

# Relationship between System Sequence Diagrams and Use Cases

## System Sequence Diagram (SSD)

**System Sequence diagram Definition:** A System Sequence Diagram is an artifact that illustrates input and output events related to the system under discussion. They are input to operation contracts and object design. System Sequence Diagrams are typically associated with use-case realization in the logical view of system development. Sequence Diagrams (Not System Sequence Diagrams) display object interactions arranged in time sequence.

## Sequence Diagram

Sequence Diagrams depict the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the system. Sequence diagrams can be used to drive out testable user interface requirements.

## What are System Sequence diagrams?

A System sequence diagram is a picture that shows, for one particular scenario of a usecase, the events that external actors generate, their order, and inter-system events. All systems are treated as a Black-box; the emphasis of the diagram is events that cross the system boundary from actors to systems.

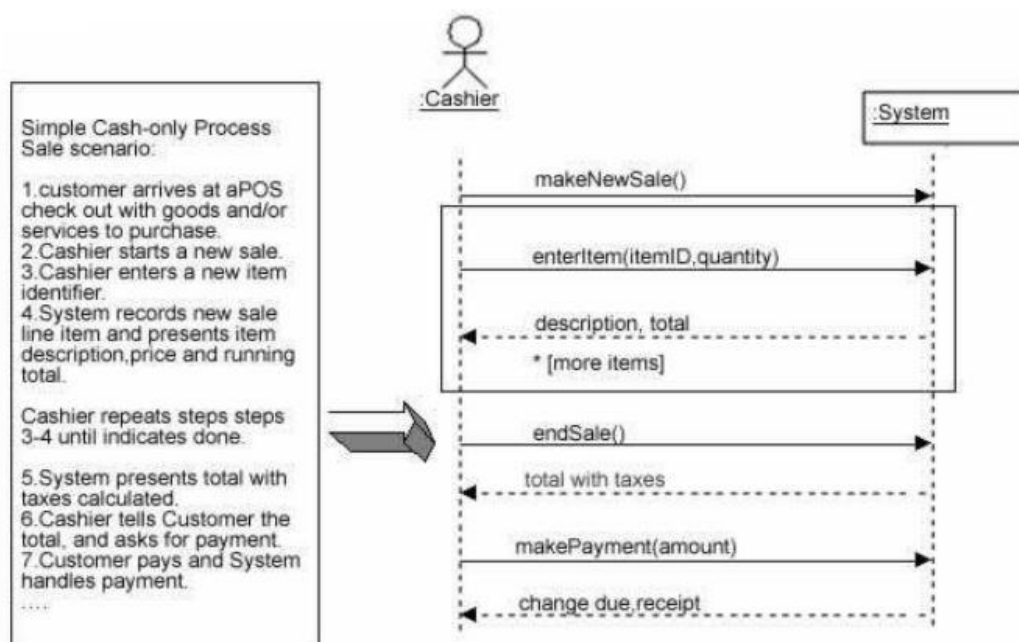
## Relationship between System Sequence Diagrams and Use Cases:

System Sequence Diagram is generated from inspection of a use case.

## Constructing a systems sequence diagram from a use case:

- Draw a line representing the system as a black box.
- Identify each actor that directly operates on the system. Draw a line for each such actor.
- From the use case, typical course of events text, identify the system (external) events that each actor generates. They will correspond to an entry in the right hand side of the typical use case. Illustrate them on the diagram.
- Optionally, include the use case text to the left of the diagram

