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VERIFICATION OF POSSIBILITY OF TRADITIONAL HOUSE USE AND THE STRATEGY FOR THE REVIVAL OF A HISTORICAL CITY

In the case of Ohmihachiman city, Shiga prefecture, Japan

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Abstract. Recently, the number of vacant traditional townhouses has been increasing, as cities’ central districts decay. In this paper, aiming at the activation of a region by effective use of vacant traditional townhouses, a rented house use strategy is proposed. First of all, the current number and potential vacant traditional townhouses and the intentions of local residents and population of surrounding area concerning to their use are accurately surveyed. As a result, it becomes clear that the rented house use of vacant traditional townhouses is necessary and possible. Next, the investigation with current tenants in their negotiation processes with vacant house owners is executed. Furthermore, some approach cases online are searched, and as a result, the following 3 points can be said: (1) it is important to collect and organize information of the vacant traditional townhouses in order to facilitate the rented house use; (2) a trustful real estate broker is necessary; (3) to consider local population expectances and understanding is necessary. Finally, the result of these is received, it is proposed that the database of the vacant traditional townhouses with VR be constructed and it be opened for public access on the Internet. In addition, the establishment of the resident organization for the rented house use as a nucleus of the use promotion strategy is also proposed.
Keywords. Historical city; investigation; vacant traditional townhouse; rented house use; VR

1. Introduction

Many historical cities have great traditions and values such as the built heritage, the landscape, and the community, among others. Recently, approaches that started to attempt the activation of these regions by using the district resource have been effectively noticed. But, on the other hand, peculiar problems for a historical city are also being noticed, such as increase of tourist, lack of heirs, traffic congestion and so on. In this paper, the authors pay attention to the fact that the number of vacant townhouses has been rapidly increasing and these cities are coming not to keep the residential function. These problems are not only seen in many local cities in Japan, but also in Hanoi, Vietnam and Sankyo, Taiwan, for example, and there is a possibility that current developing Asian countries will be confronting the same problems in the future.

2. Previous Studies

In other studies, the causes and the circumstances of population decline and programmes to overcome under-potential land utilization in local cities have been already solved, and the problem got clarified (Ikawa and Higuchi, 2002; Ohuchi et al, 2005). One of the authors has reported that the main conditions for practical use of the vacant traditional townhouses were through obtaining the cooperation of local residents, having experience of utilizing a vacant traditional townhouse, and cooperating between various parties (Fukuda et al, 2008). Furthermore, the authors paid attention to the rented house use supported with Information and Communication Technology (ICT), examined the necessity and the possibility of the vacant townhouse and pointed the problems and remarks. In addition, the supported plan with ICT was discussed.

3. Research

3.1. EXAMINATION OF THE NECESSITY AND THE POSSIBILITY

3.1.1. Grasp of available house

First, all traditional townhouses in a district were surveyed by watching and photographing and grasped the total existing. As a result, it became clear that of those ones surveyed, 437 were still remained traditional townhouses.
Next, by using the index of the maintenance level, it was evaluated how these houses maintain their past shape, and whether it is possible or not to use them as the key resource for the district revival. The maintenance level index was defined as following:

1. The elements that compose the facades of a traditional townhouse are assumed to be side door, window, wooden lattices, wall, attendant facilities, and an adding point is given according to TABLE 1.

2. Based on each item’s grading point evaluation, the maintenance level of a traditional townhouse was decided according to TABLE 2.

As a result, 126 (27.5%) of the houses were classified and included in the level 5 in the rating of maintenance index. Moreover, the number of the houses classified with a level ranging from 4 to 5 was corresponded to 40 (55.5%) and the others to 206 (44.9%). So it could be understood that a lot of vacant traditional townhouses maintain the past state.

### TABLE 1. Item of the adding point

<table>
<thead>
<tr>
<th>Element</th>
<th>Adding point</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side door</td>
<td></td>
<td>0</td>
<td>Past state is maintained.</td>
<td>The different material from a past traditional townhouse is seen.</td>
</tr>
<tr>
<td>Window</td>
<td></td>
<td>0</td>
<td>Past state is maintained.</td>
<td>The change is seen in either of the 1st or 2nd floor.</td>
</tr>
<tr>
<td>Wooden lattices</td>
<td></td>
<td>0</td>
<td>Past state is maintained.</td>
<td>Wooden lattices don’t exist. The material and shape have changed from the past shape.</td>
</tr>
</tbody>
</table>
The change is seen in either of the 1st and 2nd floor.
The change is seen in both the 1st and 2nd floor.
In front of the house, something is established as an annex or the setback is done.

