# CS 255 Model Application Short Paper

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## Process Model Application

Starting with the client side, we would start by designing a Data Flow Diagram (DFD). Depending on the user type we would branch the processes relative to each type of user. A customer would be able to perform a set of functionalities on the system, from signing in to reserving lessons to taking the lessons and logging out. These processes will also have a set of subprocesses in order for them to be accomplished. On the other hand, the DFD would indicate how each process is accomplished by defining each step of the process. Since we have a lot of processes we would break down each major process to separate smaller designs so we gain more readability and simplicity. Another thing to consider is to keep our design consistent and follows pattern, so that when someone outside the team wants to read it, it would not cause any kind of confusion or misunderstanding. Consistency not only does it help us be more organized, but also it saves us time later on when the project becomes more complex.

Going to the server side of the application, a good approach to follow is reusability of processes and functionality. Thinking deep how a process can be performed and what other processes can be reused to perform a certain process, is key when designing the backend. Backend processes are more critical and should be more reliable, since the backend is the brains of the system and the frontend is only how it looks. For example reserving a course or an in-person driving lesson can both be under one process, which is reserving a product. What changes here is the type of product and how the system should change behavior upon the type chosen. This can be said by using a state of a process, and the state should change when input changes and thus other components. This type of thinking not only diminish the amount of processes that we need to design and then code, but also make the system lighter and smoother, less resources are being used and more productivity is being achieved.

## Object Model Application

Designing the Object Model is also a critical task when working on a big project. The object model is the visual representation of the system’s objects, actions and associated attributes. First we can start by identifying the objects, like users, reservations, courses, transactions etc… Then we go a step further with the objects, what information do we want these objects to hold ? For the USER object it can be his name, email, last\_name, password, address etc … and for RESERVATION it can be USER\_INFO, COURSE\_INFO, date\_created, reservation\_date, etc …

Notice how in the examples above we can see some type of relationship between user and reservation, this is one of the benefits of object models, it can identify relationships between different areas in the system and how they can communicate together. In the RESERVATION object we see a composition, we notice that the transaction is made of the user and the course. So what we are going to do next is identify the relationships between the different object we have identified earlier.

After these 3 steps are accomplished we can go back and verify what we have came up with, with the requirements and the process model. If any gaps have been found we can correct by adding more or if some redundancy has been identified we can reduce keeping everything clean.

## Process and Object Model Comparison

The advantages of the Process model are many. We can start by saying that the process model is the model to look at when we want to know how the system works. Process model give us the ability to inspect the system from a top view without digging into details and minor functionalities. It shows us how the system perform the task whether to sign users in or to save a reservation, it demonstrates the steps taken to do these tasks. An analyst can view the gaps and identify redundancies just by looking at the process model and analyzing it. Without going into code, implementation and technicalities the system is show in a blueprint in the process model.

Some disadvantages of the process model are that it may cause some confusion when changes are made especially in an agile project where uncertainty and changes are encouraged. Also sometimes the process model can be so difficult to come up with when the requirements are uncertain and decisions are yet to be taken. Last but not least the risk of over analysis in the process model can take the model to some complex and unclear designs.

The Object model shows the different aspects of the project, how classes are defined and what attributes they hold, how they are communicated and what relationships lies between them. The object model shows us in a technical dimension what the system consists of, and how data is managed and organized. The object model allow the team to look at the system from a higher perspective and identify what each segment is consisted of and what functionalities lies within. It also reduce the development time and cost by building a blueprint for developers to follow, and it improves the quality of the system due to program reuse.

However in some projects complexity of the object model can lead to confusion and reduce productivity, since the team will rely on the model to understand the project. Working on an agile project, where requirement changes are encourages, which directly affect the object model by adding or removing classes and relationships from it. This practice may result in extended times to adjust and update the object model to meet the requirements.

## References

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