A STUDY ON THE PROCESS DEVELOPMENT OF COLLECTIVE INTELLIGENCE FOR UTILIZATION OF UNUSED SPACE OF ABANDONED SCHOOLS

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ABSTRACT

Living conditions and social environment are changing through time, and recently schooling population is diminishing in Korea. Thus the number of abandoned schools has increased. In order to utilize unused space a mechanism is required for the exchange of various ideas. However, there is little effort to provide a platform for this purpose. This study aims at developing a process and a systemic method to collect intelligence of utilizing unused space.

KEYWORDS

Abandoned school, collective intelligence, unutilized area data, decision making process.

1. INTRODUCTION : BACKGROUND AND RESEARCH GOAL

Living environments change depending on national policy, culture and its inhabitants much like a living organism. Some cities and facilities that could not adapt themselves to such changes miss their chance to be fully utilized and instead fall behind. In the case of school facilities, finding the proper flexibility to change and adapt to its environment has remained a challenge due to its characteristically sensitive nature to the population distribution of inhabitants. Those school facilities that have fallen behind from adapting and changing are easy to spot as most of them eventually become abandoned spaces. As the world enters an aging society, an upwards trend is evident in the return to farm and rural living styles in elderly people in Korea, while cultural and educational facilities seem to be neglected as they often do not meet new demands. To solve such phenomena, consistent ideas regarding the educational environment must be developed through on-going discussions of various concepts.

The supportive environment, however, is relatively weak in reality but can be highly effective when the collective intelligence is constructed on a specific topic through multiple mediums due to the advancement of the internet and mobile devices. For example, Wikipedia is one of the most influential encyclopedias based on the concept, ‘Encyclopedia written by everyone’. The development of mobile devices has helped boost ‘digital data’ environmental conditions in various physical spaces.

This research looks into methods to data unutilized areas by observing possibilities possessed by collective intelligence and by using mobile devices. It also suggests the process by which people can provide educational knowledge by utilizing ideas based on this. Nevertheless, as the category of unutilized spaces is very broad, the research has limited the space to abandoned schools as mentioned above.

2. PROCESS, TEMPLATE AND PLATFORM

2.1 Definition of Collective Intelligence

Collective intelligence means collective intellectual ability obtained through cooperation or competition of multiple unities. Such ability shows strength that exceeds the intellectual ability of a single unity. It was first

proposed in《Ants : Their Structure, Development, and Behavior》published by William Morton Wheeler, American entomologist in the year of 1910. Wheeler explained the high intellectual ability of colonies that exceeds a single unity with the example of ant colonies. In the case of human beings, such concepts are being realized through a vast network called the internet, and its related case is as follows.

2.2 Related Cases and Shared Features

Table 1. Related cases

Case name	Content	Verification method
Wikipedia	It is an internet technology-based website where people make an encyclopedia together. It does not simply create intellectual content, but also organizationally generates the expansion, confirmation and connection of contents through mutual interaction. Users are independent from one another and the order of rank is not apparent like in the existing society as it has various backgrounds. Therefore, it is much more autonomous and it updates new knowledge which is reflected without limitation.	Changed recently, various editors find errors or wrong expressions as it is consistently exposed through Observation Document Queue function.
Innovation Jam	It is one of the driving forces of IBM for consistent innovation. It provides a large-scale forum of discussion through its website every year since 2001. Approximately more than ninety thousand people scattered all over the world write ideas related to a few topics. In 2006, IBM produced 10 innovation businesses for the next generation and invested one hundred million dollars for 2 years.	Verification made through complementation and modification from focused discussion over the course of several days, 24 hours

Common features of two cases are as follow. Firstly, they provided an environment where various people can gather. Secondly, they have consistent and focused verification systems for a specific period of time. Thirdly, the necessary feedback is provided. To reflect such characteristics positively, web or mobile environments are essential.

2.3 Space Utilization Element Abstraction of Abandoned School

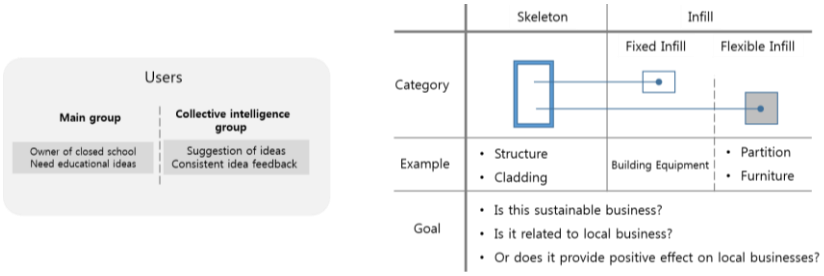

Figure 1. User and elements of abandoned school

To utilize abandoned schools educationally, two groups need to be formed. Firstly, a main group which owns abandoned school while requesting ideas. Secondly, unspecified persons called the collective intelligence group, which suggests ideas and provides feedback. In prior research, utilization methods were largely divided into Skeleton and Infill, and the above figure can be seen excluding those conditions subordinated in South Korea. To meet the suggested requirement, the main group must collect preliminary information about the provided area among the elements of Skeleton and Infill, while also providing a clearly defined goal to the collective intelligence group. Also, the collective intelligence group suggests ideas based on suggested preliminary information and goals. There must be consistent feedback for a specific period of time between the two groups based on such suggested ideas.

