The results confirm the generality of the Universal Law of Web Surfing. As WAP is a precursor of future 3G telecom systems (from which we will be able to access Web content from mobile devices with restricted interface features), these results have important implications for our understanding of future mobile Web surfing behavior, as well as how to design Web-content-access interfaces.

Today, most mobile phone users readily access Internet-provided services from their handsets. But this mobile Web revolution has had a slow start, largely due to such problems as unstable handsets, limited content, low bandwidth, and high cost to the end user. However, significant device-, bandwidth-, and charging-model improvements have led to a dramatic increase in use over the past 12–18 months. Here, we consider the underlying characteristics of the mobile Web and its usage patterns, comparing them to those of the regular Web.

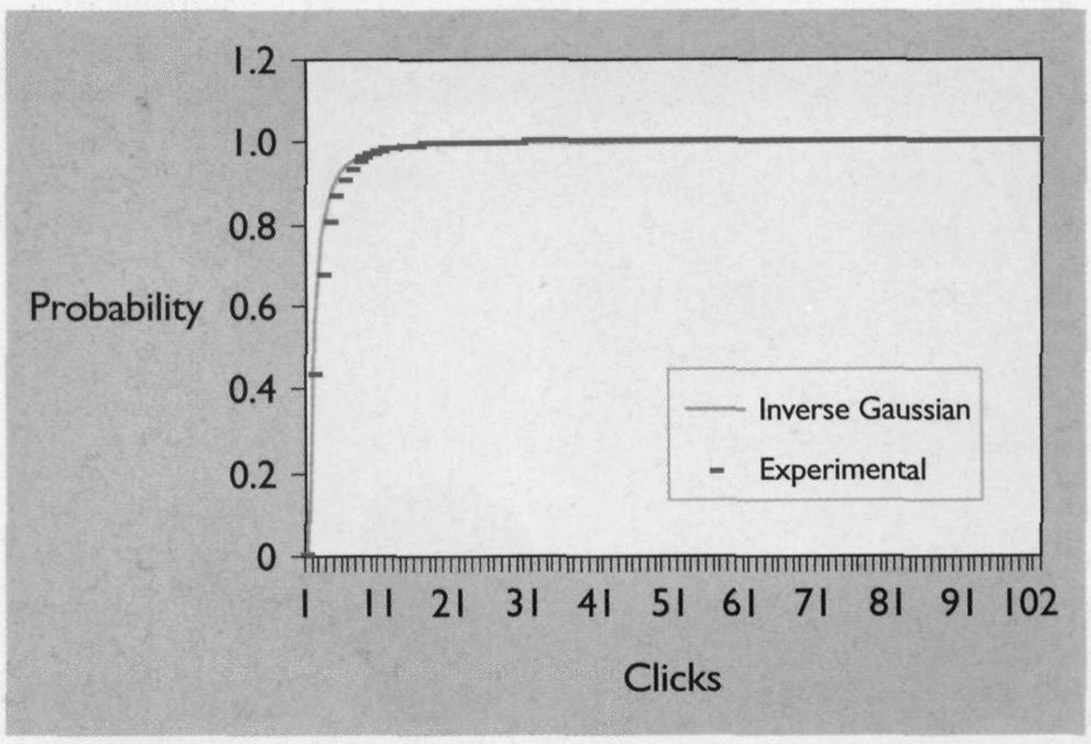

Figure 1. Cumulative distribution frequency for WAP users as a function of the number of surfing clicks. The observed data was collected in a four-week period in September 2002 from a sample of 350,635 users representing 3,006,385 sessions. The inverse Gaussian distribution has a mean of m = 3.6576 and l = 2.69.

The mobile Web represents a fundamentally different information medium from the traditional Web in terms of access devices used, content availability, bandwidth, and cost to the end user. These differences suggest there may be little to learn about mobile Web usage from observations of regular Web use. In fact, the reverse is the case; irrespective of these differences, the same Universal Law of Web Surfing applies in both Web and mobile Web surfing.

One obvious difference between the mobile Web and the regular Web concerns the devices employed by end users. There are fundamental differences between the WAP phones designed to access the mobile Web and PCs designed to access the regular Web. Screen real estate is an obvious difference, with PCs offering display sizes many orders of magnitude larger than a typical mobile phone screen. In addition, there is much greater diversity in the capabilities of mobile phones in terms of display resolution, color capability, operating system features, and browser functionality compared to the standardized world of PC-based Internet access. Mobile phones also have limited input capability; their numeric keypads allow only minimal text entry compared to the mouse/keyboard entry on PCs. In addition to these device differences, the content base of the mobile Web is much more limited in scope and diversity. Moreover, mobile Web users must also contend with slow download times and incremental billing costs [8].

