

Research on Responsibility Consciousness in Electronic Product Design

-- Design ethics in electronic products

Yang Cao*

Art Design, Jingdezhen Ceramic University, Jingdezhen 333000, China;

* Corresponding author: Email: 1305360349@qq.com

Abstract: Design ethics is a guiding principle with metaphysical significance in design, which has a very important impact on electronic product design. With the development of science and technology network, electronic products are increasingly dependent on people. Among them, the design ethics of electronic products aims to guide users to a better direction of truth, goodness and beauty, and better protect users. At the same time, it advocates the rational use of existing social resources and the protection of our environment, It plays a certain role in promoting ecological development. Electronic products are designed not only for the public, but also for special vulnerable groups, such as the disabled, the elderly and children. This paper analyzes some phenomena and problems of existing electronic products, explores how to apply design ethics to electronic product design, and analyzes the sense of responsibility of design ethics in electronic product design when people face daily life and society.

Keywords: Design Ethics; Electronic Products; Humanistic Care; Sense of Responsibility.

1. Introduction

With the rapid development of high technology and economy in the information age, and the rapid development of design, various social problems have arisen in various fields such as human society, ecological environment, business groups, and life. Environmental design under design ethics is for living, and visual communication design is for accurate and rich communication of information, so product design exists for human use. Human life has been accompanied by products since the Stone Age, and products play an irreplaceable role in human social life. What follows is that in the digital era, various head-on ethical problems in electronic product design, anti-human design in design behavior, product design leading users to blind consumption, excessive packaging, serious virtualization of life, earth ecological crisis and many other problems, which are caused by the fact that under the rapid development of industry and science and technology, human beings have ignored the corresponding ethics in product design.

2. Overview of Design Ethics

Design ethics, the first design is to serve the public, not just for the nobility. The second point is that the design is not only for the healthy people, but also for the disabled and other vulnerable groups. Third, human design should be possible to save and protect the limited resources in the earth society.

As an interdisciplinary and comprehensive discipline, the main purpose of design is for people. Therefore, human moral and ethical factors such as people, environment and resources must be comprehensively considered in design, and short-term and temporary temptations cannot be coveted while long-term interests are ignored. If people, environment and resources want to achieve the symbiotic effect of balance and coordination, then design ethics has practical theoretical guiding significance in modern design art. Designers no longer blindly deal with the problem of comprehensive design

relationship, but can develop in a more positive and harmonious direction to meet the humanistic spirit of design art.

3. Ethical phenomena and problems of digital electronic products

With the rapid development of science and technology and the Internet, the popularity and proliferation of digital electronics have greatly changed human life. While improving human living standards, it has also triggered a series of problems about design ethics. In addition to food and other living materials, people can't live without "mobile phones", which have become a very important part of life. Nowadays, short videos such as "Tiktok" and "Kwai" are springing up, and "bow heads" (Figure 1) are obsessed everywhere. The recently popular little game "A sheep has a sheep" (Figure 3) has also been pointed out as "cheating time", which was set to be a dead end from the beginning. This fast-paced product is eroding people's brains and making them addicted by taking advantage of consumers' silence psychology. There are various kinds of digital products in the market: computers, iPads, mobile phones, smart watches, smart appliances (Xiaodu, Xiaoi), game consoles, etc. There are tens of thousands of different types of styles, specifications and sizes. The speed of updating and iteration is fast (Figure 2). Some products are of poor quality. The batteries have been abolished in a planned way. The excessive packaging and packaging information that pollute the environment and appearance are distorted. A large number of complex information has been artificially manipulated, leading to the trend of values, which has a negative impact on some electronic product users who have no judgment ability. The excessive virtualization of electronic products makes people have illusions and inertia, lacking the coping ability to face the real world. There are also some design ethics problems such as concealing product defects, pretending to be famous brands, and plagiarism, which violate the principles

of design ethics.



