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## ABSTRACT

*Design allows numerous products to be presented to consumers in a variety of forms. Mass production of these products causes environmental problems. To solve these problems, there are various designs based on the perspective of the object. For example, the size of the objects can be reduced to use less materials, or made more durable so that they can be kept longer by the consumer, or green materials are used to avoid harming the environment when they are discarded. However, using design to solve problems caused by design cannot reverse the waste generated by mass production. In bartering, the relationship between the objects and the people is once again being taken seriously. Hidden behind bartering is the complicated interaction between the people and the objects. People who engage in bartering can transform what people generally see as waste or ordinary objects into bargaining chips that can be exchanged with other products. Through bartering, they not only prevent the lives of some objects from ending prematurely due to people's preference for new objects, but also let them continuously reveal their value and achieve the purpose of sustainability.*

*Sustainable design aims to meet the requirements of economy, society, and ecology. In industrial design, usually, it reaches those goals through design using materials which can be recycled, shortening the manufacturing process, or considering the needs of the third world. This study adopted qualitative research to understand how users engage in bartering without using money transactions. This process allows the objects that are separated from the mainstream market mechanism to circulate between people and extend their life cycle. This study also clearly describes the characteristics of the exchanging process, hoping that such a sustainability rooted in the society can be adopted by designers and put into their thoughts about sustainable design. Through the concept of cherishing, sharing, and community, with the aid of networking technology, the objects are allowed to circulate longer among various people to reduce the generation of waste products and achieve sustainability more effectively.*

*Keywords: Barter, Sustainability, Exchange, Sustainable design*

## 1 INTRODUCTION

Under the operation of capitalism, people possess the freedom to pursue convenience in daily living. The various kinds of objects being purchased because of various desires permeate our lives. Old objects are constantly being discarded. People and objects are like two straight lines that only intersect once. Many objects have become dispensable in our daily living. Thus, the increasing

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rate of natural resource consumption has caused us to become aware of the importance of environmental protection. Finding a way for products to achieve sustainability has become a crucial issue in the field of design.

Among the many studies seeking to solve such problems, McDonough and Braungart (2002) proposed an innovative solution. They first asserted that many products could be composed of a mixture of recyclable and non-recyclable materials. This approach not only does not achieve the effect of protecting the environment, but it also causes many difficulties during the recycling phase of the products. Thus, they advocated that vendors use pure raw materials to allow the products to be fully recycled in the two systems: Biological and Technical Cycles. However, such an approach presents many technical limitations at this stage; without professional assistance, it is difficult for enterprises to achieve this goal. Mugge, Schoormans and Schifferstein (2005) investigated this issue from another point of view. They indicated that many previous studies had proposed various physical means to stimulate product longevity, such as lengthening the product warranty period, providing comprehensive maintenance and repair, or implementing a modular or adaptable product structure. However, these studies failed to gain an in-depth understanding on how to enhance the connection between people and the objects. They believed that strong connections not only could allow users to cherish the products so that the products would not be easily damaged, and also that users also would keep the objects with them because of emotional attachments. This emotional connection could become the critical factor for postponing consumers' product replacement. Comparable to focusing on the psychological connection between people and the objects instead of merely investigating the material dimension, Boradkar (2012) also mentioned a similar situation: when the originally abandoned music player adopted another form to become connected to the people, the memories of the intertwined objects and time period allowed people to generate unique feelings toward the objects.

Regarding the objects in our daily lives, from the material cultural point of view, Dant (1999/2009) asserted that many objects were not only external goods/objects, in their various forms, but were also deeply embedded in the context of human activities. These objects were loaded with time, memories and emotions. Based on this assertion, the meanings of objects were not as simple as could be identified from a surface appraisal. Using jade and precious stones as an example, Cai (2010) described how precious stones became priceless treasures in the hands of collectors. The stones were objects that possess no substantive functions or necessity. However, by appreciating them, they became intertwined with the owners and generated numerous meanings. As Huang (2004) stated, it was not only crucial how an object was formed, but also how numerous new essential elements were added so that it became an entangled object; in the barter field, this transformation seems prominent. This was similar to Frow's assertion that the meaning and function of an object could be determined by the non-economic exchange factors, such as internal memory and emotions (Meng and Lo, 2008). At the beginning of the production, the products incurred an imagined life cycle by the manufacturer; the declining sales curve proclaimed the end of the product. How does barter break through this constraint again and again? Does this breakthrough mean that the use of money makes us ignore the unrevealed value that was hidden behind the price? Thus, this study aimed to understand the bartering field and to determine how the dynamic relationship of people and objects regenerated value. In addition, with

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the dynamic relationship as the base, how could designers reflect sustainable design?

