The Missing Link: Multimedia and E-Commerce

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ABSTRACT
The growing presence of e-commerce has not yet been grounded on sound and systematic research in human-computer interaction. The purpose of this research is to develop principles for the design and evaluation of effective and usable multimedia e-commerce applications. It has already identified generic multimedia features to be further developed into principles, through empirical work.

Keywords
E-commerce, e-shopping, multimedia interaction, online consumer behaviour

INTRODUCTION

There is an enormous potential for the use of multimedia in e-commerce; however it is not being fully explored due to the lack of sound principles guiding the design of such systems. The goal of this research is to develop a set of principles from multimedia features already developed previously that are empirically validated for e-commerce tasks. We believe that these principles will provide a consistent basis for user-interface designers to make better decisions and, hence, to build more usable and useful multimedia e-commerce systems.

Multimedia Features

From an extensive literature survey and analysis of current multimedia systems, a set of desirable features for the design and evaluation of multimedia systems were developed (for more details see [7, 4]): naturalness and realness of the medium, media allocation, redundancy, significant contribution of the media, exploration and quality of information representation. To focus the development of multimedia principles, e-commerce was chosen as a domain area.

E-Commerce

Although e-commerce applications are becoming more widespread, consumers find it really difficult to buy online [2, 6]. The promises and expectations of online shopping include convenience, easy access to information about products to enhance decision making, while saving time. The problem is that the experience is not always convenient, and the expectations are not being met. Among the reasons are poor interfaces that do not fully support the consumer's tasks [6]. In the last GVU survey the most cited reasons users might have to abandon a web site while shopping to visit another site are that (a)they could not find what they were looking for (66.8%) and that (b)the site was disorganised or confusing (59.0%). In the same survey, the two most important things searched in an e-commerce site when selecting a product are (i)detailed information about products and services (92.6%) and (ii)price comparisons (80.3%).

The challenge is to provide e-shopping applications with a user interface that helps consumers navigate a vast quantity of information to find the products that best meet their individual requirements.

Related Research

In one initial study [8], several usability problems were shown in four e-shopping sites, including poor navigation and no feedback from user's actions. Haubl and Trifts [3] analysed two different tools for decision-making in online environment: recommendation agent and comparison matrix. In an experiment, the two decision aids allowed consumers to make much better decisions while spending less effort. Lohse and Spiller [6] used 32 interface features to measure 28 online retail sites and identified design features that influence traffic and sales.

Although these are all significant pieces of research, we believe that the main questions are without answers and designers are still faced with little guidance. The present work is not only timely, but it should fill the gap between HCI, multimedia and e-commerce (fig. 1).

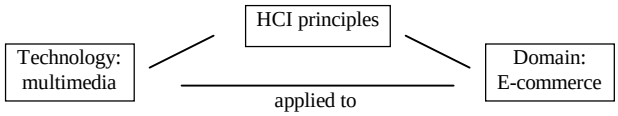

Figure 1: Missing link between multimedia and e-commerce

The principles that will emerge from our research are expected to support designers in making decisions about the various media so as to maximise the effectiveness and efficiency of the consumer-computer interactions. This will enable designers to build more usable multimedia systems, and help move HCI towards a stronger theoretical basis and more principled discipline of design.

BACKGROUND

E-commerce differs from traditional commerce because there is no face-to-face assistance and the products are not physically present. Nevertheless, a review of the literature on shopping behaviour enabled us to identify a number of relevant issues on traditional shopping that serve as a basis

for the understanding of online shopping. Particularly, the consumer behaviour models (fig. 2) were used to identify the different processes involved in purchasing activities [5]. Due to the different nature of the different processes, this research concentrates on prepurchase preparation, mainly information acquisition, integration and decision-making.

Prepurchase preparation	1.	Information acquisition: product/service search in the information space
	2.	Information integration/decision making: comparison shopping and product selection
	3.	Negotiation of terms, e.g. price, delivery, times
Purchase consummation	4.	Placement of order
	5.	Authorisation of payment
	6.	Receipt of product
Postpurchase interaction	7.	Customer service and support (return policy)

Figure 2 – A model of consumer behaviour

AIMS OF THE RESEARCH

The basic purpose of this study is to examine the effects of multimedia in consumer decision-making. In other words, how can multimedia technology affect consumer behaviour in electronic shopping? What information is important to consumers? How to present it? How do consumers use the information to make their choices?

Specifically we want to understand the role multimedia has in the consumer information processing, in terms of decision rules that are (or not) followed in different types of purchases. Does multimedia produce fewer or more efficient choices? What's the effect in the consumer's search effort for product information?

In order to develop the aforementioned principles, one study and one experiment will be carried out for two different classes of products. The manipulation will be done in terms of efficiency on finding a product (search and navigation), quality of information about a product, the media used, interactive tools for decision-making and representation of the product performance.

The first exploratory study will be done with a product characterised by a complex decision-making [1], which means that it is technologically complex, new, and involves a considerable amount of money. The second will involve a product for which little decision-making is necessary.

Data will be collected using audio and video recording (with scan converters), and think-aloud protocols. After the session, a retrospective protocol was used to get a richer picture of the participant's behaviour. Quantitative data will be collected and analysed relating to task *effectiveness* (if the task could be completed), task *efficiency (*time to complete a task, number of accessed pages, time spent reading text, time spent comparing products, time spent searching for the product). Qualitative data will be collected through a post-session interview, identifying satisfaction and quality of purchase (space limitations preclude a more detailed description of the experiments).

CONCLUSION

It is true that being online there is no problems with traffic jams, waiting in queues, no wasting time with sales people [5]. But is the consumer able to find the products he or she wants, acquire information, make selections, compare attributes, see the workings, read reviews, and on top of that enjoy the process? The big challenge is to support efficiently the potential tasks the consumers might have.

This work is intended to develop multimedia design principles that can be applied in e-commerce and to elaborate a research agenda for different domain areas.

Current work is being done with the exploratory study and with the refinement of the hypotheses. Future work includes the development of an e-commerce environment for the quantitative experiments and the validation of the hypotheses.

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