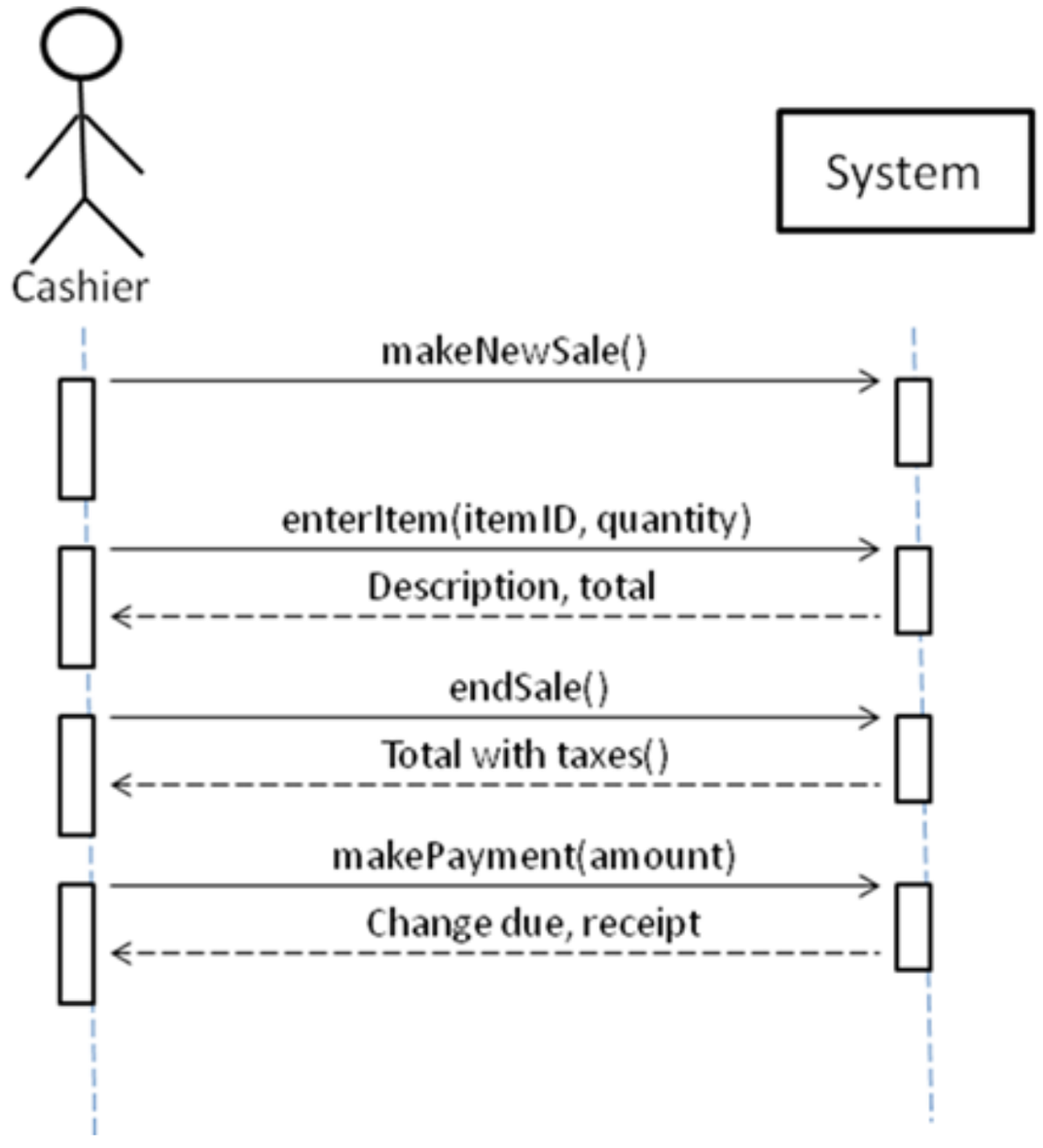
SYS466
Analysis and Design

Lecture 9 - Dynamic Modelling Summary
School of Information and Communications Technology
Seneca College

