STANDARD IRDS ARCHITECTURE

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1.0 INTRODUCTION

In this paper we presented the general structure of IRDS and the possibility of coexistence of representations of different data modelling facilities (DMF) in the IRDS environment.

2.0 A Theoretical Multi-level Dictionary System

First let us define some concepts used in this paper.

Definition 1.0   Data Modelling Facility (DMF) - A DMF is a set of data structuring rules and data manipulations. [1]

Definition 2.0   level pair - the adjacent data levels in a multilevel dictionary system where the lower level is the occurence level and the upper level is the schema level. More descriptions on level pair concept are presented in this section.

Definition 3.0   Representation of a DMF in a level pair - The set of data types and corresponding data containers in a level pair required by a given DMF to store information for the control of one or more databases in a lower level pair. For example, the E/R DMF could be represented with the data types 'entity', 'relationship', 'attribute' etc. in the schema level and the corresponding data containers at the occurence level of the level pair. Note that 'control' starts when information are entered in the database where DMF is represented. The controlled databases are said to conform to the given DMF.

Consider a theoretical multi-level dictionary system with the following characteristics:

i. A theoretical multi-level dictionary system has n levels, where n is any integer. A specific data level is referred to as (i)level or (i)data level, i = 1,2, . . . n.

ii. A level pair (i)LP consists of (i) data level where one or more databases are stored and the (i+1) data level where the schema of the databases are stored.

iii. If D is a database in (i)LP, then

its controlling DMF is represented in (i+1)LP. This is called interlocking level pairs [1]. Note that the relationship between interlocking level pairs is recursive, i.e., the controlling DMF of the databases in (i+1)LP are represented in (i+2)LP.

3.0 The General Architecture of IRDS

i. IRDS considers data to be of four levels(n = 4). These are the Application, IRD, IRD_Definition and the Fundamental levels. (1)LP is AP_LP, (2)LP is IRD_LP and (3)LP is IRDD_LP.

ii. The AP_LP consist of application databases with the application data model in its schema level.

iii. A user is free to use any DMF for the control of application databases in AP_LP.

iv. We can represent the different DMFs (may include SQL) required in (iii) above in IRD_LP by SQL DMF, i.e., represent E/R DMF by SQL, SQL DMF by SQL, IMS DMF by SQL, etc.

v. Therefore all tables in IRD_LP are SQL tables.

vi. Therefore the IRDD_LP will consist of the representation of one DMF, the SQL DMF.

vii. Recursion in interlocking level pair relationship stops at IRDD_LP. IRDD_LP is fixed and defined by ISO.

4.0 Conclusion / Future Direction

In this paper we presented the standard architecture of IRDS as well as the possibility of coexistence of different DMF representations in IRD_LP. Extensibility of IRD_LP is possible because of the presence of a higher interlocking level pair, the IRDD_LP. We would like to pursue further research on the use of IRDS as an environment for representing DMFs by SQL.

REFERENCES:

[1] ISO/IEC JTC1/SC21/WG3 N900 Technical Report on Reference Model of Data Management Standardization, 1989-10-4.

[2] ISO/IEC JTC1/SC21/WG3 N858 Information Resource Dictionary System, Working Draft, Revision 9, 1989-7-17.

[3] ISO/IEC JTC1/SC21/WG3 N967 On Characteristic Properties of the Top Two Standard IRDS Level Pairs, 1989-11-8.