# CS 255 Model Application Short Paper

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## Process Model Application

     Process modeling is a description of the processes and flow of data in a particular system. It involves graphically representing the functions and processes that capture, process, store, and distribute information between a given system and its environment. “A business process model is a graphical representation of a business process or [workflow](https://www.ibm.com/cloud/learn/workflow) and its related sub-processes. Process modeling generates comprehensive, quantitative activity diagrams and flowcharts containing critical insights into the functioning of a given process, including the following: 1. Events and activities that occur within a workflow. 2. Who owns or initiates those events and activities. 3. Decision points and the different paths workflows can take based on their outcomes 4. Devices involved in the process 5. Timelines of the overall process and each step in the process 6. Success and failure rates of the process. (IBM 2021)

For the Driver Pass application, we created a Gannt chart to depict the process model. The Stakeholders at DriverPass identified several key things that they needed in their system. We have identified the following for our process model Gantt Chart: Timeline, events, tasks, and who will initiate these activities. The project will be started on Jan 11 2023. The 1st task will be to collect requirements for the system. The development team will have 13 days for this task, and will occur form 1/22/2023 until 2/4/2023. Next, the task of creating use case diagrams will occur, and this will happen from 2/11/2023-2/18/2023. The development team will have 7 days to complete this task. The team will also work on building activity diagrams for each use case. This task will run from 2/15/2023 until 3/9/20233. The next task the development team will work on is research interface designs. The team will be allocated 8 days for this, and this will occur from 2/27/2023-3/7/2023. After, the team will work on building class diagrams for the DriverPass program. The team will be allocated 8 days for this task, and this will occur from 3/1/2023-3/9/2023. The next task will be getting Customer Approval. The development team will have 1 day to complete this task, and this will occur on 3/10/2023-3/11/2023. Next, the Development team will build the DriverPass interface, and the team will have 12 days to accomplish this task. The team will have from 3/12/2023-3/24/2023. Next, the development team will link the database to the interface. This task will be allotted 10 days to accomplish and this will occur from 3/24/2023-4/3/2023. The next task the development team will work on is building the business logic. The development team will have 22 days and this will occur from 4/5/2023-4/27/2023. The next task the development team will work on is to test the system. The time allocated for this task will be 10 days, and occur from 4/27/2023-5/7/2023. After, the team will have 1 day to deliver the system, and this will occur on 5/8/2023. Finally, the team will have a sign off meeting with the stakeholders at DriverPass and this will occur on 5/9/2023.

As we can see, it is far more efficient to create a chart, depicting what tasks need to be accomplished, when, and by who. The Gantt Chart that was created accomplished this and it does so in a far more clear and concise way as opposed to simply listing requirements, who they will be delegated to, and when they are expected to be completed. The chart also clearly shows which tasks can be worked on simultaneously with other tasks, and which tasks are dependent on the completion of other tasks to be started.

## Object Model Application

   An Object model creates a visual blue print for a system or program’s classes, objects, functions, and how they interact. These visual blue prints utilize UML diagrams. The program will define its classes objects, and functions based on the purpose and tasks that are being  accomplished. A system using object oriented programing languages should utilize an object model in order to identify its classes and objects. Identifying these also involve outlying an objects, relationship, variables, and methods. Once the system’s objects are identified, designing the system becomes possible.

Object Modeling is important for system analysis and design for multiple reasons. For one, it aids in system development. Object modeling does this by identifying its classes and objects to create a system that adheres to customer requirements and addresses their needs. Another reason is that object models complement the object-oriented approach to designing software.

There are several stages of object modeling, and they include the following:

1. Use case diagram.
2. Object Diagram
3. Class Diagram
4. Sequence diagram
5. State transition diagram
6. Activity diagram.

     Diagrams can be useful for object modeling. It assists in identifying a system’s objects by helping the analyst think critically about the objects they would need in the client’s proposed system requirements.

For the Driver Pass application, we would need to consider the system’s functions, and what actors and objects would be in the system, and how they all interact. For the DriverPass application, we have identified 3 objects that would be necessary for the system that the stakeholders are referring to in the meeting. These 3 actors are Student, or Customer, Teacher, and Administrator. We need to consider these 3 actors in order to get an idea how the flow of the application would occur. These 3 objects have varying level of permissions, abilities and functions. 1st, we will consider the Student or Customer. The Object Model illustration would need to depict what data and functions the Student has access too. 1st, the user would need to log in. Once the proper credentials are provided, the system will be able to determine what type of account has logged in. The student would then have access to learning materials, lesson plans, and the ability to take tests. The student would also have access to the schedule and have the ability to sign up for a particular time slot if still available. That would be the extent of the Customer’s abilities.

Next, we must consider the flow of data for the Teacher. The Teacher would need to log in. Once proper credentials are inputted, the Teacher would then have the ability to learning materials and tests, similar to the Student account. The key difference would be the teacher can also add, update, or remove lesson plans. The Teacher can also have access to the Students’ test scores from their exams. The Object model would need to depict this flow for the Teacher from log on, to information that can be accessed by the teacher in addition to what the Teacher can add, update, and delete.

Finally, the next actor that would need to be depicted by the process model would be the Administrator. The Administrator would also need to provide their credentials at login. Once verified, the Administrator would have access to all information that the Teacher and Students have. The Administrator would have additional access, which would include the ability to track all scheduling updates, the ability to reset passwords, suspend accounts, both Students and Teachers, and the ability to add or delete accounts, in the event a Teacher was fired or Student left or stopped paying. The Object model would need to show this flow of processes and functions, from login, to access to course materials and information. It would also need to show how the Administrator would have the ability to reset passwords and add and delete accounts.

## Process and Object Model Comparison

The advantages of the Object modeling are that it aids in system development. Object modeling does this by identifying its classes and objects to create a system that adheres to customer requirements and addresses their needs. Another reason is that object models complement the object-oriented approach to designing software.

The advantages of Process Modeling include that it aligns operations with business strategy, it improves process communication, it increases control and consistency, it improves operational efficiencies, and it gains a competitive edge.

The question is not so much which model is better, but more or less which is appropriate to use in a specific circumstance. In this instance, with a project as large as the one as DriverPass is, the size of the development team, the time duration of the project, both Process Modeling and Process Modeling would be optimal. Utilizing both models would clearly lay out the expectations for team members for tasks and assignments. This is helpful so team members can coordinate with each other when possible, and that the have a clear indication of what is expected from each team member. By also using the object model, the team would have an understanding on how all of the objects functions and components of the DriverPass system, even during the beginning stages of the project. DriverPass would be wise to implement both models for a more successful outcome.

## References

1) IBM, IBM Cloud Education 10/1/2016. WHAT IS BUISNESS PROCESS MODELING?. Retrieved from  
https://www.ibm.com/cloud/blog/business-process-modeling