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### Original Citation

Chen, Yi and Clarke, Robert (2011) Shanzhai products and sustainable design. In: *The Tao of Sustainability: an International Conference on Sustainable Design Strategies in a Globalization Context*, Beijing, China, 27th-29th October 2011. Huazhong University of Science & Technology Press, Beijing, China, pp. 575-579. ISBN 9787560973845

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# SHANZHAI PRODUCTS AND SUSTAINABLE DESIGN

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## Abstract

This paper investigates a possible solution to the need for sustainable design through a study of shanzhai products notable for their low price and quality and sometimes, even by their exaggerated design. Their existence reflects a need in China's post-communist society to provide its population with the kinds of material goods typically associated with capitalist economies in which the advances of science and technology have been applied to the research, design and manufacture of desirable products. Political and economic expediency has meant that because of its need to 'catch up' with western markets, China has increasingly tended to copy western designs which it makes affordable to its own population by avoiding research and development costs.

This paper will selectively examine and define the concepts and principles of shanzhai products and compare them with those of sustainable design. Although Shanzhai is satisfying in the short-term some of the materialist demands of the Chinese population, it may also be seen as detrimental to the longer-term issues of resources, sustainability and innovation.

**Key Concepts: Shanzhai, sustainable design, 'One Laptop per Child'**

## (1) Introduction

About the significant importance of sustainability, Orr states that "*no other issue of politics, economics, and public policy will remain unaffected by the crisis of resources, population, climate change, species extinction, acid rain, deforestation, ozone depletion, and soil loss. Sustainability is about the terms and conditions of human survival.*" [1]. To this end, the concept of sustainable design, has replaced what was once referred to as 'modern design' [2]. An issue for contemporary designers is one of deciding how designs fit with an ethical awareness of sustainability and the effects of resources and manufacture for the long term future [3]. And while sustainable design is widely considered to be desirable at the concept level proposed models are often far from the reality [4]. In practice, only few experiments with an affordable model have been proposed [5]. One which has attracted attention, is the "One Laptop per Child" (OLPC)

project, which aims to educate the poorest children in developing countries by the provision of free laptops [5]. Two main objectives of this project are:

- 1) To manufacture each laptop at a cost less than \$100;
- 2) To distribute these laptops freely with the aid from local governments or other organisations.

Although many organisations have made a great deal of effort, this project has failed to address its first objective in most parts of the world [5]. However, in China it has been accomplished because of shanzhai. This paper explores the possibility of applying the shanzhai design model to develop and extend the economic viability of sustainable design. It is organised as follows: Section 2 reviews concepts; principles and issues of sustainable design. Section 3 develops an understanding of shanzhai products. Section 4, analyses the OLPC project and its shanzhai counterpart, leading to the paper's conclusion in Section 5.

## **(2) Sustainable Design**

### **(2.1) Definition**

The definition of sustainable design has evolved in the last three decades, and will continue to evolve. In 1987, the term "sustainable design" was defined (probably the first time to be used in the field of design) as "*to meet the needs of the present without compromising the ability of future generations to meet their own needs*" [6]. In some of the following small-scale experiments, sustainable design has been interpreted as efficient use of energy, applying the use of alternative materials, conservation, and recycling [7]. In 2004, for example, McLennan stated that sustainable design is to "*eliminate negative environmental impact completely through skilful, sensitive design*" [8]. Recognising that the integration of all the factors can produce the best results obtained from sustainable design, some have expanded sustainable design theories and practices into complete and large-scale fields. One of the latest definitions is "*the philosophy of designing physical objects, the built environment, and services to comply with the principles of economic, social, and ecological sustainability*" [9] (this paper adheres to this definition).

### **(2.2) Principles of Sustainable Design**

There is no a common agreement on what constitutes sustainable design. Many principles have been proposed from different perspectives [1, 3, 6, 10]. In general, they fall into two classes. Those that seek to minimise the adverse effects of a product's lifecycle; and those which minimise the environmental effects of human activity.

