# CS 255 Model Application Short Paper

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## Process Model Application

A process model incorporates ordered steps of a working information system. We would start with the raw user-interface and follow with an abstraction of what the system should do in its working environment.

Our process model begins at the user-interface level, requiring one of the following options: register, login, or reset password. For registration, the user enters in their required profile information and submits it to the system via the GUI running either on a mobile device or a PC/Mac. The client-side software then makes a secure connection with the server (running in the cloud), which adds the user and their information to the database. For login, the credentials of the user are entered and passed to the server over HTTPS where they are checked against those using a secure hash function, and if the credentials match then the user is logged in and given access according to the authorization level: owner, administrator, instructor, secretary, or end-user. If reset password was selected, then the server sends out either an e-mail or a mobile text to the user with a link to reset their password securely.

Once logged in, we have a number of processes available to users of our system according to the type of credentials they own.

The GUI should display options available only to the type of user which is logged in. For the owner, this includes downloads of reports in Excel format, information about who made what changes to the database, full access to all information about user accounts. If the user is of type admin, the GUI will display options to upgrade software, add/remove/modify user accounts, access the server directly, and view logs. The secretary will see options in the GUI to add/remove/modify user information, schedule driving practice, and contact driving instructors. Instructors will be giver the option to update grades for online tests, access their personal calendar with their driving schedule, and add/edit notes regarding the student. Clients will have options displayed to update their user information, schedule driving practice, view their grades and notes, and delete their account.

Each of these options must correspond to appropriate end-user clients and server-side code in order to keep information in the database relevant.

The server will receive a connection over HTTPS and receive the request from the client, then respond by either making changes to the stored information or access the database with a read request and relay the information to the client program.

Each of these various processes should be added to the model’s graphic with flow from the user interface and describing the flow through the system and how elements should adhere to the information flow, which is beyond the scope of this paper.

## Object Model Application

In our object model, we will first enumerate all objects which are incorporated in our system, then assign to them data stores unique to their identity and functions available to each unique object.

Starting with users accounts of the system, each user account should have in the object model data which is to be used in association with their account. A unique username and a password, as well as the type of user their account is associated with. Each type of user should be represented with a separate subclass, carrying with it the functions available from the system to store/retrieve information from the server’s database. The different types of user are: owner, administrator, secretary, instructor, and client.

In addition to users, an object class should also represent the database with all possible information fields including those related to the client’s profile information, calendar information regarding times and dates of driving practice (along with the assigned car), credit card information used for payment, grades, notes by the instructors. All these fields need to be represented with GET and SET commands in the function of the class for our object model.

Each of the 10 cars should be assigned a unique identifier in order to help reserve them for driving instruction, and represented with a class in the model, with the functions to reserve and delete reservation. This should also be stored in the database and let access by authorized individuals.

The computer network itself is abstracted away but plays an essential role in the running environment of our system. One use for incorporating the computer system itself as an object is for the purpose of managing system updates via the admin console.

## Process and Object Model Comparison

The main advantage of the process model is that it focuses on what is to be done by the system, which will help developers to work on a functional approach to system design. The object model, in my opinion, will offer a better approach to the object-oriented design we expect the developers to follow, and will give us a better outline for what needs to be coded both regarding data objects and the functions which are available to that data.

It appears to me that the main aspects of the system requirements are the user accounts and their associated data and functions, and the information system itself, mainly the database which houses the information and the server-side software which accesses and modifies the database. Most of what lies between the user account and the database, where the code will run, is dependent upon the user and their level of authorization, governed by the credentials they enter when logging into the system.

When developing an information system, multiple models are used to flesh out the system, so it is an error to say that one model alone should be used for the development when in fact all models should be perceived for their unique value they add to the system. With a textual model in place, we can begin the process of making graphical diagrams which will help us better visualize the needs of the system and how to go about writing the code to perform the needed functions and fill in its associated data object requirements.