**Object-oriented design and Analysis Assignment-2**

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**Question 1: - In this chapter, we defined and discussed stakeholders and actors. Describe the difference between an actor and a stakeholder. What are the differences between them?**

* **Can a stakeholder also be an actor or vice versa?**

**Answer: - Stakeholders-** Stakeholders are persons, groups or companies with an interest in the result of an organization or plan. Their participation may be limited; yet, however, they are affected by the system’s efficiency and outcomes.

For example, customers, suppliers, and owner Rick are among the stakeholders in the PowerPoint presentation Rick’s Guitars. The system’s design and operation are influenced by the needs of each of these stakeholders, including customer happiness, sales efficiency and inventory management.

**Actors-** On the other hand, actors are something with behavior such as person, computer system or technician. The salesclerk at Rick’s Guitars is one example; they handle tasks such as processing client transactions, maintaining stock levels, and inspecting inventory. Because they supply the essential input and feedback that affect the behavior of the system, actors are essential to its operation.

The difference between stakeholders and actors are: -

1. Connection with the organization: - To do their jobs, actors interact directly with the system. They could enter sales data or oversee inventories, for example. Instead of interacting directly with the system, stakeholders may choose to focus on the consequences of its functionality, as they are primarily concerned with the system’s overall performance.
2. Focus on the role: - Actors are in the position of carrying out tasks and have well-defined responsibilities inside the system. On the other hand, stakeholders adopt a more comprehensive perspective, highlighting the project’s overall success, which includes criteria such as company performance, customer happiness, and consistency with strategic goals.
3. Participation: - Whereas stakeholders usually focus on the long-term effects of system performance and strategic interests, actors are involved in the system’s daily operations.

Yes, a stakeholder can also take on the role of an actor, and an actor may be a stakeholder.  
  
Rick is an example of both an actor and a stakeholder because he owns the guitar store. He handles activities like inventory control and sales processing directly through direct system interaction and has a stake in the company’s success. Similarly, although their primary role is that of an actor in transaction processing, salesclerks can also be seen as stakeholders because their performance and job satisfaction are dependent on the performance of the system.

**Question 2: - When identifying use cases, we find a recurring pattern. For any type of object—like inventory items for Rick —we will usually have to create an item, retrieve an item, update an item, and delete an item. These are called the CRUD operations. There are three options for writing use cases in this situation:**

**A. Write a separate use case for each operation.**

**B. Write one use case for all the operations (a CRUD use case).**

**C. Omit the use cases from the specification.**

**Which of the choices do you think is most appropriate in general? Why?**

**Answer: -** According to the PowerPoint presentation, I think option B is the most appropriate answer.

1. **Combining Similar Tasks: -** In the chapter 2 PowerPoint presentation, the goal is to write brief, redundant-avoidance, value-driven use cases. For example. When the Rick’s Guitars system is used to manage inventory, the processes for adding removing, updating, and retrieving guitars are quite similar: -

* Create: Adding a fresh guitar to the collection
* Retrieve: Examining a guitar’s information within the system.
* Update: Changing a guitar’s listing price or description.
* Delete: Removing a guitar that has been sold or discontinued from the stock.

The fundamental process for these actions is typically the same: the salesman or inventory manager connects with the system, inputs the product ID (UPC or serial number), and the system executes the required action (such changing the price or obtaining the description). You may prevent repeating similar actions across several use cases by combining these activities into a single use case.

1. **Documentation Made Simpler: -** Slide 48 presents a detailed example of managing several phases in a single flow, which is the use case “Rent Video”. All actions (such as inputting a video ID, processing payment, and generating a receipt) are handled under a single detailed use case, rather than being divided into distinct use case for each job.

A similar method works best for CRUD tasks. It may result in needless duplication and more complex documentation if we split out each action (Create, Retrieve, Update and Delete) into individual use cases. This goes against the suggestion in your materials to write clear and suggested use cases. Using option B makes it possible to handle all CRUD activities in a consistent way, keeping the documentation clear and easy to understand.

1. **Managing Failures and Differential Flows: -** Slides 49 provide an explanation of how use cases should manage extensions or alternate flows (like system outages). By utilizing option B, you may record all successful and unsuccessful outcomes in a single use case for CRUD operations. This facilitates the definition of what occurs, for instance:

* Retrieval failed: the product ID could not be located.
* A product’s deletion is unsuccessful as it is connected to an ongoing transaction.
* When data entry mistakes occur, the inventory update fails.

It is easier to maintain the use case when all these variants are handled in a single use case, since it eliminates the need to duplicate failure situations across several documents.