## 1: To minimise the environmental effects of a product's lifecycle

In this level, sustainable design purposes to minimise, or even eliminate, all environmental impact of a product within its lifecycle [8]. Therefore, a designer in a company/organisation should consider all environmental requirements (as a part of functional requirements) in the design process. The outputs (i.e. final product) are expected including one or more (the more, the better) following features:

- **Use of environmental friendly material:** It is recommended to use the recycling or biodegradable material (e.g. more recycled papers are used for packaging).
- **Efficient use material and energy:** A designer should take the following requirements into consideration (at both the product's manufacture and maintain cycle): to reduce the consumption of fresh raw materials, to reduce energy usage, to reduce air pollution and water pollution. In order to reduce the energy used in product distribution, localisation is encouraged.
- **Reusable:** This includes conventional re-use, i.e. an item used again for the same function (e.g. supermarkets in the UK recommend their customer using their own carry bags), and new-life reuse, use a product on a new function [11].
- **Recyclable:** At the end of its life, a product's components and materials should be able to make new products.

The opposite opinion argues that such methods cannot solve the environment issue wholly. People may feel free to throw environment-friendly products away. Unfortunately, most of them are not 100% recyclable, and the accumulation of their impact will finally lead to an environmental catastrophe. Thus, some claim that this environmental disaster is the result of a consuming culture. To address this issue, another principle has been proposed.

## 2: To minimise the environmental effects due to human activities

To achieve economic, social, and ecological sustainability, it is of importance to develop the notion of a sustainable life style. Therefore, the main principles of sustainable design are extended to include: *"recognize interdependence and the right to co-exist between humanity and nature, create safe objects of long-term value that try not burden future generations, eliminate the concept of waste, rely on natural energy flows, and seek constant improvement by the sharing of knowledge"* [12].

To achieve its target, requires significant evolution on economic and social system and structure. The most important objectives of sustainable design consider are:

- **Environmentally sustainable:** This requirement is mostly covered by level 1 of sustainable design (see the previous section);

- **Socially sustainable:** It proposes to reduce the gap between different societies;
- **Economically sustainable:** It aims to develop global economies without increasing resource use and environmental impact, by curbing western consumption and raising the standard of living of the developing countries [13];
- **Ecologically sustainable:** Present generation should maintain and enhance the healthy, diversity and productivity of the environment for future generations [14].

This movement requires the support of governments, companies, organisations, and society etc. Thus, the first step is to increase ‘environmental literacy’ or awareness of the issues involved in order to build social support for sustainable development [10]. For instance, most schools in the UK, supply children with Fair Trade goods. This activity results in encouraging better trading conditions for producers in developing countries, while also enhancing environmental literacy of the next generation.

This interpretation of sustainable design reaches beyond the role and responsibility of a single designer. Evidence shows that it involves a complex set of relations which begin and end in economic realities.

### (3) Shanzhai Products

#### (3.1) Definition

As a new term, various definitions of shanzhai exist. Many refer to ‘imitation and plagiarism’. The *Oxford Chinese Dictionary*, for example, states that “*Shanzhai literally translates to "mountain fort," but refers to a copied product*” [15]. Some disagree with this because it ignores the innovative nature within shanzhai products, which have empowered many businesses toward market success. They, therefore, claim shanzhai is an invention based on imitation [16]. In this paper, shanzhai design is interpreted as a secondary innovation based on imitation; and that its outputs are destined for the low-end market.

#### (3.2) A brief history

Although shanzhai is a well-known term in China, it is not familiar in the West. So a very brief history of shanzhai is given below, with the highlights of some of its milestones.

- **Original meaning and culture background:** The original meaning of shanzhai is “mountain village” or “mountain stronghold”, which term refers to the mountain stockades of regional warlords or bandits, far away from official control.
- **Relationship with intelligent property right:** The opposite words of intelligent property right are “pirate”, and probably “shanzhai” to some extent (notice that shanzhai has innovation as well).

- **The beginning in modern time:** Since 2003, shanzhai mobile phones began to be sold widely in China.
- **Impact:** Shanzhai products seize a remarkable market share. For example, in 2007, 150 million "shanzhai" mobile phones were sold worldwide [17].
- **Shanzhai culture:** Shanzhai phenomenon is widespread in contemporary China. For example, shanzhai is one of top ten catchwords of 2008 [18]. It is one of ten words used to describe contemporary China [19]. Shanzhai model are also used to describe current Chinese development model [20]. Shanzhai culture has been recognised as a grass-roots movement [21].

