Study on Design Resource as a Methodology for Area Redevelopment
-Case study of renovation project of wooden apartment in Tokyo-

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Abstract

In this study, we propose a methodology for editing architectural design into "design resource" in order to share effective design idea among multiple people. We developed a method named Archi-Commons: by applying this method through a renovation project of old wooden apartment, so called Moku-Chin, we will verify the effectiveness of design resource as a new type of design tool for urban design. We will verify the possibility of this method as a way to redevelop certain area and community. Through this study, we realized the potential of what we call "Resource based Association", a human network created through design resource, as an effective human network that would progress the urban metabolism.

We anticipate that our study opens the discussion for a new methodology for design resource and for new way of urban redesign.

Keywords:

Design Resource, Moku-Chin apartment, Wooden Densely Built-up Residential Area, Resource based Association, Piecemeal growth

1. INTRODUCTION

1-1. Background

1.1.1 Re-design of "Moku-Mitsu"

Though Tokyo represents modernized urban images, most of the land is still covered with residential house based on traditional wooden construction system. Through the high economic growth period during the 1960's to 1980's, these residential areas have been growing in order to accept people from outside the urban area. These areas are called wooden densely built-up residential area; central part of Tokyo is surrounded by these area. In Japanese we call these area "Moku Mitsu".

In these wooden densely built-up residential areas, the elderly population and vacancy rate are both increasing. This is a serious problem for owners, neighbors and even for the local government in terms of "district management" and "disaster prevention". It is essential to re-develop the area and increase the housing opportunity for the younger generation to overcome the vulnerability of the area. However, the option that owners can choose to re-build / renovate the area is limited. Therefore it is hard for landowners and government to progress the re-development. It is also difficult for architects, planners and designers to work in this field because of their conventional "design method" and "business model". Though there are many problems, these areas have been neglected by professionals. It is also difficult for planners to develop the area though they have a develop plan because of the complicated land owning system. Conventional urban design method is not useful enough in this field. Totally new way of urban redevelopment is needed.

1.1.2 Design resource and information society

Open-source has been an important idea occurred through software development since '90s and it is spreading in the field of design and architecture. By sharing ideas through Internet based platform, various potential of design and architecture has opened. It is worth to think how we could apply new ideas to urban development using new technology and idea.

1-2. Objective

The object of this study is to clarify the validity of design resource in order to develop certain area. To set up a hypothesis, we developed a method named Archi-Commons to verify the impact of design resource as a useful design tool to redevelop an area. Archi-Commons is a methodology to create and manage design as resource to be shared and to be reused. We applied this method to renovation project of old wooden Japanese apartment. We will present the process of the project and open-up the procedure of the method. Then we discuss the validity and effectiveness of design resource as a way of developing an area and try to upgrade the method as a conclusion for this study.

2. Design Method: Archi-Commons
2-1. Commons theory

To gain a new perspective to rethink design as a sharable resource, commons theory will be a useful theoretical framework for this study. Commons theory has its origin in the field of natural resource management. Today, Commons is also understood in the field of cultural movement based on digital technology / Internet such as software development, music, filmmaking and so on. Commons could be understood as a place / space to share resource with multiple people.

There are several definitions by several theorists but it could be categorized into two definitions; one is to think commons from resource itself and another definition is to think commons from the social system. By using commons theory as a theoretical background we could think design resource from two ways of approach: resource itself and social system / related communities.

