

# ACTIVITY DIAGRAM

---

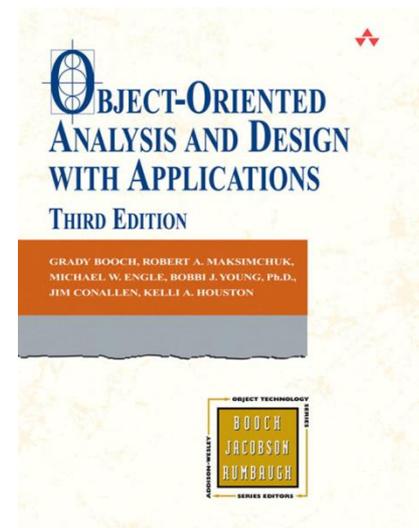
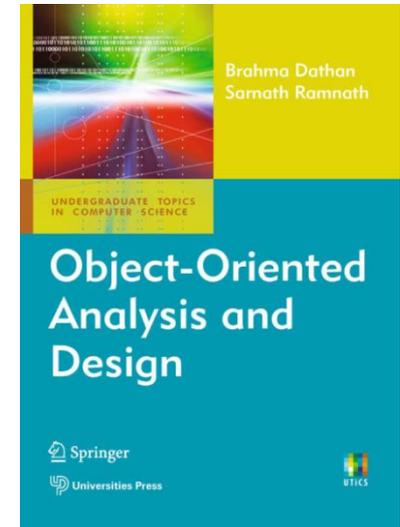
**Danang Wahyu Utomo**

danang.wu@dsn.dinus.ac.id

**+6285 740 955 623**

# Referensi

- ▶ Brahma Dathan, Sarnath Ramnath – **Object-Oriented Analysis and Design** (2011)
- ▶ Grady Brooch, Robert A Maksimchuk, Michael W. Engle, Robbi J. Young, Jim Conallen, Kelli A. Houston – **Object-Oriented Analysis and Design With Applications** Third Edition (2007)



# When to Use Activity Diagrams

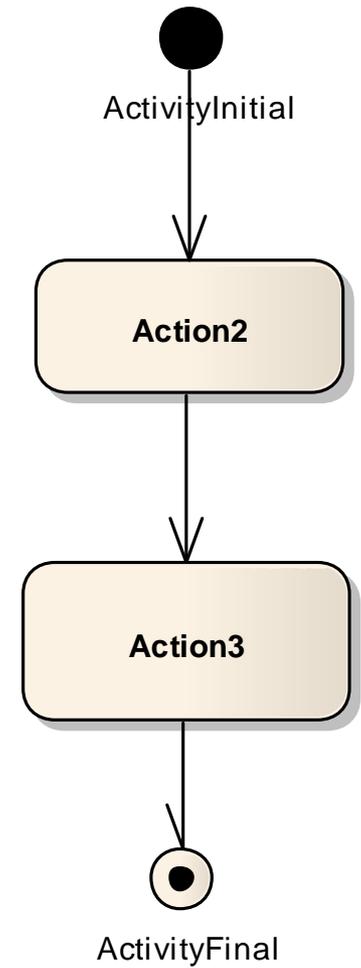
---

- ▶ Activity diagrams show behavior that spans over multiple use cases to describe the workflow of the overall process
- ▶ For multiple objects and their high-level interaction, activity diagrams are particularly helpful for representing an overview of concurrent processes.
- ▶ Do not use activity diagrams to see how objects collaborate
- ▶ Activity diagrams are not accurate for describing how an object behaves over its lifetime