2.4 Sharing space Utilization Element Using Mobile Device

Skeleton and Infill elements which will be suggested by the main group can be concretized as follows.

Table 2. How to utilization elements using mobile device

List	Utilization of mobile device	Content
Location	GPS Data input	International standard coordinates provision that shows real location
Characteristics of site	Input after taking pictures by using camera	Report site area and characteristics. Ex) garden, play-ground
Facility area	Enter the written data through the measurement of preliminary information or floor formation	Area suggestion of composing facilities
Floor formation	Utilize mobile application that creates floor plan based on image processing and AR distant shooting technique	Suggest approximate structure of floor formation
Note	Enter text and image	Major businesses of neighborhoods and cities, or population related data Suggest short-term, medium-and-long-term goals Other necessary data

2.5 Sharing Unutilized Area Data and Decision Making Process

Suggestion of sharing unutilized area data and idea decision making process by using the above conditions is as follows.

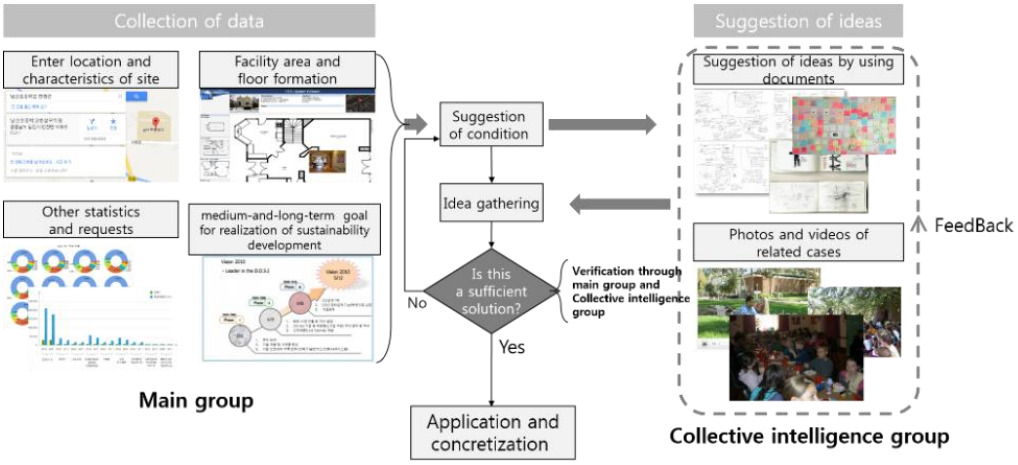

Figure 2. Decision making process

Firstly, main group collects information on the location, characteristics of the site, facility area, floor formation and other requests. Secondly, main group uploads the collected data in a website where sharing of ideas will be performed. Thirdly, main group enters ideas about expected application on facilities and input, and inquires medium-and-long-term goals and other conditions based on the collected data. Fourthly, the collective intelligence group confirms, enters, and shares ideas through various methods. At this moment, an environment is provided where they can input not only text, but also related case URL, images, or video links. Fifthly, two groups constantly give feedback for collected data during a specific period of time. Lastly, abstracted ideas are implemented on unutilized spaces.

2.6 Process Implementation Example

With the contents above, it can be imaginarily implemented on real abandoned schools in South Korea as the following. Firstly, main group suggests the following data by using mobile devices and basic information. Secondly, the collective intelligence group suggests the following idea by using the data proposed above. Thirdly, the final idea will be drawn through feedback of two groups during a specific period of time.

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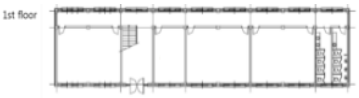
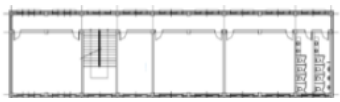
Table 3. Sharing unutilized area data and suggestion of idea

List	Contents (Example)
Location	37°08'14.4"N 127°18'29.3"E / Hupyungro 6, Wonsammyun, Yonginsi, Kyungkido, South Korea
Characteristics of site	   Secure space where outdoor activities can be performed Site area : 9,788㎡
Floor formation	  
Note	Environment near farming area as it is separated from cities Low accessibility Nonexistence of convenient facilities around Number of households/Number of population : 3,287/7,654
Traditional drink experience Realization of educational space	  Suggests educational program which can be performed without frequent visit as it has low accessibility. Even though it is adult-oriented program with high mobility, it provides educational enviro nment where youth and children can observe production and fermentation processes. Possible to have the program 3 times per year with total 4 groups in 4 months as one unit. Continue with farming producible traditional food such as Kimchi, soybean paste if expan sion is possible in the future.
Feedback	 Provide additional successful cases in other countries, example) Heineken factory, Domin us Winery etc. To reinforce the possibility of expansion, medium-and-long-term goal needs to be consider ed so that it can be performed by focusing on Korean fermenting food such as Kimchi and Soybean paste

3. CONCLUSION

The research determined how in abandoned school, unutilized space can be educationally reused through the means of collective intelligence. It was identified that collective intelligence can be used to draw and concretize ideas regarding utilization of unutilized space through this research. However, to reuse the unutilized space educationally, various conditions such as the selection of investors and operators need to be considered. Therefore, additional researches about other additional conditions must be performed with the suggested processes mentioned in this thesis.

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