“…interaction of building blocks with each other and the outside world to satisfy behavioural requirements of a system…”

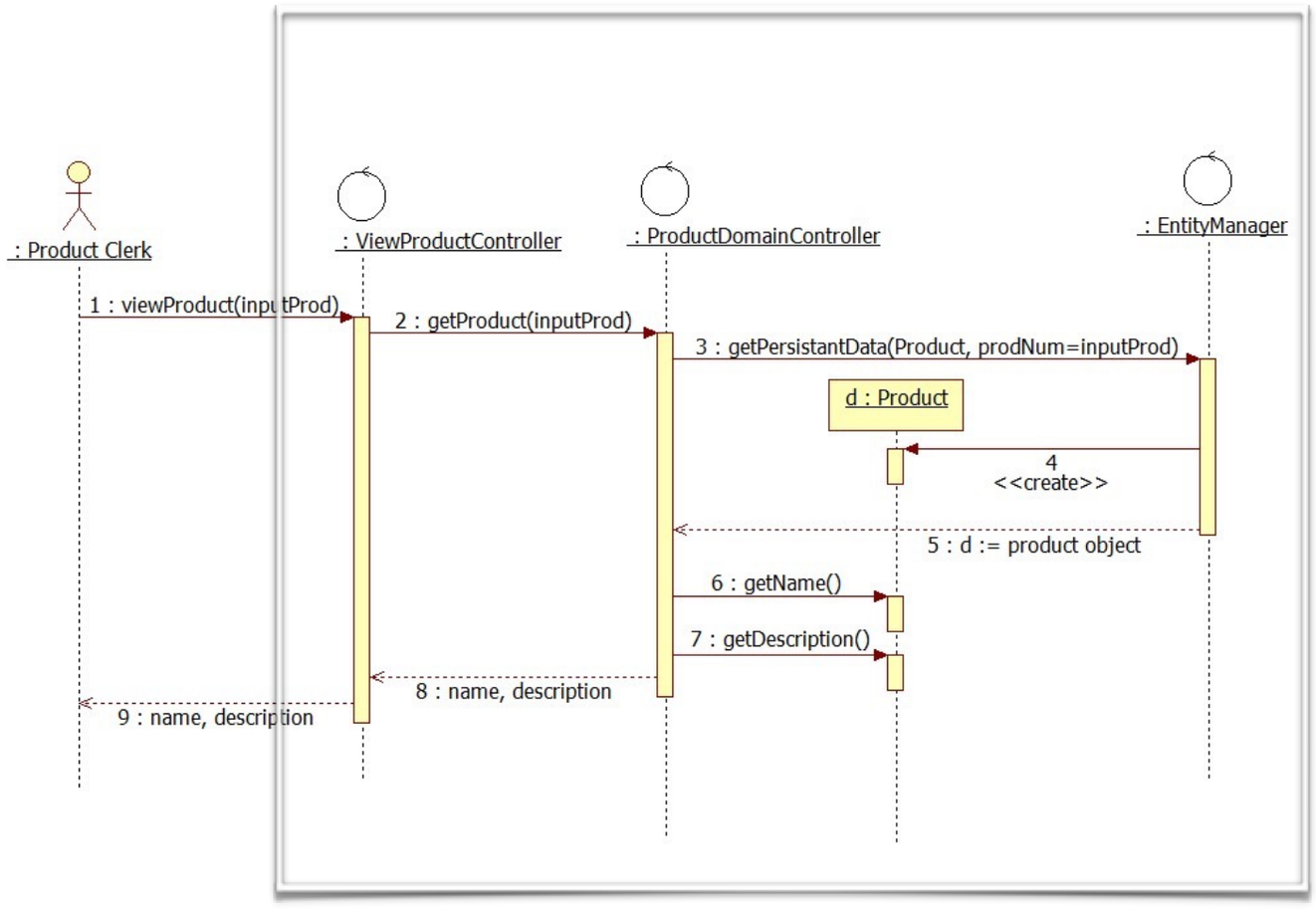
System Sequence Diagrams

- focuses on how actors interact with system
  - actor generates system events
  - system receives/handles event.
- covers one scenario
- order of events can be derived from diagram