# Activity Diagrams

---

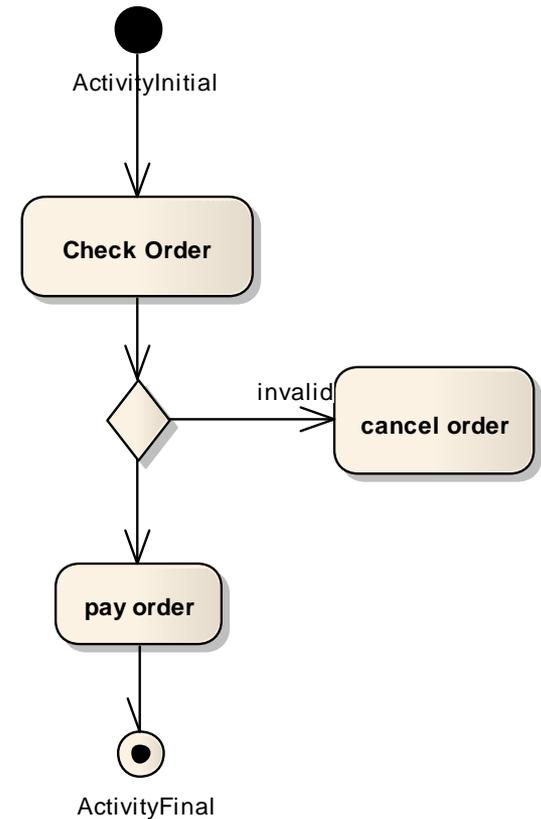
- ▶ the core symbol is the **activity** box
- ▶ The activity is interpreted differently :
  - Conceptual perspective
  - Specification perspective
- The **links** between the activities are the triggers



# Decision Activity

---

- ▶ To describe nested decisions, UML activity diagrams offer the decision-diamond activity symbol



# Concurrent Activities

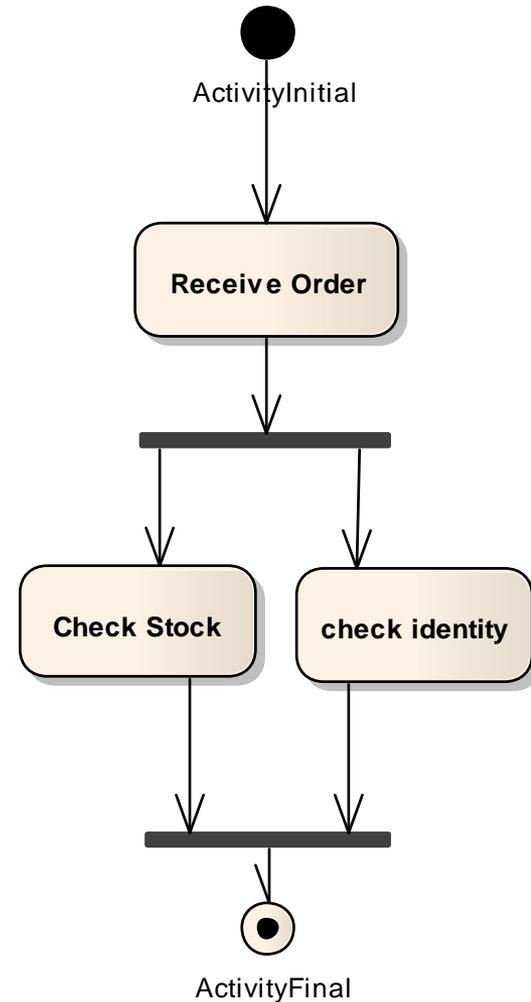
---

- ▶ Parallel behavior can be expressed
- ▶ Important for business modeling, where unnecessary sequential processes can be designed for parallel execution
- ▶ This improves the efficiency and responsiveness of business processes
- ▶ Activity diagram are also useful for concurrent program, since you can graphically lay out what **threads** you have and when they need to synchronize

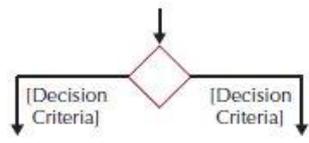
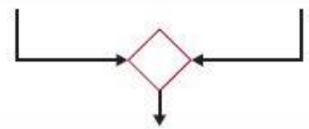
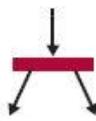
# Synchronization Bars

