Chapter 10

WEB-ENABLED SPATIAL DATABASE SYSTEMS

1. INTRODUCTION

The Internet is the de facto standard of today’s global communications. It is host to millions of corporate and organisational Web sites and Web portals where various types of information services are provided and accessed. Spatial database vendors and users alike have closely followed the advances of the Internet to develop and adopt new software tools and solutions that have basically revolutionised the ways spatial information is processed and used. The spectacular growth of spatial information technology in recent years is due more to the Internet than to any other factor. In most contemporary spatial database projects, access to the Internet is a necessary rather than optional requirement.

Aspects of using the Internet for spatial database applications are discussed at various points elsewhere in this book. This chapter consolidates this discussion by focusing on spatial database systems in the Internet environment. The objective is to explain how spatial database and Internet technologies are integrated within the framework of organisational, national and global spatial information infrastructures. The discussion covers both the conceptual design and technical implementation of Web-enabled spatial database systems.

Section 2 introduces the nature and characteristics of Web spatial database systems. Section 3 provides an overview of the development and standards of the Internet and the Web in general. The working principles of Web-enabled spatial database systems using different architectures are explained in Section 4. These initial sections provide the conceptual framework for the strategies of implementing Web-enabled spatial database
systems that are discussed in Section 5. Section 6 summarises the state of the art in Web-enabled spatial database technology as well as the trends of systems and application development in the future.

2. DEFINITION AND CHARACTERISTICS OF WEB-ENABLED SPATIAL DATABASE SYSTEMS

Web-enabled spatial database systems are database systems designed especially for access over the Internet using the World Wide Web (Web) protocol. These systems combine spatial database and Internet technologies to provide a distributed and network-centric approach to spatial information. They are increasingly used not only to enable external access to enterprise information by clients and business partners, but also to support internal business operations such as data sharing among project teams and work groups at the same or different locations of an organisation.

2.1 Characteristics of Web-enabled Spatial Database Systems

Technically and functionally, Web-enabled spatial database systems are not simply an extension of their conventional counterparts, nor are they just another one of the growing number of modern Internet applications. Rather, Web-enabled spatial database systems have several relatively unique characteristics and requirements in their design, implementation and application, for example:

- They have distinct architectures that integrate spatial database software tools, server-to-database middleware, application programming languages, and Internet markup languages. The operation of these systems requires expertise in Web server administration, telecommunications and data transfer protocols, computer network and systems security. Effective Web interfaces also require good design skills and standards.
- They are commonly used in conjunction with new data collection, processing and dissemination technologies (for example, Web cameras, weather stations, in-vehicle navigation systems) as an integral component of organisational, national or global information infrastructure, rather than as standalone monolithic database systems within a particular organisation.