



**Chapter XVIII**

**Supporting Electronic  
Commerce of Software Products  
Through Pay-Per-Use Rental  
of Downloadable Tools**

Giancarlo Succi and Raymond Wong  
University of Alberta, Canada

Eric Liu  
University of Calgary, Canada

Carlo Bonamico and Tullio Vernazza  
DIST – Università di Genova, Italy

Luigi Benedicenti  
University of Regina, Italy

*The Internet supports the development of software tools that can be downloaded on demand by users, software tools on-demand. These tools cannot be purchased like products, because they do not reside on the user's machine. Rather, they can be used as "services."*

*In this chapter, we propose a new paying mechanism for electronic commerce of software tools-on-demand, that charges users according to how much they have used a given tool: pay-per-use rental. We discuss the benefits of pay-per-use for users and producers, and we evidence the critical issues in designing a system to support pay-per-use.*

*Then we introduce WebMetrics, our pay-per-use system that supplies software metrics collection and analysis tools—on demand. WebMetrics integrates pay-per-use in a client/server Java application. It is based on the idea of prepaid "virtual cards" similar to rechargeable prepaid calling cards for long distance telephone calls.*

*We conclude with a discussion on the open issues: security, reliability, availability, and standards.*

## INTRODUCTION

The pervasiveness of Internet connectivity and the wide diffusion of Java-capable browsers foster innovative techniques for software distribution. In this chapter, we propose a new model for the electronic commerce of software tools based on a pay-per-use rental policy.

Pay-per-use rental of downloadable tools is the natural exploitation of Java applets that can be transferred on demand to the user's machine and executed dynamically inside a browser. While software rental is not a new idea (Flamnia and McCandless, 1996), at present no example of a standard pay-per-use rental mechanism for downloadable software tools exists.

This approach benefits from the advantages of central management of tools and zero maintenance for users typical of Java applets, together with a new way to pay for their use. Software rental presents several advantages to producers and users. Pay-per-use rental is particularly suited to Web-based applications, because they are offered to a very heterogeneous and dynamic user population (Bakos and Brynjolfson, 1997).

This chapter describes advantages and issues related to pay-per-use, and explains how to add it to Web-based systems, by presenting the example of pay-per-use integration in WebMetrics, a Web-based system providing distributed collection, management, and analysis of source code metrics.

This chapter is organized as follows. Section 2 discusses tools-on-demand. Section 3 presents the role of pay-per-use. Section 4 introduces WebMetrics, our prototype pay-per-use application. Section 5 describes the architecture of WebMetrics. Section 6 presents a list of open issues. Section 7 draws some conclusions.

## TOOLS-ON-DEMAND

The Web already supports two mechanisms for electronic software distribution:

- Free software can be downloaded directly.
- Commercial, shrink-wrapped software can be purchased on-line and then downloaded.

In both cases users have to install the software on their computers.

In the last two years, another distribution mechanism has become popular: tools that are downloaded on demand from the developer's server and executed inside a browser to avoid installation on the user's machine. This approach presents several benefits (Yourdon, 1996):

- The tools are immediately available to any Internet-connected computer, providing a set of computing services available appealing to telecommuters, mobile users, and consultants.
- The tools can run on any hardware platform with a Java-capable Web browser.
- Since the tools are downloaded from a central server, users always get their latest version (Gosling and McGilton, 1996).
- There is no installation, so managing a large user base becomes more viable.
- Maintenance costs are significantly reduced (Gupta *et al.*, 1998).

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/supporting-electronic-commerce-software-products/24622](http://www.igi-global.com/chapter/supporting-electronic-commerce-software-products/24622)

## Related Content

---

### From Edison to MP3: A Struggle for the Future of the Music Recording Industry

Conrad Shayo and Ruth Guthrie (2005). *International Journal of Cases on Electronic Commerce* (pp. 1-25).

[www.irma-international.org/article/edison-mp3-struggle-future-music/1477](http://www.irma-international.org/article/edison-mp3-struggle-future-music/1477)

### Semantic Web Support for Customer Services

Quan Thanh Tho, Hui Siu Cheung and A. C.M. Fong (2008). *Electronic Commerce: Concepts, Methodologies, Tools, and Applications* (pp. 571-590).

[www.irma-international.org/chapter/semantic-web-support-customer-services/9494](http://www.irma-international.org/chapter/semantic-web-support-customer-services/9494)

### Businesses and Consumers as Online Customers

Eileen Bridges, Ronald E. Goldsmith and Charles F. Hofacker (2006). *Encyclopedia of E-Commerce, E-Government, and Mobile Commerce* (pp. 83-88).

[www.irma-international.org/chapter/businesses-consumers-online-customers/12518](http://www.irma-international.org/chapter/businesses-consumers-online-customers/12518)

### Relevance of Information Systems Strategic Planning Practices in E-Business Contexts

Ganesan Kannabiran and Srinivasan Sundar (2011). *Journal of Electronic Commerce in Organizations* (pp. 17-37).

[www.irma-international.org/article/relevance-information-systems-strategic-planning/49646](http://www.irma-international.org/article/relevance-information-systems-strategic-planning/49646)

### The Effect of Social Media on Hotels' Business Performance in the Lebanese Hotel Sector: Effect of Social Media on Hotels' Business Performance

Firas Mohamad Halawani, Patrick C.H. Soh and Saravanan Muthaiyah (2019). *Journal of Electronic Commerce in Organizations* (pp. 54-70).

[www.irma-international.org/article/the-effect-of-social-media-on-hotels-business-performance-in-the-lebanese-hotel-sector/229008](http://www.irma-international.org/article/the-effect-of-social-media-on-hotels-business-performance-in-the-lebanese-hotel-sector/229008)