2-2. Mechanism of Archi-Commons

Here we propose the basic procedure of Archi-Commons. The Procedure consists of the following three phases (Figure 1): (1) Resource Development, (2) Commons Management, and (3) Resource Applying. Plus, each phase is organized into several sections in more detail. This whole process is not sequential; one needs to go back and forth reacting to each situation. (1) Resource Creation is a phase for creating architectural design and editing it into accessible media as resource. (2) Commons Management is a phase for making platform to share resource and in order to manage the stakeholders as member of commons. (3) Resource Application is a practical phase for utilizing / applying design resource in order to realize projects.
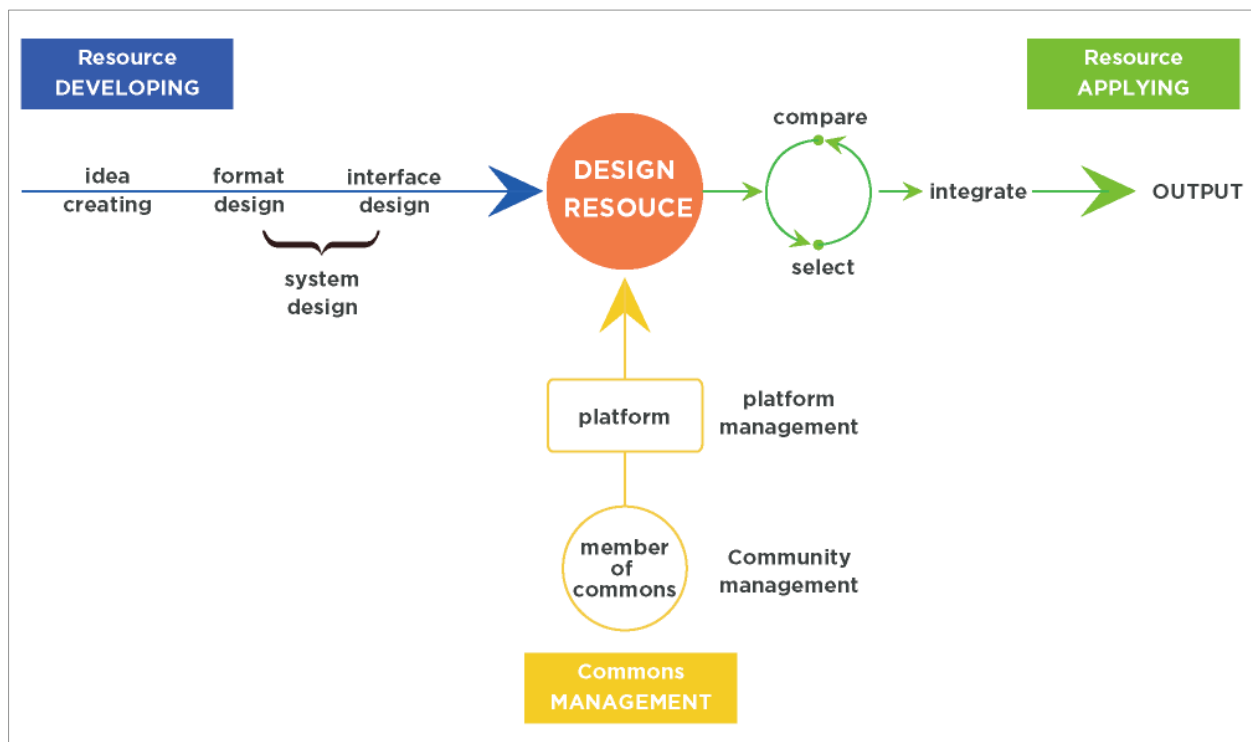

Figure 1. Mechanism of Archi-Commons

1. Resource Development

This phase shows the process in order to edit design idea into accessible and sharable resource. Idea itself is not accessible; usually it is inside designer's head. Therefore, we need to give form and media to idea so that it could be sharable among several people.

In detail, this phase is organized into following 3 sections: (1)Idea Exploring, (2)Format Design and (3)Interface Design. (1) Idea Exploring is a section in order to create and collect design idea. The original creator of the idea does not always need to be the editor / writer of the resource; it could be different person. It is important to know the problem and to define design issue. Research and fieldwork are included in this phase in order to create effective idea. (2) "Format Design" is a section for developing "explanation format" in order to notate design idea in the most appropriate way. This is one of the most important sections of Archi-Commons. Pattern language is one of the best examples of format in order to share design with multiple people to create better living environment. (3) Interface Design, the last stage of this phase, is a section in order to give suitable media and design layout for the format. "Format" and "Interface" of Archi-Commons is similar to the relation of HTML and CSS. Just like HTML expresses the structure of the website and CSS gives a design to it, format is the structural characteristic of the resource and interface is the visual characteristic to make resource accessible. We would like to name this phase "System Design" both including "Format Design" and "Interface Design."