<table>
<thead>
<tr>
<th>Maintenance level</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 5</td>
<td>1. Adding point is 0.</td>
</tr>
</tbody>
</table>
| Level 4           | 1. Only the door has changed.  
2. Only the window has changed.  
3. Both of the door and the window have changed.  
4. The door or the window has changed. Or both of them have changed and with attendant facilities. |
| Level 3           | 1. There are no wooden lattices.  
2. The wall has changed.  
3. There are no wooden lattices and the wall has changed.  
   (All of the door, the window, and the wall have changed and without the wooden lattices is excluded from Level 3.) |
| Level 2           | 1. There are no wooden lattices and the wall has changed.  
2. The wall has changed and with attendant facilities.  
3. There are no wooden lattices, the wall has changed and with attendant facilities.  
4. All of the door, the window and the wall have changed and no wooden lattices. |
| Level 1           | 1. It is setting up, or is turned into parking lot, vacant lot, and so on.                                                                  |

3.1.2. Trend of availability of the vacant house and its renewal
In the surveyed 437 houses, from the year 2000 on, 19 of them were rebuilt into the new residential houses, 4 turned into vacant lots and 3 into parking lots. In total, 26 of the traditional townhouses were demolished in a period of 7
years. In addition, according to the head of the residents’ association, 72 of them were vacant during the time.

3.1.3. Expectations for new vacant houses

Next, the intentions of local residents of surrounding area were examined. The number of interviewees over 60 years old and living alone or in couple corresponded to 73, which implies that old generation families made up to 46% of all those living in the district.

Considering the scenario of aging families progressing, the possible number of the vacant traditional townhouses in 10 years from now is predicted. The methodology used is shown below:

1. First referring to the life expectancy estimations included in the abridged life table of the Ministry of Health, Labour and Welfare.
2. Then estimating that if the householder is a woman and over 80 years old or if a man and over 75, chances are that the house becomes vacant in 10 years.

As a result, it turned out that 27 (18%) of the houses become vacant houses when considering the number of aging residents previously reported; about other 64 may become vacant in 10 years. The predicted number of the vacant traditional townhouses is at the same level as those now, so is predictable the doubling of the total number in 10 years.

3.1.4. Grasp of local residents awareness and intention

Later, the intentions of local population were examined. As a result, it turned out that 85% of the local population recognizes an increase of the vacant traditional townhouses; in addition, 60% of them thought that the vacant traditional townhouses should be used, so the request for some utilization was proved to be high among citizens.

3.2. EXTRACTION OF THE PROBLEM POINT AND THE NOTE

3.2.1. Realities grasp of rented house use

First, the investigation of the people hiring the vacant traditional townhouse by that time was executed, and it turned out that 9 in 14 people have counted on local residents information in order to find a vacant townhouse and it has taken them one year or more to get the contract approval. Based on the experience of use, the importance of obtaining the local population’s understanding was pointed out many times as a key element.
TABLE 3. Trouble until business beginning

<table>
<thead>
<tr>
<th>Item</th>
<th>Real number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
</tr>
<tr>
<td>Find the vacant townhouse that can be borrowed</td>
<td>6</td>
</tr>
<tr>
<td>Apply for agreement by negotiating with vacant house owner</td>
<td>0</td>
</tr>
<tr>
<td>Decide the investment destination of the repair and earthquake</td>
<td>0</td>
</tr>
<tr>
<td>resistant reinforcement</td>
<td></td>
</tr>
<tr>
<td>Negotiate on the repair part.</td>
<td>0</td>
</tr>
<tr>
<td>Negotiate on the lease expense and the purchase expense.</td>
<td>0</td>
</tr>
<tr>
<td>Negotiate on the lease.</td>
<td>0</td>
</tr>
<tr>
<td>Obtain the vicinity resident’s understanding.</td>
<td>0</td>
</tr>
<tr>
<td>Do various administrative procedures.</td>
<td>1</td>
</tr>
<tr>
<td>Procurement of the capital of debt, purchase, and repair</td>
<td>2</td>
</tr>
<tr>
<td>It did not have to be difficult.</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
</tr>
</tbody>
</table>

3.2.2. Intention grasp of lease use of the vacant house owner

Next, the investigation of the vacant house owners was executed to grasp their intention of rent or sale and also to identify the reasons why has not renting or selling. As a result, it turned out that 5 in 19 people wanted to rent or even sell their properties. Moreover, it was also identified that even if they wanted to rent and sell it off, they could not have made it by that time because the lack of interested people’s awareness. Such a background is received, a reliable real estate broker has been said to be a necessary support element.

