

# Smart Boxes: A Design Study

**Ted Selker**

MIT Media Lab Room E15-322 20 Ames St.  
Cambridge, Massachusetts 02139  
617-253-6968 [selker@media.mit.edu](mailto:selker@media.mit.edu)

**Winslow Burleson**

MIT Media Lab Room E15-384b 20 Ames St.  
Cambridge, Massachusetts 02139  
617-253-8307 [win@media.mit.edu](mailto:win@media.mit.edu)

## ABSTRACT

The relationship between a user and a computer begins with the out-of-the-box experience (OOBE), i.e. unpacking, setting up, and booting a computer for the first time. This paper describes a design study of ways to move on-line setup help and instructions into the packaging itself. Graphics and clever packaging streamline the OOBE in order to make the physical process of extracting the computer expose supportive information built into the packaging. The result is the "Gift Wrap" and the "Smart Box", packaging concepts that use their physical construction and relationship with a computer and accessories to guide the user through the OOBE. These are proposed as replacements for the packaging currently used with portable computers, but are applicable to a wide variety of packaged items.

## Keywords

Packaging, instructions, context-aware design

## INTRODUCTION

A customer's initial experience with a product can have a long lasting influence on the customer's perception of that product. There are always some actions users must perform on their own before they get to the point of booting up the computer for the first time. When opening the box it is often unclear what is essential now, useful later, and what is garbage. Before proceeding, the user must know whether there are any missing accessories, batteries, cables, disks, or printed documentation. The user must learn how the pieces plug together, and the locations of plugs, switches, latches, etc. Only after everything is properly plugged in and the correct software has been loaded can the user begin using the computer. Hopefully the computer hasn't been broken in the process.

The OOBE must be unchallenging to the new user. Until the machine boots up, the user is navigating with only the printed OOBE materials provided in the box. After boot-up, help and tutorial software should be available to help guide the user COACH [1]. The OOBE is the last pep talk that can be given a user before they turn it on. The OOBE should be seen as an opportunity to help, impress, and excite all users, while introducing them to their new device.

## BACKGROUND

Problems encountered on the first day of ownership can form opinions that are difficult to overcome. Often, however, the OOBE is given little attention or is poorly addressed in product design. This was highlighted in an early IBM thinkpad "Product Map"; a poster-sized sheet of paper with outlines for the computer and its accessories. The intent was that the user would unfold the Product Map, lay the pieces found in the box upon their outlines, to learn how they fit together. In practice, the Product Map took a whole table to set up and was covered with confusing icons (less than 10% of users even tried to use it). The device added effort and required understanding to set up. The user was given no diagram or text to explain the use of the map. In designing hardware, it is important to facilitate the user's OOBE by making it easy to add and remove accessories. It became apparent that more attention needed to be paid to the OOBE materials. We set out to develop materials that were simple and obvious in their use.

## CONSTRAINTS

A number of constraints were perceived: Cost is a sensitive issue. Even a ten-cent additional expense is considered significant. Recyclability is an important issue to which all companies should be committed. Paper and cardboard are environmentally friendly materials, while plastic and foam are less so.

Warnings to the user about hazardous materials (i.e. chemicals in the battery and LCD) and easily damaged components are required. However, these warnings should not sound frightening. Users should not be afraid to open the computer to change a battery or a disk drive. For example, the ThinkPad manual frequently includes warning notices such as "Danger" and "Caution". "Public Record" notices should not be the novice's central OOBE. While noticeable, the warning stickers should not dominate the battery graphically. Phrases like "Safety Information" would be less alarming than "Danger".

Nationalization: supporting multiple languages can be a design challenge; three approaches include: multiple manuals, multiple languages on each item, or pictographic-only material can be used. We found that in attaching the physical to the pictographic it was possible to make things setup tasks more understandable.

Battery life: Ideally, the battery would arrive with enough charge that the user could begin using the multimedia capabilities of the computer immediately without learning

how to connect the power supply. But batteries discharge at 1-2% a day so, in some cases, the battery power is likely to be too low on arrival to power the computer. There were also safety concerns.

Theft is also a concern because losses occur in shipping and distribution. One approach is to mark the package externally on only one side and to palletize the product with the marked side facing down or inward.

## DESIGN ITERATIONS



Step 1

Step 2



Step 3

Smart box

We developed an approach we call “gift-wrap”. It puts the instructions on strips of paper that are inserted in the machine itself. I.e. one strip is on the outside, another becomes visible when the lid is raised, and another becomes visible when the keyboard is lifted. This both keeps the instructions close to the product features and sequences the instructions. The user is only presented with one new action at a time.

This approach was developed over a period of months in at least a dozen iterative design prototypes and testing cycles. The wrapping paper was developed for our test system (a ThinkPad 760) which included 7 graphical and physical steps. The 3-inch wide strip of paper inevitably draws a user through 7 steps of setting up and turning on their computer as part of extracting the paper. This approach is similar to Don Norman's concept of "forcing functions", i.e. avoiding user error by restricting the number of paths the user can follow [2]. This approach offers the following valuable features:

It personalizes the packaging with the signature of the President, the designers, or other relevant people.

A Seal certifies the quality of the product. The seal makes the statement that this is a new computer and the user must break the seal to open the box. The seal indicates acceptance of the licensing agreements on preinstalled software.

Set-up instructions are presented in the order that they occur, and in close physical proximity to the product features they describe.

This last feature was particularly important in driving the packaging design. A competing proposal was to develop a "quick set-up guide", as a separate document but this would suffer the same disconnect between the documentation and the physical hardware that occurred with the Product Map. It is important that the OOB documentation for new users should not be a separate booklet or card. By providing the OOB documentation wrapped around and through the computer, new users are not required to figure out the mapping between the documentation and the computer components.

The final concept is the Smart Box. In this design the user is invited to open the box. This presents a second box and a second invitation to proceed. (The inner box can later be used for storing or shipping the computer.) To help a user start the process of unpacking and to give a playful element of surprise, we made a Nerf-like foam ball inside spring the box open. (The ball then becomes a toy with a help phone number on it.) New instructions are revealed when the box opens. The sides of the box fall down to reveal instructions that refer to features along the edge of the computers, such as switches and communication ports. By placing components, such as the power supply, in close proximity and suggestive orientation to the power supply connection on the computer, this design illustrates a complete solution.

## CONCLUSIONS

The OOB is a synergy of many forces: cost, theft, users, branding, and - potentially - fun. The Product Map failed because of the separation in space between the physical object being described and its diagram. Even with improved diagrams, not all users can be expected to comprehend the relationship between a complex diagram and that to which it refers. Wrapping paper places instructions physically close to the features that they describe. The wrapping sequences the instructions. The Smart Box sequences presents the instructions and places physical objects in a direct relationship with suggested actions (instructions), eliminating some (not necessarily all) numbered action steps. By including a compressed foam ball, the Smart Box can also provide a memorable and dynamic feature that makes setting up and using a new computer a joy.

## REFERENCES

1 Selker, T. Cognitive Adaptive Computer Help, COACH A Case Study, Advances In Computing, Volume 42, Chapter2, Eslavier Press

2 Norman, D. The Psychology of Everyday Things, Basic Books, NY, 1988.

