Chapter I

Multilingual Electronic Commerce in a Global Economy

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The purpose of this research is to further the knowledge required for building electronic commerce systems that operate in multiple languages in global settings. The issues in multilingual electronic commerce are presented in two parts. First we describe a bilingual electronic catalog that can be used by online retailers for selling products and/or services to customers interacting in either English or Chinese that was developed to investigate into the nature of user interactions in multilingual electronic catalogs. Second, we discuss issues in developing multilingual electronic catalogs.

INTRODUCTION

As all of commerce is converging on the Internet, the nature of business is changing rapidly. One of the main features of business on the Internet is the ability to transcend geographic boundaries. But along with the benefits of the widespread outreach of the virtual marketplace come many challenges. An example of such a challenge is to provide cost-effective interchange across language and culture. Many organizations are confronted with the requirement of making their products or services available in multiple languages, particularly in their Asian and European markets. Internationalization of systems may involve enabling the input and display of non-English characters, changing default formats for date, time, currency, and measuring units, and using Unicode to handle the mix of European and Asian characters for complex operations such as rolling up data from multiple sites in many languages around the world.

While language technology (Nirenburg, 1992; Onyshkevych & Nirenburg, 1995; Sheremetyeva & Nirenburg, 1996) is making rapid progress, much research is needed in managing and accessing multilingual information in order to reach full potential of global electronic commerce (e.g., Malhotra, 1997, 1998).

The purpose of this research is to further the knowledge required for building information systems that operate in multiple languages. Specifically, we focus on studying user behavior in performing various tasks in a multilingual system. In order to study user behavior and performance in a multilingual electronic commerce setting, we have designed a bilingual electronic catalog which can be used by online retailers for selling products and/or services to customers interacting either in English or Chinese.

An electronic catalog is a graphical user interface that presents product and/or service information to users, typically using the World Wide Web. An electronic catalog is a key component of electronic commerce that has been used for business-to-consumer commerce as well as business-to-business commerce (Adam et al., 1998). Although the term “electronic catalog” might sound like an electronic extension of chapter catalogs, it offers features that are far beyond those found in chapter catalogs. Such features include computational services such as efficient browsing and searching, online order processing such as checking out products using shopping carts and secure payment mechanisms, and backend processing such as integration with company databases (Segev et al., 1995). These features have extended the role of electronic catalogs to the point of being used as electronic storefronts.

With the rapid proliferation of electronic commerce both in local and global markets, there is an increasing need to provide support for internationalization such as foreign currencies, different date and time formats, sort order, and multiple languages (Broin, 1999). The need for providing multilingual support is echoed by the rapid increase of non-English speaking users in the Internet.

The rest of the chapter is organized as follows. In the next section we describe the electronic catalog and its components. Next, we discuss issues related to language preferences by bilingual users, based on an experimental study. Next we discuss various issues in designing multilingual systems. The last section contains our conclusions and future research directions.

A BILINGUAL ELECTRONIC CATALOG

Description of the Catalog

A prototype electronic catalog has been implemented in the World Wide Web using ColdFusion 4.0 as the front end, which is connected to a Microsoft Access database at the back end, using an ODBC driver. The catalog is composed of two identical interfaces in two languages: English and Chinese. Following the unified content model (Doherty, 1999), the English interface has been translated element by element into the Chinese interface, with the only difference being the order in which the products are sorted.

The purpose of using the unified content model was to eliminate any presentation bias in user preferences. The front-end interface is shown in figure 1, which shows two language options (English and Chinese) and two separate applications (Office Supplies and Food Market). Figures 2a-2b show the second-level interface that is invoked once a user selects...
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