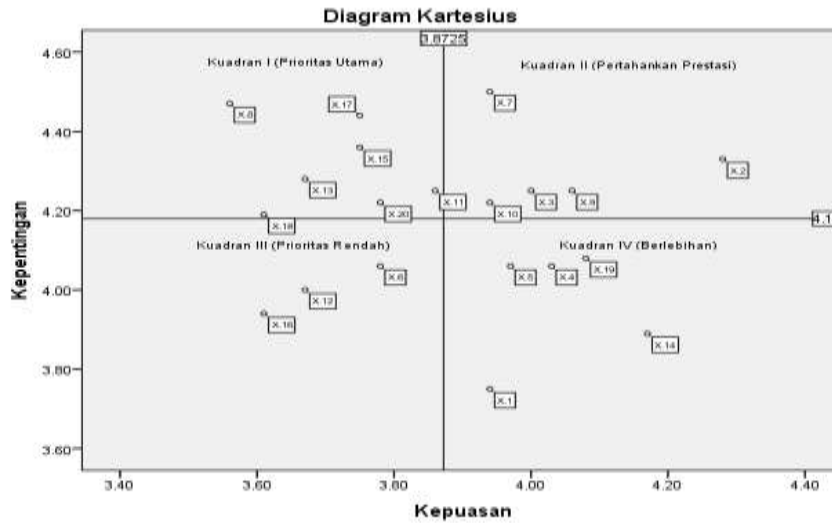


Figure 1 Cartesian diagram

- Quadran I = Main Priotas
- Quadrant II = Keep up the good work
- Quadrant III = Low Priority
- Quadrant IV = Exaggerated

IV. RESULTS

Based on the picture the diagram can be classified into four quadrant diagrams, as follows:

1. Quadrant I (Top Priority)

Quadrant I shows the factors or attributes in this quadrant need to be considered both prioritized/ improved again to meet the satisfaction of building users. Because the existence of this variable is very important but in its implementation it is still not satisfactory. The variables included in this quadrant can be seen in the table as follows:

Table 7. Variables of building user satisfaction in quadrant I

Variable	Measurement Variable	Quadrant	Handling
X.8	There are pictures or floor plans of each building to get to the room to be addressed	I	Main priority
X.17	Quick and responsive in making repairs	I	Main priority
X.15	Kualitas atap / Plafond	I	Main priority
X.20	Friendliness and courtesy in repair services	I	Main priority
X.18	Sensitivity in complaints	I	Main priority

From the above variables, there are seven user satisfaction variables for the new ULM building. Variables that are in quadrant I show that the level of satisfaction with new buildings is low while the interests or expectations of building users are high and therefore handling becomes a priority and further increases so that users using the building achieve high satisfaction.

It can be seen from the results of quadrant I variables x8, x18, x11, x17, x15 for performance, it turns out that there are more staff than students (see appendix satisfaction variables to quadrant I) while for the importance level is the staff which complains about this variable x8 that is, staff who are dissatisfied but have interests that greatly speed up the work in the new building. While the variable x13 for performance many choose students, but the importance is the

staff, which can be stated that the dominant student is not satisfied, but according to the perception of staff users, this is very important. For the x20 variable performance many choose students but the important thing is students who can be said to be dissatisfied are students, but according to the perception of students, this variable is also very important.

2. Quadrant II (Keep up)

This quadrant shows the factors or attributes that are considered important and are expected to be a supporting factor for user satisfaction so that they must be able to maintain their performance. This quadrant also has a high level of satisfaction and importance, in other words the building user is satisfied. Generally the implementation is in accordance with the interests and expectations of building users so that user satisfaction has been achieved. The variables included in this quadrant can be seen in the table as follows:

Table 8. Variables of building user satisfaction in quadrant II

Variable	Measurement Variable	Quadrant	ling Pen
X.7	There is a lecture room, prayer room, toilet and staff room	II	High priority
X.2	Parking facilities	II	High priority
X.3	Provision of access for people with disabilities	II	High Priority
X.9	Electrical installation system	II	High priority
X.10	Floor Quality	II	High priority

From the table above, it can be seen that there are five variables, where the level of satisfaction and the level of importance / expectation is high in handling this need to be maintained so that it can be said that the building user is satisfied with the use of the new building.

3. Quadrant III (Low Priority)

Quadrant III shows that factors that have satisfaction or interest level are considered not too important so that they are not prioritized for handling or increased because they are low priority. The variables included in this quadrant can be seen in the table as follows.