### **2 METHOD**

The purposes of this study were to examine how the barter system can operate in modern times, how objects can be transformed from waste products through circulation, how individuals engaged in bartering view these objects, and whether the relationships between the people and the objects in this system undergo changes. This study adopted the qualitative research method. By immersing into the barter situation and dealing with people involved in the system, the researcher tried to understand this unfamiliar field and collected information regarding this situation. In the interviewing process, the researcher and the participants constructed a realistic scenario where both parties were the main entities (Xie, 2004). Blumer believed that the generation of meaning is embedded in the cultural context of the situation and the process of social interactions. To understand the complexity, we could adopt participant observations in response to issues related to situational and cultural contexts (Hu, 2008). To prevent the risk of being unable to establish rapport because of misunderstanding as a result of direct contact through the internet, the researchers adopted convenience sampling for the initial interviews to select participants. The researcher first selected the people they knew who had engaged in bartering. Then, snowball sampling was adopted and the participants were asked to introduce key informants they knew to be active in barter. Distinct sampling was adopted so that the data would be solid and rich.

To obtain an in-depth understanding on the phenomena of the field, the researchers adopted semi-structured in-depth interviews. Each interview process was approximately between one and 1.5 hours. Regarding sampling, convenient sampling was used at the beginning, with people who had bartering experiences, and then the theoretical sampling was adopted. Based on the forming theories, the researchers selected possibly-related concepts as the base of sampling. The researchers identified participants who were engaged in distinct bartering objects, methods and time until the data sufficiency reaches the theoretical saturation (Strass and Corbin, 1998/2001). Based on the solid data of the field research, through data coding and compiling, the researchers adopted the ground theory. By adopting open, axial and selective coding, the main category and the subcategory of the data compiled were interconnected, which enabled the collected phenomena to explain the field research and generate theories. Subsequently, the barter and the context embedded in society could be clearly presented.

### **3 RESULTS**

In addition to the public data observed from the bartering on the internet, the researchers conducted 11 interviews. Of the participants, six participants simultaneously engaged in sales and purchasing while bartering on the internet; five participants engaged in bartering only; and two participants not only bartered, but also delivered free objects. The categories of the bartered objects varied, including: appliances, books, clothes, furniture, homemade crafts, home-grown fruits and vegetables. The results of this study included a discussion of the content about why the discussed objects could circulate. Also, selective plausibilization was adopted for interview data so that the interpretations could achieve clarity and be based on credibility (Flick, 2009).

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From this study, we understood that bartering was different from quick and convenient money transactions. The processes of waiting for inquiries, selecting and discussion are all time-consuming; however, the processes did contain attractive features. In sales and purchasing, money caused people to prioritize obtaining profits. Money was regarded as a necessary property and any expenses as losses. Thus, buying goods required the payment or "loss of" money. However, in bartering, although both parties wanted to exchange or dispose of their own objects, as they were not needed. The feeling of losing something was not as strong as when paying money. Furthermore, when obtaining objects through barter, both parties feel pleasure. An interviewee stated "I once had a plastic food container which could be sold for only 7 dollars in the market, but I bartered it for one thing which is worth 25 dollars. After that, the counterpart even said "How terrific it is, I met such a nice exchanger. But I was wondering who the real nice person was when I heard of it." The interviewee laughed loudly after saying that. Individuals who benefit from bartering are appreciative and thankful. They anticipated that one day they would be supplied with some bartering objects in return. With a virtuous cycle, bartering became a smooth process. An interviewee stated "because of bartering, I became friends with many individuals. I did not just exchange objects, I also exchanged feelings." This kind of interaction makes single and independent exchanging events, which have no connections, gradually become connected (fig. 1). Similar to Mauss's (1990) study on past indigenous tribes, due to the interactions between individuals, modern bartering also forms benign exchanges. Such exchanges become the motivation of many people who barter.

