

# The *HomeBox*: A Web Content Creation Tool for The Developing World

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## ABSTRACT

This paper describes the implementation and testing of the *HomeBox*, a prototype that seeks to provide a cost effective and scalable means for allowing users in the developing world to publish on the Web. It identifies the key requirements for such a design by drawing lessons from a variety of sources including two studies of networked community projects in Africa and South America. It ends with a discussion of possible design developments and plans for field trials in the Dominican Republic.

## Keywords

Internet, developing world, web content creation.

## INTRODUCTION

It has been calculated that only 0.05 per 1,000 members of the developing world has access to the Internet [1]. Of this number it is assumed that far fewer have or can easily acquire the skills necessary to create and publish their own content. As shown by the LINCOS [2] and various African pilot projects [3] there is an increasing interest amongst governments and aid organizations to provide community-based networked computer centers.

However, if these kinds of interventions are to be scalable (The Dominican government plans to install thirty LINCOS telecenter projects in the near future [2]) the cost per user must be reduced by a factor of around 20 [2]. The field study reports also highlight that much of the hardware currently being supplied is provided without sufficient training or explanation and that even costly items often remain unused (*Many [users] had little understanding of how to operate the computers [or] internet, or the benefits that could be derived from their use* [3]).

This paper proposes the *HomeBox* as an interface that significantly reduces the cost and complexity of the standard GUI while still supporting the potential for economic development afforded by the Web.

## IMPLEMENTATION

The *HomeBox* consists of a set of drawers that are each uniquely identified by a series of slots in the back panel. Users place physical content inside of these drawers (including handwritten papers, photographs and three-dimensional objects). These drawers and their contents represent the user's web pages and the entire unit can be freely transported to the user's home or workplace requiring no additional power or phone connection infrastructure.

The user uploads the contents of their *HomeBox* by taking it to their local telecenter and inserting each drawer into a modified scanner that uploads an image of the drawer contents to a standard html file. The file name is encoded with the unique identification on the back of the drawer and overwrites any previous pages that were created using the same drawer. Users are free to annotate the scanned objects with searchable keywords using the keyboard of the conventional GUI workstation located in the telecenter.

In a similar manner to the approach taken in [4] CGI forms allow other web users to upload comments to directly overlay pages created with the *HomeBox*. When the *HomeBox* user returns to the telecenter to upload their contents they are able to view and respond to these comments.

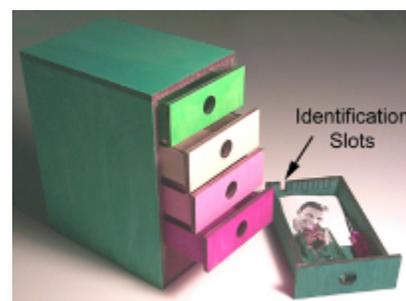


Figure 1. The *HomeBox* design and implementation

## Scenarios

It is hoped that this system would allow users to define their own usage patterns. Here are three example scenarios:

1. A craftsman wants to expand his market by selling his wares on the web. He uploads images of his work by placing physical objects in the *HomeBox*, annotates these with a price and searchable name and waits for a response.
2. A schoolgirl creates a page about the local flora and fauna in her neighborhood. She builds a display in the *HomeBox*, scans and uploads this to the server. This physical display can then be viewed by other school children in nearby towns and in other parts of the world.
3. A farm owner advertises for local labor to help with the harvest by placing a handwritten note into the *HomeBox*. An unemployed worker in the next valley views this notice, responds and is given a job.

## TESTING AND EVALUATION

### Trials in the Lab

In order to test possible reactions to the *HomeBox* before a full trail in the field we asked a group of five users that had no previous experience with creating content on the web to produce three homepages, one using standard html, one using *DreamWeaver* and one using the *HomeBox*. We prepared the subjects by giving them 10 minutes of instruction in each method. We recorded the time if users took to complete the pages and recorded their comments.

Content creation tool	User time spent at computer (m)					Average time (m)
	A	B	C	D	E	
<i>DreamWeaver</i>	22	18	6	33	28	21.4
<i>html</i>	41	22	31	17	35	29.2
<i>HomeBox</i>	1.5	3	2	2	2.5	2.2

### Efficient use of Resources

When compared to a standard GUI interface the *HomeBox* significantly reduces the cost of access to the web by increases the number of users per connection while also keeping the cost of the interfaces to an absolute minimum. It allows the design and organization of web pages to be conducted off-line only using the limited hardware and connection resources located in the telecenter for the essential task of digitizing and uploading.

### Narrowing the Knowledge Gap

The *HomeBox* does hide the technology of the Web through an automated process. However, it has the benefit of offering people, for whom it may be unrealistic to learn even the simplest conventional tools, to gain an immediate presence on the Web. It is hoped that this kind of creative interaction would lead to improved user confidence and a greater understanding of the practical and social potential of the Web.

## Self Organizing System

While the drawers do limit the maximum size of objects that can be directly placed in the *HomeBox* it also ensures that all of the digitized pages correspond exactly to the contents of the drawers. This insures that objects removed from the *HomeBox* (for example when an item is sent to the buyer following a sale) the image of that object is also removed from the user's page. Further more, by limiting the number of pages available per user, the system ensures that server space will never be exceeded and that no higher-level management is required.

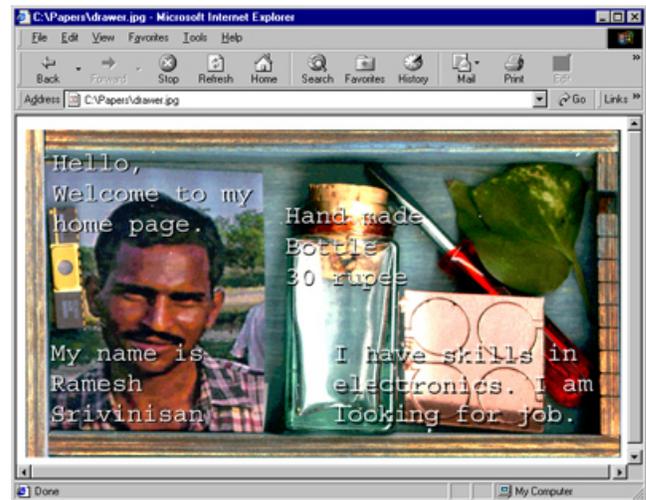


Figure 2. An example page generated using the *HomeBox*

## FUTURE WORK

In the future we plan to introduce the *HomeBox* to a telecenter community located in Bohechio County in the Dominican Republic where we plan to investigate the potential for character recognition software to allow handwritten messages to replace the need for the conventional GUI interface used in the telecenter.

## ACKNOWLEDGMENTS

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