

A New Methodology for Elicitation of Data Warehouse Requirements based on the Pivot Table Formalism

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Abstract. Data Warehouses (DWs) are conceived according to data sources and users requirements. Therefore, the more the DW model reflects stakeholders' needs, the more the stakeholders will make use of their data. Therefore, in literature particular attention has been provided to DW requirement elicitation, specification and validation processes. However, most of these approaches are based on the interviews and complex formalisms that cannot be used with unskilled OLAP decision-makers. Therefore, we propose a new elicitation methodology based on the pivot table formalism, since it is well-known and used by decision-makers. We validate our methodology using a real case study.

1 Introduction

Decision Support Systems (DSSs) are flexible and interactive information systems that help decision-makers to extract useful information for identifying and solving problems and make decisions. Among DSSs, Data Warehouse (DW) and OLAP systems are probably ones of the most used in academic and industry communities. A DW is a subject-oriented, integrated, time-variant and non-volatile collection of data to support the decision-making process [Kimball et al. (2015)]. Warehoused data are analyzed using OLAP systems enabling on-line exploration of data stored according to the multidimensional model. Warehoused data are represented according to analysis different axes (dimensions) and facts. Dimensions are organized in hierarchies composed of levels. Facts represent the analysis subjects, and they are described by numerical measures. Measures are aggregated along dimensions hierarchies using aggregation functions (e.g. sum, min, max, etc.). Since DWs are conceived according to data sources and users requirements, the more the DW model reflects decision-makers' needs, the more the decision-makers will make use of their data. Therefore, in literature particular attention has been provided to DW requirement elicitation, specification and validation processes [Prakash and Prakash (2018)]. Requirements elicitation is the practice of collecting the requirements of a system from users, customers and other stakeholders. Requirements elicitation is non-trivial. Requirements elicitation practices include interviews, questionnaires, user observation, workshops, brainstorming, use cases, role playing and prototyping [Pohl (2010)].