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Implementation of a web services-based SDI to control and manage private ownership rights on coastal areas

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ABSTRACT

It is stated in the legislation related to the management of coastal areas, particularly in the Coastal Law, that private ownership shall not be allowed in coastal areas in Turkey. However, due to deficiencies in the legislation, insufficiencies in control and enforcement, and, most importantly, lack of interoperability among institutions, it is evident that private ownership exists in coastal areas. According to the Coastal Law and the Regulation for Application of the Coastal Law, Shore Border Line (SBL) infringing sections of a real estate that remain on the coast should be annulled from the title and they should be allocated for public use. In practice, owing to the fact that institutions, which perform title annulment procedures, collect the required spatial data from the related institutions via traditional methods, it is seen that procedures are carried out quite slowly, and the process of title annulment lasts for months. Effective cooperation among many different institutions is needed in the management of coastal areas. The mechanism that will ensure this cooperation is "Spatial Data Infrastructure (SDI)." The SDIs are interoperability infrastructures that allow sharing of the data and services among the related institutions or parties. Service Oriented Architecture and its most common implementation method, web services, are the latest software architecture that is recommended for realizing interoperability. In this study, the legislation related to management of coastal areas in Turkey is examined and institutions, which appear in the process of title annulment of real estates, which remain on the coast by infringing the SBL, and the procedures carried out are explained. Next, a series of web services were designed and developed for an SDI implementation, and it is demonstrated that procedures which are in practice implemented quite slowly by traditional methods can be implemented in a fast and proper manner in a web services-based SDI environment.

1. Introduction

In the conceptual sense, coast is defined as the transitional area between the land and the soil type that surrounds all kinds of natural water masses such as sea, lake, or river, or it is the contact point between the land and the lowest line of the sea (Kay and Alder, 1999). The coast may be thought of as the area that shows a connection between land and ocean, and a coastal area defined as the band of dry land and adjacent ocean space (water and submerged land) in which terrestrial processes and land uses directly affect oceanic processes and uses, and vice versa (Ketchum, 1972; Kay and Alder, 2005).

It is well known by everyone that there are various benefits of the coastal areas to humanity including living space, source of food, industry (such as oil and gas exploration), fisheries, aquaculture, transportation and tourism activities and these are expressed frequently in the literature (Bartlett et al., 2004; Strain et al., 2006; Vaez et al., 2007). Despite its overwhelming importance to society, the coastal zone is a difficult geographical area to manage due to temporal issues (tides and seasons) and the overlapping of physical geography and hydrography (offshore, near shore, shoreline, inshore), of jurisdictions, legal mandates and remits of government agencies and the often competing needs of stakeholders. Typically, many different local, national and regional government agencies are responsible for different aspects of the same physical areas and different uses of the coastal zone, e.g. fisheries, environment, agriculture, transport, urban planning and cadastre, national mapping agency and the hydrographic service (Bartlett et al., 2004).

Sharing of datasets describing the coastal areas by the relevant institutions for the right decision-making in the coastal area

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