

Design-driven Urban-rural Coupling: Building a New Model for Sustainable Interaction Service Design

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Abstract:

As the urban-rural gap in China continues to grow, the problems of unequal distribution of resources, uncoordinated economic development, and lack of cultural exchanges are becoming more and more apparent, and there is an urgent need for an innovative model to promote balanced development between urban and rural areas. The study starts by identifying the current problems of unbalanced resource distribution, the homogenisation of economic activities and the breakdown of cultural inheritance in urban and rural development. In order to address the problem. This study suggests a design-centred solution framework that employs an interdisciplinary research approach, combining theoretical and experimental research in the fields of sociology, economics and design. The results indicate that the design can not only effectively solve the specific problems in urban and rural development, but it can also promote the development of interaction between urban and rural areas, and construct a service information carrier with rural innovation centres as the base point, with urban sustainable living experience shops as the output point, and with industrial innovation as the transformation point, so as to form a closed loop of urban and rural coupling. We take sustainable materials and sustainable healing innovation centres as specific entry points to explore how to develop relevant information carriers for urban-rural coupling service design. With the implementation of the strategy, this study is expected to promote urban-rural development into a new stage of sustainable “conscience”, and provide new ideas and practical paths for the urban-rural coupling of the whole society.

Keywords:

Urban-rural Interaction, Service Design Information Carriers, Sustainability

1. Rural-urban Development Imbalances and Problems

1.1. Economic imbalances

Societies and governments have entered the twenty-first century with multiple problems of ecological, social, economic and governance systems that are deeply intertwined. These issues are interrelated and have developed into wicked problems.

Rapid urbanization has also exacerbated the imbalance between urban and rural social economic development, and rural economic development is structured in a unitary and un-innovative manner compared to urban areas [1]. Compared with the city, the rural economic development structure is simple and lacks innovation. In the traditional Chinese perspective, the city and the countryside are like Yin and Yang, which complement each other [2]. A field survey was conducted based in depth village, Jiuzhou village, and Wuping county near Longyan, Fujian province (Figure 1 and Figure 2). The problems are as follows: Due to the meagre income from food crops, intensive management is mainly based on planting cash crops; and the township infrastructure is low, the development of rural study tours to drive rural economic and urban economic growth and the development of rural study tours to generate interactive economic growth, the model is single, lack of innovation, compared to the urban economic model has not formed its own innovative economic model; The design of rural agricultural products lacks innovation, and the agricultural product economy does not integrate local cultural attributes.



Figure 1. Deepin Village grows a large amount of cash crop tobacco.



Figure 2. Jiuzhou village study tourism to stimulate the economy, the structure is single.

1.2. Imbalance in cultural exchange

The weakness of rural culture, along with the economic weakness, is the increasingly weakened position of rural areas in cultural production and cultural influence, which is replaced by the strong position of the city's cultural system, the value of the rural way of life has been seriously neglected [4], the rural culture is difficult to inject new vitality into the rural economy, difficult to use the culture of the city of the reverse output, the formation of a more balanced urban-rural exchange; design is not enough to explore the degree of rural culture, not from the core considerations of rural culture design expression, but only the surface. The degree of exploration of rural culture is not enough, and the design expression of rural culture is not from the core consideration, but only on the surface.

1.3. Resource allocation imbalance

Unbalanced deployment of resources between urban and rural areas, the country has more natural resources and does not well exploit its value, urban talent, funds, capital and other resources are also not counterparts in the countryside, the allocation of resources between the two is unreasonable, and there is no new model of urban-rural interaction that can reasonably allocate their resources.

Designing a new innovation development mode for the problem of disparity of economic and cultural resources between urban and rural areas, various types of rural innovation centres match with urban sustainable living experience shops, conducting sustainable research and development through the innovation centres, and co-operating with the sustainable living experience shops to conduct innovation output, forming a new sustainable mode, which is an exploration of the coupled interaction innovation design mode between urban and rural areas [3]. This is an exploration of the coupled interactive innovation design mode.

