GoogleBuddy: Collaborative Environment
for Learning and Sharing Search Knowledge

Andrew Paulsen, Mark LaRosa, Warner Washington, Adam Ward. Advised by Suresh Bhavnani

I. GoogleBuddy

Despite the use of powerful search engines like Google, many searchers become frustrated when looking for information on the web. Research has shown that users become frustrated because they do not understand how information is organized in unfamiliar domains [1,2]. For example, without extensive shopping experience, it is difficult to know that there exist **product-review** sites, **price-comparison** sites, and **coupon** sites, each of which are important to visit when searching for a high-quality product at a low price. Unfortunately, such information organizations are not obvious by just using Google or Froogle.

The GoogleBuddy directly addresses this problem by providing an environment where users can learn and share such search knowledge in different online domains such as shopping, healthcare, and academics.

Learning by Observation. Flash animation and audio will quickly teach users how to follow a search plan in domains such as shopping and healthcare.

Learning by Doing. Modified queries will teach users how to implement in Google each step in the search plan.
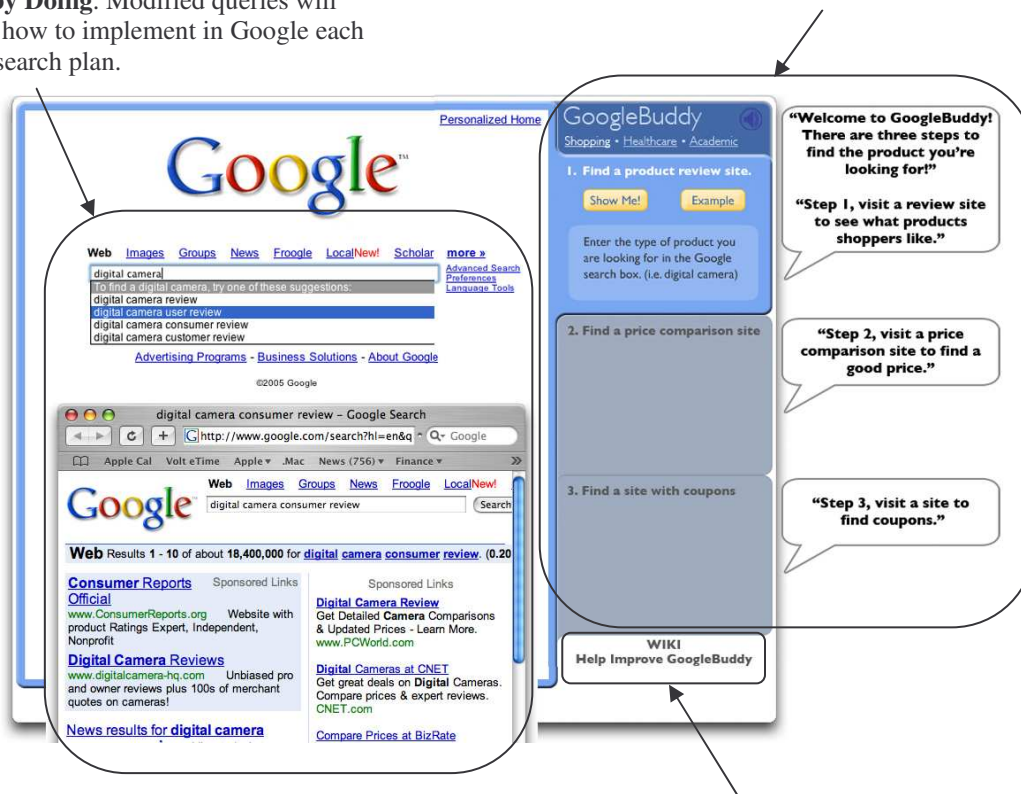
Sharing Knowledge. A wiki interface will enable users to share search knowledge and vote on which search plan is the most useful.