### (3.3) Principle Features of Shanzhai Design

There are some studies on shanzhai in the field of business and economy [16, 22]. However, in literature so far examined, there is no study of shanzhai from the design aspect. Typically, the principle of shanzhai design can be categorised as “attractively priced profitable products whose appearance and function is derived from imitation and low-level innovation.”

The features of shanzhai products are summarised as follows:

- **Profitable:** The aim of shanzhai products, the same as all businesses, is to make profit.
- **Low cost and low price:** Shanzhai products focus on low-end market which is normally ignored by branded products (e.g. a shanzhai mobile phone is often sold at half price, or even less, of its imitating object).
- **Plain quality:** To reduce the cost, their quality is normally just acceptable.
- **Imitating of some well-known design:** To speed design at low cost, imitation is the most common method used in shanzhai products design. Two methods are often implemented, that of imitating a successful branded design (e.g. iPhone), and that of imitating a well-known object (e.g. a mobile phone with an appearance of cigarette box).
- **Innovation:** To address a localised requirement, special functions are developed on shanzhai products. (e.g. mobile phones for Buddhists; mobile phones with massage function; mobile phones with extremely loud speakers and a long lasting battery for farmers)
- **Flexibility:** To design to meet specific market needs. (e.g. In 2008, "Obama" mobile phones, decorated with Obama's name and his famous slogan "yes we can", were sold in Kenya [23].

## (4) COMPARISON AND DISCUSSION

Sustainable design is the future design, while shanzhai design can be recognised as a low-end design. There are significant differences at a glance. However, shanzhai products address some sustainable requirements if we examine them carefully. This section compares two designs involved in a study of the OLPC project.

#### **(4.1) An Overview of “One Laptop per Child” Project**

OLPC, developed by a U.S. non-profit organization, aims to bring education to the poorest children in the most remote parts of the world. It is a well-known experiment of sustainable design.

- OLPC was launched at the 2006 World Economic Forum in Davos, Switzerland [24].
- OLPC aimed to design and produce a \$100 laptop in 2006.
- In 2008 the laptop is manufactured in China at a price close to \$200 in 2008.
- This project has been supported by many developing countries but did not include China, the biggest target market.
- The 2008 economic downturn caused a significant reduction of funding for this project. This project is struggling to survive and its future is uncertain.

#### **(4.2) Relative Shanzhai Products**

Some of counterparts of OPLC are listed below:

- An education computer, namely Xiao Ba Wang, has been sold around \$30 in China since 1993 [25]. It is a typical shanzhai products: a game console (imitating of Nintendo console) with keyboard and mouse which can imitate the simple functions of computer, a perfect alternate learning tool for children that can both play games and practise basic computer skills.
- iPad, a tablet pc produce by Apple Ltd, was launched In January 2010. After two months, the first shanzhai counterparts has been produced, and it follows with different type of shanzhai iPads. (Many of them are sold online with price started at £45 (\$70) in the UK). Those shanzhai products have full set of functions similar to a desktop computer and their appearance follows the design of Apple’s iPad.

#### **(4.3) Comparison & Discussion**

OLPC laptop, as a well-known sustainable designed product, has many features in common with shanzhai iPad, such as similar functions and target markets as shown in Table 1.

