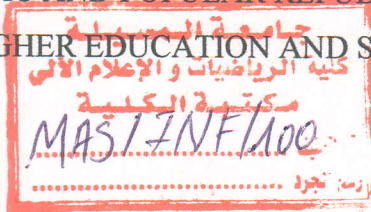


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THEME

**Design, Development And Implementation Of
Hospital Data Warehouse
Case Study: Al Zahrawi Public Hospital, M'sila**

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INTRODUCTION

The field of healthcare is certainly one of the most important and discussed topics in the world. It is necessary together data and analyzes every detail about it.

Data warehouse technology has been in various industries at home and abroad has been widely applied; the market developed rapidly and achieved remarkable results.

In recent years, major hospital information construction made significant progress, information systems has developed from the stage of the cost information management to the stage of clinical information management. Especially in the general medical record data have accumulated for a very long time, how to integrate the use of these data and analysis have become the contents of the scholars beginning to study. Furthermore, Medical staff also needs to analyze a large number of treatment programs in order to summarize regularities in time; it will have a positive effect to the process of accelerating the research.

Problem statement

Nowadays, the healthcare industry is under pressure to lower cost and improve service quality. Oftentimes, information produced is excessive, disjointed, incomplete, inaccurate, in the wrong place, or difficult to make sense. A critical problem facing the industry is the lack of relevant and timely information. As information costs money, it must adopt innovative approaches to attain operational efficiently.

Designing good architecture for hospital data warehouse will help decision makers to use information to weigh alternatives analyze options, and anticipate implications and project outcomes within the context of their organization and environment. Another hand, the problems which are exist in information system in healthcare organization which are suitable for decision support and they have been designed to support short transactions affecting a few records at a time will be solved.

Research questions

This study aims to determine the following questions:

- a) What are the requirements to design architecture for hospital data warehouse?
- b) How model the proposed architecture?
- c) How evaluate the proposed architecture?

Objective of study

The main objectives of this study are the following:

- a) To identify the requirements for designing architecture for hospital data warehouse.
- b) To design, development and implement hospital data warehouse.
- c) To evaluate the proposed hospital data warehouse architecture.

Thesis outline

Our thesis is organized as follows:

The first chapter has a small description of decision support system, a detailed description of business intelligence, its history and evolution. It identifies few definitions of BI followed by discussing what constitutes it and key characteristics of a BI system. At the end of this chapter we give some common definitions between BI and DSS.

The second chapter reviews and covers the literature about Data Warehousing. It presents background and gives detailed description and information about Data Warehouse.

Firstly, it gives definitions and history of data warehouse. Then, it identifies goals of data warehouse. We also discuss basic elements of the data warehouse and its different architectures.

This chapter also explains about data mart, dimensional modeling, On-Line Analytical Processing (OLAP), ETL process and benefits of data warehousing.

At the end of this chapter, we will continue by the applications of data warehouse in industry and the relationship between BI and DW.

The third chapter gives an overview of our case study which is drawn from the healthcare sector and studied in our project. It presents a general knowledge about Al Zahrawi Public Hospital, its definition, legal framework, location, departments and missions.

Furthermore, the fourth chapter provides information on healthcare data warehousing and its benefits. It also discusses the goals of healthcare institution and describes some practice applications and frameworks that are in use.

The last chapter will present the research methodology used in this study in order to achieve the objectives of this study. Then it describes our proposed conception model; it is implemented and applied to the case study in healthcare industry.

Business Intelligence Development Studio is used for development and deployment the data warehouse and Microsoft SQL Server 2008 Analysis Services (SSAS) is used for multi-dimension data cube's design.

Using Microsoft SQL Server 2008 Integration Services (SSIS) create, deploy and manage SSIS package step by step for implementation of the extract, transform and load data to the hospital's data warehouse.

Finally, we summarize the results and findings of this research thesis; introduce possible areas and suggesting some guidelines for further development and research.

1. Introduction

In this chapter, we give an overview about Decision Support Systems, its definition and purpose. It also discusses the background theory of Business Intelligence, its history and evolution. Then it explains and identifies few definitions of Business Intelligence followed by discussing what constitutes a Business Intelligence system, key characteristics of a Business Intelligence system.

We will continue this chapter by some comparison definitions between BI and DSS.

2. Decision Support Systems

2.1. Definition of Decision support systems

A decision support systems has been defined as "an interactive computer-based application that combines data and mathematical models to help decision makers solve complex problems faced in managing the public and private enterprises and organizations." [1]

According to Alter, DSS should fulfill three basic rules:

- ✓ Facilitate decision making
- ✓ Support and not automate decision making
- ✓ Quickly respond to the needs of decision makers

2.2. Purpose of Decision Support Systems

Holsapple and Winston stated that, the purpose of decision support systems is to improve the decision making ability of managers by allowing more or better decisions within the constraints of cognitive, time, and economic limits. More specifically, the purposes of a decision support system are [2]:

- ◆ Supplementing the decision maker
- ◆ Allowing better intelligence, design, or choice
- ◆ Facilitating problem solving
- ◆ Providing aid for semi-structured decisions

ملخص

الهدف الرئيسي لمشروعنا هو إنشاء مستودع بيانات مستشفى. تركيزنا الأساسي هو بناء مستودع للبيانات وفهم آليات إنشاء هذا المستودع والمكونات الأساسية له والهدف من وراء بناءه واستخدامه من طرف المؤسسة كقاعدة أساسية من اجل اتخاذ القرارات المستقبلية التي تخص المؤسسة.

الكلمات المفتاحية:

مستودع البيانات، نظام دعم القرار، مكعب، OLAP، ETL

Abstract

The main objective of our project is to establish a Hospital Data Warehouse. In our project's primary focus is to build a Data Warehouse and to understand the mechanisms of the creation of this Data Warehouse and its basic components and the purpose behind its construction and use by the institution as a basic rule in order to take future decisions concerning the institution.

Key Words:

Data Warehouse, Decision support system, Cube, OLAP, ETL.

Résumé

L'objectif principal de notre projet est de construire un entrepôt de données d'un hôpital. L'objectif principal de notre projet est de construire un entrepôt de données et comprendre les mécanismes de la création de cet entrepôt ainsi que ses composants de base, et le but de sa construction et son utilisation par l'établissement comme afin de prendre des décisions futures concernant l'institution.

Mots clés :

Entrepôt de données, Système décisionnel, Cube, OLAP, ETL.