The University of Iowa

CS:2820 (22C:22)

Object-Oriented Software Development

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System Sequence Diagrams

by
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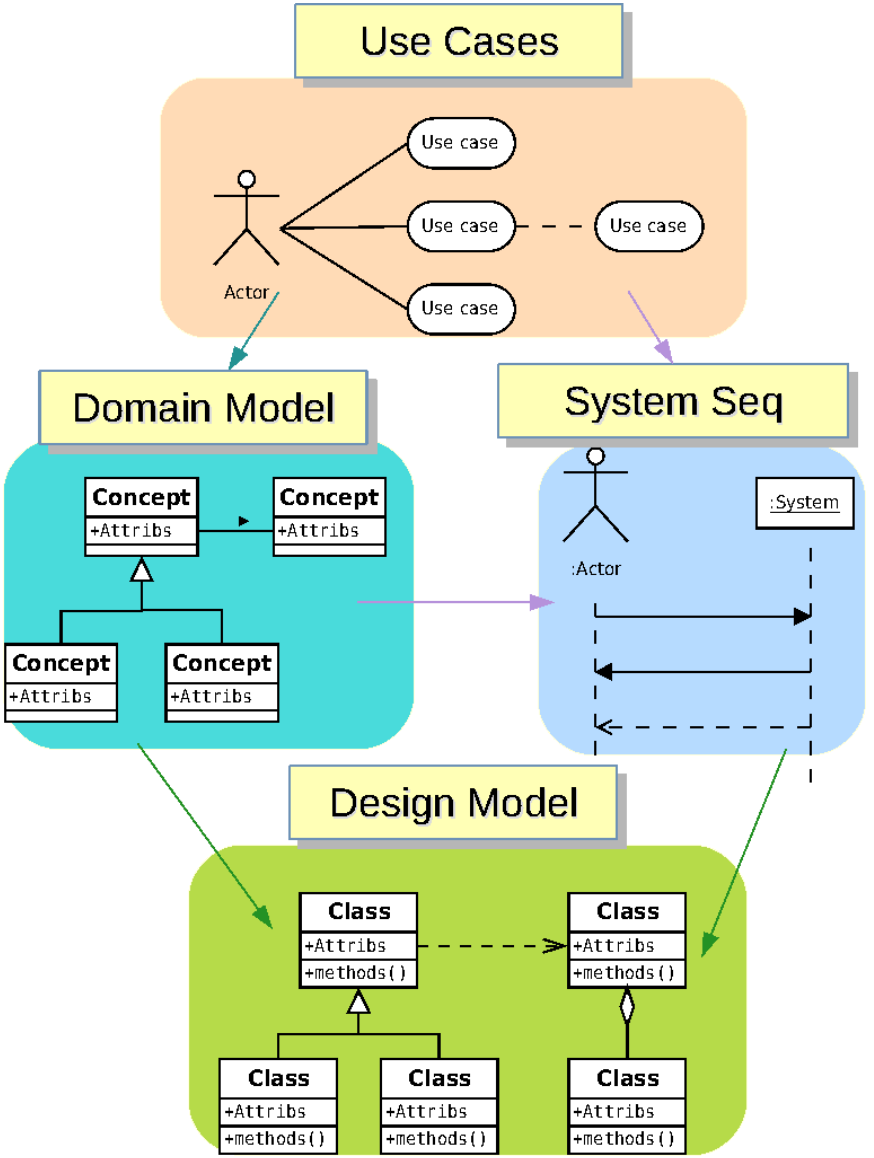
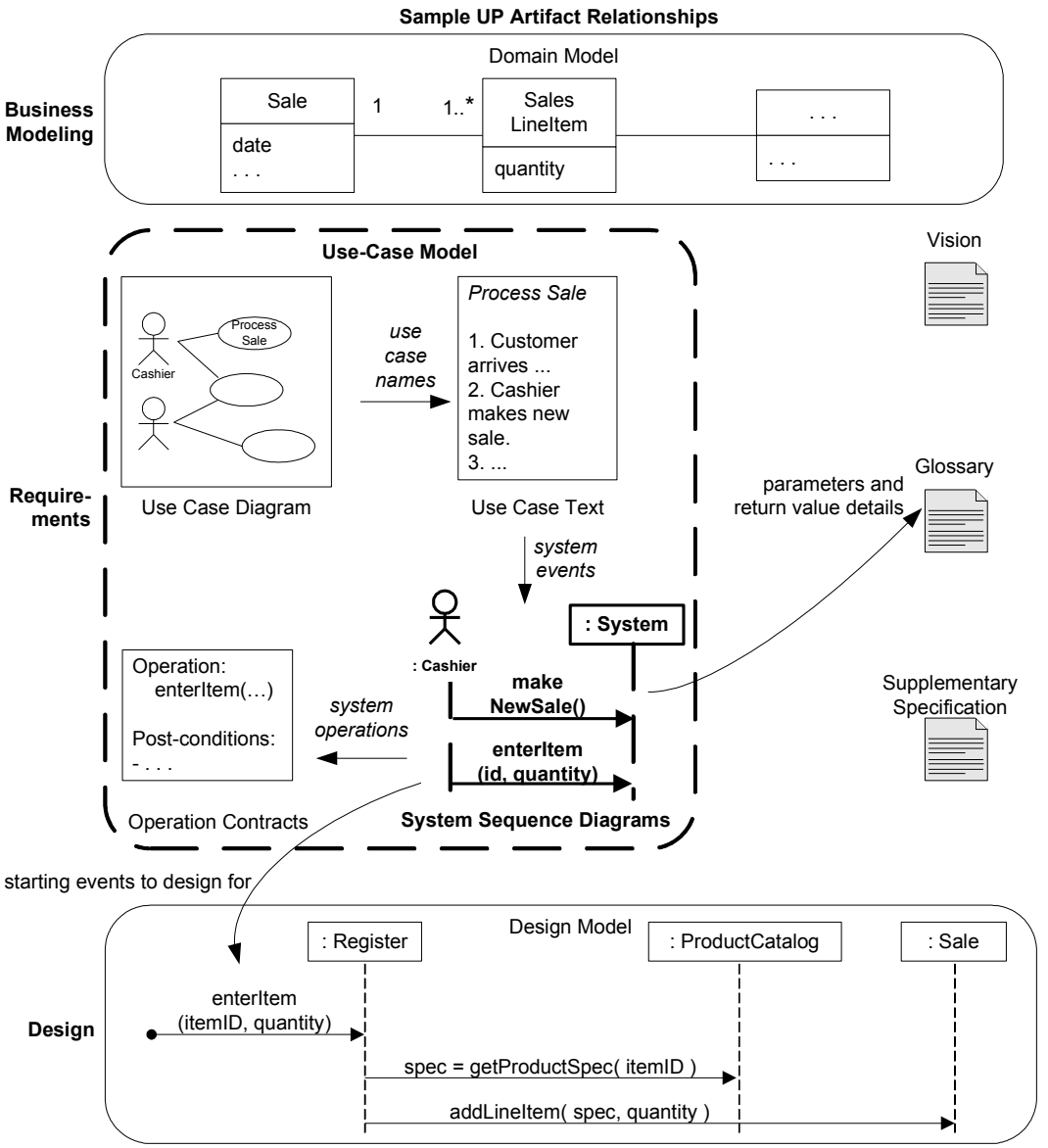
Design road