2. Resource MANAGEMENT

This phase shows a way to activate condition in order to make design resource sharable among several people. In order to make resource distributable and sharable, we need to prepare a service to support people and a platform to provide information in order to collect people who will participate the commons as a member. Resource needs to be controlled and managed by particular person, organization or a community. We need a rule, system or a platform to make design resource useable and to make idea open to the public. Resource itself couldn't be self-independence. It realizes its value by appropriate use by related people. In this phase we need to try to make a certain platform to activate design resource as a sharable and distributable resource. It is also important to manage the community / association / stakeholder to improve the value of resource by managing the platform.

3. Resource APPLICATION

Resource Application, the last phase of Archi-Commons, is a section to utilize design resource in order to apply idea to real project. Design process using design resource is slightly different from the usual one. First of all, one needs to select several design resources that seems to be adaptable and by putting it into the site, one needs to check the "fitness" between the idea and the context. You need to repeat this process until you get the best selection as a solution for the project. After getting appropriate set of idea one needs to adapt and fix the resources in order to integrate the idea into a single plan as an output.

3. Applying the method: Moku-Chin Apartment renovation project

By applying "Archi-Commons" to Moku-Chin Apartment renovation project, we will verify the applicability of the method. From the results of the project, we will clarify the effectiveness of design resource as an new method for area redevelopment.

3.1 About Moku-chin Apartment

3.1.1 Outline of Moku-Chin

Moku-Chin is a typical type of Japanese apartment (Figure 2). "Moku" stands for "wood", "Chin" stands for "rent".   Many Moku-Chin exist in "wooden densely built-up area" including Tokyo. Moku-Chin has been built through high economic growth through 1950's ~ 1980's in order to accept people from outside the urban area. There are two important characteristics to understand Moku-Chin apartment.

Figure 2. Exterior of typical type of Moku-Chin Apartment

1: More than 160,000

This is the number of existing Moku-Chin Apartment. One could easily find Moku-Chin anywhere around Tokyo. Though owners own each apartment personally, these personally owned building could easily effect the urban landscape since it is spread in the large quantity. Moku-Chin will affect the daily life of the people who live in the area. It is important to think Moku-Chin as a social resource / infrastructure. Most of the apartments are dilapidated building that need to be renovated / rebuild. The potential market size of Moku-Chin is large enough to challenge.

2. Based on same construction system

Most apartments share its characteristics in terms of its shape, form, scale, material and planning. This is because Moku-Chin apartment is all based on Japanese traditional construction system. You can categorize Moku-Chin in certain types/pattern.

3.1.2 Problems: Dilapidated structure/function

Though Moku-Chin exists everywhere in Japan, there are many problems. The main problems are the three following aspects: 1.Poor living conditions, 2.Increase in vacancy rate, 3.Aging of the owners and residents. These three problems are creating vicious circle. To break the vicious cycle it is valuable to expand and open the housing opportunity for younger generation, in order to decrease the vacancy rate and the aging rate to over come the vulnerability of the area. By decreasing the vacancy rate, it will make owners to re-invest to their apartment. To maintain the environment it is important to make people move-in and eventually to make the flow of money.

3.1.2 Two major ways to renovate Moku-Chin

Though it is essential to re-develop Moku-Chin it is very difficult to renovate in the conventional situation. Basically, if owners try to renovate Moku-Chin there is only two limited ways.

1. Ask a normal remodeling contractor or Real Estate Company
2. Ask a designer or an architect

The renovation cost of the first approach will be cheap, but the final output will be ticky-tacky. By this approach it is hard to increase the value of the apartment. By the second approach, owners can get high quality design, but it will be too expensive for them to pay.

By using design resource, we believe that totally new way of renovation will be realized.

3.2 About the Project: MOKU-CHIN KIKAKU

We started the project from 2011 spring. Through the project, we have been applying Archi-Commons as a methodology to manage the project. By applying the method, we have been able to create a design resource named "Moku-Chin Recipe." At this point, we have completed six renovation projects by using Moku-Chin Recipe. In the following section, we will introduce all our output that we created by applying Archi-Commons. By looking at output we will analyze the effectiveness of design resource (Moku-Chin Recipe).

