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**Course: CS 255 System Analysis and Design**

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**Assignment: Module 4**

**Prompt**

Hamp Crafts is a family-owned craft store that has been in business for decades. Its current operations are limited to its physical (brick-and-mortar) storefront. Recently, the owners have determined that one of the best ways to gain additional revenue is through online sales. You have reassured Hamp Crafts’ owners that adding in an online storefront will work with their current processes. In this assignment, you will review an object model, specifically a UML class diagram for the new online store. You will interpret the diagram and reflect on how well it meets Hamp Crafts’ needs.

1. First, review Hamp Crafts’ needs for their online storefront. Then review the UML class diagram for the new online storefront. A version with alternative text is also available: [Module Four Online Shopping Cart Object Diagram With Alternative Text](https://learn.snhu.edu/content/enforced/1196074-CS-255-T2795-OL-TRAD-UG.22EW2/course_documents/CS%20255%20Module%20Four%20Online%20Shopping%20Cart%20Object%20Diagram%20With%20Alternative%20Text.pdf?_&d2lSessionVal=Elzqy73C8lpq8gD5tOhB1lunv&ou=1196074).  
     
   Hamp Crafts would like customers to be able to create an account with their shipping, billing, and contact information. For customer orders, Hamp Crafts would like to accept credit and debit cards for transactions. Hamp Crafts plans on using an established credit card vendor service (e.g., Square, Shopify) to receive customer payments. Once a transaction is complete, the customer should receive a notification based on the information in their personal profile regarding order status and confirmation. On the administrative side of the online storefront, Hamp Crafts should receive an alert of the transaction. Customers should be able to check the status of their order any time online from their personal account profile under order history. The business owners also need an administrative back end for customer support and updates to customer information and the website.
2. **Interpret the object model** for the new online storefront by responding to the following prompts:
   * What are the different functions of the online storefront? How are they represented in this type of model?

A UML diagram, UML stands for Unified Modeling Language. UMLs assist developers by improving integration between structural models and behavior models. They also add the ability to define the hierarchy of classes in a particular system, and how various subcomponents interact. Functions are represented in the lower class block. For example, when looking at the Hamp Craft online store UML, the functions are on the bottom of the class block. The “Shopping Cart” class block contains 4 functions, which are addCartItem(), updateQuantity(), viewCartDetails(), checkout(). The “Customer” class contains 3 functions, which are register(), login(), updateProfile, the “User” class contains the function verifyLogin(), the “Administrator” class contains the updateCatalog() function, the “Shipping Info” class contains thefunction updateShippingInfo() function, the “Order” class contains the placeOrder() function, and the “Order Details” class contains the calcPrice() function. Classes that have a “+” next to them are functions that are public and they can be accessed outside of the specified class when an instance of that class is called on. If a function has a “-“ that function is private and cannot be called upon by a different class with the same attributes.

* + What are the different classes of “users” represented by this object model? What are the associations between these classes?

The two “users” classes are Administrator and Customer. Both Administrator and Customer inherit the following properties from the User Parent Class: a -userid: string, a -password:string, a -loginStatus: string, and a -registerDate: date. These properties are private, so one instance of a class that is created could not access the information from the other instance, and would only be available to the class that possessed that information.

* + How would the objects “use” their respective variables and functions?

Each instance of a class has the ability to access its functions within a parent class that it inherits. For example, the Customer class inherits functions from the User parent class. By accessing the functions of their class, the class has the ability to complete functions that are made accessible by the parent class. The variables of a particular object class are accessed through these functions as well. They can only be used in an instance of the object itself if they are private functions or variables. Access to any private variables from outside the class would not have that ability and would be forbidden, and only functions and variables within a particular class may access or change them.

* + Does this object model capture all of Hamp Crafts’ desired functionality? Why or why not?

Hamp Craft’s UML model does well in depicting how an order is processed which would be that a customer puts items in a shopping cart, the order is processed, shipping is then determined, and order details are given once the order is processed. There are some issues with the UML Model, however, that would need to be addressed. For example, Hamp Craft could add functions, such as an order history. This would be important for Hamp Craft to possess in order to determine what inventory they need restocked. This feature could be added in the Order Details class.

* + The above diagram uses a solid diamond shape to represent a form of aggregation. What type of aggregation does this represent? What does it imply about the relationship between the classes? Why is a solid diamond the appropriate choice here?

A solid diamond shape is displaying a composition and non-shared dependency between the classes. A non-shared dependency implies that the parent class has ownership over the child class, and not vice versa. This seems to be an appropriate choice for what Hamp Craft is attempting to accomplish. For example, the Customer class is the parent class between the Shopping Cart class and the Order class. Shopping Cart class and Order class cannot exist without the Customer class, therefor these classes share a non-shared dependency between the Customer class. This also occurs in the Hamp Craft UML between the Order parent class and its child classes, which are Shipping Info Class, and Order Details class. Without the Order class, the Shipping Info class and Order Details class cannot exist.

1. Finally, think through the two different models you’ve explored for Hamp Crafts’ systems: a process model and an object model. Then **compare these models** by responding to the following prompts:
   * How well do you think a process model describes the system? What information does it make easier to understand? What aspects of the system are more difficult to understand or are not represented?
   * How well do you think an object model describes the system? What information does it make easier to understand? What aspects of the system are more difficult to understand or are not represented?

    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.

     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. The differences between the two are that an object model shows a system’s classes and objects and a process model depicts a system’s processes and functions.

Both the Object Model and Process Models have their purpose, and some instances it would be beneficial to use the Object Model and other instances it would be better to use a Process Model. Hamp Crafts utilization of their process model from Module 3 was effective in displaying the behaviors of how information flowed to the shipper. In Module 4, Hamp Crafts was effective in utilizing object modeling in portraying the various Classes, objects, and functions and see a clear visual of how they interact with each other.