Object System Sequence Diagrams

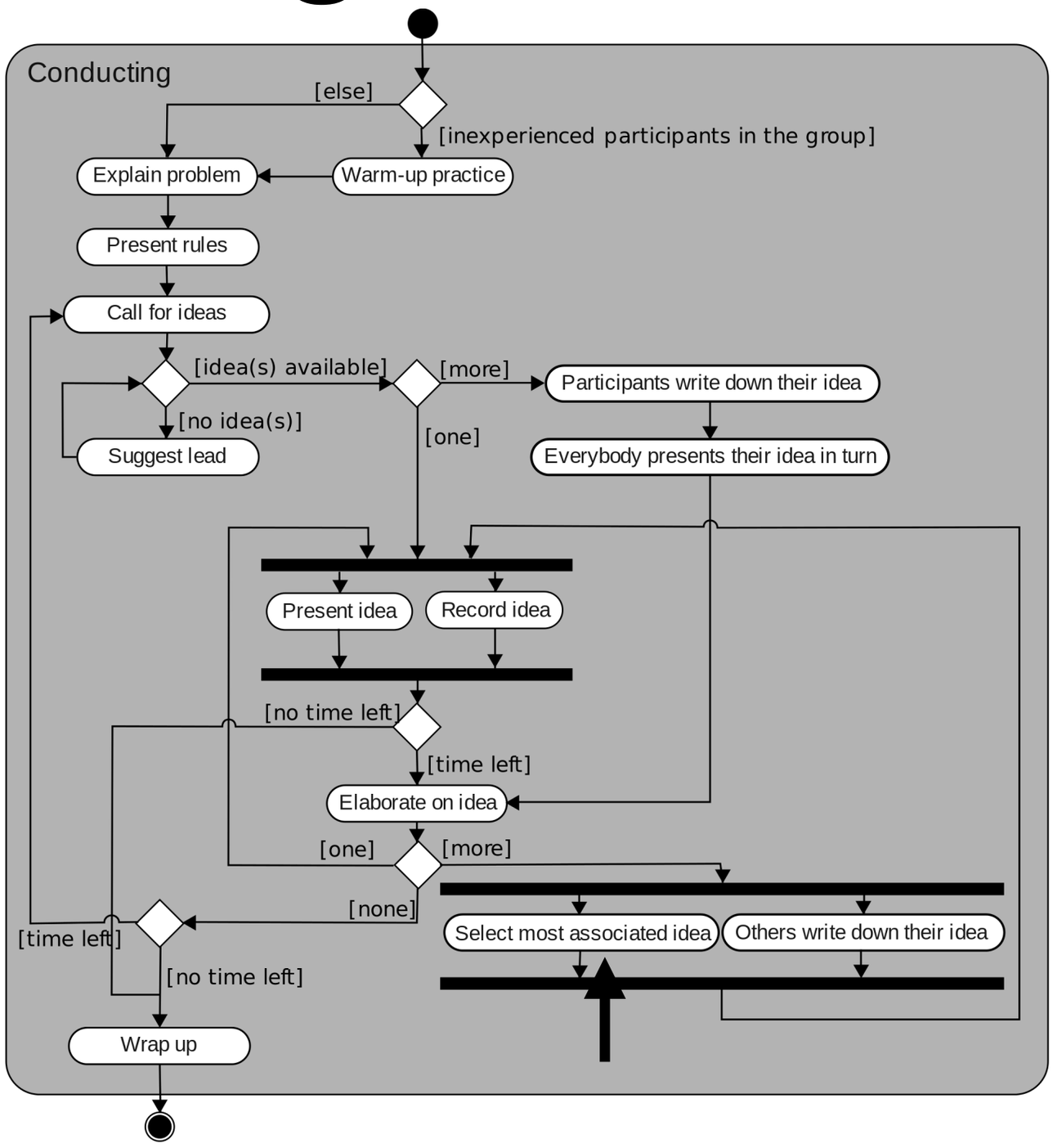
- opens up the “black box”
- documents interaction for a single scenario
- shows how objects collaborate to fulfil a request
- used to illustrate ordered sequence of messages between objects
- not good at describing exact behaviour