Figure 1. Left: Hand drawn bow head family

([https://gimg2.baidu.com/image_search/src=http%3A%2F%2Fbpic.588ku.com%\);](https://gimg2.baidu.com/image_search/src=http%3A%2F%2Fbpic.588ku.com%)

Figure 2. Apple mobile phone replacement:

([https://gimg2.baidu.com/image_search/src=http%3A%2F%2Fceim. age.tianjimedia.com%2FuploadImages\);](https://gimg2.baidu.com/image_search/src=http%3A%2F%2Fceim. age.tianjimedia.com%2FuploadImages);)

Figure 3. Right: Sheep have a sheep Games:

(<https://www.upan.cc/game/199988.html>)

3.1. Section Excessive Consumption of Resources and Environmental Damage

The first thing to bear the brunt of the waste of electronic products is the excessive variety of products. The original dozens of electronic product models designed are enough to meet all human needs. However, in order to stimulate consumption, businesses shorten the service life of the battery design by making design changes to the shape, appearance, and packaging (to be abolished in a planned way), so as to meet businesses' constant incentives to consumers to replace. If the original purpose of product design is to stimulate consumption, the products created by these designs are easy to be eliminated constantly, and the harm to the environment caused by waste cannot be underestimated. This is not only a serious waste of resources, but also a deliberate design to stimulate consumption and destroy the environment and waste resources runs counter to design ethics. For example, if the kaolin used to make porcelain is over exploited, the chip resources will be scarce; The addition of fluoride toothpaste will lead to the destruction of the ozone layer, excessive packaging, and shortened battery life.

People and the environment belong to a community of common destiny and are interdependent and symbiotic. We have the obligation to maintain the earth's environment and resources on which we depend. In the design industry, people and the environment are also sustainable development, maintaining ecological balance and avoiding excessive development leading to waste. For example, in recent years, the design of mobile phone chargers has attracted attention. The designers found that different types of mobile phone chargers exist today (Figure 4). When different mobile phones are replaced, the original chargers are discarded. Nowadays, the design of mobile phone chargers is gradually unified. Multiple models of mobile phones can share one model (Figure 5), so as to avoid waste caused by excessive purchase of chargers. This is a positive measure to protect resources in accordance with design ethics in electronic products.

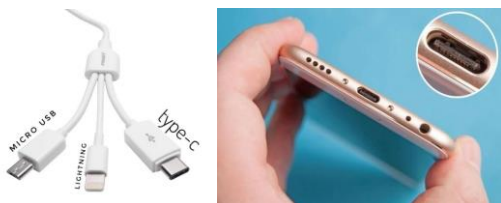


Figure 4. Left: Three chargers:

(https://www.sohu.com/a/517673535_1205825700)

Figure 5. Right: Charging port:

(<https://baijiahao.baidu.com/s?id=1705410679168974117&wfr=spider&for=pc>)

3.2. Electronic products consume people's energy excessively

Excessive use of electronic products has serious harm to human beings: children's brain and immune system are not yet mature, vulnerable to radiation, affecting brain development and sleep. Not only that, parents' addiction to technology products is not an exception. They neglect to take care of their children and unconsciously make their children addicted to electronic products. In the long run, their learning ability will decline, their attention will be lacking, their cognitive ability will be delayed, and their probability of suffering from depression will also increase, resulting in anxiety, autism and other problems. When children learn, they can easily find answers through electronic products, which is not conducive to students' independent thinking and reduces their self-control.

Since electronic products are highly addictive, whether designers should consider this aspect when designing products, and stop indulging in controlled restraint rather than aggravating its occurrence. For example, Tiktok short videos are highly addictive, games, short videos, electronic novels and other entertainment consumption. When designing, once people use timeout: remind them when they have time, set the minors mode, or force them to turn off. For example, qq, WeChat minors cannot register.

Google has a position called Product Ethics Designer, which aims to reduce the number of times and time users use mobile phones. They intentionally or unintentionally use people's psychological weaknesses to manipulate users' attention. This case shows that product designers have a great influence on user behavior. Therefore, as a designer, we should follow the design ethics to avoid or reduce the harm of electronic products to human beings in the use process.

3.3. Excessive Marketing Means

For electronic products that are gradually saturated to a certain bottleneck period, how to improve their own value, or create a gimmick that is higher than their own value, in order to attract consumers, are some marketing methods adopted by enterprises in operation, such as advertising, promotion, rebates, price war, ignoring strategic management and system management, ignoring the establishment of long-term competitive advantage. The demand created by the enterprise intentionally leads the public to buy blindly. For example, the demand for the frame rate of the display is higher when the public buys blindly. The manufacturer claims that its products have a high refresh rate. The marketing routines played by these major enterprises are constantly emerging in products such as keyboard, mouse, camera, mobile phone and computer. In order to stimulate people to pursue better product experience, pixel pk between camera and mobile phone, multi-functional technology of electronic products, etc. may be just the moneymaking marketing strategies created by businesses. These excessive marketing and publicity methods violate the principles of design ethics.