2. Rural Community Innovation Center

Innovation centres in rural communities are the basic vehicle in the new model of urban-rural coupling, aiming at re-constructing a new relationship between people, nature and facts between the countryside and the city to form a virtuous circle of development led by service design. These centres are designed to explore the potential of the countryside through design and innovation based on the potential resources of the local area, and not simply to provide products and services to the city, but more importantly, to “incubate” and demonstrate new economic models, to drive local employment, to attract urban intellect, capital and resources to the countryside for entrepreneurship, and to fully interact with the local community [4]. This paper expands the two rural innovation centres of “Sustainable Physical and Mental Healing” and “Sustainable Materials” to build a series of sustainable service design information carrier system, and develops a new mode of urban-rural coupling.

2.1. Design of service information carriers for the Sustainable Mind-Body Healing Innovation Centre

The Innovation Centre for Sustainable Physical and Mental Healing aims to create a new service design system based on rural travel and accommodation, through which the countryside, B&B, city, capital, talent and governments are systematically linked to create a new information carrier for sustainable rural healing service design. It is an act of connecting brand-new stakeholders for system innovation (Figure 3).

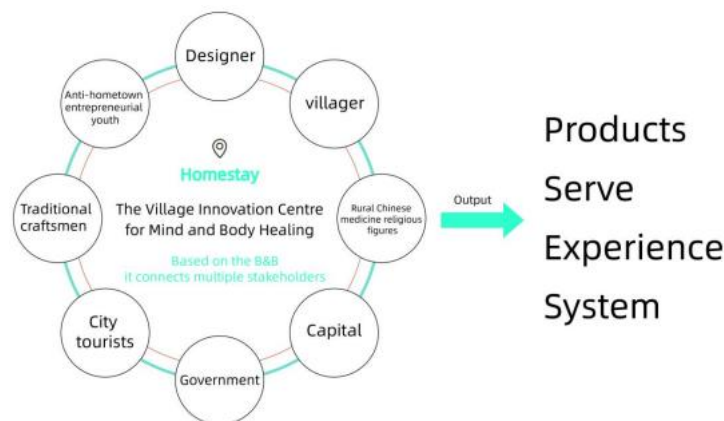


Figure 3. Stakeholders and outputs of the Village Innovation Centre for Mind and Body Healing.

In this kind of system, the rural B&B is taken as the object space centre of the community base, and it is possible to combine new community possibilities beyond the limitations of the existing rural B&B model, and in the new system, use “design” to integrate urban and rural resources to creatively research and develop unprecedented products, services, experiences, and systems.

The Sustainable Healing Innovation Centre is a tandem perspective of service design that creates a new interaction node in the rural B&B environment. The purpose of the Healing Innovation Centre is to create a new form of rural development, expand the diversity of rural economic activities, and promote cultural exchanges and outputs, which not that only incubate new business systems, but also integrate into the existing rural culture and tourism system, and the culture and life system. In other words, it can be used as a bed and breakfast to receive tourists, a cultural exhibition, a business incubator for rural enterprises, and a place for physical and mental healing at the same time. The Body and Mind Healing Innovation Centre can complete the integration of rural food and drink, accommodation, body and mind healing, traditional culture school, B&B services, culture and tourism through the activities of various stakeholders. They can be put through the various service design interaction nodes of the B&B (Figure 4), where different stakeholders generate different interaction possibilities under the rural B&B space.

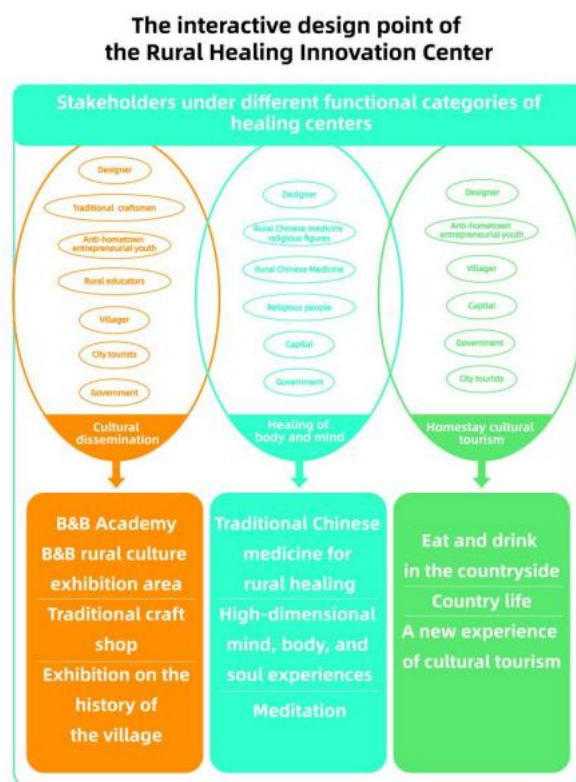


Figure 4. Interaction design point of rural Physical and mental Healing Innovation Center.

