# CS 255 Model Application Short Paper

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## Process Model Application

Process modeling is crucial for understanding, analyzing, and optimizing the business processes associated with the DriverPass system.  The process modeling approach is a way of representing the business processes or workflows of an organization or a system using graphical tools like diagrams or flowcharts. For this application, we will describe how you would apply a process modeling approach to the DriverPass project.

Applying the process modeling approach to the DriverPass project would involve capturing and representing the flow of activities, tasks, and interactions that occur within the DriverPass system.

The first step would be to identify or define the scope and objectives of the project. What are the main goals and requirements of the DriverPass system? Who are the stakeholders and users of the system? What are the expected outcomes and benefits of the project? The next step would be to analyze the current state of processes and identify opportunities for improvement What are the pain points and challenges of the current processes? What are the gaps, inefficiencies, or risks in the current processes? What are the root causes of the problems and how can they be addressed? This could include identifying the inputs, outputs, and resources of the processes such as user registration, booking a driving test, scheduling lessons, conducting tests, and issuing licenses.

How well are the current processes meeting the objectives and requirements of the DriverPass project?

Followed by the sequence of activities, identify the logical order in which activities should occur. Identify dependencies and relationships between different activities. Choose an appropriate process modeling notation, such as the Business Process Model and Notation or the UML Activity Diagrams, to represent the processes visually. Helping design the future state of the processes. Consider how will the new system interact with the existing processes and systems. What are the goals and requirements expected and will they benefit or impact the operation of the new processes?

The last step would be to validate and clearly define the inputs required for each activity and the outputs generated. How well does the future state meet the objectives and requirements of the DriverPass project? This helps in understanding data flow within the system.

The advantages of process modeling would provide a clear and visual representation of how activities are conducted within the system. This will help in the communication and alignment of the vision and expectations of the DriverPass project among the stakeholders and users. Another advantage of process modeling is it helps identify and eliminate the waste, redundancy, or complexity of the processes, which can improve the efficiency, quality, or costs of the processes. Supporting the consistency and standardization of the processes helps with the continuous improvement and innovation of the processes.

The disadvantages of process modeling can be time-consuming and resource-intensive to create, maintain, and update the process models, especially if the processes are complex, dynamic, or changing frequently. Process models are also static representations, and they may not capture dynamic aspects of processes well. Real-world processes can be more fluid and adaptive. This modeling can be met with resistance or skepticism from the actors involved in the process keeping the system up to date can be challenging, especially in dynamic environments where processes frequently change.

Object Model Application

Object modeling is crucial for representing the classes, attributes, methods, associations, messages, events, states, and transitions of the objects with the DriverPass system Object modeling involves representing real-world entities and their interactions through the creation of classes, objects, and their relationships.

Object Modeling approach is a way of representing the entities, relationships, and behaviors of a system using graphical tools like diagrams or symbols. An object model can help identify and define the classes, attributes, methods, and associations of the system by showing the properties, operations, and interactions of the objects.

Applying the object modeling approach to the DriverPass project would identify the scope and objectives of the project. What are the main goals and requirements of the DriverPass system? What are the expected outcomes and benefits of the project? Start with defining the use cases of the system. Describing the main functions or features of the DriverPass system. Define the interaction diagrams and the state diagrams of the system. How do the objects communicate and collaborate with each other to perform the use cases? Consider the state diagrams of the system.

The advantages of object modeling allow for breaking down the system into modular components represented by classes. In modularity, each class encapsulates data and behaviors related to a specific entity (e.g., Student, Instructor, Schedule). This modularity facilitates code organization and reusability. Object-oriented modeling promotes abstraction by focusing on the essential characteristics of entities and their interactions. The modular nature of object modeling simplifies maintenance tasks. Updates or modifications to a specific functionality can be isolated to the relevant class, reducing the risk of unintended side effects in other parts of the system.

The disadvantages of object modeling, same as process modeling can be time-consuming and resource-intensive to create, maintain, and update the object models, especially if the system is complex, dynamic, or changing frequently. There is a risk of over-engineering if the object model becomes overly complex, therefore transitioning to an object-oriented paradigm may pose a learning curve for the development team.

To create the object models, I would use a standard graphical notation such as Unified Modeling Language (UML) or Object-Role Modeling (ORM) to represent the classes, attributes, methods, associations, messages, events, states, and transitions of the objects.

Process and Object Model Comparison

Designing the DriverPass system requires careful consideration of modeling approaches to effectively capture the system's requirements and functionality. A process-modeling approach focuses on the how of the system, while an object-modeling approach focuses on the what of the system.  A process-modeling approach describes the processes or workflows of the system, while an object-modeling approach describes the entities or objects of the system.

A process-modeling approach is more suitable for dynamic or complex systems, while an object-modeling approach is more suitable for static or simple systems.

In closing, a process- and an object-modeling approach have different strengths and weaknesses for addressing the DriverPass project. Depending on the scope, objectives, and requirements of the project, one approach may be more appropriate or effective than the other.

## References

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