Facilitating Evolution in Relational Database Design:

A procedure to evaluate and refine novice database designers' schemata

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Michael Robert Ryder

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"A little learning is a dang'rous thing;
Drink deep, or taste not the Pierian spring:
There shallow draughts intoxicate the brain,
And drinking largely sobers us again."

(Alexander Pope)

Ars longa, vita brevis

Abstract

Relational database management systems (RDBMS) have become widely used by many industries in recent years. Latterly these systems have begun to expand their market by becoming readily available at minimal cost to most users of modern computing technology. The quality of applications developed from RDBMSs however is largely dependent upon the quality of the underlying schema.

This research looks at the area of schema design and in particular schemata designed by people who have a minimal understanding of relational concepts. It uses a survey and case studies to help define some of the issues involved in the area. A procedure to modify existing schemata is described, and the schema from one of the case studies used to apply the schema re-design procedure to a real database design. The results are compared to the original schema as well as a schema designed using a conventional application of the NIAM analysis and design methodology.

The research supports the hypothesis that database applications based on schemata designed by lay-persons are currently being used to support business data management requirements. The utility, reliability and longevity of these applications depend to some extent on the quality of the underlying schema and its ability to store the required data and maintain that data's integrity. The application of the schema re-design procedure presented in this thesis reveals refinements on the original schema and provides a method for lay-persons to evaluate and improve existing database designs.

A number of issues and questions related to the focus of this research are raised and, although outside the scope of the research, are noted as suggestions for further work.

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