

AN IMPROVED GENERIC ER SCHEMA FOR CONCEPTUAL MODELLING OF INFORMATION SYSTEMS

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Abstract

The Entity Relationship (ER) model is widely used for creating ER schemas for modelling application domains in the field of Information Systems development. However, when an ER schema is transformed to a Relational Database Schema (RDS), some important information on the ER schema may not be represented meaningfully on the RDS. This causes loss of information during the transformation process. Although, several previous researches have proposed solutions to remedy the situation, the problem still exists. Thus, in this on-going research we wish to improve the proposed solutions and maximize information preservation in the ER to relational transformation process. Cardinality ratio constraints, role names, composite attributes, and certain relationship types are among the information frequently lost in the transformation process. Deficiencies in the ER model and the transformation method seems causing this situation. We take the view that if the information lost is resolved; a one-to-one mapping should exist from the ER schema to its RDS. We modified the ER model and the transformation algorithm following a heuristic research method with a view to eliminating the deficiencies and thereby achieving a one-to-one mapping. We should show that the mapping exists for any real world application.

We create a generic ER schema - an ER schema that represents any phenomena in symbolic form - and use it to show that a one-to-one mapping exists for any real world application. In this paper, we explore our generic ER schema and its advantages over its predecessors in view of representing any real world application.

Keywords: Conceptual model, Database, ER model, Generic ER schema, Information System, Relational database schema

1. Introduction

When an Information Systems development work is undertaken a conceptual model is drawn in the form of an ER schema using the ER model[1, 2] to represent user requirements of the application domain concerned. An ER schema is a graphical diagram and represents phenomena in the real world,

such a entities, relationships, and attributes via graphical constructs, for instance, rectangles, diamonds, and ovals, etc. The constructs that are modelled on an ER schema are usually named by the corresponding real-world names (e.g., Employee, Designation, and Location, as in Figure 1) occurring in the application domain to which the ER schema is drawn.

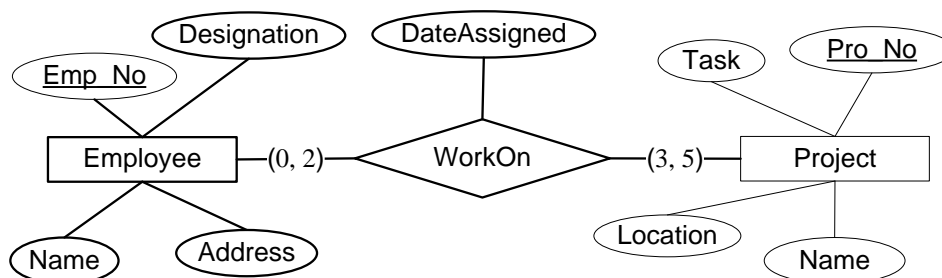


Figure 1: An ER schema that represents a real-world application domain