

Case Management Model and Notation - CMMN

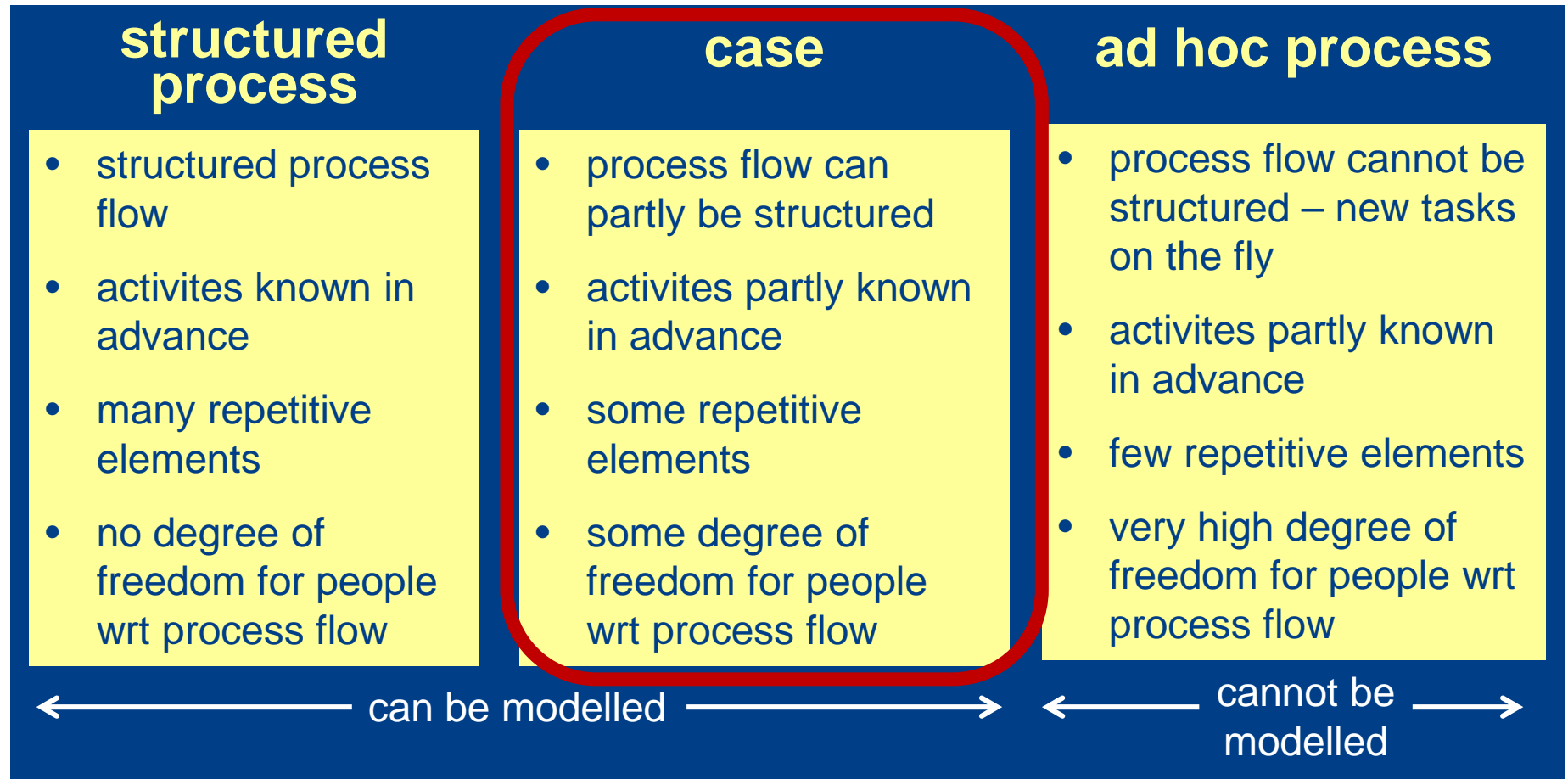
Knut Hinkelmann



CMMN - Case Management Model and Notation

- OMG defined a Modeling Standard for Case Modeling
 - ◆ Case Management Model and Notation (CMMN)
- Version 1.0 is from May 2014
- Version 1.1 published in December 2016
 - ◆ <http://www.omg.org/spec/CMMN/1.1/>
- CMMN is specialized notation to model cases. It is independent from BPMN

