

Chapter 6: Concepts for Dynamic Modeling (Process Modeling)

1 Conceptual Process Model (CPM)

The Conceptual Process Model (CPM) enables a conceptual representation of the processes performed within an enterprise. It relies on the specification of business rules and represents: events, outcomes, operations, and synchronizations. The CPM provides a dynamic representation of the enterprise's information system.

2 Basic Concepts of CPM

2.1 The Event

An event represents a change in the external environment of the information system or within the information system itself.

- **An external event** is a change in the external environment.
- **An internal event** is a change within the information system.



Internal events are represented by a solid-line ellipse, while external events are represented by a dashed-line ellipse.

Examples:

Receipt of an order, Lack of response

Note: An event is generally designated by a verb in the past participle form or a derived noun.

2.2 The Operation

An operation is a set of actions executed by the system in response to an event or a conjunction of events.

Examples:

- Order processing
- Invoice payment

Key Points about an Operation:

1. Action:

An action is an elementary function. Within an operation, there are no waiting states between actions, and their execution is sequential.

2. Emission Rule:

An emission rule defines the condition under which result events are generated by an operation.

- An operation can have one or more emission rules.
- A single rule can govern the emission of one or several result events.

3. Unconditional Emission:

An operation may not have an emission rule. In this case, the emission of events is unconditional.

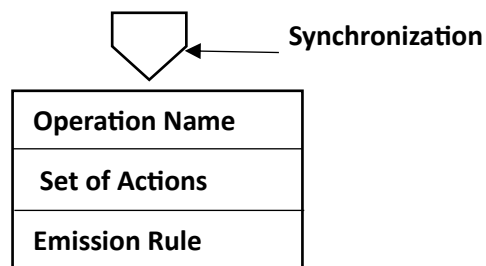
Operation Name
Set of Actions
Emission Rule

2.2 Synchronization

Synchronization is the association of two or more events for triggering an operation. It is a Boolean expression formed using the AND, OR, and NOT operators.

Examples:

- Invoice received and goods received.



2.3 The Result

It is the system's response to the events that triggered an operation.

Examples: Order processed, Goods delivered

Note:

- An operation can produce multiple results.
- The production of results may be subject to exit conditions of the operation.

The result of an operation

The result of an operation can act as an event in another operation, which is called the internal event.

- An operation cannot be triggered only by internal events; there must be at least one external event.

2.4 The Process

A process is a synchronized sequence of operations representing a homogeneous unit of processing. A process is specific to a business domain. A domain can be represented by a set of processes.

Example:

- Billing process.

