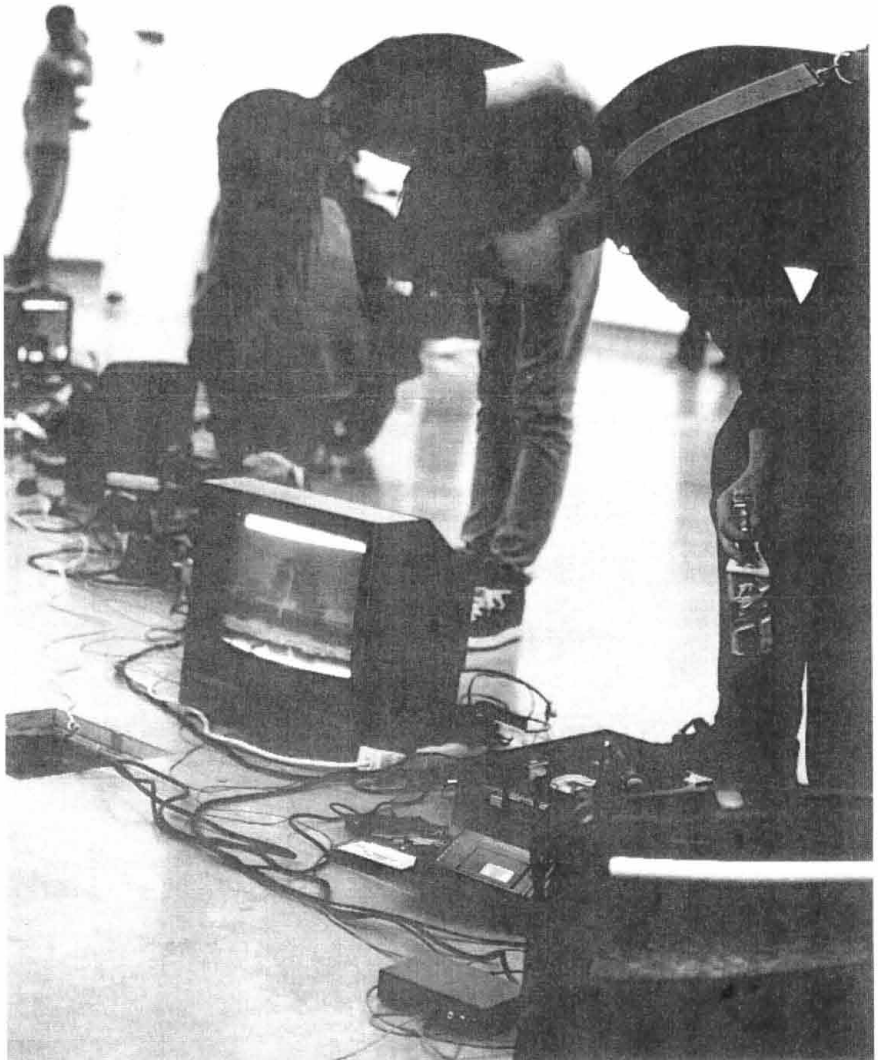

Hardware hacking and recycling strategies in an age of technological obsolescence

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Planned obsolescence was first explicitly formulated in the 1920s and 1930s as part of a strategy to promote recurrent consumption [1]. The term "planned obsolescence" already appears in the 1930s, as exemplified by Bernard London's pamphlet of 1932, Ending the Depression Through Planned Obsolescence [2]. In the 1950s, further evidence of this dynamic can found in statements by designers such as Brooks Stevens [3] and retailing experts like Victor Lebow [4].

Planned obsolescence may be described as a design strategy that pre-emptively restricts the lifespan of a commercial product, involving an factors intended to promote early replacement (of the object or various parts thereof) before usability is fully exhausted. These built-in factors may be of a technical or material nature, e.g., some inkjet printer manufacturers use smart chips in their ink cartridges to prevent them from being used after a certain threshold like the number of pages or time. Apple's iPod, iPhones and iPads are manufactured with no user serviceable parts inside, including their batteries. After approximately three years of use, the lithium-polymer battery will no longer work and the device will either need to be professionally serviced or discarded. Similarities they may comprise a marketing strategy in which the appearance of "new" models within the same product range relegates older models to obsolescence [5].

Planned obsolescence is an especially suitable strategy in the consumer technologies and personal electronics market, where there is a clear premium on the novelty and iterative development of new generations of the same underlying technologies (e.g. the personal computer and the mobile phone). Dianne Nixon, a senior industrial engineer at Pentagon Design, which builds portable devices and computers for companies like Hewlett Packard, says "We note that we design in-house." [6]. The combination of short term design and marketing strategies and fast consumption behaviours tends to generate the increasing amount of electronic waste [7].

A counterpoint to the development of planned obsolescence is evidenced by the work of artists, hobbyists, hackers, activists and sustainability advocates who explore the latent potential of apparently "obsolete" devices. Early indications of this tendency are in the work of Reed Ghazala [8] who ventured and first commercialised the practice of "Circuit Bending" in the 1960s which has not been widely documented, studied or theorised [9]. An other emerging practice is the recycling and hardware hacking processes that are driven by necessity by Hackers and Hoobins in westerns and developing countries [10]. Though driven by entirely different motivations, these practices can inform each other. Furthermore these practices have the potential to make significant contributions into the debate of technological obsolescence.