## SSDs are derived from Use Cases



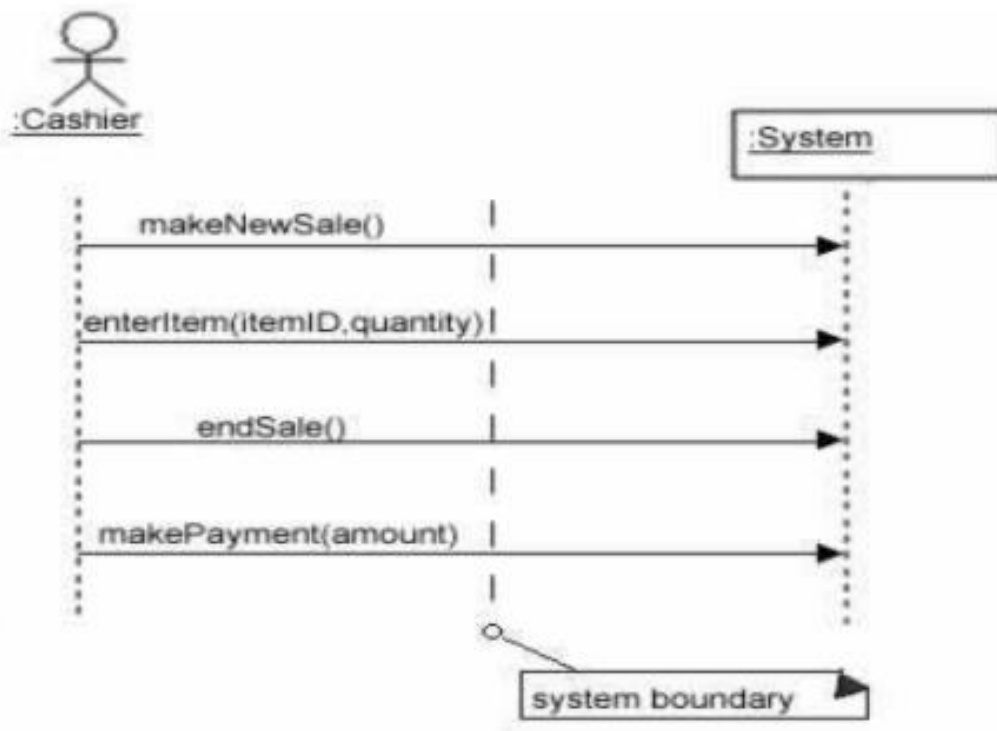
## System Events and System Boundary

### Identifying the System events:

Determine the actors that directly interact with the system.

In the process Sale example, the customer does not directly interact with the POS system. Cashier interacts with the system directly. Therefore cashier is the generator of the system events.

### Defining the System Boundary



### Naming System Event and System Operations

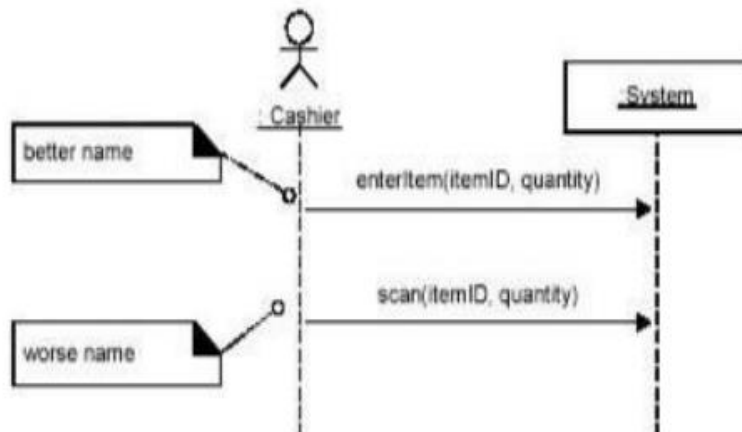
System events- They are external input events generated by an actor and they initiate a responding operation by system. System events should be expressed at the abstract level of intention rather than in terms of the physical input device.

Which is better, `scan(itemId)` or `enterItem(itemId)`?

"enteritem" is better than "scan" (that is, laser scan) because it captures the intent of the operation while remaining abstract and noncommittal with respect to design choices about what interface is used to capture the system event. It also improves clarity to start the name of a system event with a verb (add..., enter..., end..., make...), since it emphasizes the command orientation of these events.

**System operation**-Operation invoked in response to system event.

## Choose an Event and Operations Names at Abstract Level



## Modelling SSDs involving other external systems

SSDs can be used to illustrate collaborations between systems, such as between the NextGen POS and the external credit payment authorizer.

### SSDs and the Glossary

The terms shown in SSDs (operations, parameters, and return data) are terse. These may need proper explanation so that during design work it is clear what is coming in and going out. If this was not explicated in the use cases, the Glossary could be used. For eg: Changedue, receipt – It is a vague description and a complex report. So the glossary can have a receipt entry, which shows sample receipts and detailed contents and layout.

### SSDs within the UP

Inception—SSDs are not usually motivated in inception.

Elaboration—Most SSDs are created during elaboration, when it is useful to identify the details of the system events to clarify what major operations the system must be designed to handle, write system operation contracts and possibly support estimation.