**Table 1: Comparison of OLPC laptop and Shanzhai iPad**

	<b>OLPC laptop</b>	<b>Shanzhai iPad</b>	<b>Comment</b>
<b>Profitable</b>	No	Yes	Profit makes business sustainable
<b>User</b>	Children in developing countries	Grass-root people	Both are low-end market. Promote social and economic sustainability
<b>Quality</b>	Acceptable	Low	Low environmental sustainability
<b>Cost</b>	Low	Even lower	Both low-cost oriented
<b>Price</b>	\$200	\$70	Shanzhai products are much cheaper
<b>Design method</b>	Up-down	Reverse engineering	OLPC is designed for the poorest people by social elite, while shanzhai iPad is designed for grass-roots by grass-roots.
<b>Innovation</b>	Yes	Very few	OLPC: rugged, low-power computer

Many lessons can be learnt from the OLPC, some of them are detailed as follows:

- **Sustainable design should design for the majority:** In the current consuming culture, designers normally target the elite to gain added-value, and often ignore the requirements of the grass-roots (especially those in the developing countries). Much attention has been paid to OLPC because this project is for the majority, thus, promoting social sustainability. Note that the majority plays a significant role in consuming of products of sustainable design. Obviously, it is impossible to achieve sustainability without attracting the majority.
- **Sustainable design is a low cost design:** Only outputs of the low cost design are affordable by the majority. This is why OLPC focuses on controlling cost. Of course, the high-end design for the elite, who use most of resource, is also important but this discussion is beyond the range of this paper.

So controlling the cost is of significant importance in sustainable design. OLPC is struggling to reduce the cost, while shanzhai design controls the cost very well. How can shanzhai design achieve this objective easily? As shown in Table 1, the saving is partly through reducing quality requirement. And the major saving is from its imitation activity, which reduces or avoids the design cost of research and development. Design is often a value-adding process, and generally protected by intelligent property right. Avoiding the cost on intelligent property right is the major method used by shanzhai design. That is also the reason why shanzhai raises serious debates about legality and morality. The relationship of intelligent property right and shanzhai is discussed below:

- Historically, shanzhai is sometimes used as a metaphor to describe bandits who oppose and evade the corrupted authority to perform deeds they see as justified. Chinese kids like dressing up as a head of a shanzhai, while children in the West prefer the pirate game. The opposite words of intelligent property right are “pirate”, not “shanzhai” due to shanzhai has the meaning of justice to some extent.



- Shanzhai products are developed based on imitation. Imitation and copying are fundamental to human nature. Civilisation is the result of copying and learning from each successful development in human history. Thus, from this point of view, shanzhai products can be traced back to the earliest stage of the human history. Nowadays, the object, imitated by shanzhai, is a famous/successful/branded product which is protected by intelligent property right. Before introducing the concept of intelligent property right, the activities of imitation were acceptable, and there was no concern about their legality and morality. In the period transforming from an agrarian society into an industrial one, Chinese have gained more knowledge about intelligent property right, and are gradually becoming conscious about the related issues. This is probably why the term “Shanzhai” is introduced to mark such imitation activities in contemporary China.

The attitude toward intelligent property rights is the main difference between OLPC and shanzhai products. It caused OLPC to deliver fewer free laptops to the poorest children. It does not mean that we should be against the intelligent property rights. Rather, the problem is that it may be unsustainable in global scale if most of ownership of knowledge is privatised by the developed countries. To achieve the sustainable design for the majority, we do need more knowledge in public domain (for example, much free software has been developed to break the fences built by commercial software).

The shanzhai approach to design provides a solution to lower the cost, thus, benefit the majority and promote the social sustainability. However, shanzhai design itself is not a sustainable method of design. Some of reasons are: 1) shanzhai products may only exist for a short period while China is in the progressing in its industrialisation (and the influence of Shanzhai products will be decreased significantly when branded products are more affordable in the future); 2) Unreliable quality of shanzhai products makes the waste of labour force and natural resource.

## **(5) CONCLUSION**

This paper reviewed the concepts and principles of sustainable design and organised them into two classes for a better understanding. A summary of shanzhai products design was given in relation to its potential to provide affordable products aimed at the developing world. However, shanzhai does this by ignoring intelligent property rights to a degree that would not be acceptable in law in many western societies. As they stand, the current intelligent property rights system could become an obstacle to delivering sustainable design to the majority. Ideally, a balance needs to be struck between recognition of intelligent property rights law and the need to bring greater benefit to the material needs of the developing world. This finding is not a surprise.