---

- ▶ Initiate concurrent sections in an activity diagram.
- ▶ Triggers can occur in parallel and no sequential order is established



# Component

<p><b>An Initial Node:</b></p> <ul style="list-style-type: none"><li>■ Portrays the beginning of a set of actions or activities</li></ul>	
<p><b>A Final-Activity Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to stop all control flows and object flows in an activity (or action)</li></ul>	
<p><b>A Final-Flow Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to stop a specific control flow or object flow</li></ul>	
<p><b>A Decision Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to represent a test condition to ensure that the control flow or object flow only goes down one path</li><li>■ Is labeled with the decision criteria to continue down the specific path</li></ul>	
<p><b>A Merge Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to bring back together different decision paths that were created using a decision-node</li></ul>	
<p><b>A Fork Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to split behavior into a set of parallel or concurrent flows of activities (or actions)</li></ul>	
<p><b>A Join Node:</b></p> <ul style="list-style-type: none"><li>■ Is used to bring back together a set of parallel or concurrent flows of activities (or actions)</li></ul>	

# Case Study

---

- ▶ Currently, the Ministry of Education Malaysia (MOE) has changed the method of assessing the students. The teachers need to observe and monitor their students' performance from standard one to the secondary school. All the information regarding the students are stored with manual filing which lead to problem in managing the records such as missing related documents and files and time consuming. There is also lack of ways to automatically update the MOE for each of the students record. Parents also do not have any medium to monitor their kids progresses accept with an annual face-to-face meeting with teachers.

# Exercise

---

- ▶ Create a set of use cases for a university library borrowing system. The system will record the books owned by the library and will record who has borrowed what books.
- ▶ Before someone can borrow a book, he or she must show a valid ID card that is checked to ensure that it is still valid against the student database maintained by the registrar's office (for student borrowers), the faculty/staff database maintained by the personnel office (for faculty/staff borrowers), or against the library's own guest database (for individuals issued a "guest" card by the library).
- ▶ The system must also check to ensure that the borrower does not have any overdue books or unpaid fines before he or she can borrow another book. Every Monday, the library prints and mails postcards to those people with overdue books.
- ▶ If a book is overdue by more than two weeks, a fine will be imposed and a librarian will telephone the borrower to remind him or her to return the book(s). Sometimes books are lost or are returned in damaged condition. The manager must then remove them from the database and will sometimes impose a fine on the borrower.

# Exercise

---

- ▶ Create a set of use cases for an online university registration system. The system should enable the staff of each academic department to examine the courses offered by their department, add and remove courses, and change the information about them (e.g., the maximum number of students permitted). It should permit students to examine currently available courses, add and drop courses to and from their schedules, and examine the courses for which they are enrolled. Department staff should be able to print a variety of reports about the courses and the students enrolled in them. The system should ensure that no student takes too many courses and that students who have any unpaid fees are not permitted to register. (Assume that a fees data store is maintained by the university's financial office, which the registration system accesses but does not change).

# Exercise

---

- ▶ Create a use case diagram that would illustrate the use cases for the following dentist office system: Whenever new patients are seen for the first time, they complete a patient information form that asks their name, address, phone number, and brief medical history, which is stored in the patient information file. When a patient calls to schedule a new appointment or change an existing appointment, the receptionist checks the appointment file for an available time.
- ▶ Once a good time is found for the patient, the appointment is scheduled. If the patient is a new patient, an incomplete entry is made in the patient file; the full information will be collected when the patient arrives for the appointment. Because appointments are often made far in advance, the receptionist usually mails a reminder postcard to each patient two weeks before his or her appointment.

# Assignment

---

- ▶ Find two videos about activity diagram
- ▶ Describes your justification
- ▶ Give example for each videos (by own your case)
- ▶ Discuss your report in class



---

**TERIMA KASIH**