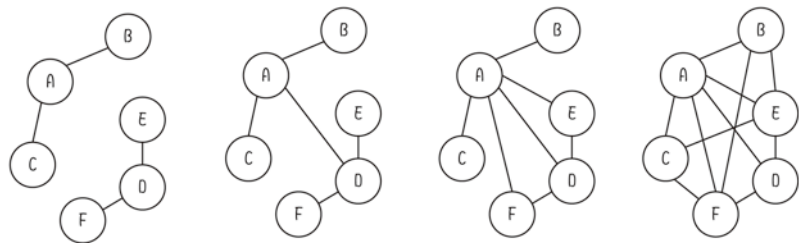


Figure 1: At the beginning, A and D are two independent individuals, they don't know each other. In an event to exchange things, D found that A is a trustworthy person to exchange things with. So, D introduced A to E and F whom D used to do exchanging with. Later, E and F knew B and C through A. The relationship network of trustworthy grows through introduction.

The goods that were placed on the bartering platform were in distinct forms compared to the goods just produced by the manufacturers. The goods in the barter had less attractive packaging and advertising. The issue related to the essential and simple nature of the goods; were they usable or not? An interviewee stated: "For me, need is not my major consideration when I choose what I want. The most important consideration is the condition of the thing I would like to choose. For the same reason, it is not a good attitude to take one thing which you think is garbage to exchange for what you think is valuable." Only excellent objects that are to be bartered can motivate the circulation of exchange. Bad objects only damage the individuals' perceptions on the exchange. In fact, the nature of the objects to be bartered was a conditional non-necessity. Boradkar (2012) said that barter helped to find a second life for objects from a bin. The objects were not acquired from trash; they only became superfluous because they were detached from the original life context. Modern

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life is fast-paced and changes are rapid so that the objects we possess can quickly become outdated. Examples include studies, promotion and moving. In addition, commercial operation approaches cause many unnecessary objects intrude into our lives. Examples include raffle giveaways, discount packaging and products for promoting. For these unnecessary objects, we are often not willing to discard them, bestow them as gifts, or use them appropriately; the last resort is to put them away. However, bartering has become a solution to this problem. The system not only extends the time of using the objects, but also avoids unnecessary disposal and waste. Because of successful experiences of bartering, many participants of bartering realized that numerous objects which would be discarded, could actually become the chips to barter with. Bartering allows exchangers to cherish the objects around them, to keep them in good condition until they do not need them, and then to extend the value and life of the objects through bartering.

To these exchangers, although a brand new and usable object can be 100% recycled like McDonough and Braungart's (2002) ideal, this type of recycling is still a discard. The object not only consumes resources in recycling, but also prompts further production. Even though they could be tagged with a price and sold, the money earned would be limited because the real value of the objects is obviously underestimated. An interviewee stated "Some objects I auctioned on the internet did not reflect their value. For example, one object could be worth 3000, but the auctioned price could be less than 1000. When you barter this object, you could exchange it with another object worth 3000." Consequently, the goods that can only be sold at low prices in auction but could be exchanged for necessary objects with similar values on the bartering platform. In other words, the price that the mainstream had labeled on their superfluous objects, no longer reflected the true or potential value of the objects. Bartered objects achieve a value that could not be achieved in a conventional retail environment, whilst allowing other individuals to possess them again.

Thus, the exchangers chose to cherish each object they possessed. Even when the object became unneeded, it could be exchanged intact in the barter system to pass along to the next person.