- We have described the Domain Model
- We now describe the System Sequence Diagram(s)
- Based on both of the above, we will create the Design Model



Design road

A more detailed design road for the Unified Process



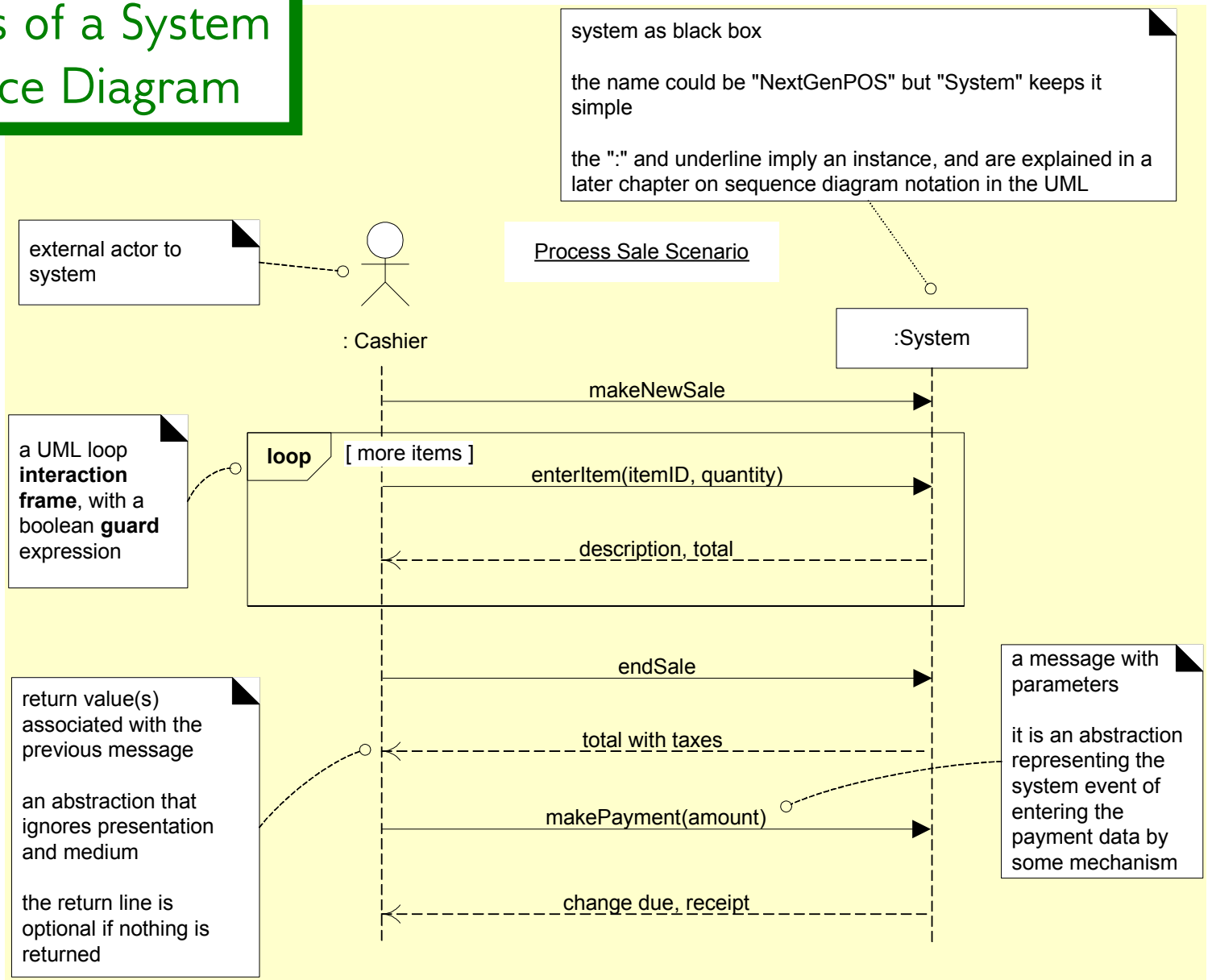
Question: can you explain this layout?

System Sequence Diagrams

- We revisit the Use Cases
- The Domain Model did not model how Use Cases unfold with the system
- **System Sequence Diagrams** (**SSD**) model how interactions (incidents, events) unfold
- Domain Model used simplified Class Diagram
- SSDs use simplified Sequence Diagrams