3.3 Output

3.3.1 Resource CREATION

-MOKU-CHIN RECIPE

Through the "Resource Creation" phase we created and developed a design resource named "Moku-Chin Recipes". Presently there are 42 recipes (Figure 3). Moku-Chin Recipe is a design tool for renovating and customizing Moku-Chin apartment to improve bad living condition. All the recipes are uploaded on the website so that people can see and check good ideas to renovate their building. Moku-Chin Recipe is a set of partial ideas to re-design Moku-Chin. One need to select 5~15 ideas in order to create a renovation plan. Since Moku-Chin is based on same construction system, good ideas a reusable to similar type of houses.
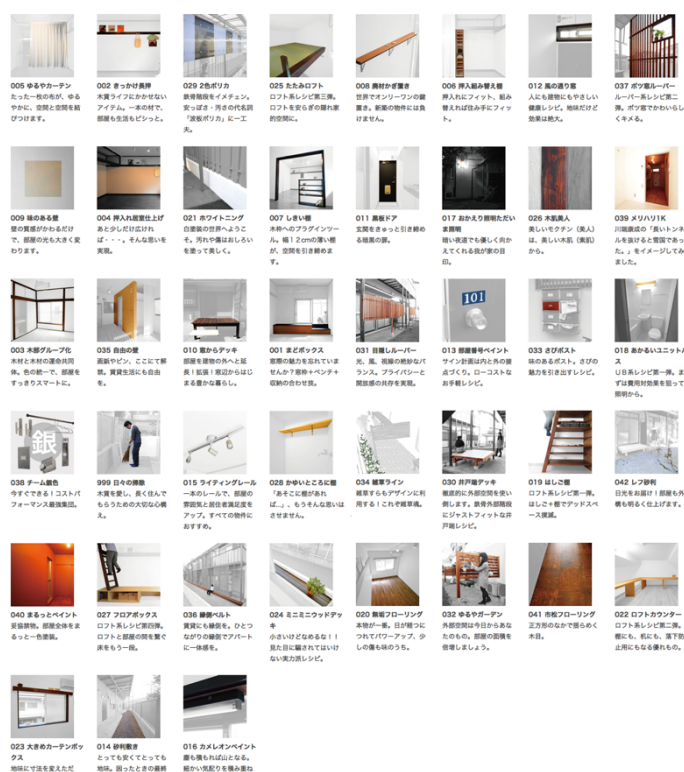

Figure 3. List of Moku-Chin Recipe

-FORMAT DESIGN

Through the project, we created several types of format in order to express and notate renovation idea. We changed contents of the format depending on objective, phase, and condition of the project. We always tried to develop a format with a clear and simple expression.

The original format consisted of five following contents: 1.Name of the recipe, 2.rough drawing of the idea, 3.Design issue, 4.Design solution, 5.Author of the recipe (Figure 4). This format was first developed to share ideas among the design team, not for the general public. By using this format each designer created and expressed their ideas. This format made it easy to

share ideas and it has developed to some sort of common language among the team. It also made it easy to compare each idea.
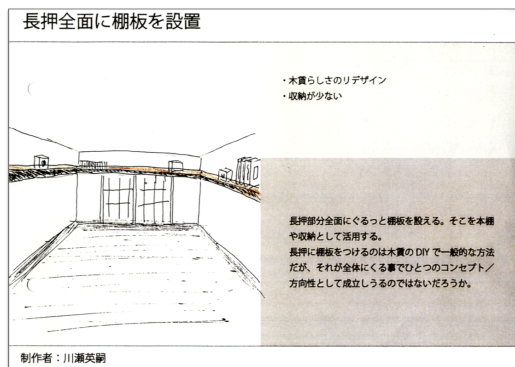

Figure 4. Original Format of Moku-Chin Recipe

When we decided to make a booklet of Moku-Chin Recipe to make it easy to share idea with several people including owners and Real Estate Company we decided to change the format of Moku-Chin Recipe. We created a new format by developing the former format including following 10 contents: 1.Recipe ID, Recipe Name, Brief Copy of each recipe, 2.Recipe Image, 3.Adaptable room type, 4.Design Issue and Design Solution, 5.Related Recipes, 6.Guideline, 7.Feasibility, 8.Cost, 9.Case study, 10.Similar recipe (Figure 5).