3.4. Protection of users' information privacy

In the era of information explosion, all kinds of cloud storage, account login, and website filling in information are quietly applying your information in many cases, and the problem of information privacy disclosure is becoming more and more serious. Bombing and promotion of various junk phone messages, stealing information for loans, pornography,

fraud and other illegal and criminal acts. At the same time, mobile phones, USB flash drives, electronic watches, iPads, computers and other electronic products are updated rapidly, and people pursue new products and frequently replace them. However, it contains a large amount of personal information. When electronic products are transferred or recycled, attention should be paid to whether personal information is cleaned up to avoid potential security risks. The public listing and random sale of micro camera stealers (Figure 8), some illegal electronic stores, watches (Figure 9), buttons, car keys, pendants... these common daily necessities may become micro camera stealers wearing "waistcoats", indicating that the number of most of these "three no's" products has reached a considerable scale and the market demand is expanding. Some people are specialized in sending information about taking photos to illegal websites, and taking photos with micro camera has become a commercial chain. This phenomenon has sounded an alarm for the protection of personal privacy. Of course, reasonable monitoring facilities such as cameras in public places are mainly aimed at public safety. However, if these micro electronic products are sold and used indiscriminately, people's sense of insecurity and distrust are also growing, which will inevitably bring many social problems.

How to better protect users' privacy and strengthen the protection of information during design is a very important point for people to pay attention to when using electronic products, and also a factor for designers to consider when designing electronic products.



Figure 8. Left: Micro camera:

(<http://opinion.cctv.com/2019/05/07/ARTIenvKXZStebWuskBcIFWS190507.shtml>)

Figure 9. Right: Watch pinhole camera:

(<https://bkingm.cdn.bcebos.com/pic/838ba61ea8d3fd1f590b0e24324e251f95ca5fa9?x-bce-process>)

4. Social responsibility of design ethics in electronic products

4.1. The electronic products under the principle of design ethics guide a healthy lifestyle in the face of different groups, reflecting humanistic care.

It is the sense of social responsibility of electronic products to actively and healthily guide people to a healthy lifestyle under the guidance of design ethics. Some good designs of electronic products have sports and health indicators. When the alarm device is in danger, it can sound the alarm, locate at all times, and increase safety attributes; Some sports watches and smart bracelets (Figure 10) are designed to get rid of people's dependence on mobile phones in sports, so that people can exercise more healthily and attentively; The electric toothbrush (Figure 11) has changed people's lifestyle, and people have better oral health.



Figure 10. Left: Smart bracelet

(https://item.m.jd.com/product/66198835034.html?cu=true&utm_source=baidu-juhe&utm_medium=kong&utm_campaign=t_1000151230_juhe)

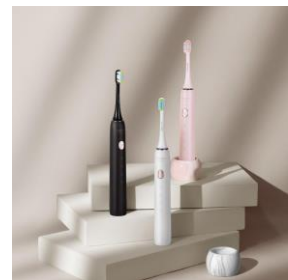


Figure 11. Right: Electric toothbrush:

(<https://baijiahao.baidu.com/s?id=1724380190566498925&wfr=spider&for=pc>)

In the face of consumer groups and users, the positioning of electronic products is not limited to professionals and young consumers, but also to the elderly and disabled. The electronic products with large screen, fall proof and big ring tone and electronic blood pressure device suitable for the elderly are designed (Figure 12). For the disabled, taking the Jiugong blind mobile phone (Figure 13) as an example, using hearing and touch instead of vision, the touch keyboard is used to change the operation mode of the blind when using the mobile phone. The side of the mobile phone is designed with touch points to enable the blind to quickly distinguish the positive and negative directions, using different tactile characteristics of materials and functional zoning to improve the convenience and accuracy in the use process, and special charging interfaces are designed, these are all designs from the perspective of blind consumers, reflecting the humanistic care of design ethics principles.



