

## Department of Computer Science and Software Engineering

### Master Thesis Defense

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Title:	A UML Framework for OLAP Conceptual Modeling
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### ABSTRACT

Data warehouses are used by organizations around the world to store huge volumes of historical data. Ultimately, the purpose of the warehouse is to allow decision makers to assess both the history and, more importantly, the future of the organization. In practice, the capacity to make meaningful decisions is further supported through the use of Online Analytical Processing (OLAP) applications that provide more sophisticated representations of the warehouse data. In order to do this, OLAP systems rely on a multidimensional conceptual data model that represents the core elements of the data warehouse, as well as the relationships between them. Currently, there is no definitive conceptual model for these kind environments. It is therefore quite difficult for data warehouse designers to express the kind of complex analytical requirements which arise in real-world situations. In this thesis, we propose a robust and flexible conceptual model that can be used to represent multi-dimensional OLAP domains. Specifically, we present a profile extension of the Unified Modeling Language (UML) that consists of a set of stereotypes, constraints and tagged values that elegantly represent multi-dimensional properties at the conceptual level. We also make use of the Object Constraint Language (OCL) to ensure the correctness and completeness of the specification, thereby avoiding an arbitrary use of the basic components. Furthermore, we demonstrate how the new OLAP profile is utilized in MagicDraw, one of the leading UML development tools. The end result is an OLAP Modeling Environment (OME) that should significantly reduce development time, as well as improving the quality of the analytical interface for the end user.