Hardware hacking as an art practice has emerged very recently, notably in the field of electronic music as the technique of "circuit bending" where cheap music toys and instruments are modified to create new and unique music instruments. While less prevalent for visual artists, perhaps because it requires more specific skills and knowledge, it is a practice, which has seen a growth in popularity.

While it is a new practice, its art historical precedents can be traced back to the cybernetic art movement of the 1960s best known through the Jasia Reichardt curated "Cybernetic Serendipity" exhibition in the U.K in 1968. Key influences would include the installation work of Nam June Paik, the machines of Jean Tinguely and the lesser-known work of French cybernetic artist Nicolas Schaffer.

Examples of artists and artists groups involved in hardware hacking would include the Institute for Applied Autonomy, Peter Vogel, Casey Smith (Junkfilms), Labb, Gebhard Sengmüller, Karl Klomp, Gijs Gruitrs, Rosa Menkman, Tom Verhaeggen, Jonah Brucker-Cohen & Kathrine Mermaki (Scrapyard Challenge), Bas Cazzo and Miguel Rodriguez of Bastardo, Garnet Hertz, Niklas Roy, Todd Holoubek, Gordan Savicic, Harold Scheffers, Peter Edwards, Martin Diamant, Günter Eckert, Nicolas Collins, Cory Arcangel, Natalie Jeremijenko, Troika, Phil Archer, Michael Gotembewski, John Bowers, Julius von Bismarck, Caleb Coppock, Lesley Flanigan, James Hoonan, Aleks Kolkowski, Alexis Malbert, David Wills, Belas Duffy, Jeff Boyman, Tom Koch, Arcangel Constantini, LuVid, Stefan Imkiue, Philip Stearns, and many more.

New technological developments such as the availability of low cost micro controller boards like Arduino [11] made specifically for artists and designers and the sharing of techniques and information via the Internet have made hardware hacking easier and as a result the popularity of hardware hacking is increasing as an artistic technique.

The significance of this type of artistic practices is clear when one considers the sheer volume of waste electronics being disposed "round world". Moore's law dictates that the complexity of computer chips doubles each 18 months. By consequence every year 20 to 50 million tonnes of E-waste is generated worldwide [12].

Notes

(1) It is worth noting that some critics have suggested that the root concept of promoting consumerist consumption through the premature "wearing out" of a commodity is already in evidence in the 19th century pointing to cases as such as Discourse on Trade (1690) by Nicolas Barbon in which he argued that, "Fashion or the alteration of dress is a great promoter of trade, because it occasions the expense of cloths before the old cloth are worn out"
(see Edwards, 2005, pp.24)

(2) Bernard London, "Ending the Depression Through Planned Obsolescence" (pamphlet), 1932. Reproduced by Adbusters Magazine, "How Consumer Society is Made to Break," available online at <http://www.adbusters.org/category/tags/obsolescence> (Last modified October 26th 2008, last modified October 18th 2008.)

(3) "Aims to give something a little newer, a little better, a little sooner than is necessary." Brooks Stevens, Talk at Midland (Minneapolis) in 1954, audio recording available at <http://www.mam.org/video/watchmedia/broadcast/biography.asp>

(4) "These commodities are never to cease by offered to the consumer with a special urgency. We require not only hotted draft consumption, but expensive consumption as well. We need things consumed, burned up, worn out, replaced, and discarded at an ever increasing pace." Victor Lebow, Price Competition in 1955, The New York Guaranty Journal of Retailing, Volume XXXI, Number 1, Spring 1955, page 7

(5) Although the term has retain currency in popular discourse, considered definitions for "planned obsolescence" are not very common although Brian Vance Packard (The Waste Makers, Sawers & Schuster, 1978) and Thomas Frank (The Conquest of Cool: Business Culture, Counter culture, and the Rise of Hip Consumerism, University of Chicago Press, 1997) have attempted to provide these. These definitions tend to focus on the question of consumerism and not specifically about electronic waste.

(6) Computers Shift Warranties, Rendering Gadgets Disposable, Tuesday, July 16, 2002, By Jane Spencer Staff Reporter of The Wall Street Journal

(7) The average lifespan of computers in developed countries has dropped from six years in 1997 to just two years in 2005. Mobile phones have a lifecycle of less than two years in developed countries. 167 million computers were sold worldwide in 2004 – 11.6 percent more than in 2003. 674 million mobile phones were sold worldwide in 2004 – 30 percent more than in 2003. By 2010, there will be 710 million new computers in use. There will be 1.78 million new computer users in China, 60 million new users in India. The e-waste problem, Background – May 23, 2005, Greenpeace International – http://www.greenpeace.org/international/en/campaigns/toxics/electronics/the-e-waste-problem/

(8) Reed Ghazala, "The Folk Music of Chance Electronics: Circuit-Bending the Modern Concept", Leonardo Music Journal Vol. 14, MIT Press.

(9) Some interesting work exists such as Zombie Media: Circuit Bending Media Archaeology into Art, Method and Motivation, Hertz & Jussi Parikka, July 19th 2010, Vilem Flusser Theory Award 2010

(10) Scientists – Phone recycling – via Technorati Blog by David Kaufmanhttp://technorati.wordpress.com/tag/scientists-phone-recycling/

(11) Arduino is an open source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.
http://www.arduino.cc/