

Dupliances: Physical and Virtual Activity Encompassed

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ABSTRACT

This paper makes a case for *dupliances*, which are defined as devices that encompass both physical and virtual activity, as an alternative to information appliances that are only intended to support a specific virtual purpose. Besides putting the uninteresting physical containers of information appliances to use, potential benefits of the notion of dupliances include fewer devices to carry; novel synergy effects arising from creative embodiment of virtual and physical functionalities; and an expectantly higher degree of acceptance from particular user groups. To exemplify the notion of dupliances further, two design concepts are presented and discussed.

Keywords

Dupliance, Information Appliances, Mobility, Ubiquity, Physical/Virtual, Interaction Design

INTRODUCTION

In a recent book, Donald A. Norman renews the concept of information appliances—a term coined by Jef Raskin in 1978—and makes a strong case for it as the vehicle away from the intrusive, imperious and intrinsically complex desktop computer, toward a more humane, unobtrusive and invisible model of computer use [3]. Recently, this notion has given name to a host of small devices, such as hand-held computers, mobile phones and PDAs. Whether or not these devices are in fact appliances is highly debatable, but the term has been widely accepted.

Traditionally, devices designed to perform specific functions have been referred to as appliances, especially electrical devices for household use such as toasters and coffee machines. Information appliances, hence, are also defined as being designed to support specific activities, but specialize in information [3].

The main characteristic of an appliance is its simplicity to learn and to use, and its specialization of function that allows customization in terms of operation, look, shape and feel. Norman offers three design axioms for information appliances. First, simplicity is an inherent virtue, as the appliance should strive for invisibility to the task in a Heideggerian spirit. Second, it should be versatile, allowing

novel combinations and interconnections, and third, it should be pleasurable in that the user takes pride and has fun in owning and using the information appliance.

Examining the Notion of Information Appliances

While appliances should be designed to be simple and specialized, those characteristics come at the cost of lost flexibility [3][4], and there seems to be no tradeoff that is optimal for everyone, not even for a single individual [4].

Another key drawback of information appliances drawn on in this work is that while all the devices the user will carry each supports one specific instance of virtual activity, their physical bodies merely constitute lifeless containers. As an example, the physical body of an mp3-player is primary an electrical circuit jug needed to support the virtual activity of playing digital music through headphones, including its UI. Obviously, an earpiece with a built-in mp3-player would not suffer from this, as the physical shape would add to the appliance's virtual functionality, and they would become one. This seems rarely to be the case, and hence the physical bodies of current information appliances seem infrequently imperative in practice.

It has also been argued that if one device is to support many activities it must compromise on how well it handles each distinct task, that the specialization which makes an information appliance ideal for one task will interfere with its other activities [3]. However, this view presupposes that the scope of the device is limited to support information-related, virtual tasks and is not as apparent if we consider simple analog appliances, such as napkins. It is not unusual to have a knotted corner of a napkin as a reminder of something, which is a form of virtual functionality. However, here you still retain the napkin's physical functionality, e.g. to dry one's hands. The key incitement of this line of reasoning is that an appliance may in fact have two functionalities that will not interfere with one another as long as one of these functionalities is intended to support virtual activity and the other supports physical activity.

INTRODUCING THE 'DUPLIANCE'

The concept of *Dupliances* draws on two recognitions made in the previous section:

1. The physical body of an information appliance is often only a container for its virtual functionality
2. An appliance may support two functionalities that do not interfere with one another if one is virtual while the other is physical

A dupliance is a device that is as simple to learn and use as any well designed information appliance, but instead of one encompasses two functions, one being virtual and one being physical. A dupliance is hence two appliances that come together in one body, hence forming a *dupliance* ('du' from dual and due, *Ital.*). Currently, there are quite few 'dupliances' available. However, there are a number of devices that should not be mistaken for dupliances, such as microwave ovens and coffee makers. Their virtual functionality is only intended to support the main physical activity, and hence they are in fact appliances. However, devices like *Interactive Barney*, discussed in [1], could actually be seen as surreptitious dupliances if we regard its physical function to be play and its support of virtual activity to secretly influence the minds of our children.

Potential benefits of this notion—besides putting the uninteresting physical containers of information appliances to use—include fewer devices to carry, novel synergy effects arising from creative embodiment of virtual and physical functionalities, and an expectantly higher degree of acceptance from some user groups, e.g. children. Obviously, these need to be further investigated.

DESIGNING THE DUPLIANCE

The design concepts in this paper have been chosen among several that were developed during a brainstorm session; a common component of the design process where ideas are generated in three steps [2]. Here, physical appliances were listed on the left part of a large whiteboard, and virtual appliances-like activities on the right. Children were chosen as the primary target group for the design concepts. Each physical item was then combined with each virtual item, and pairs that made sense subjectively amid the group where listed as 'dupliance candidates' on the whiteboard. Sketches and use scenarios were then made of each candidate and discussed, from which the two design concepts presented in the next section were chosen.

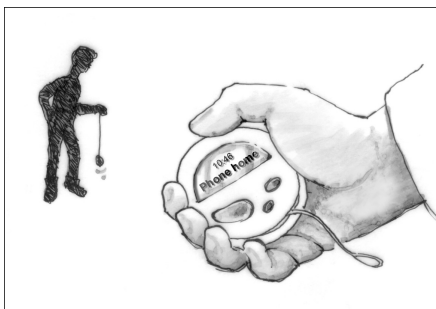


Figure 1. The YoYoPager

Design Concepts

The YoYoPager

A yoyo provides a small physical body that excellently may encompass virtual functionality. The YoYoPager, shown in Figure 1, introduce pager functionality to a yoyo. This prototype shows how a dreary physical body of an information appliance may come to life without interfering with its functionality, and it is also an example of how the concept of dupliances leads to fewer things to carry.



Figure 2. The SkipRope++

The SkipRope++

As cell phone technology is becoming ubiquitous and cheap, it seems enviable that they be connected with certain activities where people would like to be available rather than as it is today, where you tend to be always available if when carrying a cell phone. Figure 2 shows the SkipRope++, which draws on this idea by combining a children's skip rope with a cell phone. This way, each child would not have to have the responsibility of carrying and worrying about a phone of his or her own. Because the phone is connected to a certain activity, it may also be designed to encompass what might be expected of the specific physical activity that the dupliance supports, and in this case support rough treatment, damp environments, shocks etc. The physical shape of the skip rope also provides a natural, though somewhat historical, UI for making telephone calls.

FUTURE DIRECTIONS

While this paper is primarily conceptual, focusing on the notion of dupliances, the design concepts introduced are among a group of dupliances currently being developed into working prototypes. These will undergo extensive testing and evaluation on their intended target groups.

CONCLUSIONS

Dupliances are devices that encompass both physical and virtual functions in one physical body, which separates them from information appliances that has only one specific virtual purpose. A key design incentive has been to put the uninteresting physical bodies of current information appliances to use. To exemplify the notion of dupliances, two design concepts have been introduced and discussed. These were the YoYoPager, which combines a yoyo with pager functionality, and the SkipRope++, which merges a skip rope with a cell phone.

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