Chapter 3
The User as a Service

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ABSTRACT

The Web has changed a lot since its inception, 20 years ago, now offering dynamic information and services. The users have also evolved and are no longer mere information consumers, but rather active producers. This calls for a paradigm shift, with the user at the center of the information, service, and collaboration networks, taking the role of active services (able to respond to requests), in equal terms with current service providers. This leads to a unified user model, in which both individual and institutional entities are users and providers, although with different emphasis. To support this approach, the authors present a new Web access device, the browserver, which includes a browser and a server working in close cooperation, with the goal of replacing the classical browser but being backwards compatible with it to ease the migration path. The authors show how it can be implemented and its advantages in the case of typical applications.

INTRODUCTION

The web appeared as a universal mechanism of browsing information stored on a universally available server. The browser was an innovation, since until then every application had its specific interface. The technologies (e.g., CGI, HTTP, the browser, HTML) and principles (e.g., stateless servers, sessionless clients, client/server paradigm) adopted then were tailored for the job (information search and browsing).

Since then, the web has changed a lot. The world has become dependent on the Internet almost as much as on electricity. All sorts of applications now use the web as the main channel, at both consumer and business levels, virtualization and cloud computing are revolutionizing the concept of resource and, above all, users are not mere consumers anymore but are actively contributing to web content and interaction transactions.

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We are now in the era of consumer-level electronic services, in which users access directly services available online, in a self-service fashion. Many of these services are not limited to consumption, as the highly popular social networks and file sharing sites show. Users also provide services to others (typically involving information sharing).

The underlying technology has evolved as well, spurred in great part by the necessity of improving the end user experience, with more dynamic and interactive pages. Oddly enough, and although the needs and objectives of the Web today are very different from the original ones, most of the technology is based on the same principles that drove the Web at its early stages. Backwards compatibility in technology terms is desirable, but allowing it to influence the Web's model and not providing an evolutionary migration path inevitably leads to problems.

In retrospect, several decisions were taken at the inception of the Web that are understandable in the timeline context but that later hampered the alignment between the Web capabilities and the needs and goals of the society, namely:

- Client/server paradigm, instead of P2P. Users were given a browser and told to browse. Current users do a lot more than browsing and interact seemingly in a direct fashion with other users, but all this is no more than a lot of tweaking with scripts at the browser and support from central servers. It works, but at the cost of the complexity of the entire system. Users are not an integrant part of the Web, but rather separate entities that connect to the Web at browser endpoints. The Web of users doesn't really exist and is no more than a virtualization of the reality;
- A sessionless, stateless, application level protocol (HTTP), when current services require transport level (one OSI level lower, such as SOAP, strangely enough emulated on top of HTTP) and support for sessions and state, which in practice motivated such tricks as cookies, AJAX and Comet;
- Document oriented information with text as the main information type, with the rest (pictures, videos, animations, sounds, forms, binary data, etc.) as a sort of add-ons. Text markup is still the main information structuring mechanism, but the typesetting model that made HTML be based on SGML is long gone. Today, we no longer have a web of documents, but rather a web of services, with active, not static, information. Web Services, although implementing a service model, are actually (XML) documents. All the behavior is hidden behind the interface and outside the model. The current Web's native entities are still documents, not services.

The main objectives of this chapter are:

- To show that the nature of the Web usage has changed from its inception, 20 years ago, and that there is now a mismatch between that nature and the available technologies that users have at their disposal to access the Web;
- To introduce the idea that a paradigm shift is needed to contemplate the new user semantics and role, from client-server to service-based, decentralized applications. The user is no longer simply a consumer, but an active producer, and needs to be treated as an active service provider, in equal terms with other entities in the Web (namely, current providers);
- To describe the *browserver*, a package comprising a browser and a server, and to justify its need as a new Web access device for human users.