

Djilali Boonaama University Khemis-Miliana
Faculty of Matter Sciences and Computer Science-DBKM
Computer Science Department



Matter: Information Systems (IS)

**Chapter 4: MERISE -- *Conceptual Treatment Model (C T M)* --
*Conceptual Process Model (C P M)***

Level Students: 2nd year bachelor's degree in Computer Science

Professor: Omar BOUKADOUM

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Abstraction levels of MERISE

The abstraction levels with their resulting models are summarized in the following table:

LEVEL	DATA	TREATMENTS
Conceptual <i>Management choice: What?</i>	Conceptual Data Model (CDM)	Conceptual Model of Treatments (CTM)
Organizational <i>Organizational choice: Who? Where? When?</i>	Logical Data Model (LDM)	Organizational Model of Treatments (OMT)
Physical <i>Technical choices: How?</i>	Physical Data Model (PDM)	Physical Model of Treatments (PMT)

Introduction

The goal of the CMT is to represent the **dynamic aspect** of the domain under study, specifically the activities carried out within the domain. It is also referred to as the “***Event-Result Model***”: the occurrence of one or more events triggers an operation that produces a result.

2 Basic Concepts of CTM

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.

**External
Event**

**Internal
Event**

In other words, events notify the information system that something is happening and require a response

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

2 Basic Concepts of CTM



2.1 The Event

Examples:

- ❖ Arrival of an order: an event that triggers the execution of the operation related to order processing.
- ❖ Receipt of an invoice: an event that triggers the execution of the operation related to invoice payment.

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.

A **set of actions** executed **without interruption**, which does not depend on the occurrence of any event other than the initial trigger.

An operation produces **new events** as output.

Examples:

- Order processing
- Invoice payment

Name of Operation
Action 1
Action 2
..
Action n

2 Basic Concepts of CTM



2.2 The Operation

Example: The operation "*order preparation*" includes the following uninterrupted actions:

- Identifying missing products and the quantities to order,
- Selecting a supplier,
- Drafting a purchase order.

2 Basic Concepts of CTM



2.3 Synchronization Rules

A *Boolean condition* representing the management (business) rules that events must satisfy to trigger an operation. Synchronization rules are the translation of these management rules and define the *conditions* under which operations are triggered. They are expressed using logical operators (primarily **AND** and **OR**).

Example:

To initiate the creation of an order (operation), one must have:

Either a stock shortage (نقص في المخزون) OR a demand to fulfil

(synchronization rule) (تنفيذ الطلبية)

2.4 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*.

Example:

□ If the order is compliant, then...

Due to their complexity and for better readability, emission rules are generally expressed as **OK**, **not OK**, or **OK (conditionally)**.

2.5. Result

The product of executing an operation. A result is also an **event**-like fact and may serve as the trigger for another operation.

Examples:



- Transmitted order: the result of the operation related to order creation.
- Approved file: the result of the operation related to file verification and validation.