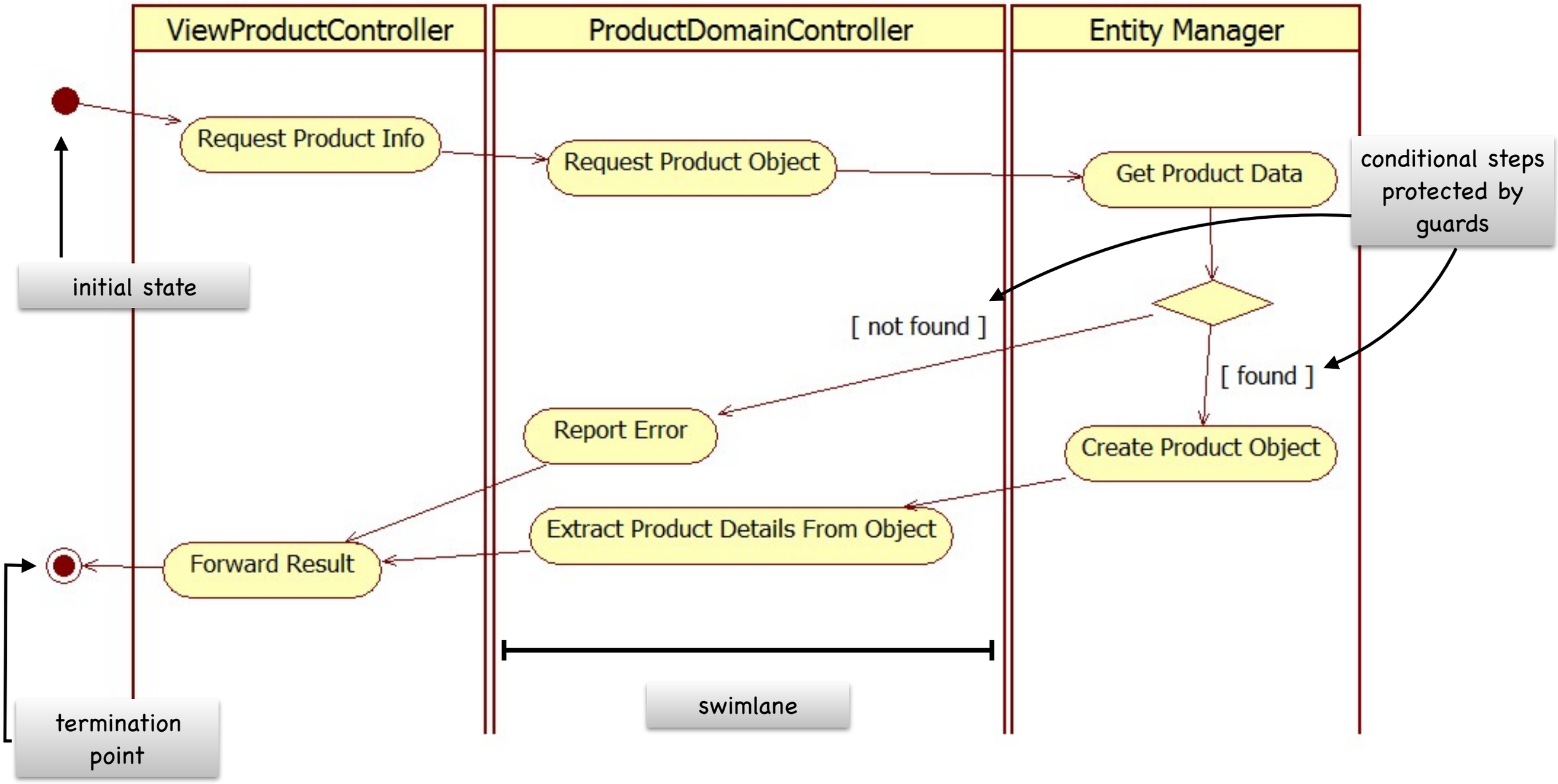


System Details

Activity Diagrams

- documents interaction for a single scenario
- focus on logical flow
- sequential, iteration (loops) and conditional (guarded) steps
- support for parallel execution





