

Domain Overview

DEPARTMENT OF TRANSPORTATION UNIVERSITY OF KENTUCKY MEMORANDUM

INTRODUCTION:

An information system is created to keep track of vehicles borrowed from the motor pool of University of Kentucky. A policy has been established to ensure responsible operation of the university motor pool vehicles and thereby enhance the health and safety of employees during the operation of university motor pool vehicles.

POLICY:

The policy applies to all members of the university who will be required to acknowledge these policies prior to being authorized to operate a university vehicle.

- Motor pool vehicles are owned(**UK vehicles**), rented or leased(**non-UK owned vehicles**) by the University of Kentucky which are available to reserve and use by employees. The vehicle is identified by a unique ID, seating capacity, ownership, and the type such as sedans, mini-vans, SUVs, and station wagons. The number of **passengers** must comply with the norms of the National Safety Council based on the capacity of the vehicle .
- A **department** is headed by a **Department Administrator**, who handles department funds, has a unique ID, and authorizes drivers operating a university vehicle based on their employee ID. Qualified **employees**, selected university police, guests for college business purposes(**non-employees**) can use the university vehicles. Use of university vehicles by students is prohibited.
- An authorized **driver** has a distinctive driving license ID with no health restrictions to driving, five years of driving experience and discloses his information by submitting a single **Motor Vehicle Record (MVR) Release and Information Form**, constituting deficiency points and a unique ID , issued by the **Risk Management Department**.
- Drivers of passenger vans and commercial motor vehicles must complete an online van training program and possess a valid Commercial Driver's License respectively.
- Only the operators of emergency or public safety vehicles, approved by their department administrator, may engage in text messaging with a driver on duty.
- When an **accident** occurs, the driver of a University Vehicle must notify the police, University's third-party administrator and Underwriter's Safety and Claims by phone, (877) 252-4839, or fax, (502) 489-6435. The driver must complete the **Vehicle Accident Report (VAR) form** and provide it to the motor pool office. Underwriters Safety and Claims instructs drivers and handles claims arising from any accident by a unique VAR_ID, date and its location.

- Failure of the vehicle driver to follow the reporting procedures are a violation of university policy and subject to disciplinary action.

INSURANCE COVERAGE:

- **Fleet Insurance Policy** and **Worker's compensation insurance** are the two different categories of insurance that provide financial protection to university's vehicles and authorized drivers against any claim for loss, damage, or injury.
- Fleet insurance policy allows excess liability protection for employees when they drive their personal vehicles while on official business and physical damage coverage includes actual cash value comprehensive and 500\$ deductible collision.
- Workers' compensation insurance covers employees injured while driving for official business and does not include personal responsibilities such as exceeding authorized use, violating traffic regulations.

DISCUSSION OF IMPORTANT CONTROVERSIES AND DECISIONS:

- We focused more on drivers while building a university motor pool information system by having 'driver' as the superclass entity rather than employee since drivers, although rarely, includes non-employees. We did not include too much information about motor vehicle insurance in the diagram since that is a separate system altogether.
- We assumed that the VAR form will have an ID to identify an accident, along with other attributes such as the location and time of accident.
- The addition of a student entity made the information system unnecessarily complex and was excluded since the university motor pool is focused on employees and drivers.

SUMMARY:

The policies are devised by the University motor pool to regulate operations and ensure safety of the community. The drivers of university vehicles must comply with the rules prescribed in the above policy and must be aware of the reporting procedures of accidents and liability claims of insurance policies.

IMPORTANT CONTROVERSIES AND DECISIONS

In modelling the various information systems for the University of Kentucky motor pool domain, multiple challenges were faced with different portions of the modeling process for the different information system models. These controversies were discussed, and decisions were made to model the information system by either resolving or going around to find a solution.

Relational Database Modeling

The relational database was designed from the updated EER Diagram, populated with realistic instances and SQL queries were created to obtain information from the database.

Controversies:

- Major controversies were involved in designing the ‘accident’ part of the EER diagram, since it was related to many entities in the model. We decided to associate driver entity with number of accidents and included appropriate relationships to each of the entities associated with accidents.
- Although much information was not available about the ‘passenger’ entity, we decided to include it in the model because of its significance in describing who used the university motor pool vehicle.

Datalog

A knowledge base was created for the University Motor Pool and inference rules were designed in Datalog to obtain information about individuals in the system.

Controversies:

- Major controversies were involved in populating data in knowledge base assertions where we had to adhere to proper usage of data format in Datalog. We converted relevant data to appropriate formats suitable for use when creating the knowledge base.
- The usage of aggregate functions in Datalog was beyond the scope. Hence, we had to retrieve parts of information from the SQL queries which had aggregate functions for creating inference rules.

Apart from the above controversies, some implementation difficulties were also faced while modeling Datalog inferences. It was difficult to implement one of the inference rules

wherein total count was required. Aggregate functions like ‘count’ were found to be not implementable in Datalog.

Protege

An OWL ontology that models the domain entities and relationships of the University Motor Pool was created and class equivalences were added to identify inference rules.

Controversies:

- The first controversy was that many classes had the same object property. For example, Classes like employee and vehicle have the same object property “covered by”. Since the domain and range constraints are specific to the object property, it makes it difficult when asserting object properties for individuals of the classes. We created new object properties with similar naming convention and added one to each group of the corresponding domain class and range to avoid the confusion of logic expression. For instance, an object property “covers” similar to “covered by” was created for employee and vehicle respectively.
- The second difficulty was in the process of developing ontology according to the EER diagram of the project. We were not able to deduce inferences from existing entities in previous milestones. We added extra subclasses which were not a part of EER Diagram in Protege to create reasonable inferences.