

Query-By-Object Interface for Information Requirement Elicitation in M-Commerce

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Abstract

Information Requirement Elicitation (IRE) is essential in wireless web service to elicit information requirements through interactive choice prompts. This paper presents a case study for the design of a high-level user interface as a component for an IRE-enabled information system, in the context of database queries by a mobile web user. The prototype is based on the notion of a Query-By-Object (QBO) approach of building a query using multiple user-level steps. The test prototype system uses the Mobile Information Devices Profile (MIDP) of the Java 2 Platform, Micro Edition (J2ME), for a wireless front end, and a Java 2 Platform, Enterprise Edition (J2EE) application server and an Object-Relational Database Management System (ORDBMS) at the back end. The QBO interface supports Closure Property. It is intuitive, simple to use, and can cater to common spatial queries that customers may need to ask. The effort aims to eliminate ambiguities in users' intentions by virtue of a step-by-step procedure. The main contributions of this interface are its simplicity to express a query and its expressive power.

Keywords: *Accessing dynamic contents, high-level user interface, information requirement elicitation, user-database interaction, web-database query.*

1. Introduction

M-commerce involves an emerging set of applications and services that people can access from their web-enabled mobile devices [15]. New generation wireless networks and devices aim to give users ubiquitous access to information. However, compared with PC-based computing, it is not as convenient for a user to search for information via a wireless device such as a cell phone or PDA, mainly due to its smaller screen and narrower bandwidth (see [4],[7],[9] which address some problems of Web browsing through wireless devices). An interface should be developed to compensate for the limited visual display of such devices [11]. New or modified interaction techniques are necessary to overcome the physical limitations of mobile devices [20]. Given the small

keypads and limited display interfaces of cell phones and PDAs, it is important to provide simple menus, and a high-level query interface to match user skills. These must allow user's navigation with little or practically no typing.

The information requirement elicitation (IRE) approach and its conceptual design were proposed by Sun [17] to facilitate user information search in a mobile environment. IRE offers an interactive communication in which an information system helps users specify their requirements with adaptive choice prompts. A prototype of IRE in an imagined m-commerce scenario is demonstrated in [18].

This study presents a high-level user interface for IRE based on the notion of Query-By-Object (QBO). In this paper, we consider an example of a visitor finding a suitable restaurant in a city being visited. In the scenario for finding a restaurant, you want to find "near-by" restaurants of your choice or those along a certain route on which you are travelling. Using your mobile terminal, for example, you query for the closest fast food restaurant, say a McDonald's. As a response, a McDonald's outlet address/location is displayed on your terminal. In addition, a map showing its location (or driving instructions) can also be displayed.

The rest of the paper is organized as follows. Section 2 discusses the Query-By-Object (QBO) interface as well as some implementation details. Section 3 describes the database used in this paper. How the QBO approach supplements IRE is described in Section 4. In Section 5, a sample query is discussed. Section 6 presents summary and conclusions.

2. Query-By-Object (QBO) Interface

The QBO interface has been studied in [2] for Geographic Information System (GIS) applications. A similar interface is also being proposed for common database queries [3]. In this system, users communicate with an ORDBMS through a web interface. The user intent is captured via objects and path navigation through an option-based interface. Finally, a query is formulated and executed at a DBMS server after it is converted into