Table 9 Variables of building user satisfaction in quadrant III

Variable	Measurement Variable	Quadrant	Handling
X.6	Comfortable receptions room	III	Low Priority
X.12	AC	III	Low Priority
X.16	Use of new facilities	III	Low Priority

From the table above, it can be seen that there are three variables, where the level of satisfaction and the level of importance / expectation is low, but in handling those with low priority, it can be said that the building user perceives as less important in their performance while the level of quality of the implementation is quite clear.

4. Quadrant IV

Quadrant IV shows factors that are considered not expected by the user. This area has a high level of satisfaction while the level of importance is low. For this reason, its handling can be reduced by looking at the level of urgency in its implementation. For the quality of the implementation is very good so satisfying but the user considers it is not too important to the existence of these variables. The variables included in this quadrant can be seen in the table as follows:

Table 10. Variables of building user satisfaction in quadrant IV

Variable	Measurement Variable	Quadrant	Handling
X.19	Good communication between parties	IV	Exaggerated
X.5	There are warning signs or warning stickers	IV	Exaggerated
X.4	There are lecture rooms, prayer rooms, toilets and staff rooms	IV	Exaggerated
X.14	Quality window / door sills	IV	Exaggerated
X.1	Building model	IV	Exaggerated

From the table above there are four variables, where the level of quality of the implementation is very good and the level of satisfaction is quite satisfying for new ULM building users so that it can reduce the implementation of performance deemed excessive by the building user.

Analysis of the results of the respondents' assessment of the actual field

Analysis of variables that affect the level of satisfaction of building users with the new ULM building. The following will describe the results of the respondents' evaluation of the actual conditions in the field of the maintenance report as follows:

1. The level of user satisfaction with the use of the new ULM building obtained value of the Customer Satisfaction Index (CSI) based on the analysis obtained a value of 77%, the value lies in the range between 60% <CSI <80%. From these results it can be concluded that the user is satisfied during the use of the building in the maintenance period of the new building.
2. There is an expectation from the user but in the contract it turns out that there is no contract for the drawing or floor plan of each building to go to the room to be addressed (X8), but after the second handover must be completed and it is recommended to add pictures or floor plans of each building by the owner after the second handover was handed over.
3. At the time of maintenance repairs carried out by the contractor. The existence of a quick and responsive complaint (X17) in making improvements where the contractor only has a contractual agreement with the owner, which complains that this is slow in making improvements even though there is discussion or not reporting to the owner so there is dissatisfaction in being fast and responsive in making repairs in the new building. After the first handover (PHO) of this new building is operated during the maintenance period which is carried out in a trial using the system of user use loans. The suggestion is that if there is damage, it must be reported in stages or in stages in the new building to the owner, then the owner reports the contractor and the report is immediately followed up by the contractor, but if the end user directly to the contractor is difficult to follow up (no contractual).
4. There are complaints that occur and look at the quality of the leak (X15) in several new buildings that occur due to open land with high pressure but after the damage has been repaired by the contractor and immediately handled. Because of this complaint, which complained, where the enduser or the user feels disturbed using the facility at the time of building repairs. The suggestion is that the user also conducts routine checks and data input is then reported with the owner and immediately followed up by the contractor.
5. Seen in actual conditions in the field there is often damage to the toilet accessories (X13) even that has been repaired there is damage back to the blockage in the floor drain, jet shower, the faucet is often broken and loose and has a leak. Because there is an agreement which between the contractor and the owner if there is damage caused by the user it will be the responsibility of the user phak even though ultimately it becomes the responsibility of the contractor. The advice is to do socialization and provide awareness from the owner owner so that users are more careful in using the facilities properly.
6. In the new building that has been operated during the maintenance period it is the responsibility of the contractor. Because in the trial period the system uses a facility where the repair work is carried out in stages by prioritizing the most severe and lightest damage. The contractor has carried out routine checks every day but if the user complains of a cracked wall (X11) which is because they report complaints to the contractor even though it is

difficult to follow up, there is a contractual agreement. The suggestion is that the user / end user reports to the owner first, then the owner reports to the contractor so that it is quickly followed up and a few cracks occur, so the efforts made by the contractor by changing the method of repair so that it does not repeatedly occur.