System Sequence Diagrams

Elements of a System Sequence Diagram

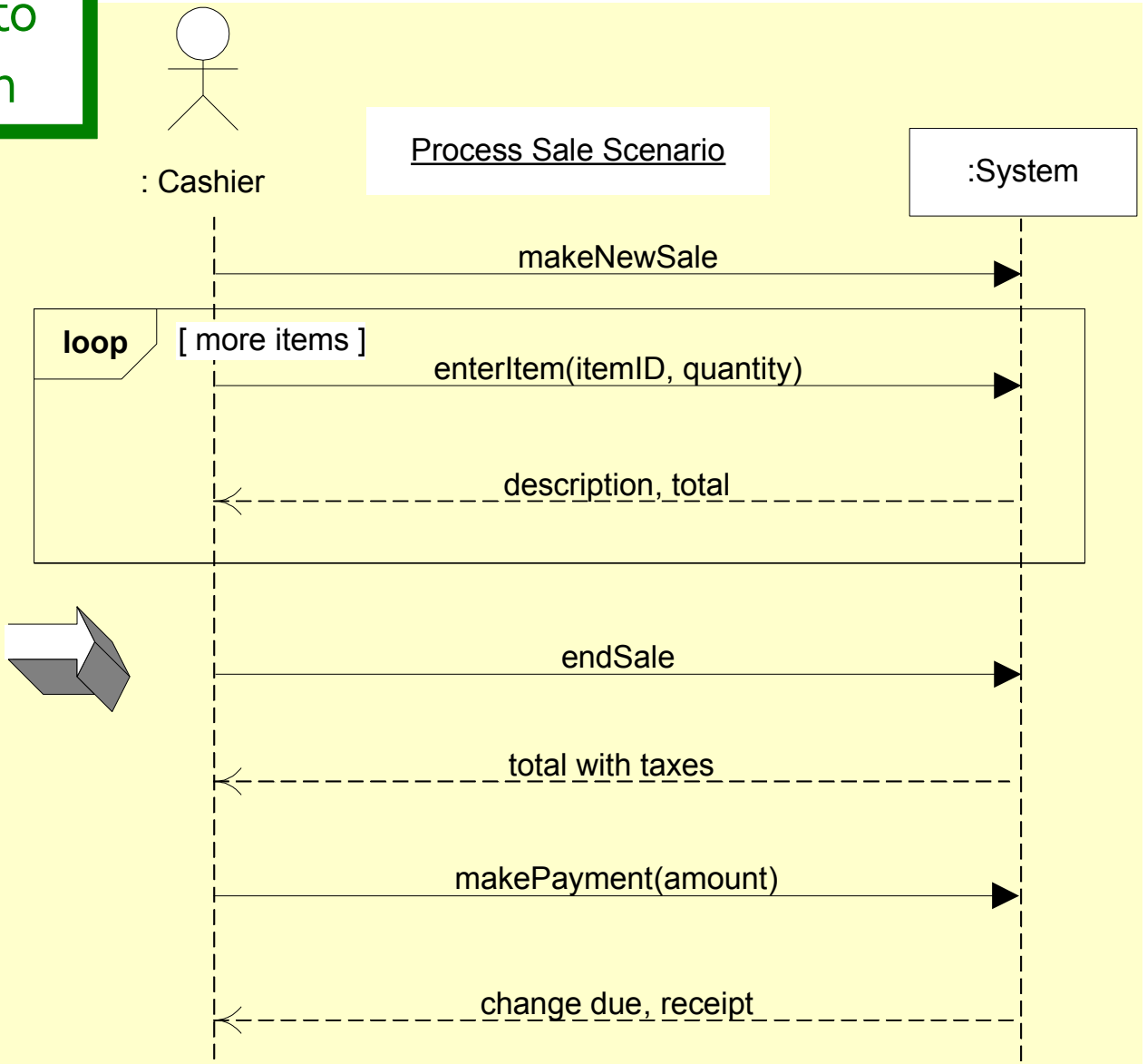


System Sequence Diagrams

Mapping from Use Cases to System Sequence Diagram

Simple cash-only Process Sale scenario:

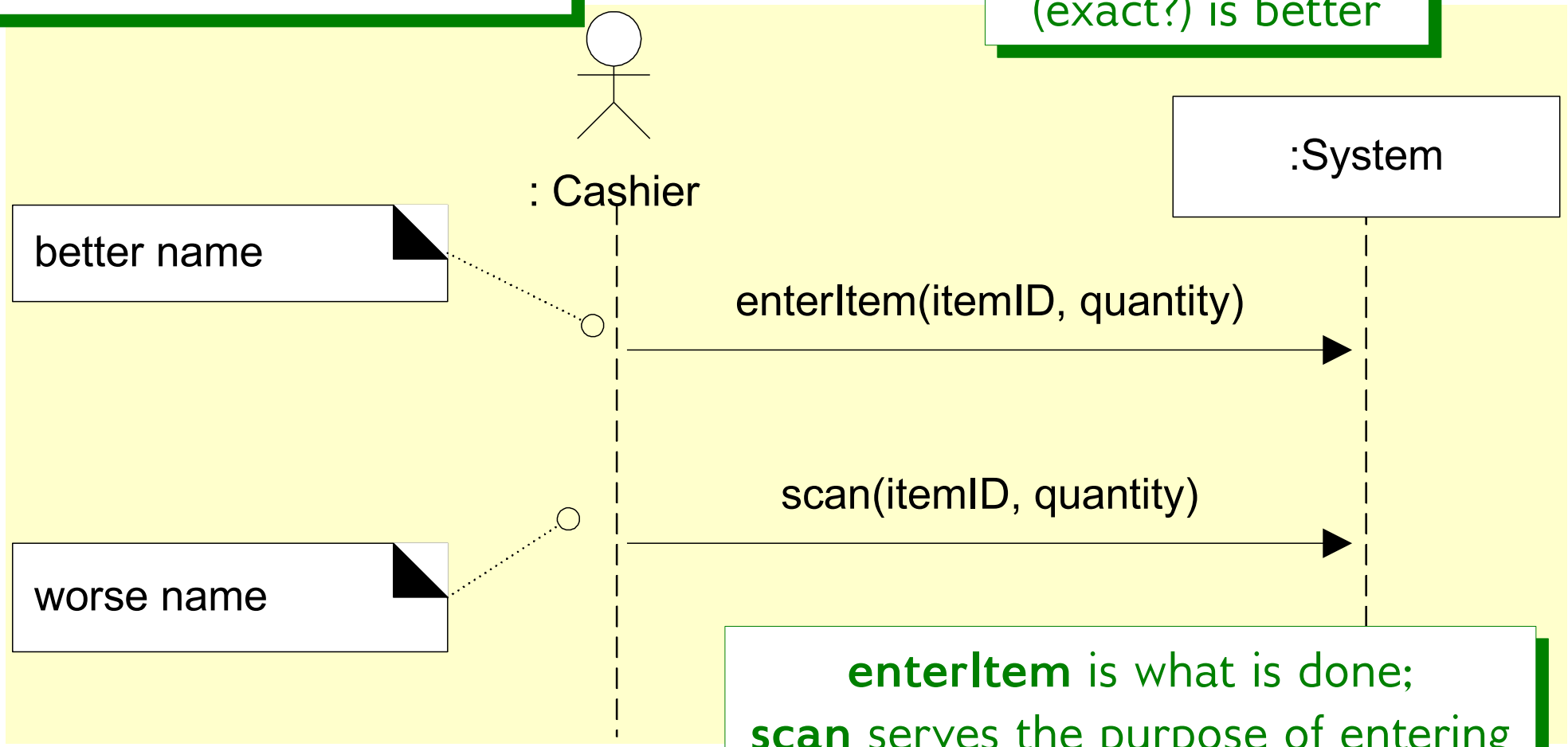
1. Customer arrives at a POS checkout with goods and/or services to purchase.
2. Cashier starts a new sale.
3. Cashier enters item identifier.
4. System records sale line item and presents item description, price, and running total.
Cashier repeats steps 3-4 until indicates done.
5. System presents total with taxes calculated.
6. Cashier tells Customer the total, and asks for payment.
7. Customer pays and System handles payment.
...



System Sequence Diagrams

Naming: wording should be consistent with the domain!

Also, being specific (exact?) is better



enterItem is what is done;
scan serves the purpose of entering an item, and is system related (bad)

More on the purpose of SSDs

- SSDs are part of the Use Case analysis
- Draw an SSD for a main success scenario of each use case, and frequent or complex alternative scenarios
- SSDs allow for **black box** description of the behavior of the system
- SSDs can also be used to illustrate collaborations between systems (*other actors, no?*)

More on the purpose of SSDs

- SSDs are seldom used in the inception
  - If used, it is for early cost estimation
    - *I mentioned that this is very hard and unreliable!*
- SSDs are used in the elaboration for
  - Clarify major operations
    - *Think about priority requirements, value*
  - Write operation contracts
    - *More on this later*
    - *Think about testing as well*
  - Support ongoing estimation
    - *Again, a hard task*

Credits

Notes and figures adapted from

Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development by C. Larman. 3rd edition. Prentice Hall/Pearson, 2005.