The main points of interaction design are divided into: cultural dissemination, physical and mental healing, B&B cultural tourism, in the object space scene of the B&B, to create three major service design interaction touch points, to give the Innovation Centre a number of new prototypes of the development of active design. “Active design” is a very important attitude and culture through the social innovation [6], the time of design for all! The era of everybody’s design has arrived [5]. Create a traditional culture dissemination experience in the B&B, with the service design as the

leading role, joint traditional rural craftsmen, villagers, entrepreneurs and other stakeholders to carry out the B&B school, B&B rural culture exhibition, shops of traditional crafts, village history exhibition and other related service design touchpoints to create the scene; create a physical and mental healing experience in the B&B, joint rural doctors, religious people, capital and other stakeholders to carry out. Creating a traditional Chinese medicine rural healing experience, high-dimensional body and soul experience, meditation and other related service design touchpoints to create a scene; creating a new B&B culture and tourism experience in the B&B, which is different from the traditional B&B experience, which can be the B&B culture and tourism enhancement by combining the villagers, entrepreneurs, capital, the government and other stakeholders, and the enhancement of the service design touchpoints can be the food and drink in the countryside and the countryside life, such as returning to the basics of the “Li Ziqi” style B&B cultural tourism experience. The three service design interaction points driven by “design” provide a possibility for the incubation of new products, services, experiences and systems for the Body and Mind Healing Innovation Centre. There are many similar cases of incubation of prototype communities at home and abroad, such as: NICE2035 community of Tongji University, strategic design of Chongming Xianqiao community of Tongji University, supply and marketing centre of Bishan Village of Anhui Province, and D&DEPARTMENT of Japan, which have formed new prototypes from different perspectives of design, and adopted the method of Mudding Through to develop new prototypes. “Mudding Through” approach to exploring new forms of business creation [6].

3. Sustainable Materials Innovation Centre Service Information Carrier Design

The Centre for Sustainable Materials Innovation is the most direct innovation point of design between man, nature and artifacts. In the previous development of human economic activities, we have seen a lot of artifacts that cannot naturally degrade back to nature after they are manufactured in or discarded, which leads to a large amount of pollution, a concern for the human living environment, anomalies of the climate, and a break in the balance between man and nature. The centre for sustainable material innovation obtains biological materials and other discarded materials from nature, and through design as a bridge of innovation, it processes the materials in various aspects of “clothes, food, housing and transportation, so as to truly achieve the state of virtuous circle of taken from nature, used for human beings, and returned to nature, and there are a large number of raw materials in the countryside for design to do experiments, and to explore the possibility of combining with relevant modules of other disciplines together. In October 2015, the International Council of Societies of Industrial Design (ICSID) issued a new classification of design, emphasising that “design is a creative activity that applies strategic problemsolving processes to products, systems, services, and experiences in order to drive innovation, promote business success, and provide a better quality of life”. It is the creative activity of applying strategic problem-solving processes to products, systems, services and experiences. A large number of institutions at home and abroad are engaged in the research and development and application of sustainable new materials, such as: Shanghai Mosaics, Macao Tea Adoption, Shenzhen Recycling Bio-technology, all of them are exploring in different material fields (Figure 5, Figure 6 and Figure 7).



