EvolveDB - Initial Evaluation

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1 Introduction

EvolveDB is an Eclipse-based framework for schema evolution in MySQL databases. The user specifies the evolution steps by freely editing a database model extracted by reverse engineering. EvolveDB analyzes the differences between the status quo and the evolved model structures and generates a data migration script. To evaluate our approach, we conducted an initial evaluation with a field experiment. The evaluation should address the following research question: **Can the tool be used by software developers who do not necessarily have SQL knowledge and experience with schema evolution?** This document presents the results.

2 Participants

We conducted the field experiment with seven software developers. Each participant had to answer some questions about their experience with Eclipse, MDSD and schema evolution in general. Table 1 gives and overview.

ID	Eclipse	MDSD	SQL level	Schema Evolution
1	proficient	yes	proficient	yes
2	proficient	no	expert	no
3	intermediate	no	proficient	no
4	proficient	yes	expert	yes
5	proficient	yes	proficient	no
6	novice	no	intermediate	no
7	proficient	no	proficient	no

Table 1: Overview

3 Field Experiment

At first the participants had to familiarize themselves with EvolveDB. For this purpose, they were asked to read the end-user documentation and perform some evolutions on an example database schema using a step-by-step guide. In the second part, the participants were asked to perform some evolutions on the MySQL *classicmodels* sample database schema depicted in figure 1.

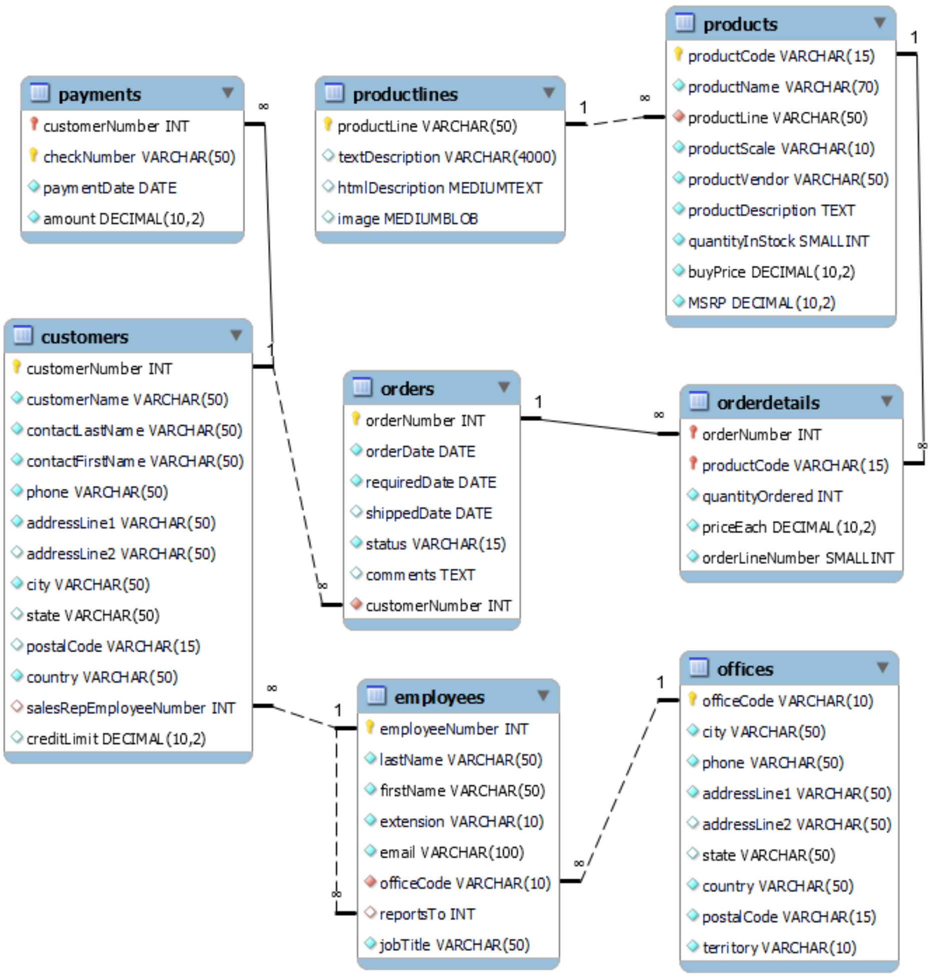

Figure 1: MySQL sample database

The intended changes were described with a textual specification. Overall, participants were asked to make the following changes:

1. Set the default value of column *state* in table customers to "not set".
2. In addition, add a not null constraint. All existing null values should be replaced with the default value.
3. The *productName* in table *products* should be unique.
4. Create a new column *salary* in table *employees* with the datatype *DECIMAL*.
5. Delete the column *extension* in table *employees*.
6. Currently, employees can only work in one office. In the future, employees should be able to be assigned to more than one office.

