A visual integration information platform for maintenance management of concrete structures based on information technology

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Abstract

Maintenance management of concrete structures is often complicated because a large amount of information is generated during the service time. The lack of links between information storage and spatial locations increases the difficulty in information retrieval and display. A large number of information technologies provide the possibility of efficient information management during the maintenance management phase, such as building information modeling (BIM) technology providing digital geometric spatial information of concrete structures, geographic information system (GIS) technology providing geospatial information, and databases providing information storage. This paper proposes a visual integration information platform for maintenance management of concrete structures which enables the storing, retrieving and extracting of maintenance information more effectively through linking documents with 3D visual objects.

Keywords: BIM; GIS: Database; Integration information platform.

1 Introduction

Maintenance management of concrete structures is a difficult and complicated work because maintenance period is long, and a lot of information is likely to be generated [1]. Managing maintenance information contributes to successful maintenance management. Currently, maintenance information is mainly stored in paper-based documents in a scattered and invisible manner. Managers need to manually retrieve information from massive paper drawings and documents, and then match to the spatial locations according to the description in the documents, which results in difficulty and inefficiency of information retrieval. With the development of information technology,

information management system that links information in form of electronic documents with visible physical models is widely concerned to improve information management efficiency. Su [2] proposed a BIM based Facility Management (BIMFM) system to track and manage the related maintenance information in the 3D environment. Ahn [3] mentioned that information should be embedded in 3D model to effectively feedback to maintenance stage.

This paper proposes a new and practical method to manage information by using Building Information Modeling (BIM), Geographic Information System (GIS) and database technology. A visual integration information platform is developed, in which BIM and GIS are integrated to create multiscale and multiple