

ENHANCEMENT OF EXPERT SYSTEMS WITH OBJECT-ORIENTED DATABASE FEATURES

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Abstract

Intelligent systems are computer-based systems that use knowledge and reasoning techniques to solve problems. But they haven't the ability to manage a large amount of data like a DBMS's. Many expert system applications have large amount of data, thus we need to couple both the knowledge base and database systems. In this work we built two systems named Loosely Coupled System (LCS) and Tightly Coupled System (TCS).

LCS statically couples the knowledge base and the database. This means that LCS must first invoke all the required data from the database. Secondly, it stores them in the working memory of the system. Finally, it starts the interactive session. TCS dynamically couples the knowledge base and database. This means that the interactive session starts first. Whenever the system needs data from the database, the inference engine asks the database to afford the specified data.

Both LCS and TCS developed to couple KROL knowledge base with the external storage utility of the SICStus object prolog languag. An Object-Oriented Layer (OOL) has been built on the top of the external storage utility of SICStus Prolog to handle the database objects and to convert them to the external storage format. LCS and TCS are tested by building many applications in the agriculture domain, and their performance is investigated.

1. Introduction

The integration of a knowledge-based system and a database system is important to a large class of users and applications. Such integration can be achieved in two ways that are loosely and tightly coupling [Heng 97]. Moreover, the integration, as such, must be simple, accurate and maintainable. These goals ware the aims of different researchers and systems such as the following.

- [Claude 88] is composed of inference rules written in PROLOG extension language (G-LOGIS) and set of facts managed by a DBMS (G-BASE). G-LOGIS is an object-oriented implementation of PROLOG, while G-BASE is an object-oriented DBMS that manages the object structured fact base. G-LOGIS and G-BASE are able to work in harmony because they are both based on object-oriented paradigm.