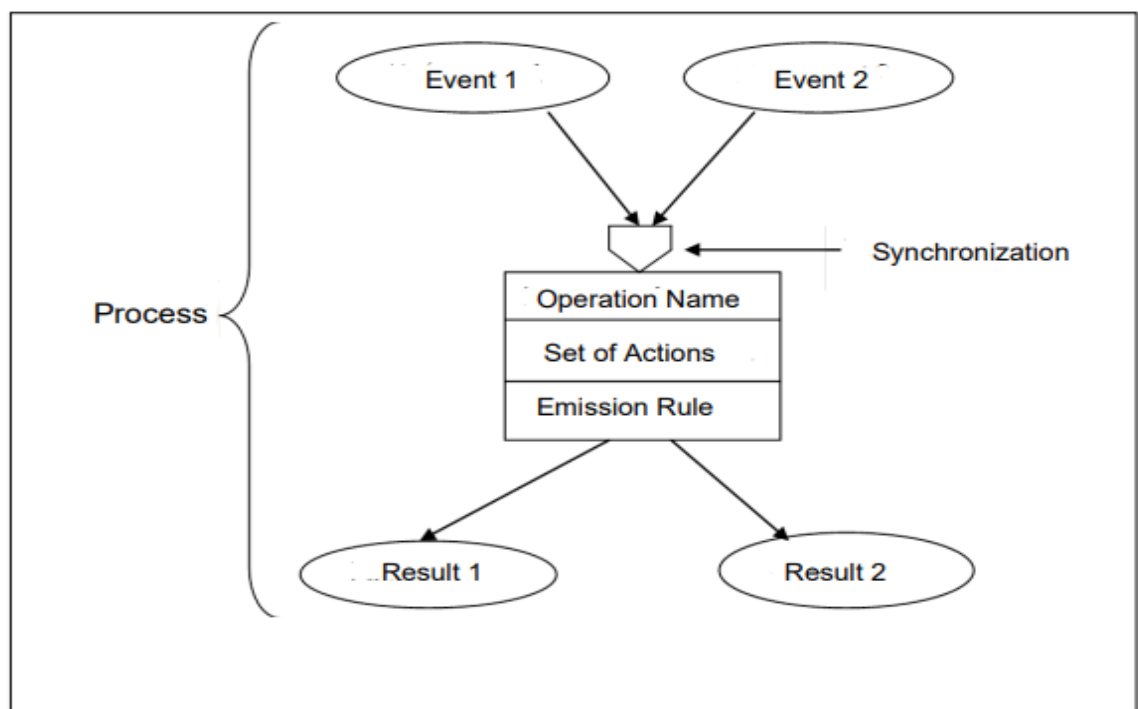


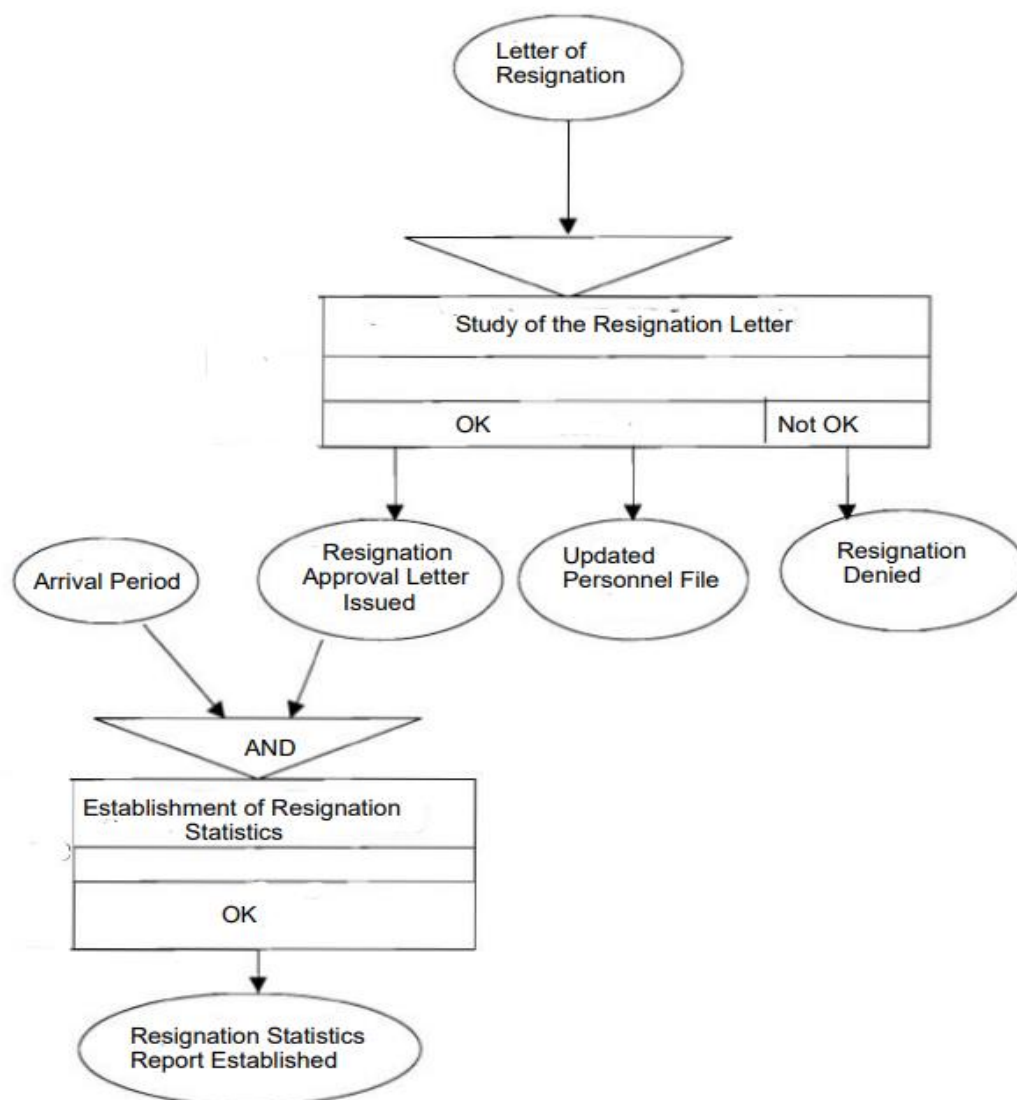
Figure 4.9: Formalism of a Process

5.3 Construction of the CPM (Conceptual Process Model)

The Conceptual Process Model allows for the schematic representation of event management. The CPM is represented by a sequence of processes. The construction of a CPM follows these steps:

1. Construction of a flow diagram between external and internal actors for each domain.
2. Transformation of the flows into a graph of flow sequencing (events/results).
3. Transforming this flow sequencing graph into a CPM by replacing each transition from a set of events to a set of results with an operation.

Example: Modeling of the Employee Resignation Request Process



This CPM represents a diagram outlining the process of handling an employee's resignation request. Here's a textual description of the process:

1. **Letter of Resignation:** The process starts when the employee submits a letter of resignation.
2. **Study of the Resignation Letter:** The resignation letter is then reviewed:
 - If the letter is **OK**, the process continues to the next step.
 - If the letter is **Not OK**, the resignation is **Denied**.
3. **Arrival Period:** If the letter is accepted (OK), the next step involves handling the employee's arrival period (the notice or transition period).
4. **Establishment of Resignation Statistics:** Once the arrival period is considered, resignation statistics are established, which may involve tracking the reasons for resignation and other related data:
 - If the statistics are **OK**, the process continues.
5. **Resignation Statistics Report Established:** Finally, the resignation statistics report is compiled, concluding the resignation process.