1. **Ability to Adjust for Upcoming Improvements: -** There are future plans to add more goods to my freelancing work for the Point of Sale (POS) system. The CRUD functionality of the system may be made sufficiently adaptable to accommodate new product kinds without requiring modifications to the use case structure by employing Option B.

Slide 50, for example talks about open concerns and potential developments, further emphasizing the necessity of flexibility. For each new product category, a single CRUD use case ensures long-term scalability by allowing the system to expand without the need to rewrite several use cases.

1. **Preconditions and Postconditions: -** When the use case includes linked actions, preconditions and postconditions may be recorded quickly, as demonstrated by the fully clothed use case examples in the PowerPoint slide 48. Typically, system initialization and actor authentication (as demonstrated by the cashier in Rick’s Guitars example) are requirements for CRUD operations. The postcondition would guarantee that, in accordance with the action carried out (e.g. adding, retrieving, updating, or removing a product), the database has been updated. These common preconditions and postconditions may be simply defined without repetition by writing a single CRUD use case.

**Question 3: - Name all the actors that may be involved in the final system in Chapter 1 (Rick’s Guitars).**

**Answer: -** All the actors that may be involved in the final system in Chapter 1 (Rick’s Guitars) are: -

1. **Customers: -** Users engage with the system by looking for guitars according to factors like price, model and kind. They start the transaction process by buying guitars and use the inventory system to locate appropriate selections.
2. **Salesperson: -** By locating the needed guitar models, confirming inventory levels and processing purchases, the salesperson helps customers by using the system. They operate the system as the main operator.
3. **Rick (Store owner): -** Rick utilizes the system as the owner to keep an eye on sales figures, manage inventory and make sure everything works well in the business. Based on system data, he may also update the inventory and make decisions regarding management.
4. **Inventory Manager: -** Adding new guitars to the system, maintaining stock levels, and changing inventory data (such as price and description) fall within the scope of this actor. Rick might be able to fill this position in his own small firm.
5. **Supplier: -** A supplier of guitars to Rick’s Guitar shop. Their involvement in adding fresh guitar stock to the system may be involved.

**Question 4: - Create a fully dressed/formal use case called “Process Sale” from the information provided in Assignment 1. Using the example from the PowerPoint slides, slide 42 in Chapter 2 PowerPoints contains a description of what is placed in each section of a fully dressed use case.**

**Answer: -** The below is the fully dressed/formal use case called “Process Sale” from the information which was provided in Assignment 1: -

Fully Dressed Use Case: **Process Sale**

**Use Case Name:** Process Sale

**Level:** User Goal

**Primary Actor:** Clerk

**Preconditions: -**

1. Brand, model, price, UPC/Serial Number, and product description are all included in the first inventory that is entered into the system.
2. Ready to handle transactions, the clerk has logged into the system.
3. All payments may be handled using the cash drawer, which is provided.

**Postconditions: -**

1. The sale has been successfully entered into the system, and the inventory has been updated.
2. It applies and calculates the appropriate tax amount.
3. Together with the change given to the customer, the system creates a receipt that lists the goods that were purchased, the subtotal, tax, total and amount.

**Stakeholders and Interests:**

1. Clerk: wants the inventory to be managed and sales to be processed by the system precisely and fast.
2. Customer: anticipates a smooth transaction and precise total calculation, tax included.
3. Tax: calls for accurate tax calculation and collection for every sale.
4. Stakeholder: desires to keep a current inventory and track sales.

**Make Success Scenario (or Basic Flow)**

1. Customer: bring the items they have chosen to buy to the cashier
2. Clerk: inserts or retrieves each product’s UPC/Serial Number.
3. System: shows each product submitted along with the price, running total and description.
4. Clerk: Continue steps 2-3 until every product has been added.
5. System: calculates the tax, grand total and subtotal.
6. Clerk: asks for the payment in cash from the client.
7. Customer: tenders’ cash
8. System: depending on the amount offered, determines and shows the total change that is owed.
9. System: produces a receipt with the goods listed, the subtotal, the tax, the total and the amount of changed owed.
10. Clerk: closing the deal by giving the customer the receipt and change.

**Extensions (or Alternatives):**

1. Step 2: The clerk is alerted by the system to manually enter the product data or verify inventory, if the UPC/Serial Number cannot be found.
2. Step 7: The clerk is prompted by the system to seek the remaining payment if the customer has insufficient cash.

**Special Requirements:**

1. You can only pay with cash on the system.
2. For every sale, the correct tax rate must be given.

**Technology and Data Variations:**

1. The clerk has the option to manually input the UPC or serial number.

**Frequency of Use:**

Several times a day, as each transaction in the shop necessitates this procedure.

**Open Issues:**

1. Should the system allow cards?
2. Are discounts on items allowed by the system?