14.4 USE CASE DIAGRAM

A system runs through various functions, applications, transactions and features. A system may be an application or small process with specific output contributing to the system goal. The systems are activated by users of the system. The user could be an insider or an outsider to the system. Both have a role and responsibility in the system. They contribute towards the goal achievement of the system or are benefited by the system. In TSD, with the SSAD approach, the system is viewed with what it does and not how it does it. In OOSAD, the question is asked: How does the system work? And the answer is sought through processes run by the users. These processes are modeled in the use case, and the situation in which the user plays this role is called a scenario. Each situation scenario has preconditions and post conditions, when a use case is taken up for execution.

Use case model is a representation of sequence of transactions initiated by the user (actor) from outside the system. In the process, the transaction uses internal objects to take the transaction to completion. Use case defines and describes what happens in the system in logical order, termed as system behaviour. They represent the flows of events that the user triggers. The user/actor is anything that initiates or triggers the action in the system.

It is not necessary that the user be a human being. It could be an external hardware like a barcode reader, a card-swiping machine, an ATM, or any other system with an interface. Users can be of the same kind, type, role and responsibility performing the same use case. Members of the library or club, ATM card holders and clerks in accounts department are users of the same kind and type, with the same roles and responsibilities in their respective use cases.

Use case diagram is a graphical presentation of a user's view and a developer's understanding of transactions is performed in the case scenario. A use case is modeled by a

- Boundary or frame
- Line of communication of participatory association between actor(s) and the use case
- Transaction steps
- Generalisation among use cases.

The symbols used in drawing use case models are shown in Fig. 14.12.

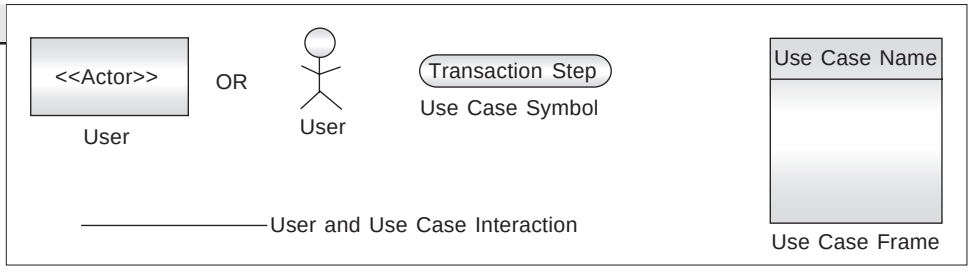
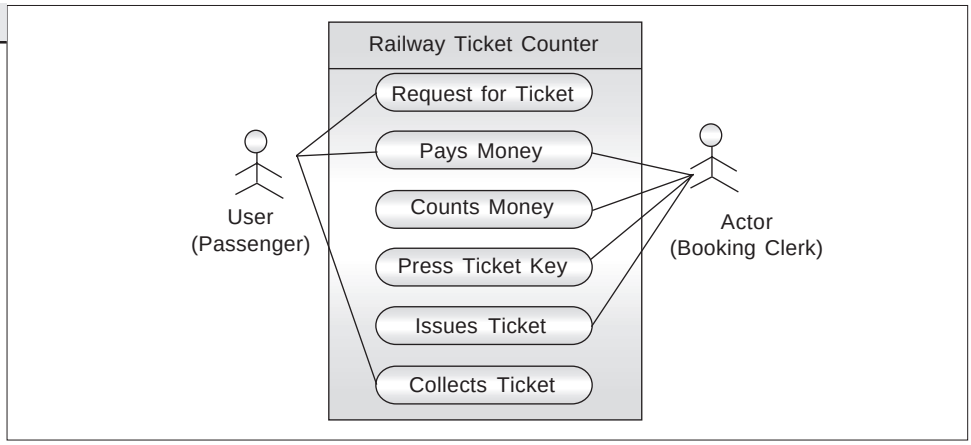


Fig. 14.12 *Use Case Model Symbols*

Figure 14.13 shows an illustration of a use case model diagram, representing a case scenario of buying a ticket at the railway ticket counter.

Fig. 14.13
Use Case Illustration



Some action/transactions are initiated by either user or actor, and some actions are one-to-one interactive. The request for a ticket is done by a passenger. But in the transaction pays money, both passenger and clerk participate.

A use case may begin with no preconditions or with some preconditions. It concludes with the achievement of a specific goal. In our example, that the ticket counter should be open and empty is a pre-condition. If it is not, then the passenger waits in a queue. The conclusion of use case is that the passenger collects the ticket and walks away.

In this use case, the passenger communicates to the clerk the destination for the ticket. The clerk communicates the cost of the ticket. These steps establish a communication relationship between the clerk and the passenger. In the execution, the clerk uses the ticket-vending machine and the tariff card. You will notice that use case steps are executed in a logical order. In some cases, a single user is involved; in some, there could be more than one. There are no limits on users on either side of the use-case frame. For example, in our illustration of railway ticket booking, on request of the ticket, a clerk will collect money and issue a token to the passenger; the second clerk will issue the ticket, obtaining the token from the passenger.