Chapter XXV
Web Log Analysis: Diversity of Research Methodologies

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ABSTRACT

Web log analysis is an innovative and unique field constantly formed and changed by the convergence of various emerging Web technologies. Due to its interdisciplinary character, the diversity of issues it addresses, and the variety and number of Web applications, it is the subject of many distinctive and diverse research methodologies. This chapter examines research methodologies used by contributing authors in preparing the individual chapters for this handbook, summarizes research results, and proposes new directions for future research in this area.

INTRODUCTION

The Web has become the environment where people of all ages, languages and cultures conduct their daily digital lives. Working or entertaining, learning or socializing, home or on the road, individually or as a group, Web users are ubiquitously surrounded by an infrastructure of devices, networks and applications. This infrastructure combined with the perpetually growing amount of every imaginable type of information supports the user’s intellectual or physical activity. Whether searching, using or creating and disseminating the information, users leave behind a great deal of data revealing their information needs, attitudes, personal and environmental facts. Web designers collect these artifacts in a variety of Web logs for subsequent analysis.
Web Log Analysis

The Handbook of Web Log Analysis reflects on the multifaceted themes of Web use and demonstrates an equally diverse range of research methodologies. The next section briefly reviews research methodologies applied by contributing authors. Subsequent sections report research results obtained using these methodologies and propose directions for future research in the field of Web log analysis.

RESEARCH METHODOLOGIES

What are the research methodologies frequently applied in Web-based research? Some researchers focus on collection and preparation of information for data analysis (Jansen, 2006), while others concentrate on elicitation; reduction and visualization for user-profiling (Romano et al., 2003). Researchers also benefit from a new, aggressively growing source of personal communication – blogs (Jing, 2006; Rossler, 2002).

In a different direction, there are a number of studies that focus on analysis of research methodologies. Powel (1999) uses a comprehensive classification developed by Kim (1996) to review, define and discuss quantitatively and qualitatively-driven methodologies. Another publication (Palvia et al., 2007) provides a slightly different but equally comprehensive classification of research methodologies. Using these three sources, we identified the following methodologies used by this handbook’s authors:

- **Conceptual Framework / Inquiry:** Concepts are introduced and defined, and subsequently used to construct conceptual frameworks that provide study directions.
- **Phenomenology / Ethnomethodology:** An interpretive methodology that examines users’ behavior. Ethnomethodology, an extension of phenomenology, examines individual and group interactions within a social structure.
- **Content Analysis:** A methodical and replicable methodology used to determine, quantify, and analyze the presence of research objects within a large data set.
- **Ethnography:** A qualitative study in which the researcher observes members of a chosen group in a natural environment over a long period of time.
- **Historical Method:** Collects and examines facts about events, people and the environment of the past.
- **Discourse Analysis:** A scientific argument evaluation method.
- **Case Study:** A comprehensive study of a single subject, influenced by a proper selection of unit of analysis.

CONCEPTUAL FRAMEWORK / INQUIRY

Many research studies clearly specify and explain the methodologies used to describe or explain the subject under study. These studies usually introduce a set of concepts related to an existing (or future systems), or to a set of objects, or to behavior aspects of participants. Concepts are then used to construct conceptual frameworks, which provide the plan, purpose and direction for the study. Depending on the goals, data and technology, the conceptual frameworks offer a choice of methodologies: surveys, data analysis, literature review or many others. The conceptual frameworks methodology is widely used in many Web studies including information retrieval (Jansen 2006; Jansen et al, 2000), Web log analysis in e-commerce (Meersman et al., 2003), education and library studies (Nicholson 2004; Vrana, 2002).

Transaction Log Analysis

Transaction log analysis is a broad category of methods used for macro and micro analysis of
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