

# Logging IE: Barriers to Studying User Behaviour on the Web

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## ABSTRACT

We recently conducted a field study examining user behaviour on the Web using a client-side logging approach. We reflect on the challenges encountered and suggest future directions for the development of client-side logging tools.

## 1. INTRODUCTION

There are a variety of data collection approaches for researchers to choose from when studying user behaviour on the Web. We recently conducted a field study examining how users interact with their web browsers during information seeking tasks. We chose a client-side logging approach in order to capture fine-grained web browser interactions.

Over the course of the week-long field study [2], participants used a custom web browser that logged all of their web usage and interactions with the web browser. Participants were also asked to annotate their web usage, according to a given task categorization (Fact Finding, Information Gathering, Browsing, Transactions, and Other). They could do so either in real time using a task toolbar or at the end of the day using a task diary.

## 2. LOGGING IE

Microsoft's Internet Explorer (IE) was chosen as our target browser because it was the most commonly used browser at the time of the study<sup>1</sup>. Our logging requirements including the following web browser functions and interactions:

- Page title and URL (with timestamps and window ID)
- Use of web browser navigation mechanisms (e.g., back and forward buttons, auto-complete, bookmarks)
- All browser functions (e.g., copy/cut/paste, save, print)

We examined various commercial and academic logging programs and found they typically collected a small subset of interactions with the browser, such as the time and URLs of visited pages, and did not log the use of navigation mechanisms (e.g., bookmarks, typed-in URLs) or any other interactions with the web browser. We also examined instrumented web browsers but found they were out of date and missing standard browser functionality.

Another alternative was the use of a Browser Helper Object. A BHO is a .dll file that loads every time IE loads. While the BHO allowed us to easily track the page title and URLs, and a subset of browser functions, it was virtually impossible to log the use of many web browser navigation mechanisms. We also explored the use of screen capture software. This approach presented two problems. First, the software created a delay on older systems and

we did not want to limit our recruitment to participants with high powered machines. Second, all captured video would then have to be coded by hand, which would be extremely time-consuming.

Therefore, we built a custom web browser in C# using the Microsoft .NET Browser Control Object (BCO). The BCO essentially provides the web page viewing window but all other web browser functionality must be recreated. Our custom browser was built to mimic IE in all areas of look and feel (e.g., shortcuts, icons, etc.).

## 3. DISCUSSION

While this client-side logging approach allowed us to capture the required data in a relatively natural environment, the custom-built web browser did present some issues. Overall, the custom web browser was not able to match the robustness of commercial web browsers. There were a small number of issues with the custom web browser; the browser was slower to load than IE and had difficulties with some pages containing JavaScript. Some participants were also concerned about the security offered by the custom web browser. Also, as new versions of IE are released, it may be difficult to continually update and refine the custom web browser to reflect changes to the browser.

Based on our experiences, we suggest future directions for the development of client-side logging tools. First, as a community, we need to make our tools readily available to other researchers. Second, when possible, tools should capture a standard set of actions and activities. Therefore, we also need a standard set of web actions that can be logged. Byrne et al.'s [1] Taskonomy of WWW use and Oard and Kim [3]'s work examining observable behaviours provides initial directions in this area. Researchers could then choose which interactions they would like to log. Finally, we must concentrate on logging tools that work across multiple browsers and platforms.

## 4. ACKNOWLEDGMENTS

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## 5. REFERENCES

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<sup>1</sup> [http://www.onestat.com/html/aboutus\\_pressbox34.html](http://www.onestat.com/html/aboutus_pressbox34.html)