Experiment 1 ORM briefing Version 080716

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Introduction: Thank you for agreeing to participate in my UML class model experiment. The purpose of this experiment is to compare different methods for constructing UML diagrams from a textual input document.

The data that you provide will be stored in an online database that only I can access. Your personal details are required for reasons of authenticity and for providing you with direct feedback on the results. Your name will not be revealed to a third party. The results in any reports will be anonymous.

The aggregate data will be used for statistical analysis and reporting for my dissertation which will be submitted to Liverpool University not later than 28 August 2008.

After 28 August 2008, the data will be removed from the online database server and stored offline in a secure location in the UK.

Procedure summary: This experiment requires that you convert the airline scope description (see page 3) into an object-role model and then convert the object-role model into a UML class diagram

ORM Tool: You may use one of the following three tools: VisioModeler, VEA or NORMA
UML Tool: You may any UML tool.

The following UML tools are available as free downloads:
* JUDE Community V5.2.3 free from http://jude.change-vision.com/jude-web/product/community.html
* Visio Professional 2007: free download from http://office.microsoft.com/en-gb/visio/default.aspx

First steps: You should begin by taking a few minutes to carefully read the procedure and the scenario. You should then **make two time estimates:**

> 1: How long you think it will take you to complete phase 1 - the ORM phase.
> 2: How long you think it will take you to complete phase 2 - the UML class model phase.

After making your estimates you should begin phase 1.

Thank you for your contribution

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Procedure

Please use the following two-phase procedure to create a "data only" UML class model that contains all of the information in the page entitled "Airline Scope description".

Phase 1: Please use an ORM tool (VisioModeler, VEA or NORMA) to prepare an object-role model that describes the information in this document entitled "Airline Scope Description"

Make a note of how long it takes you to complete phase 1.

Phase 2: Use your ORM model as a guide to defining a UML class model. You may create your UML class model directly by inspecting the Relational Model generated by your ORM tool. Alternatively, you may use the conversion procedure described on page 389 of the book "Information Modeling and Relational Databases: Second Edition which is summarised below:

1. Binarize any sets of exclusive unaries
2. Model selected object types as classes, and map a selection of their n:1 and 1:1 associations as attributes. To store facts about a value type, make it a class.
3. Map remaining unary fact types to Boolean attributes or subclasses.
4. Map m:n and n-ary fact types to associations or association classes.
   Map objectified associations to association classes.
5. Map ORM constraints to UML graphic constraints, textual constraints or notes.
6. Map subtypes to subclasses, and if needed, subtype definitions to textual constraints.
7. Map derived fact types to derived attributes/associations, and map semi-derived fact types to attributes/associations plus derivation rules.

Make a note of how long it takes you to complete phase 2.

Class model standards

Your UML class model should use standard UML class notation and should meet the following criteria:

- Class structure normalized and all classes properly attributed
- Associations to be shown with appropriate multiplicity
- Aggregations to be shown
- Constraints to be shown (you may use text or OCL)

Experimental Data to be provided

When you have completed phase 2, please complete the online form and email your files.

Online Form to be completed

Please answer the questions at: http://www.ormfoundation.info/fs1/fs-Ex1ORM.aspx

Files to be emailed

Please email the following two files to experiment1@ormfoundation.org

ORM File: Please send your object-role model in the format used by your ORM tool. You should name your file Experiment 1_ORM_**xxxx. yyy** where **xxxx** is your last name and . **yyy** is the file format.

Class Model file: You may send your UML class model in one of the following formats: JUDE 5.2.3, Visio (vsd), Word 2003 (.doc), Word 2007 (docx), pdf, rtf or png.

Data requested by the online form

The online form requests the following data: Please only record times for actual work on the two phases. Please do not include the time that it may have taken you to prepare for this experiment.

First name, Last Name, your email address
Is English your first or second language?
Your country of residence
The number of years experience you have in working with ORM
The number of years experience you have in working with UML
Is your ORM skill self-taught or have you attended formal training?
Is your UML skill self-taught or have you attended formal training?

Phase 1: Data to be recorded about preparing the Object-Role model
Time: Estimated work time in minutes.   Actual work time in minutes
Procedure: Please provide a short description of the procedure that you used.
Tool: Please list the ORM tool(s) that you used.

Phase 2: Data to be recorded about converting the object-role model to a UML Class Model
Time: Estimated work time in minutes.   Actual work time in minutes
Procedure: Please provide a short description of the procedure and UML tool that you used.
Tool: Please list the UML tool(s) that you used.

Please do not include the time that it may have taken you to prepare for this experiment.

Airline Scope description

The airline is required to record the following data for all persons who are involved with the airline's activities: name, date of birth, country of nationality, email (optional) and residence address. (For this model, the address can be shown as a single attribute.)

The airline defines an employee as a person who is either ground staff or aircrew.

A customer is a person who is a fare-paying passenger but is neither a travel agent nor an employee. A travel agent may not be a customer or an employee.

Each month, an invoice is sent to each travel agent showing the payment amount, the invoice issue date and the payment due date. Each invoice is identified by a unique number. The travel agent is required to pay the invoice amount within 15 calendar days of the issue date.

If a travel agent's payment is overdue, the travel agent's credit status is changed from "good" to "bad". When an overdue payment is received, the travel agent's credit rating is restored to "good".

A travel agent with a "good" credit rating is given a credit limit of $50,000. A travel agent with a "bad" credit rating has a credit limit of 0.

Aircrew are either cabin crew or pilots.

A pilot must hold a flight license for at least one aircraft type. Cabin crew must hold a valid training certificate for at least one aircraft type.

The airline operates four types of aircraft: A380, B747, A310 and B737.

The airline uses its aircraft to offer flights between airport pairs. For example: between London Heathrow (LHR) and Schiphol (AMS).

Each flight is operated by a flight crew comprising pilots and cabin crew. To be qualified to fly as a member of a flight crew, each pilot must have a valid flight license for the type of aircraft to be used for the flight and each cabin crew member must have a valid training certificate for the type of aircraft to be used for the flight.