3.2.3. Trend grasp of existing system on the internet

To understand the trend of existing matching system, some approach cases on the internet was searched. As a result, it turned out that there were 38 groups working on the vacant traditional townhouses preservation, supporting their initial idea. Among these 38, 8 had already some database of vacant traditional townhouses, and other 3 had some scheduled database disposal. Moreover, groups that had a public access database on the Internet were only 3, concluding that is still difficult to obtain this type of information. In addition, the information open to the public is consisted basically of hand-drawings, external photographs, and textual information. When the rented house use is examined, necessary information on the vacant traditional townhouses is scarce.
4. Result

Summarizing the information described in previous sections, it can be highlighted as following:

4.1. THE NECESSITY AND THE POSSIBILITY FOR RENTED HOUSE USE

It became clear with section 3.1 that: (1) a lot of vacant traditional townhouses maintain a past state; (2) there are 72 of vacant traditional townhouses; (3) 26 houses are demolished in 7 years; (4) the predicted number of potential vacant traditional townhouses is at the same level as now and so doubling the total number in 10 years; (5) request for their utilization is proved to be high. Thus, the following 2 main points can be said:

A. The rented house use of the vacant traditional townhouses is necessary.
B. The rented house use of the vacant traditional townhouses is possible.

4.2. THE PROBLEM POINT AND THE NOTE FOR RENTED HOUSE USE

The problems identified from section 3.2 are: (1) it is difficult for potential use applicant to find a vacant traditional townhouse by himself; (2) there is a lack of necessary information on the vacant traditional townhouses, even if on-line; (3) it is difficult to find those who are interested in the use of the vacant traditional townhouses. Moreover, the notes became clear from section 3.2 that: (1) a reliable real estate broker is pointed as a necessary support element. (2) obtaining the local population’s understanding is an important path for rented house use. Thus, the following 3 points can be said:

A. It is important to collect and organize information of the vacant traditional townhouses for rented house use.
B. A trustful real estate broker is necessary.
C. To consider local population expectances and understanding is necessary.

5. Discussion

With the resulting conclusions from section 4.1, the authors propose the rented house use promotion strategy supported with ICT, as the following:

5.1. DESIGN POLICY OF THE SYSTEM

To attend the item A in section 4.2 and thus facilitate the promotion of rented house use, the authors propose the construction of a database of the vacant...
traditional townhouses with Virtual Reality (VR) and its free accessibility to public on the internet. In this database, a lot of information would be included. The policy of the VR system’s development is shown in TABLE 4. Compared with the past matching methods used for townhouse renting process, using VR and allowing applicants interaction, rent or purchase negotiations can be easily confirmed in real time.

TABLE 4. The policy of the VR system’s development

<table>
<thead>
<tr>
<th>Development of the contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Modeling the vacant traditional townhouses by using 3DSMAX and ArchiCAD</td>
</tr>
<tr>
<td>· Simplification of the data by texture mapping (especially the roof tile)</td>
</tr>
<tr>
<td>· Improving the traditional townhouses expression by texture mapping and bringing them close to realistic ones</td>
</tr>
<tr>
<td>· Improving a peculiar aging expression (especially dirty and old expression)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Development of the interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Walk-through function to stroll in a vacant traditional townhouse</td>
</tr>
<tr>
<td>· Indicative function with visual and aural information to show the space where use applicant can use, loan and buy</td>
</tr>
<tr>
<td>· Indicative function to show the maintenance level (shown in section 3.1.1)</td>
</tr>
<tr>
<td>· Learning function with visual and aural information for use applicant to know about the traditional townhouses and the historical city (ex. previous house’s shape, previous functions, materials)</td>
</tr>
<tr>
<td>· Indicative function to show the voice of the local residents (ex. type of use which locals hope, rules of the community)</td>
</tr>
</tbody>
</table>

Figure 1. (left) 3 dimension visualization, (right) VR of the vacant traditional townhouse
5.2. OPERATING POLICY OF THE SYSTEM

To attend to issues B and C in section 4.2, the authors propose the establishment of the resident organization for rented house use as a nucleus of the rented house use promotion strategy. This organization would be in charge of investigating the type of use local population wish for the vacant traditional townhouses, collecting the information provided by a landlord, and also doing the maintenance management of the database (shown in section 5.1).

When potential applicants inspect VR of the traditional townhouses on the internet, and the rented house use is hoped, it is reported to the concerning landlord through this residents organization. After the report, and if in a landlord consent, the matching is approved, and rented house use begins.

6. Conclusion

In this paper was first discussed the necessity and the possibility of the promotion of rented house use for the vacant traditional townhouses in an attempt to achieve central districts reactivation. After a detailed survey on local citizens expectations on townhouse uses and the available resources to promote it, it was pointed the ICT support plan as possible instrument to facilitate matching among landlords and potential tenants interested in some use for the house.

As for a future achievement, the implementation and the evaluation of the system are expected. The extraction and additional design of VR function for rented house use promotion are still necessary. It is also necessary to consider the problem of the protection of personal information. For instance, as one method, information is disclosed only to the member. Furthermore, it is also necessary to propose management solutions for the method before it turns into part of the residents’ organization.

Acknowledgements

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