**50234          Amina Khalfe**

# Derivation of Initial Data Warehouse Structure By Mapping Operational Database On Transaction Patterns

## Abstract

Data warehouses improve the quality of integrated information in the organization for decisionmaking. The data for the data warehouse comes from online transaction systems. These online transaction systems generate vast quantities of products, customer and market data and are not well suited for supporting decision-support queries or business questions that managers typically need to address. The fundamental reason for building a data warehouse is to improve the quality of information in the organization [20].

Data warehouse designing for any business is a complex, expensive and tedious process requiring understanding of the longer-term business requirements in addition to the user requirements. Typically, an involved process of analysis precedes the actual design phase of a data warehouse [23]. There is also lack of guidance for the requirements engineering part of the data warehouse's development process [16]. Senior business analysts who are well versed in the business issues and understand the market sector, and senior technical architects who understand the technical and design issues of decision support systems and data warehouses do this. The analysis process becomes more difficult because of the costs involved in hiring experienced staff and the privacy issues arising from the use of external consultants [7, 9]. The analysis and design of even a basic data warehouse structure may require months of effort. Inexperience is one of the main causes of failure in DW projects [19, 26]. The difficulty in gathering relevant information from the domain experts is solved by Coad *et al* [37] who has defined a number of patterns aimed for use during the analysis and design of a wide range of business domains from sales, purchase and production of physical products to travel, insurance and other professional services.

Thesis of this research is that the mapping of the operational databases on the transaction pattern facilitates the derivation of initial data warehouse structure. During the mapping process, the relationships, roles and attributes of the players defined by the transaction pattern help us in identifying the instances of the pattern in the database. Through these instances, we can then derive the initial data warehouse structure i.e. the attributes of the fact and dimension table(s). The data warehouse structure thus derived reduces the need for an extensive information analysis of the needs of the user and the dependency on the experienced personnel for data warehouse development**.**

The proposed methodology consists of 6- step derivation methodology that is illustrated using a case study of an organization's operational database. The attributes of fact table derived from the methodology are; keys of transaction patterns players; transaction, transaction line-item, place, participants and items. Each of the transaction players contribute in making the dimension tables as well. The initial data warehouse structure can be derived for the whole range of business domains where transaction patterns are used.