Contemporary design is mainly focused on satisfying private individual needs, whilst often ignoring the greater public needs. In the longer term this can lead only to an unsustainable future. Therefore, future design should balance both private and public requirements, and aim to achieve economic, social, and ecological sustainability. At the end of this paper, we restate the great issue of contemporary design as described by Rawsthorn - “designers spend most of their time designing product and services for the 10% of the world’s population that already own too much, when 90% don’t have even basic products and services to lead a subsistent life” [26].

## References:

1. Orr, D.W., *Ecological Literacy: Education and the Transition to a Postmodern World*. 1991: State University of New York Press.
2. Schwarz, M. and J. Elffers, *Sustainism Is the New Modernism*. 2010: D.A.P./Distributed Art Publishers.
3. Braungart, M., *Cradle to Cradle: Remaking the Way We Make Things*. 2002: North Point Press.
4. Wahl, D.C. and S. Baxter, *The Designer's Role in Facilitating Sustainable Solutions*. *Design Issues*, 2008. **24**(2): p. 72-83.
5. Smith, C., *Design for the Other 90 Per Cent*. 2008: Cooper-Hewitt Museum.
6. World Commission On Environment and Development, *Our Common Future*. 1987: Oxford University Press, USA.
7. Van der Ryn, S. and S. Cowan, *Ecological Design*. 1996: Island Press.
8. McLennan, J.F., *The Philosophy of Sustainable Design*. 2004: Ecotone Publishing Company LLC.
9. Wikipedia editors. *Sustainable design*. 2011-07-07]; Available from: [http://en.wikipedia.org/wiki/Sustainable\\_design](http://en.wikipedia.org/wiki/Sustainable_design).
10. Shu-Yang, F., B. Freedman, and R. Cote, *Principles and practice of ecological design*. *Environmental Reviews*, 2004. **12**(2): p. 97-112.
11. Wikipedia editors. *Reuse*. 25June, 2011]; Available from: <http://en.wikipedia.org/wiki/Reuse>.
12. Wikipedia editors. *Hannover Principles*. 25June, 2011]; Available from: [http://en.wikipedia.org/wiki/Hannover\\_Principles](http://en.wikipedia.org/wiki/Hannover_Principles).
13. Ruffing, K., *Indicators to Measure Decoupling of Environmental Pressure from Economic Growth*. 2007.
14. Wikipedia editors. *Ecologically sustainable development*. 25June, 2011]; Available from: [http://en.wikipedia.org/wiki/Ecologically\\_sustainable\\_development](http://en.wikipedia.org/wiki/Ecologically_sustainable_development).
15. *Shanzhai*, in *Oxford Chinese Dictionary*. 2010, OUP Oxford: Oxford.
16. Peng, S., Y. Xu, and Q. Lin, *The Revolution of Shanzhai Economy--The innovation comes from imitation (in Chinese)*. 2009, Taipei: Showwe Information Co., Ltd.
17. Wikipedia editors. *Shanzhai*. 25June, 2011]; Available from: <http://en.wikipedia.org/wiki/Shanzhai>.
18. *The top ten catchword of 2008 (in Chinese)*. Yao Wen Jiao Zi, 2009.
19. Hua, Y., *China in Ten Words*. 2011: Pantheon.
20. Han, H., *Floating China (in Chinese)*. 2010: Oxford University Press.
21. Gan, A., *Shanzhai Revolution (in Chinese)*. 2009, Beijing: CITIC Press.
22. Tse, E., K. Ma, and Y. Huang, *Shan Zhai A Chinese Phenomenon*. 2009, Booz & Company Inc.
23. Veronica. *Obama's "sponsorship" of Shanzhai "Blockberry"; Chinese netizens reactions*. 2009 25June, 2011]; Available from: <http://www.littleredbook.cn/2009/07/06/obamas-sponsorship-of-shanzhai-blockberry-chinese-netizens-reactions/>.
24. Nations, U., *Humanizing the Digital Age*. 2007: United Nations.
25. Baidu editors. *Xiao Ba Wang Education Computer (in Chinese)* 2011 15 June, 2011]; Available from: <http://baike.baidu.com/view/789042.htm>.
26. Rawsthorn, A., *Alice Rawsthorn on design for the unwealthiest 90 percent*, in *The New York Times*. 2007: New York.