Research on Village Sustainable System Innovation Based on MSDS Method

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Abstract. There are many design-led village innovation in China. However, not all of them are sustainable system design. Some of them are successful but some of them are problematic. Till now, we are facing difficulties such as lacking of methods and tools related to these practices. This paper give some suggestions on both village design and methods and tools. The results are come from case study and tool analysis during one project Current Situation Investigation and Design Requirement Research for Rural Area at Central Region of China.

Design into Society

Victor Papanek said that there are rarely other jobs are more hazard than industrial design—now, industrial designers are murdering based on the mass production. He recommend that designers who are working in the areas such as product design, tools and community infrastructures should have more responsibilities for the society and ecosystem.\textsuperscript{[1]}

Today, it is still necessary to find a new model of innovation, design and originality. This new model should take the untraditional parts of design into consideration—the co-fusion of changing culture, social context and the whole society—including old people, children and marginal nationalities. The development of design should focus on the real needs of our society not only the commercial and technology.

When we think about innovation, the most frequently used word is technology. However, there are many innovations are not happened in the lab but in our society. We take these kind of innovations as social innovation.

Social innovation always are radical innovations. Take the car sharing for example. We want to move from one place to another place in a fast, safe and comfortable way so we keep changing on the technology of the cars. These innovations are progressive. When we think of the needs carefully, we will find that the car is not the only way to help us move to another place in a fast, safe and comfortable way. As what we have seen now, there are services such as car sharing is becoming more and more popular. This kind of innovation has jumped out of the original system and is one kind of radical innovation.

Design into village

This kind of radical innovation is needed when we are considering the issues in village. To improve the living standards in village, we have put many efforts on urbanization. However, this kind of innovation is progressive. When we jump out of the urbanization, we will find that it is not the only way for village to become a better place.

Although, there are many explorations on the development of village innovation model in China. For example, Liang Shuming, Yan Yangchu and Peng Yuting established the village reconstruction activities to get deeper effect on village development.\textsuperscript{[2]} One of the most influential results from that time is the doctoral thesis Jiangcun Economy written by Fei Xiaotong.\textsuperscript{[3]}

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However, all these explorations are in a different context compared with today. It is necessary for us to rethink the village development in a society with all kinds of new features like dispersion, sharing and flattening.

We made a study on village sustainable system innovation and MSDS tools through the project Current Situation Investigation and Design Requirement Research for Rural Area at Central Region of China. Now we want to discuss what we have found.

Village Sustainable System Design Research Process

The definition of sustainable system design can be found from the book System Design for Sustainability written by Carlo Vezzoli. The design for social equity and cohesion of an eco-efficient system of products and services that are together able to fulfill a particular customer demand (deliver a unit of “satisfaction”), based on the design of the interaction of the stakeholders directly and indirectly linked to that “satisfaction” system. We used the MSDS method to explore how design for village to end up with a sustainable system. Based on this method we divided the whole process into five steps: strategic analysis, exploring opportunities, system concept design, system design and communication. Now we are going to introduce the first three parts of this process.

Strategic Analysis

The main aim on this step is to gain information for further development of the design. The research steps on this step including: the analysis of the project sponsor, the context, the structure, the best cases and the priorities of the design concept.

The cases we used in our study including: Shejilixian, Bishanjihua, Design Harvest. As the limitation of the time we just studied two issues among these cases.

Problems or Resources? Through the case study we realized that all of them take village as a resource not a problem. In the case Shejilixian, they put efforts to improve the traditional industry in that village as they though the traditional industry here is one kind of resources.

In the case of Design Harvest, they took the village and city as an equal important parts in our society. The project sponsor once said, what we did is not to design a future for the village but to design a relation between the city and the village to enhance the interdependency between them. In the case of Bishanjihua, they put efforts to collect the information of the local handicrafts.

Bottom up or top down? Through the case study we found that not all of them are established through the same way. In the case of Bishanjihua, the most famous collective activity in the village is the “square dancing” which is organized by the local villagers. This is a bottom up way. In the case of Shejilixian, they turned the traditional industry from a products design oriented company to a brand design. This was done through top-down model. Through these case studies we can find that compared with which way to create the innovation the reasons why to make a change is more important.

To sum up, during the strategic analysis, the orientation of our design is becoming more and more clear. On the one hand, we should explore the local resources. On the other hand, we should make sure the real needs in this village.

Exploring Opportunities

The main aim of this step is to come up with some promising concepts for the sustainable system. The studies on this step including: sustainable system vision and concept.

To finish this step, we studied the resources and problems in this village based on the 72 hours anthropology video. The final concept is a design in a module way. There are four layers in this system. The first layer is the space module including: sale space, information space, innovation space and health care space. The second layer is the content of these services in each space. The services in each space are: products selling and entertainment activities in the sale space, information consulting and publishing in the information space, education and creative activities in the innovation space,
local and remote health treatment in the health space. The third layer in the system is the products in these services. The fourth layer is the relationship between the village and the city.

**Concept Design of the System**

The main aim of this step is to evaluate the system design with the help of the tool SDO from different perspectives: environment, social morality and economy.\(^\text{[10]}\)

**Environmental Sustainability**

As it is designed in a module way, there will be a progress on the system life optimization. As the concept will merge the product offer, with services for their on-site assembly, the transportation will be reduced. As the concept offers collective use of products and infrastructures, the needed resource will be reduced. As the sale space offers the sharing of the secondary resources, the waste will be reduced. There is no change on the toxicity reduction. The final evaluation results in environmental sustainability can be found in the figure 1.

**Socio-Ethical Sustainability.** The villagers can sell local products to the city in the sale space and can receive health care from the city in the health space so we can say it promote systems enabling neighbourhood social integration. Also, these activities in the sale space and the health space could help to enhance the living standards in the village so it promote and enhance equal and just relations with clients and end-users. It also involve and improve conditions of weaker social strata. As in the sale space the people could sale the local products to the city. It enhance peculiar local cultural characteristics. The final evaluation results in socio-ethical sustainability can be found in the figure 2.

**Economic sustainability.** When we use this tool to evaluate the economic sustainability we got some troubles. First of all, we don’t have the user and the company. As this project is designed for both the government and the village, we can’t take the government as company and the villagers as users. This is a common issue when we are designing a social system. The traditional stakeholders (users and companies) in a market are not suitable here. The final evaluation results in economic sustainability can be found in the figure 3.
Summary

First, we found some suggestions for the village sustainable system design. It is important that we take the village as one kind of untouched resource not as a gather of all kinds of problems.

Second, we found some results for the MSDS methods. On the one hand, it provides us a useful structure for the exploration of social sustainable system design. One the other hand, it has some limitations. One of the limitations is it can only evaluate the design from the environmental, socio-ethical and economic sustainability perspective. It would be a great help if it could provide other options or could make a change in the value criteria. Another limitation is the notion of user and company is not suitable for social sustainable system design. The flexibility in this method and tool need to be enhanced.

Figure 2. Evaluation results of the socio-ethical sustainability.

Figure 3. Evaluation results of the economic sustainability.
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References


[7] Cao Tianhui. Innovation design in the ecological test—study on the harvest design of college of design and innovation, Tongji University. Design drive commercial innovation: Tsing Hua University International conference on design & management. 2013.12.01


[10] Information on http://www.polimi.it.sdo