Figure 5. 2nd Version of Moku-Chin Recipe

In 2012, we decided to migrate Moku-Chin Recipe to Internet based platform. We developed a dedicated database system in order to manage all the design resource (Moku-Chin Recipe). At this stage, we added some extra information to make recipe easier to understand (Figure 6). Moreover, we decided to separate Moku-Chin Recipe into two parts: (1) open-access page with basic information, (2) extra pages for exclusive use of members with detailed information.

Figure 6. Format developed for web version

-INTERFACE

Through the project we used several types of media to make Moku-Chin recipe sharable device: booklet, card and website. Selecting media was an important decision for our team to manage Moku-Chin Resource to make it effective used by various people. "How should it be open?" "For whom should it be open?" has been the two important issues that we need to discuss when we need to decide a certain media for design resource. At this stage, we have been using Internet based platform to share our idea. After using Internet, it has been easier to manage and control our resource and also easier to spread our idea among multiple people. By using Internet to manage Moku-Chin recipe it has been easier to update information and spread it among people.
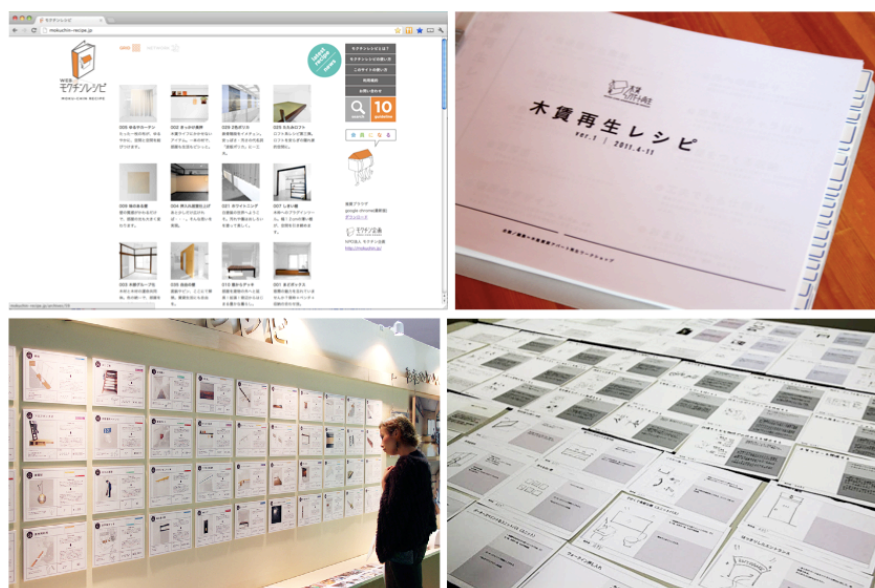
Figure 7. Several types of Interface developed for Moku-Chin Recipe
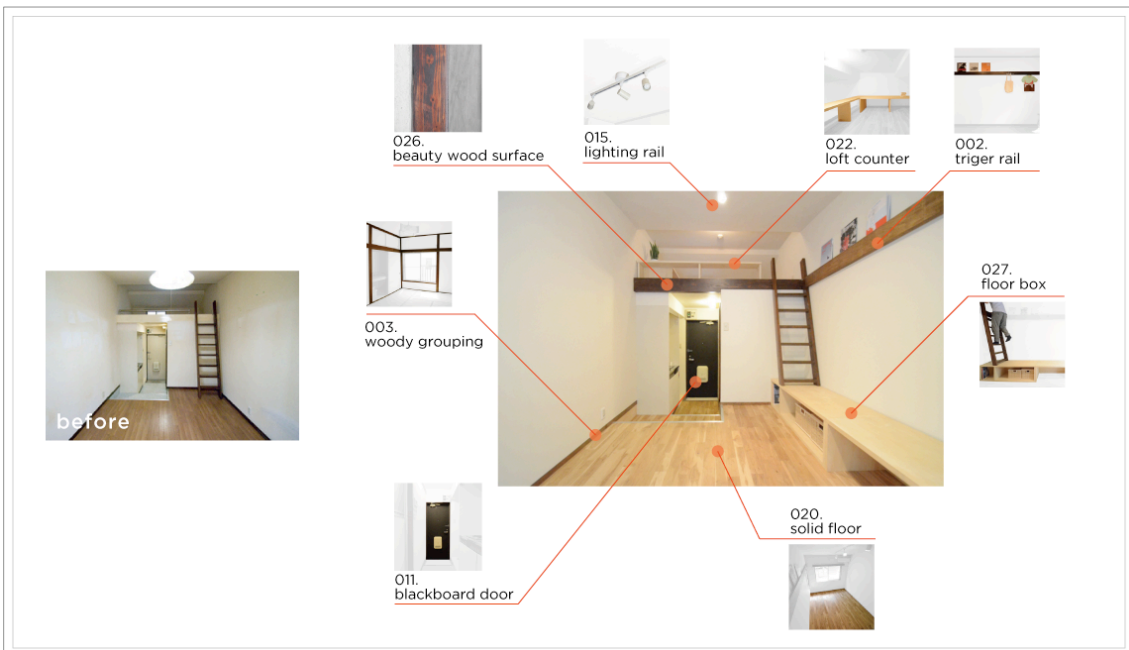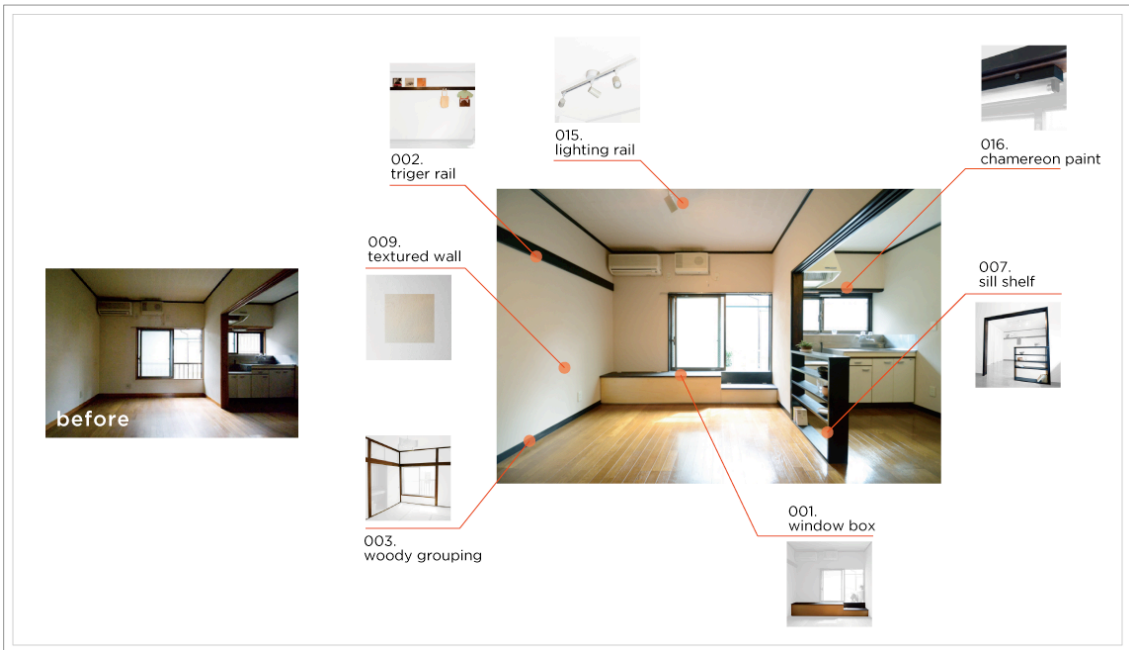
3.3.2 Commons MANAGEMENT

In 2011 we revealed "partnership program" to gain collaborators. The main target of this partnership program is local based Real Estate Company. We realized that we need a platform to share design resource in order to distribute our design. By participating partnership program, Real Estate Company could get an access ID and password for all of the pages to Moku-Chin Recipe and they could also get some support from our team in order to use Moku-Chin Recipe effectively.