2 Basic Concepts of CTM

2.6 The Process

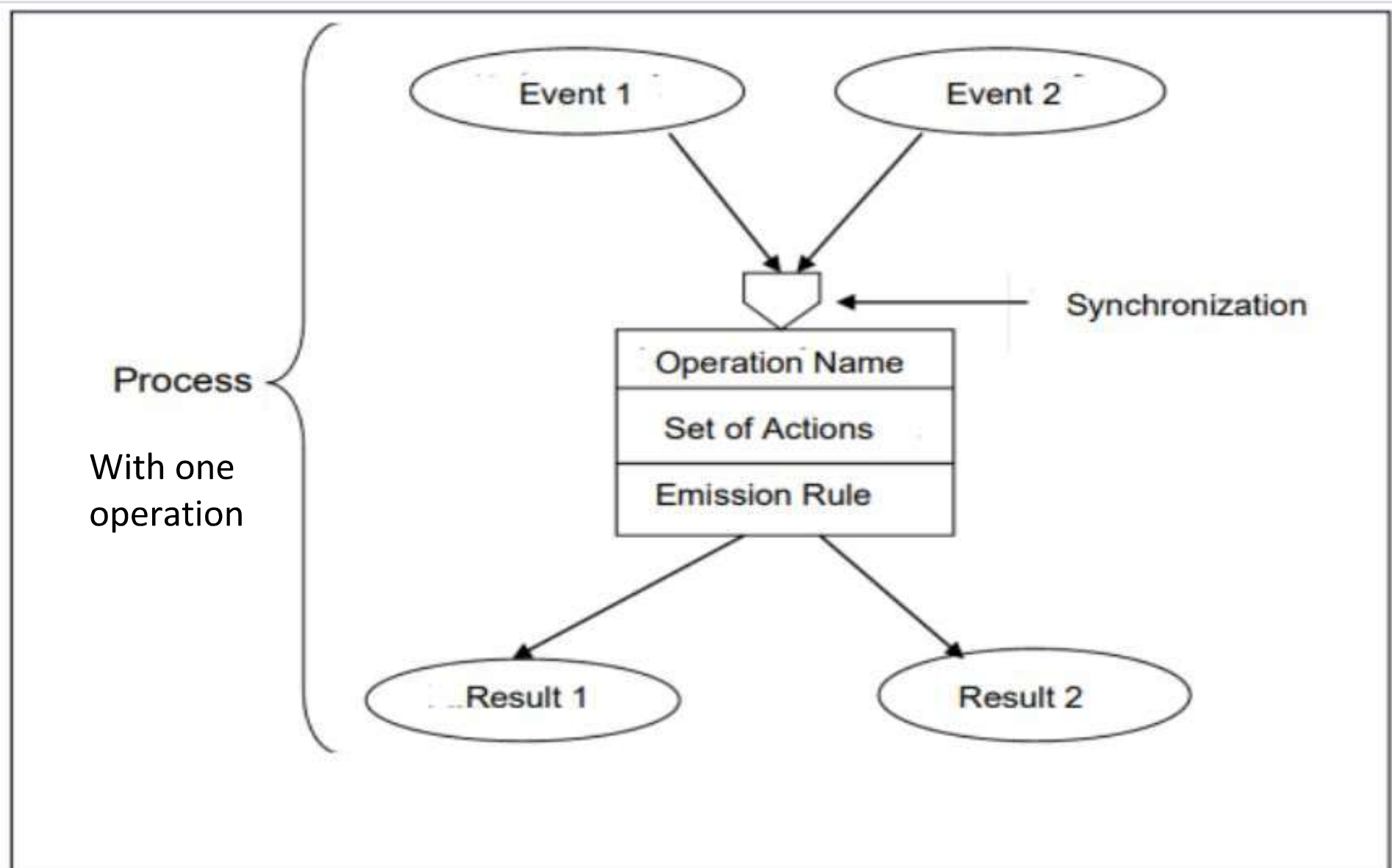
1. A process is a synchronized *sequence of operations* representing a homogeneous unit of processing.
2. A process is specific to a business domain.
3. A domain can be represented by a set of processes.

Example:

- Billing process.

2 Basic Concepts of CTM

2.4 Graphical representation of The Process



3 Construction of the CTM (Conceptual Treatment Model)

The Conceptual Treatment Model allows for the schematic representation of event management. The CTM is represented by a sequence of processes.

The construction of a CTM 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 CTM by replacing each transition from a set of events to a set of results with an operation.

Example: Modelling of the Employee Resignation Request Process.

Exercise: the process of handling an employee's resignation request

عملية التعامل مع طلب استقالة الموظف

1. **Letter of Resignation:** The process starts when the employee submits a

letter of resignation. ١. خطاب الاستقالة: تبدأ العملية بتقديم الموظف لخطاب استقالته.

2. **Study of the Resignation Letter:** The resignation letter is then reviewed:

o If the letter is **OK**, the process continues to the next step.

o If the letter is **Not OK**, the resignation is **Denied**.

٢. دراسة خطاب الاستقالة: يُراجع خطاب الاستقالة بعد ذلك: إذا كان الخطاب مقبولاً، تنتقل العملية

إلى الخطوة التالية. إذا لم يكن الخطاب مقبولاً، تُرفض الاستقالة.

3. **Arrival Period:** If the letter is accepted (OK), the next step involves handling the employee's arrival period (the notice or transition period).

٣. فترة الوصول: إذا قبل الخطاب (موافق)، فإن الخطوة التالية هي التعامل مع فترة وصول

Exercise: the process of handling an employee's resignation request

عملية التعامل مع طلب استقالة الموظف

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:

o If the statistics are **OK**, the process continues.

٤. إعداد إحصاءات الاستقالة: بعد دراسة فترة الوصول، تُنشأ إحصاءات الاستقالة، والتي قد تتضمن تتبع أسباب الاستقالة والبيانات الأخرى ذات الصلة: إذا كانت الإحصاءات مقبولة، تستمر العملية.

5. Resignation Statistics Report Established: Finally, the resignation statistics report is compiled, concluding the resignation process.

٥. إعداد تقرير إحصاءات الاستقالة: وأخيراً، يتم إعداد تقرير إحصاءات الاستقالة، مُختتمًا بذلك عملية الاستقالة.