Classification of Processes

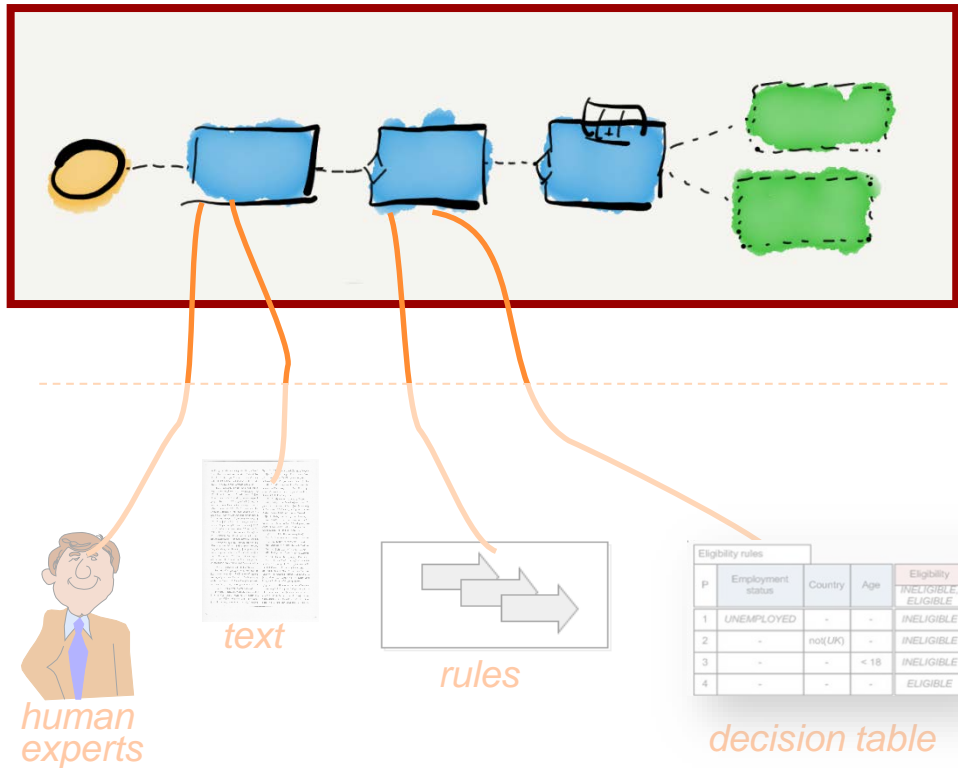


partly translated from (Gadatsch 2005, S. 44)



Focus of CMMN is on Modelling Flexible Process Logic

Process Logic



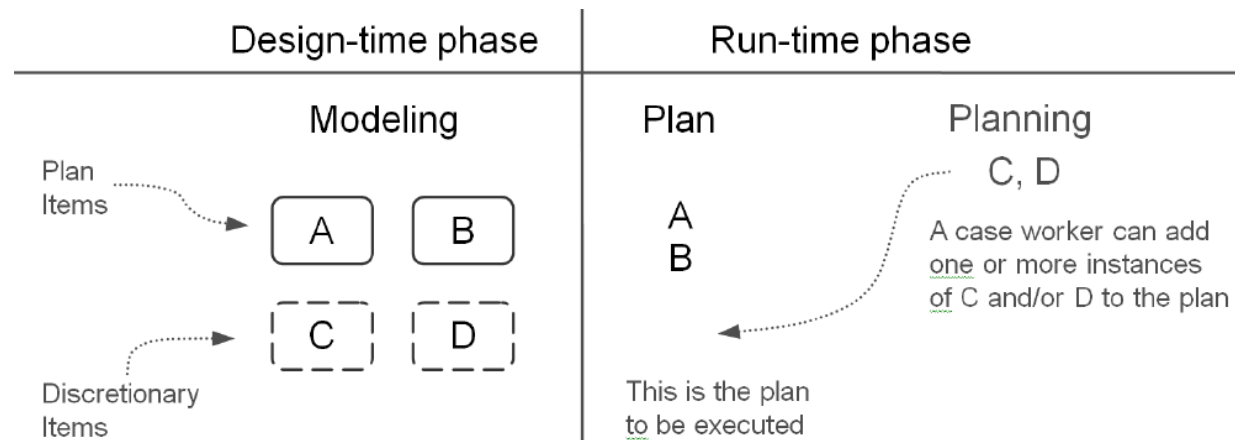
Two kinds of tasks

- Structured process part: Tasks which have to be executed if
 - ◆ events occur and/or
 - ◆ conditions are given
- Flexible process part: (Discretionary) tasks which can be executed if
 - ◆ they are chosen by a worker
 - ◆ they make sense

Business Logic

Design Time vs Run Time = Modeling vs Planning

- A Case has two distinct phases: design-time and run-time
 - ◆ During the **design-time** phase, **business analysts** engage in modeling, which includes defining
 - Tasks that are always part of pre-defined segments in the Case model, and
 - “discretionary” Tasks that are available to the Case worker, to be applied in addition, to his/her discretion.
 - ◆ In the **run-time** phase, **Case workers** execute the plan, particularly by
 - performing Tasks as planned,
 - adding discretionary Tasks to the Case plan instance in run-time.

