

Conceptual Framework of a Data Warehouse for the Nationalpark Hohe Tauern

Hubert Hasenauer¹, Ingrid Haslik¹, Roman Rosenthaler¹,
Günther Pernul² und Dietmar Stangl³

Abstract

Die Arbeit stellt ein Data Warehouse Konzept für die Datenorganisation in einem Nationalpark vor. Die darauf aufbauende Implementierung eines Prototypen mit Hilfe des Universal Server 9.12 von INFORMIX zeigt die Anbindung an das Internet und diskutiert die daraus entstehenden Vorteile.

1 Introduction

Data warehouse technology offers a powerful tool to provide integrated information from different data sources. It can be used to improve data management and to enhance the decision support (Ballou/Tayi 1999). One of the main benefits of the data warehouse is that operational data can be transformed into strategic decision making information and that the granularity of the data in the warehouse may be different from the original data. Thus the data warehouse stores, summarizes, integrates data and offers the opportunity of data aggregation and filtering of the source data (Inmon 1996).

In a national park information system, different groups of users may be interested in the data collected (e.g. tourists, researcher, public administration, wildlife deputy). For the different user groups different levels of access must be provided to ensure a user friendly access to the data and security requirements.

In this study we developed a conceptual framework of a data warehouse for the national park Hohe Tauern. The idea is that different data sources are available (e.g. forest inventory, weather data, administration data, etc.) at different granularity and accuracy. The proposed framework combines the information and reorganizes the data to address the needs of the national park. The data warehouse is used as an interface between the potential user and the integrated data pool to provide the in-

¹ Universität für Bodenkultur Wien, Institut für Waldwachstumsforschung, Peter-Jordan-Straße 82, A-1190 Wien, email: hasenau@edv1.boku.ac.at

² Universität GH Essen, Institut für Informationssysteme, Fachgebiet Wirtschaftsinformatik, Universitätsstraße 9, D-45141 Essen, email: pernul@hsun6.wi-inf.uni-essen.de

³ Nationalpark Hohe Tauern, Techno-Z, Kapruner Straße 7, A-5700 Zell am See

Conceptual Model of a Warehouse for a National Park

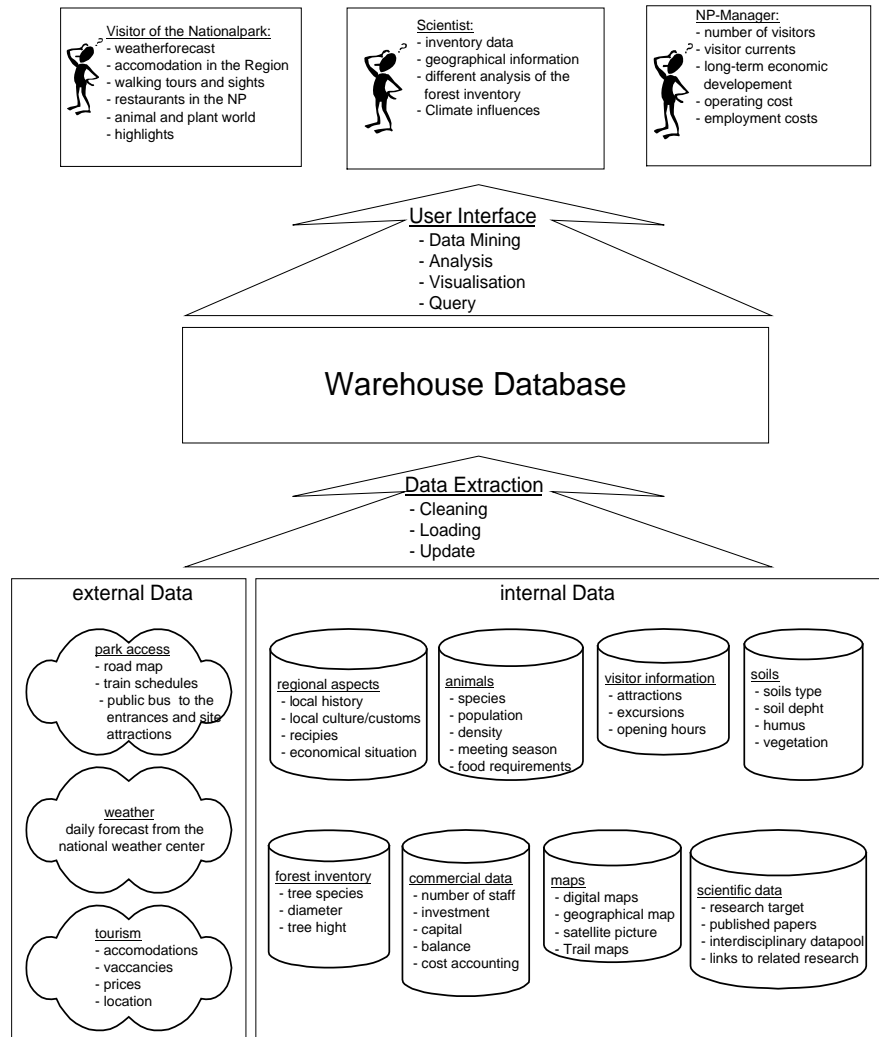


Figure 1

The conceptual model of the four layers including three examples of user profiles⁴

⁴ The first layer is divided into two parts, the operational database layer (internal data) and the external data base layer (external data). The data extraction layer is responsible for cleaning, loading, updating, and aggregating of the internal and external data. The data access layer is the user interface between three different types of user profiles and the warehouse database layer using the WWW.

formation requested in a secure and user friendly way. As an evaluation system a prototype implementation using the software system INFORMIX Universal Server 9.12 has been developed (Haslik 1999, Rosenthaler 1999).

2 The Conceptual Framework

In the application environment existing data base systems are available. These data sources were developed independently and can be divided in internal and external data (Figure 1). Considering the heterogeneity of the information an efficient and user-friendly access is nearly impossible. Thus we propose a newly designed data management system which is particularly designed to address the needs of the national park.

By extracting the data from the original data sources we improve and simplify the data structure, address authorization and access control which will be important for the user interface, clean, integrate and aggregate information (Figure 1). The conceptual framework manages the loading and updating of the data warehouse.

The important benefit of using data warehouse technology is the user friendly access of the data extracted. In our application environment a wide variety of potential user groups can be expected. Furthermore for some user it may be important to have access to the information stored using the world wide web. This is particularly important for tourists because professional marketing has an important impact on the park's business.

Each group of users (scientist, tourist, national-park-administrator) can be supplied with a specific user interface, which enables simple access to relevant information. Another important topic is the implementation of an access-strategy to ensure proper access and usage of the data. The usage of search-tools, testing for coherent information (-> Data Mining) and data access from the WWW is possible.

Literature

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