Figure 12. Left: Intelligent sphygmomanometer:

(https://gimg2.baidu.com/image_search/src)

Figure 13. Right: Blind mobile phone: Page not found - Designbuzz

The design will not hurt anyone, and the product can be used by any group without barriers. When designing electronic products, when facing vulnerable groups, we should think from the perspective of consumers, and have the humanistic care spirit of equality, self-esteem and fairness at the design level. This is also the embodiment of the sense of social responsibility of electronic product designers.

4.2. The Change of Design Ethics on Electronic Products Affects Future Education

With the gradual popularization of smart homes, electronic nannies and the Internet of Everything, parents' busyness is accompanied by children's habit of being accompanied by intelligent devices since childhood. Will this affect children's growth? I think the answer is yes. The younger age of electronic products shows that the design ethics of electronic products will deeply affect the education and development of children in the future.

Science and technology should be used to help children

grow up. When designing some electronic products, a child mode is set to prevent children from indulging in it, so as to control their use time. When parents are working outside, they can share the monitoring images with the kindergarten at any time through the built-in monitoring camera of the preschool education, so as to enhance the relationship between parents and children and enhance the parent-child relationship. Children's childhood education company is not limited to parents' personal education. Through different electronic products, education methods are enriched, and tablet computers are used to learn more extra-curricular knowledge; Children's early education machine (Figure 14), story machine, electronic toy, intelligent nursing robot, learning machine (Figure 16), etc., improve children's hands-on ability through human-computer interaction electronic products generated by point reading interaction.



Figure 14. Left: Early education machine:

(<http://www.t-chs.com/pche50008838/572625677531.html>)

Figure 15. Right: Learning machine:

(<http://baijiahao.baidu.com/s?id=1689594444989643138>)

These electronic products in line with design ethics are playing a positive role in promoting the healthy development of children. In the future, the influence of most electronic products will play a more important role in children's learning. Then, with more and more users, whether designers should strengthen the social ethics guidance of electronic products. This is the embodiment of social education responsibility of design ethics in electronic products.

4.3. Social Responsibility of New Electronic Product Design in Line with National Conditions under Design Ethics

In the case of global chip shortage (Figure 17), in the capital operation of electronic product design, the planned abolishment system of some designs in the United States, even now, did not use resources reasonably and efficiently for the waste of scarce resources, which increased the waste of resources and increased the cost of recycling resources (recycling old mobile phones, some of which may be stacked at home and cannot be recycled). Under the expulsion of interests, Ignore the social responsibility and ethics of design.

At this stage, new energy vehicles (Figure 18) change oil energy consumption into electricity energy consumption, convert nonrenewable resources into renewable resources, and use photosynthetic plates to store energy, wind energy, and hydropower to generate electricity. It is not only green, but also China is a large oil importing country. If we can start from resources, greatly reduce or do not need to import oil from other countries to ensure China's transportation and industrial development, it will be a great breakthrough, the independence of our country has been further improved. Efficient utilization of Chinese resources through the application of design ethics in design.



Figure 16. Left: Chip:(<http://kymicro.com/page133>)

Figure 17. Right: New energy vehicles:

(<https://baijiahao.baidu.com/s?id=17294429310347768260>)

5. Conclusion

Design ethics should use design electronic products to effectively avoid wasting social resources, protect the ecological environment, and achieve more humanistic care and promote the development of education. As the media carrier of scientific and technological information, digital electronic products are closely related to people's life. While designing products to meet the needs of the public, we should pay attention to the fact that excessive satisfaction of people's greed may violate social ethics, causing people to rely too much on electronic products, so that excessive virtual replacement of reality, greater convenience and greater inertia. Therefore, in design, excessive function may also lead to bad design. Abuse and waste of energy in design, over emphasis on design, and loss of humanistic care are undesirable. The so-called humanity refers to morality and humanity. Human nature is a combination of good and evil, and people's desire cannot be excessively satisfied; We will safeguard the most fundamental and long-term interests of people to the maximum extent, meet the needs of the people more rationally, and at the same time meet the constraints. Ethical influence not only affects the mechanism, approach and outcome of design activities, but also meets the needs of mass users in terms of material needs, ideas and emotions. Understand the humanistic spirit in design, and deal with the ethical relationship between design and people, design and society, design and nature. Grasp the conflict between design responsibility and design interest, so that ethical principles can be effectively implemented in electronic products. This is our social responsibility as electronic product designers.

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