#### 4 DISCUSSION:

For economic recovery, past enterprises practiced strategies that included planned obsolescence and perceived obsolescence. Individuals in modern times are constantly changing the objects they possess. Rapid replacement of old goods with new goods has not only become a habit, it become a trend (Leonard, 2007). Because of rapid environmental changes, many objects have been eliminated. In addition, transportation has become more convenient, so moving has become part of many individuals' daily life. Thus, large objects can no longer be carried with them. Design allows many products to be presented to the consumers in many forms. A large amount of manufacturing produces a large number of business opportunities, as well as consumption of resources. Thus, great damage to the environment has resulted (Papanek, 1984). Sustainable design aims to meet the requirements of economy, society, and ecology. In industrial design, usually, it reaches those goals through the design using the materials which can be recycled, shortening the manufacturing process, or considering the needs of the third world. To solve this issue, some designers design goods from the perspective of the materials. They studied various environmentally-friendly materials, hoping that even discarding the goods would

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not cause harm to the environment. However, using design to solve the problems caused by design cannot reverse the trash produced by mass production because the spirit of sharing and cherishing objects no longer exists.

Various ways of thinking in the past seemed to suggest that people's wasting behaviors were ingrained, so past studies, including community and product studies, tried to influence society and strengthen the linkage between people and sustainability through better creativity. However, they ignored the fact that bartering is different from the rationality in the monetary economy of capitalism which focuses on never-ending precisely calculating financial value.

An object circulated, reused and bartered among a group of people gives greater flexibility in measuring the value of the object (table 1). Bartering not only maximizes the life of products, postpones the waste of goods, but also becomes a plausible sharing pattern and its concept is closely connected with sustainability. Individuals cherish their objects and maintain the objects in excellent condition for recirculation. This barter system allows us to understand that much merchandise that cannot be placed on the shelf does not signify that it will become a waste product. Their values are actually buried by the current market. The power of bartering has been deeply rooted in the society and it happens to make up the disadvantage of the design in the past which often sacrificed other goals in order to solve a particular problem. This study expects that designers learn from bartering activities, take its sustainability features, which have existed in our society for a long time, as a base of design, and think of some creative ways that design can utilise this social force. This study also hopes that designers may try to move away from a typical way of design which attempts to respond consumer's awareness of green through products themselves, and start to adopt some other methods, such as system design and social design, to expand this social force and let numerous idle and unwanted objects that filled our daily lives to start circulating so that sustainability can become natural and inevitable in our daily life. Finally, figure 2 shows a conceptual idea to flow products to the consumers through bartering. I hope this paper can initiate new ideas and approaches to design by placing bartering at the centre of the design problem.

CHARACTERISTICS OF BARTER	CHARACTERISTICS OF CAPITALISM
Emotional	Rational
Value is flexible	Value is determined by precisely calculated price
A collaboration done by a group of people	A single consumption done by a single consumer
The main theme is to share	The main theme is to possess

Table 1: Comparison of the concept of value between barter and capitalism

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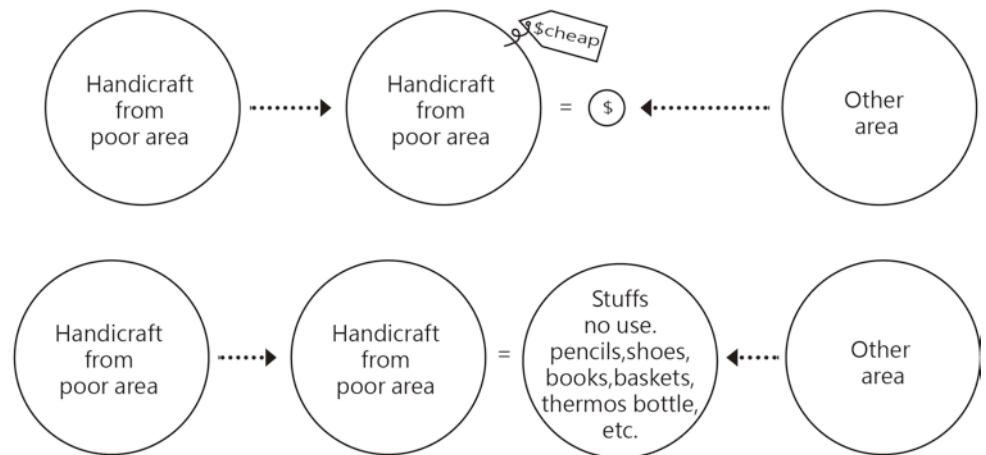


Figure 2: To sell the handicrafts from poor area with cheap price can only get minimum money. The flexibility of their value will surprise us when they are used to exchange for things which are not needed by the party who offers it.

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