Figure 5. *Jame & Chau Coffee Yunnan Xizhou Sustainable plant and flower board.*



Figure 6. *Tea Animal & Shanghai Bund Sustainable Tea Residue Recycled furniture.*



Figure 7. *Circular Biotechnology & Sustainable mycelium in Longyan College of Communication Design.*

Based on the local Yunnan countryside's plant and flower abundance and other characteristics, Shanghai Materia is taking materials from the local countryside, making attempts to incubate urban and rural sustainable new industries, and pioneering new scenes of brand-new consumer products. In April 2024, the author started a workshop on sustainable materials in the teaching of sustainable design in colleges and universities, and led students to carry out experiments on material innovation with bio-mycelium materials in limited conditions, and colouring mycelium with large lacquers after it was shaped. The mycelium was coloured with large lacquer, and through experimenting and expanding sustainable materials, the students were able to make the preliminaries for the creation of new products, services, and experiences.

The Sustainable Materials Innovation Centre attempts to create a new service design system in the countryside, through which the countryside, resources, materials, talents, capital and government are systematically linked to establish a rural sustainable materials service design information carrier, which can be used to connect stakeholders to carry out innovative design (Figure 8). In such a system, the countryside is used as the supply point of sustainable resources, and the environmental resources and material generation sites are combined in a double landing, so that the system of fetching materials, processing products, services and experiences can be completed in one stop, which breaks the disadvantage of the countryside as the provider of the most essential resources and materials in the past.

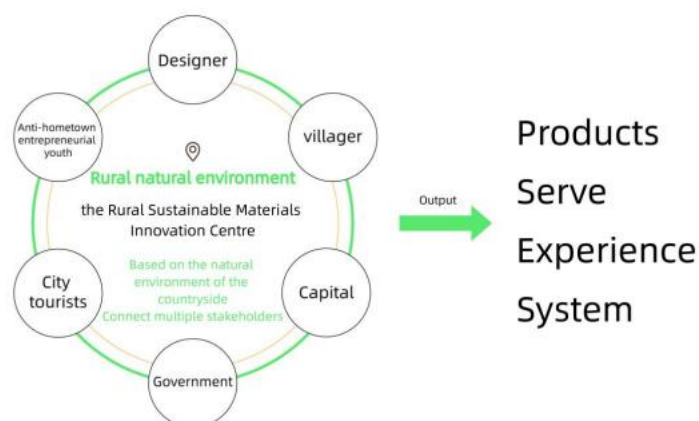


Figure 8. Stakeholders and outputs of the Rural Sustainable Materials Innovation Centre.

The Centre for Sustainable Materials Innovation (CSMI), with the interactive serial perspective of service design, takes materials locally in the natural environment of the countryside and processes and produces systematic serials, aiming to the development of new rural business, new economic forms and new cultural dissemination modes through sustainable biomaterials; Can also promote the vitality of local enterprises, the countryside, everywhere is a “zombie enterprise”, some enterprises zombie decades, no way, why not activate the “zombie enterprise” and to circle the new land China Rural Construction Institute [8], Li Changping, president of rural revitalisation and raised the idea of “zombie enterprise”. Not just attract investment for useless enclosure, under this view, sustainable materials innovation centre is the countryside to maximize the land use of resources, rather than the development of “zombie enterprises”, is a kind of “design” as the lead, mobilizing all kinds of rural. It is a design-led approach to rural development that mobilises all stakeholders in rural development. Under the existing rural natural resource extraction and manufacturing, cultural creation, exhibition, enterprise, branding and capital are integrated into the innovation centre. Under the sustainable innovation centre, not only the extraction of raw materials can be completed, but also the output of cultural and creative products can be completed, and enterprise marketing and branding can be achieved, so the innovation centre becomes a multi-dimension incubation and innovation system (Figure 9), and the different stakeholders generate new interaction possibilities under it. New interaction possibilities are generated by different stakeholders.

Interaction design is mainly divided into: material extraction factory, product incubation, product incubation, branding and marketing. Within this space, three directions of service design interaction points are created to give the Material Innovation Centre multiple missions to incubate related industries, enterprises, services, products, et cetera. Take the materials to run a factory is to make full use of the natural environment of the local countryside, and running a factory with materials is a positive environmental friendly form of industry, which is different from the environmental damage caused by running a factory in the past. On the basis of running a factory with materials, take “design” as the leading role, and stick to the local craftsmen, entrepreneurs, the government, and corporate capital, etc., and conduct the output of cultural and creative products and incubate the products in the innovation centre. We can output cultural and creative products, incubate sustainable and environmentally friendly products, services, systems, etc.; jointly open brand marketing construction with the enterprise government, and continue to incubate new economic forms and other possibilities, breaking the previous “black slave” mode of

sacrificing and plundering rural resources, and letting the countryside gradually generate industries that can feed itself through design behaviour. Economic chain, this can better solve the current complex problems.