Figure 1. A mock-up of the GoogleBuddy which **teaches** users how to search in different domains through a search plan and modified Google queries, and enables users to **share** search knowledge by modifying and voting on the best search plan. This system is expected to be cool to learn and share knowledge about the web, which plays such a dominant role in our academic and personal lives.

II. Contact Information

Andrew Paulsen, School of Information, University of Michigan. ajpaulse@umich.edu. 203 Edenwood Drive, Apartment 208, Ann Arbor, MI 48103-6978.

III. Participating Students

Andrew Paulsen

Education	Master's in Information Science, **School of Information** (expected in 2007).
	Bachelor's in Computer Science and Engineering, **EECS** (2005).
Experience	Campus Representative for Apple Computer with tasks that include technical consulting and marketing for the University of Michigan. Extensive programming experience in MySQL/PHP. Has created and maintained large databases.
Project Role	Will use his computational skills to write the PHP code to manage GoogleBuddy and the database for the wiki interface.

Mark LaRosa

Education	Master's in Information Science, **School of Information** (expected in 2007).
	Bachelor's in Computer Science and Engineering, **EECS** (2005).
Experience	Co-owner of a consulting company that assists organizations to purchase and install computers. Has also been a consultant for Paramount Bank, where his tasks included troubleshooting and website design. He is experienced in the use of heuristic and cognitive usability evaluation methods.
Project Role	Will use his usability experience to help design the graphical interface, and user-test the interface.

Warner Washington

Education	Bachelor's in Art and Design, **School of Art and Design** (expected in 2006).
Experience	Has extensive experience in graphic design and illustration in traditional and online media. Has developed website using DreamWeaver, Frontpage, and Flash.
Project Role	Will use his art and design skills to design the graphical interface including colors that are handicap accessible, animation, and audio.

Adam Ward

Education	Bachelor's in Computer Science, **EECS** (expected in 2006).
Experience	Has extensive experience as a freelance web programmer, is a Campus Representative for Apple Computer, and is actively involved in Apple marketing initiatives at the University of Michigan. His extensive real-world experience with web programming and internet technologies is a powerful asset to the team.
Project Role	Will assist Andrew Paulsen in the computational design and will develop the Flash ActionScript for GoogleBuddy.

IV. Project Objective or Research Question

Numerous studies have shown that despite the use of powerful search engines like Google, users have difficulty in finding comprehensive information about many topics. This is because knowledge of specific domains is difficult to acquire just by using search engines. Our project therefore asks the question:

> *Is it possible to develop a learning environment where users can acquire the knowledge of how to search in unfamiliar online domains, and share their search knowledge with others?*

Our vision is to develop an exciting, dynamic environment where students from the University and Michigan and other universities can learn and share their search knowledge about the rapidly changing web landscape that has become critical for academic and personal activities. This dynamic approach will enable the GoogleBuddy to remain fresh and useful over time.

V. Project Description

Architecture of the GoogleBuddy

The GoogleBuddy will consist of two interfaces and a database:

1. **The Learning Interface.** (mock-up shown in Figure 1). This interface will provide users with a motivating Flash and audio animation to teach them how to organize a search plan, and learn how to implement that search plan through direct interaction with Google.

2. **The Sharing Interface.** This interface will provide the users a wiki interface where they can add new search plans and vote on the success of existing search plans and queries.

3. **The Database.** The sharing interface will store user's shared knowledge and votes in a database, and display results automatically in the learning interface.
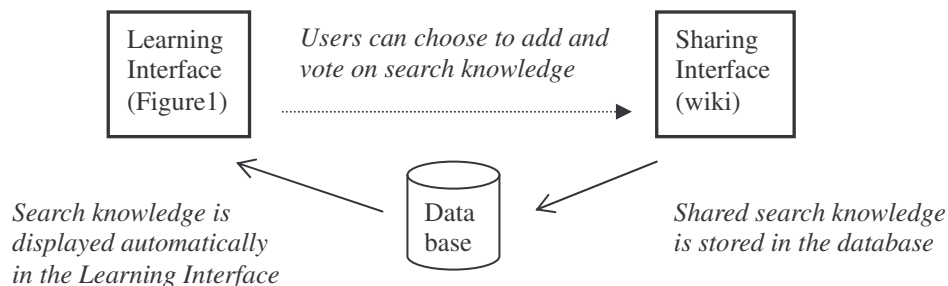

Figure 2. Architecture of the GoogleBuddy showing how the Learning Interface, Sharing Interface, and Database interact.