7. Set the new default value "In Process" for column *status* in table *orders*.
8. Change the name of the foreign key *salesRepEmployeeNumber* to *salesEmployeeNumber* in the *customers* table .

The evolved version of the database schema is depicted in figure 2.

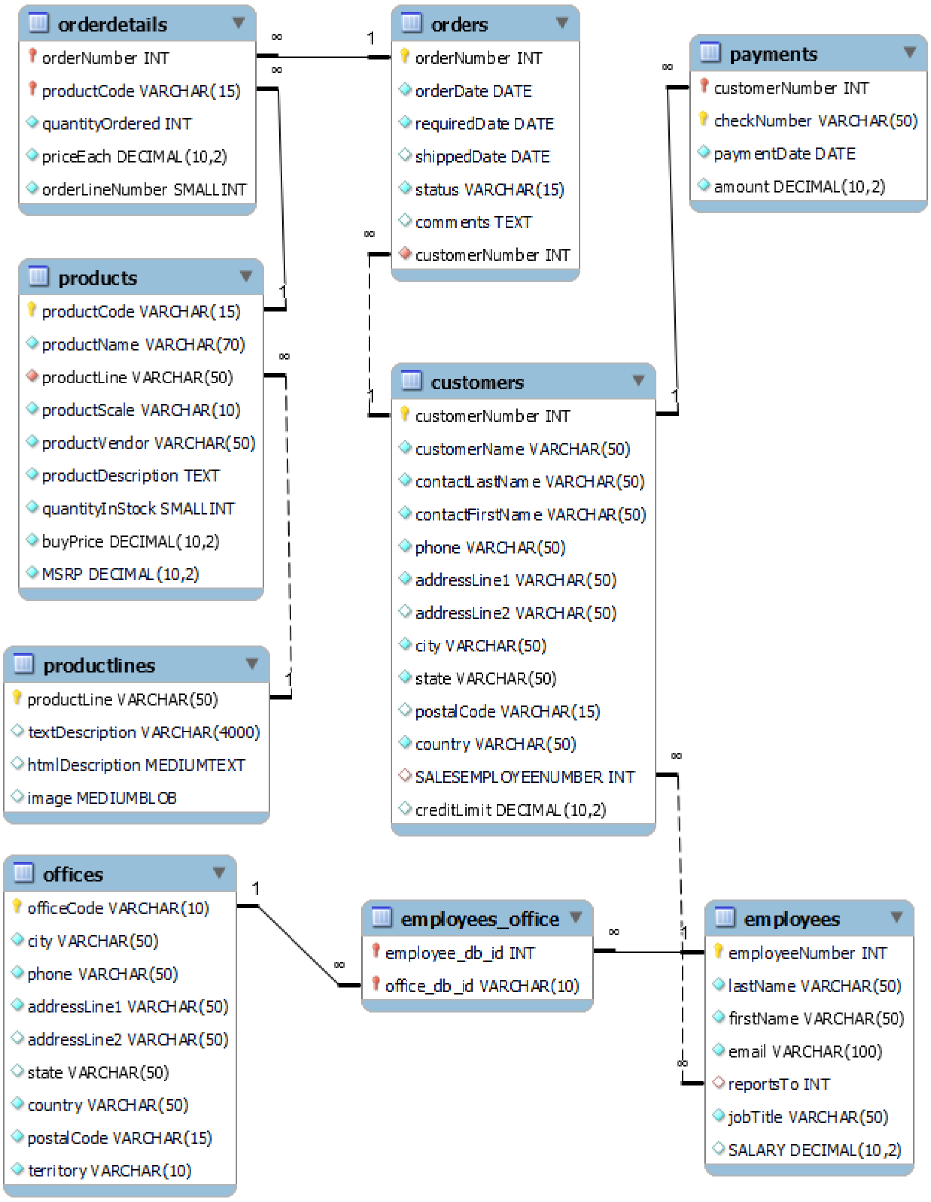

Figure 2: Evolved MySQL sample database

3.1 Results

It took participants between one and three hours to read the documentation and complete the tutorial. After familiarizing themselves with EvolveDB, they were able to evolve the classicmodels schema in an average of 20 minutes. We reviewed the result for correctness and completeness. Each user had to make eight modifications on the database schema. To check the results, we compared the generated scripts and the models produced by the participants with our solution. Overall, 95% (38/40) of the desired modifications were performed correctly. Only one participant omitted one operation and one change was incomplete.