Figure 9. Sustainable Materials Innovation Center Interaction design point.

The major problems facing mankind today are not the problems of a single discipline [9], they involve complex social technical systems and a wide range of stakeholders. As Herbert Simon said, design is a set of behaviour that steer an existing situation in a better direction [10]. In the above rural-urban interface rural innovation centre, the design acts as a guide, breaking the single discipline perspective, using design to unite many stakeholders to create new ideas, sustainable design is needed not only to design the world of facts, but also to design human behaviour, especially in the sense of social groups [11].

4. Urban Sustainable Living Experience Shop

The “urban sustainable living shop” is the prototype output of the Rural Innovation Centre, and it is the core of the design of the information carrier of the urban-rural coupling service. By combining different stakeholders through the Rural Innovation Centre, a new rural economic and industrial prototype is designed, urban and rural resources are reallocated, cultural exchanges are promoted, and a new meaning and value system is created, and the “Urban Sustainable Life Experience Store” is the result presentation spot of the “Rural Innovation Centre”. The “Urban Sustainable Life Experience Store” is the “Rural Innovation Centre” [3]. They will form a dynamic collaborative network with each other and maintain close contact and communication with the collaborative network of the Innovation Centre. By materialising traditional Chinese culture and the healthy, fresh and natural lifestyle of the countryside into products and services. This new product and service system is showcased in the urban sustainable living experience shop, which can attract the attention of consumers, capital and other social groups, which can change the guidance of the value and meaning of behaviour in the world of artifacts, carry out the transformation of industrial innovation, and at the same time complete a triangle closed loop (Figure 10) led by “active design”, with the social innovation from point to point, and the social innovation from point to point. At the same time, it completes

a triangular closed loop with “active design” as the leading role and social innovation from point to surface (Figure 8).

There are a few similar sustainable shops in China, such as some urban sustainable living shops: Hong Kong slowood zero-waste eco-friendly grocery shop, Shanghai stopshop, 3RLABS, Multi Fish Recycling Store, and Yunnan Dali Drinking Cup Paddy Field (Figure 11), which all embody the concept of sustainable design from different product perspectives. In Dali, Yunnan Province, there are a lot of on-demand rural natural food products in the shop, which breaks the previous situation of buying by the bags in supermarkets, so that people can buy only a small amount of bulk food according to their own needs, and buy bulk vinegar for one person, etc., which reduces unnecessary wastage. There are also brands that transform sustainable ingredients into products, such as “Tongshang”, or “Natural Creatures”, a brand that creates cultural and creative products from rural non-legacy (Figure 12). These shops and brands have achieved sustainable transformation of urban and rural areas from different perspectives, but most of them remain at the level of product transformation or transformation of a certain aspect, and the volume and degree of innovation still need to be explored in depth, and services, experiences, and overall transformation of the system can be more in-depth thinking, and in addition to the transformation of the material level, the transformation of the non-material level is also of particular importance. A good way out is to create non-material incentives through design in exchange for material consumption so that people can change their behaviour consciously and voluntarily. Both fashion and religion know very well how to operate design to create experiences to promote collective behavioural change [11]. In the service interaction design contacts of the Rural Innovation Centre, the author has suggested a number of intangible experience designs and other other service experience aspects of the development, which are an alternative viewpoint and approach.



Figure 10. Urban-rural coupling interactive service design triangle closure diagram.



Figure 11. “Drink Rice field” shop in Dali, Yunnan province.



Figure 12. Natural creation brand.

In this urban-rural interaction mode, a brand-new urban-rural coupling innovation system has been constructed, and through designing the service carrier between the countryside and the city, the fragmented information is reorganised and designed, which also provides new possibilities for solving the problems of urban-rural development and designing a brand-new meaning and value system. It also provides new opportunities for solving the current problems of urban-rural development and designing a new system of meaning and value. It will promote urban-rural development to enter a new stage of harmonious and sustainable “conscience-awareness”.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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