Project Plan

The project will consist of three steps: (1) Design the Learning and Sharing interfaces. (2) Develop the learning and sharing environments. (3) User-test and refine the learning and sharing interfaces.

1. Design the Learning and Sharing Interfaces

The success of the GoogleBuddy depends largely on how well the interface motivates users to learn and follow a search plan. Figure 1 shows our initial ideas, but we will brainstorm to determine in detail how the GoogleBuddy learning and sharing interfaces will work with animation and audio. Mockups will

enable us to get rapid feedback from faculty and students across campus. We will also test the queries to make sure that they bring up the correct sites in Google. Our team provides a rich mix of art, design, technology, and human-computer interaction backgrounds to ensure a design that is cool and fun to use.

2. Develop the Learning and Sharing Interfaces and Database

After we get informal feedback for the learning and sharing interfaces, we will develop the three components shown in Figure 2. For the Learning Interface, we will use Flash animation and audio. For the Sharing Interface, we will use standards-compliant XHTML/CSS. A database will connect the two interfaces. Therefore, the search plan in the Learning Interface will extract the most popular search plan and queries from the database and automatically display it on the interface. In addition, the inputs from the wiki will be entered into the database. The database experience of Andrew Paulsen and Adam Ward will ensure the success of the implementation.

3. User-Test and Refine the Learning and Sharing Interfaces

Once the system has been developed, we will do a small user test of the Learning and Sharing Interfaces. Three students with little experience in shopping on the web will be asked to search for a low price of a digital camera with specific attributes. We will record their interactions using a screen capture tool, and analyze the time and problems they encounter. After their interaction, we will interview them to understand their experience in using the system. We will use their inputs to refine the system. Another three students with experience in searching will also be asked to perform the task, and then asked to either modify or add new knowledge to the system in the Sharing Interface. Their feedback will also be used to refine the Sharing Interface. The experience of Mark LaRosa will ensure the success of the user testing.

VI. Equipment and Resource Requirements

Besides the laptops we currently own, we will need the following:

- A public web server to develop and test PHP code, and automatic text to speech conversion.
- Access to Mac and PC workstations to test for system and browser compatibility.
- A cubicle where the GoogleBuddy team can be co-located to enable fluid collaboration.

VII. Participating Advisor

Suresh Bhavnani, Assistant Professor at the School of Information will act as an advisor on the project. he has a PhD in Human-Computer Interaction from the School of Computer Science at Carnegie Mellon University, with a research interest in the strategic use of complex computer systems. He will advise the GoogleBuddy team on interface design, implementation, and usability testing. Informal advice will be provided by Elliot Solloway from the School of Education who has shown interest in the GoogleBuddy.

VIII. References

[1] Fox, S., & Fallows, F. (2003). Health searches and email have become more commonplace, but there is room for improvement in searches and overall Internet access. Pew Internet and American live project: Online life report. Avail: http://www.pewinternet.org/reports/toc.asp?report=95 (accessed May, 2005).

[2] Bhavnani, S.K. Why is it Difficult to Find Comprehensive Information? Implications of Information Scatter for Search and Design. *Journal of the American Society for Information Science and Technology* 56, 9 (2005), 989-1003.

IX. How did you hear about GROCS?

We heard about GROCS through a poster at the Duderstadt Center, and through a discussion with Elliot Soloway at the College of Engineering.