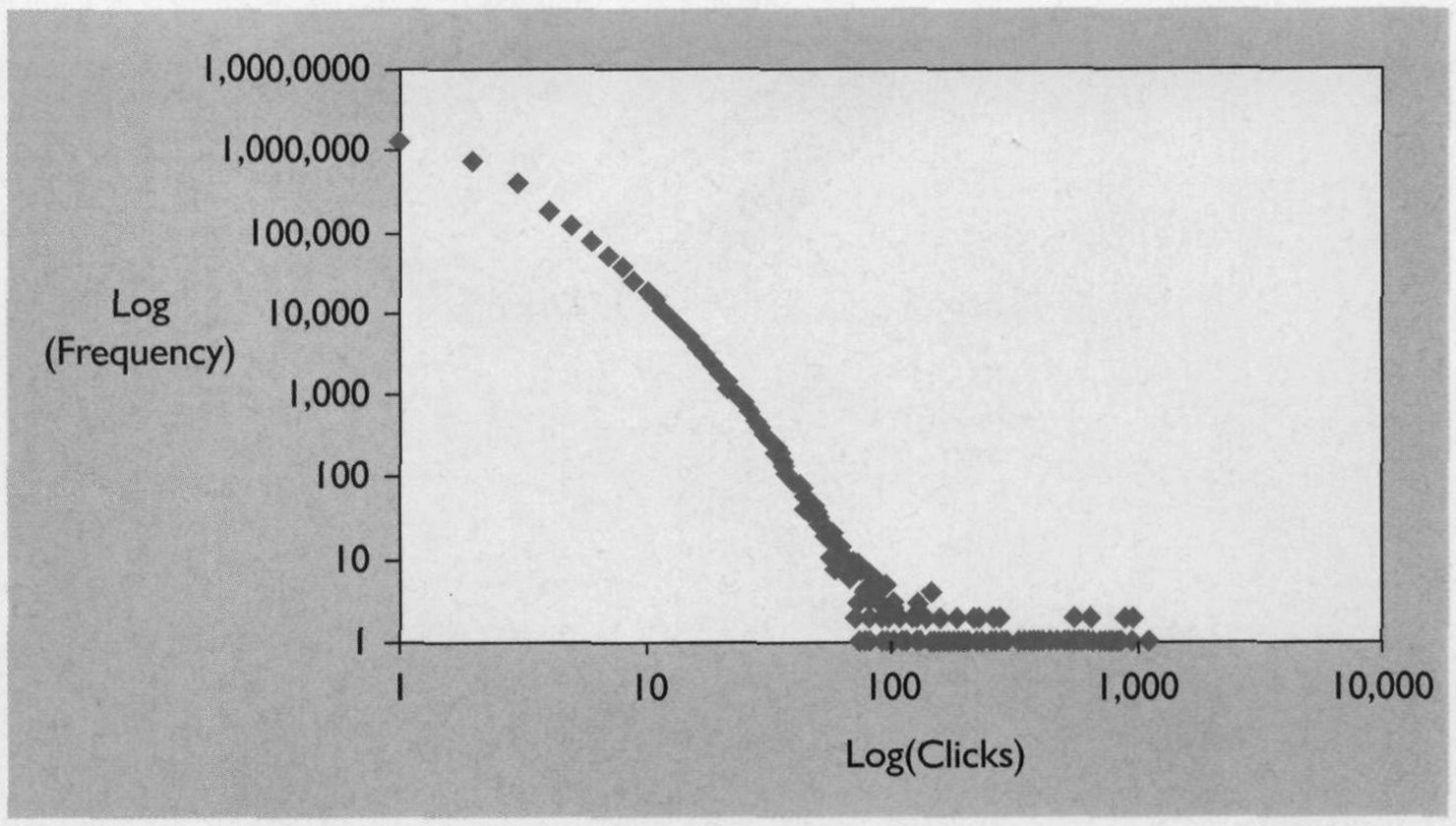

Figure 2. Frequency distribution of surfing on log-log scales. We used the same data set as in Figure 1 for the calculations and the plot.

These differences have led to differences between the way users access information on the mobile Web and the way they access information on the regular Web. For example, mobile users generally adopt a browsing model of information access [1, 2, 4, 6, 12], locating information and services through the menu hierarchies of operator portals, a type of access for which mobile phones are well adapted. In contrast, the primary mode of access on the Web today is via search engines. However, the input and output limitations of mobile handsets make it difficult for users to specify queries or sift through long lists of results.

Several recent studies [1, 2, 4, 6, 12] have identified several universal laws that appear to characterize