7. The existence of friendliness and courtesy in repair services (X20) may be the user communicates not with the party designated as maintenance repairs from the contractor. Because in the maintenance period with a large number of buildings, the contractor made the repairs carried out in stages and as much as possible both in terms of handling or being friendly and polite in receiving user complaints. The suggestion is that the user must also know which party is appointed directly in handling maintenance repairs and the contractor must also provide a friendly and courteous person in the service of building maintenance repairs in progress.
8. Sensitivity in complaints (X18) users of perception so far lacking sensitivity in what they complain about also occurs due to limited resources in dealing with this. Delays in repairs that occur due to development debates that should not be fixed by the contractor. Users should know what is done during the maintenance period has a stage where the owner and the contractor have a mutual agreement. Because the building has many different locations, the contractor will gradually improve. The suggestion is that if there is a complaint from the user, the owner reports to the owner and then the report is submitted by the owner to the contractor and followed up with repairs.
9. Field conditions in which the user operates the building after the second handover (FHO), the owner needs the operator who has been appointed by the person in charge of the building must have received training and know the basic repair procedures manual and as-built drawings also have an operation and maintenance plan in the building including funding so that expectations for the value of the condition of fixed assets are maximum and can provide services to stake holders.

Analysis of corrections (corrective) in quadrant I, namely:

1. There are manual instructions for building boxes and other supporting facilities (water pumps, air conditioners, laboratory equipment, sound systems, electricity networks)
2. There are officers who handle it, including security, operational funds and must carry out routine and periodic maintenance, if the value of the condition of the building or facility decreases, rehabilitation is carried out until the replacement of the equipment (because the economic age has passed or the condition value = zero)
3. All existing facilities should have been trained by personnel who would operate them by contractors rather than people trained by those operating differently
4. All data finding activities that occur damage from the building of each user make a diary as a report
5. Mutual check is carried out together if there is work that has been severely damaged and tests can be done in the field can be replaced by new ones or dismantled.
6. Form a coordination team to periodically check on the user's side and have an integrated grub to resolve it both in terms of the input system to resolve existing complaints as well as monitoring the building by communicating to the person in charge of the building.
7. The owner should make an evacuation route and floor plan after the second handover (FHO) but in the loan-to-use system it is entirely the responsibility of the contractor. Actually it is not the contractor's job because that request is very important for guests both staff or students.

V. CONCLUSION

From the research of building user satisfaction with ULM's new building, several conclusions are drawn:

1. The results of the level of satisfaction of users in the new building ULM from the questionnaire distributed to service users randomly both students and staff also guests by doing calculations using the CSI and IPA methods obtained results that the user is satisfied. This can be seen from the percent of satisfaction standard specifications stated in the CSI method.
2. The results of the questionnaire analysis using the IPA method found the factors / variables of user dissatisfaction that had the highest expectations but the performance was low the need for a subscription that needed to be improved again was the variable the quality of the walls, the quality of the roof / ceiling, pictures or floor plans of each building to get to the room to be addressed, toilet accessories, fast, responsive in making repairs, sensitivity in complaints.

3. The solution given to the problem consists of seven variables / factors that have the highest priority that need to be improved. The solution step is by doing routine checks carried out by the user not only expecting the owner or contractor, it is necessary to add directions to the plan of the room to be addressed or a warning sign about how to use the facility, evaluating by replacing existing repair methods in the new building.
4. The results of the analysis concluded, as follows:
5. The results of the level of satisfaction of users in the new building ULM from the questionnaire distributed to service users randomly both students and staff found that the user was satisfied.
6. The results of the questionnaire analysis using the IPA method found the factors / variables of user dissatisfaction that have the highest expectations but low performance the need for a subscription that needs to be improved again, namely the variable quality of the walls, roof / ceiling quality, pictures or floor plans of each building to get to the room to be addressed, accessories toilet, fast, responsive in doing repairs, sensitivity in regarding complaints.
7. The solution given to the problem consists of seven variables / factors that have the highest priority that need to be improved. The completion step is by doing routine checks carried out by the user not only expecting the owner or contractor, it is necessary to add a map of the room to be addressed or a warning sign about how to use the facility, evaluating by replacing existing repair methods in the new building , the owner should also involve the user in the planning period and provide socialization in order to have awareness of maintaining the quality of facilities to improve and improve the handling that occurs in order to achieve the satisfaction of building users as expected.

VI. SUGGESTION

The suggestions that can be given for research are

As for suggestions that can be given include:

- The contractor and owner or user should pay attention to the variables of user satisfaction level analysis for the consideration of the contractor and owner as well as in the service improvement efforts produced to building users so that complaints do not recur, thereby reducing re-work.
- Users must regularly check and input data or reports of damage that occurs to the owner.
- Further research needs to be done after the second handover (FHO).
- The implementation of repairs in the field which is considered not optimal should be considered by the contractor to replace the repair method that is really good and does not rework.
- The need to add knowledge of procedures for using both manual box facilities and special training socialization for the use of building facilities takes place.

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