Activity Diagrams

Swimlanes allow assignment of responsibility for steps

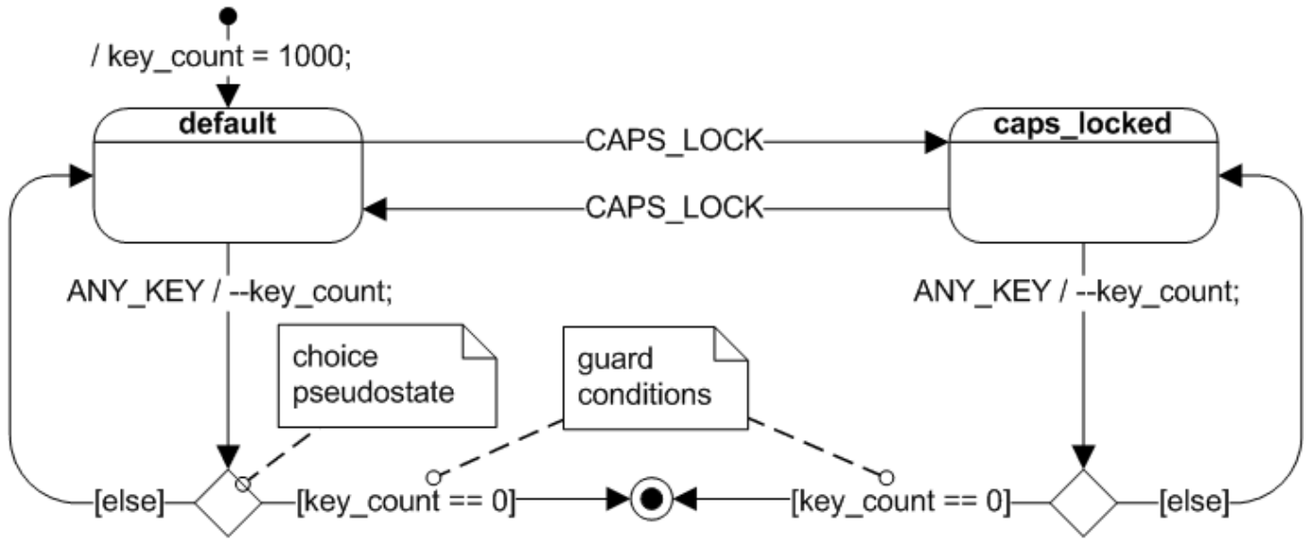
Statechart Diagrams

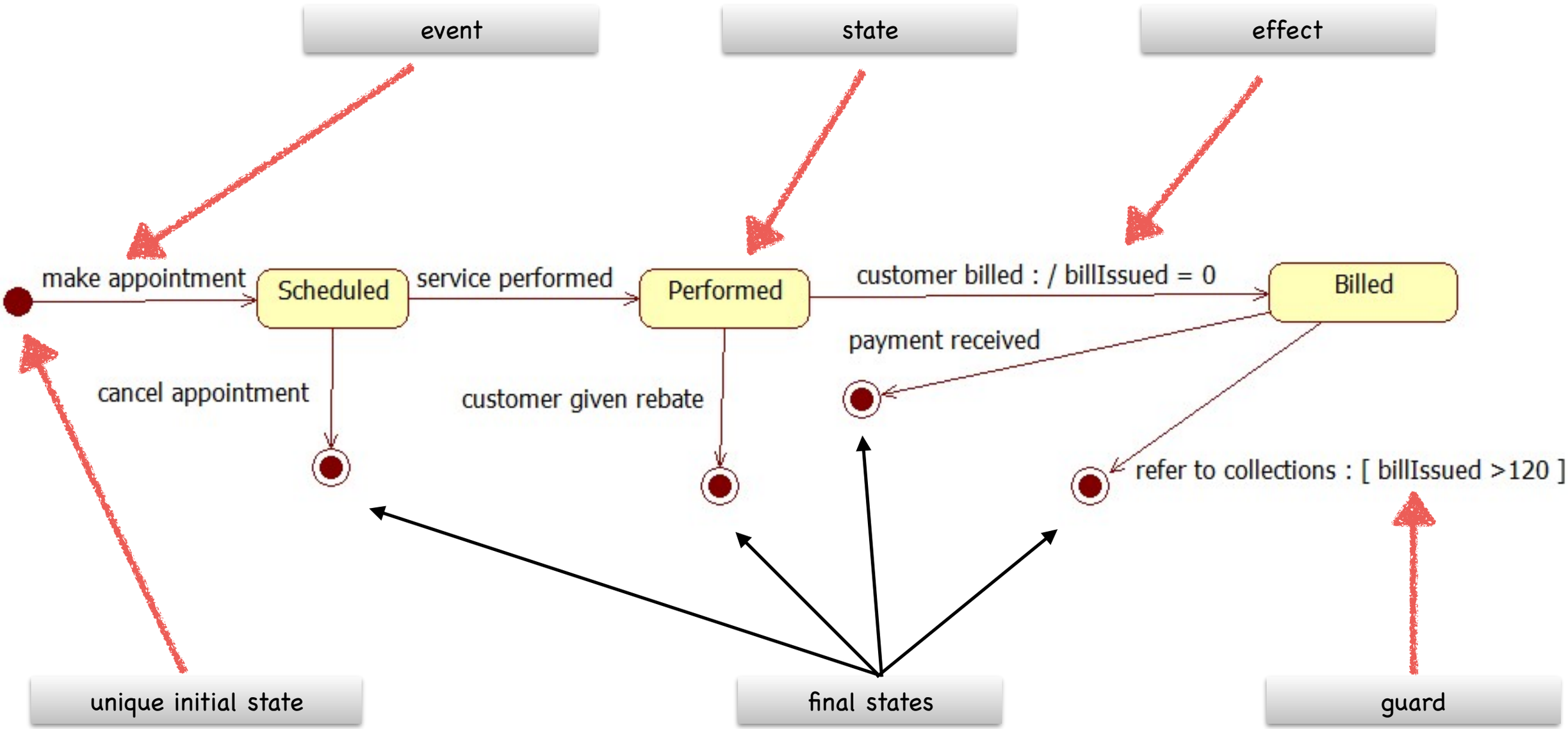
- documents significant changes in state over an object's lifetime

- focus on a single object not a collaboration

- state is a value of object's attributes at a point in time

- can also document conditions that must hold during collaborations





Statecharts

Contain an object's possible states and events that trigger state change

Statechart Meaning

```
class ServiceOrder {
      state = “initial"
      makeAppointment() { … do stuff… , state=“Scheduled” }

      cancelAppointment() {
          assert(state == “Scheduled”)
          … do stuff..
          state=“final”
          … do more stuff
          assert(state == “final”)
           }

     servicePerformed() {  assert(state == “Scheduled”)… do stuff.. ,
     state=“Performed” }
     ….

}
```

condition which must hold when involved in collaboration

state change

condition which must hold when operation is complete

Dynamic Modelling Diagram Summary

	Sequence Diagrams	Activity Charts	Statecharts
viewpoint	system-wide	system-wide	local to a object
focus	object collaboration	control flow	object state
control flow	limited - best for sequential	good support	no explicit support
invariants (required conditions)	limited	limited	yes