At this stage, there are sixteen companies working with our team as a member of partnership. By supporting them and giving them our know-how we are able to develop the quality of this network as a community. The aim of this membership program is to improve design literacy of the Real Estate Company in order to make them realize a better environment in their located area.

Furthermore, we also started a general membership program for other types of people. This program is for the people who would like to check Moku-Chin Recipe including the detail pages. By creating a platform (membership program) we are able to gain people who would use our resource and this human network is an important tool for us to develop our project.

3.3.3 Resource APPLICATION

Here, we introduce three Moku-Chin Apartments renovated by using Moku-Chin Recipe. As one can see from the picture, 5~15 recipes are used to renovate an apartment. By selecting appropriate set of recipes one could make a renovation plan to improve the quality of living environment.

002.
triger rail

015.
lighting rail

016.
chamereon paint

009.
textured wall

007.
sill shelf

before

003.
woody grouping

001.
window box

026.
beauty wood surface

015.
lighting rail

022.
loft counter

002.
triger rail

027.
floor box

003.
woody grouping

before

011.
blackboard door

020.
solid floor

029.
2colored PC

017.
welcome illumination

030.
parish-pump
wooddeck

013.
number paint

021.
whitening

before

031.
blind fold
louver

033.
rusting post

The rent money increased 10 percent in average, and owner got a new young tenant. Before the renovation, since the room has been vacant, owners could not get rent money as their income. If vacancy rate increase and the period of room being vacant, it would make owners difficult to invest for the apartment in order to upgrade the spatial condition. This vicious circle makes the redevelopment of the area tough and complicated.

4. Human Network Created by Design Resource

4.1 Collaborating with the real estate company

We were able to renovate three apartments in the same area. Usually, it is rare for architect, designer and planner to commit to same area by working on several projects. In our case, it was easy to realize some projects because we work with Real Estate Company who are member of our partnership program.

By collaborating with Real Estate Company we were able to renovate 3 apartments in one area. It is efficient to collaborate with local based Real Estate Company since they have wide spread human network between the owners and habitants. They also have some negotiation skills to make owners pay for the renovation cost.

Thinking the physical environment from partial element we are able to recreate our living space and able to access to the urban context. We are planning to develop this method as a new way of urban redevelopment. Design resource act as a common language between the Real Estate Company, and it will be a good incentive to work with us. By opening-up design solution, it will make easy to collect multiple collaborator. We would like to name this situation "Resource based Association". We believe that Resource based Association will be a efficient network to progress urban design in a new way. It was a surprising discovery to know that resource could form a community.

Our next issue is to develop this human network to make it activate to be useful in the development. By creating design resource we always need to explore a good relation between design and society that we live.

4.2 To the new way of area development: Piecemeal Growth

In order to develop certain area, traditional way of urban planning based on central coordination is not enough to shift the situation. "Piecemeal growth", a concept developed by Christopher Alexander, is an interesting concept in order to think and develop new way of urban design. The basic idea of Piecemeal Growth is to develop and construct the environment step-by-step. This idea strongly opposed to the large development by central control. Using design resource and collaborating with local community will realize the urban development based on Piecemeal Growth.

We think that "Design Resource" and "Resource based Association" would be an intensive working framework to realize "piecemeal growth" based urban design in the relation to the real economic market and society.

5. CONCLUSION

In this paper, we proposed Archi-Commons as a methodology to change design idea into sharable resource. By collaborating with the local Real Estate Company, design resource could be a useful tool to redevelop certain area especially a place where modern urban planning method is difficult to apply. Through this study, we realized that Resource based Association is formable by creating efficient design resource. Design Resource and Resource based Association would be an intensive working framework to realize area redevelopment in a certain way.

Since Moku-Chin Recipe empowers general people including Real Estate Company, owners, inhabitants, it will gradually progress the re-development of the area. People will be able to re-create their own environment by them selves from the very little scale and cost. It is valuable to increase the design literacy of the Real Estate Company because they have wide network and relation between owners and inhabitants. If they are able to propose a good design output or a renovation plan, our living environment will be a better place.

We also recognized that the procedure of making design resource is just one type among many. We anticipate that our study open the next discussion for the methodology for creating design resource for the realization of the better living environment.

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