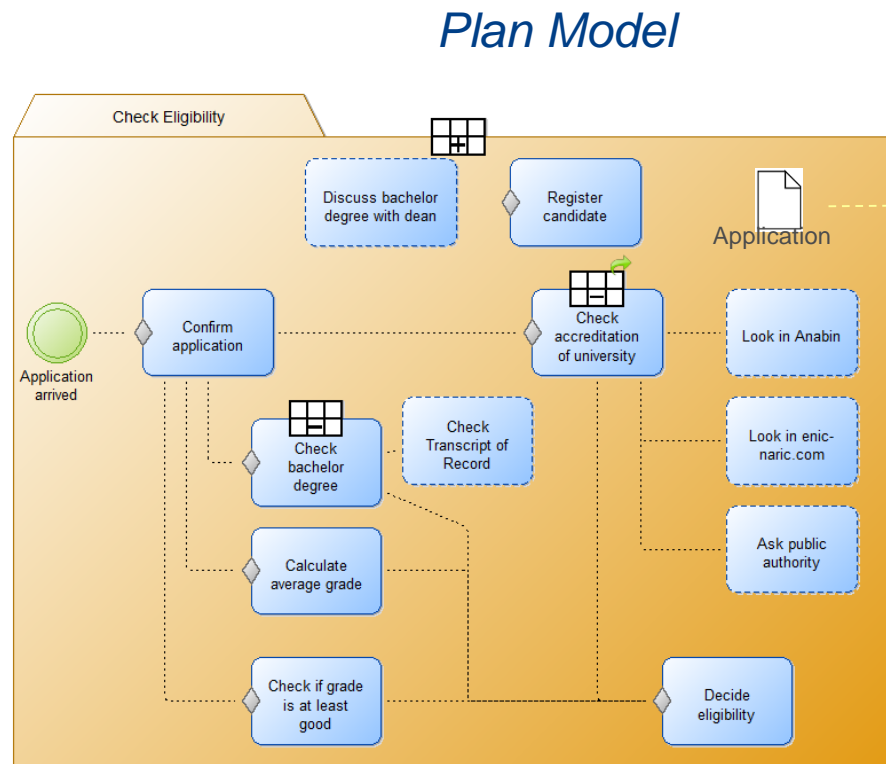


(CMMN 1.0, p. 5f)

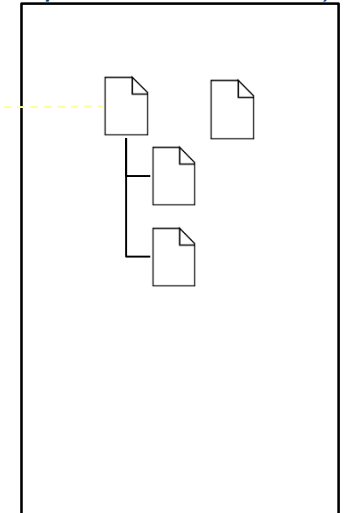


A Case Model in CMMN

- A Case consists of a *case Plan Model*, a *Case File Model*, and a set of *case Roles*



Case File Model
(not part of the standard)



(CMMN 1.0, p. 12)

Case Plan Models

- There are four types of Plan Items:



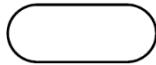
◆ ***Tasks / Discretionary Tasks***



◆ ***Plan Fragments / Stages***



◆ ***Event Listeners***



◆ ***Milestones***

- There is one connector



- There are two types of "control flow" elements:

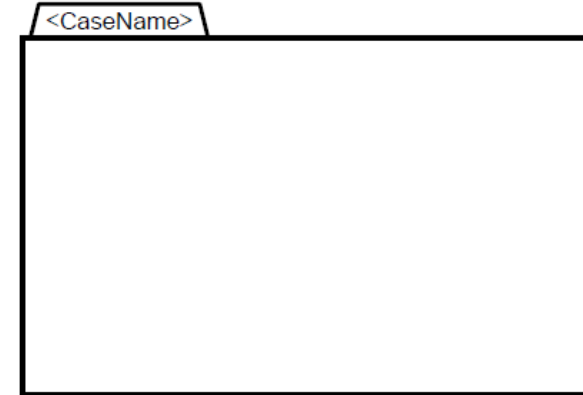
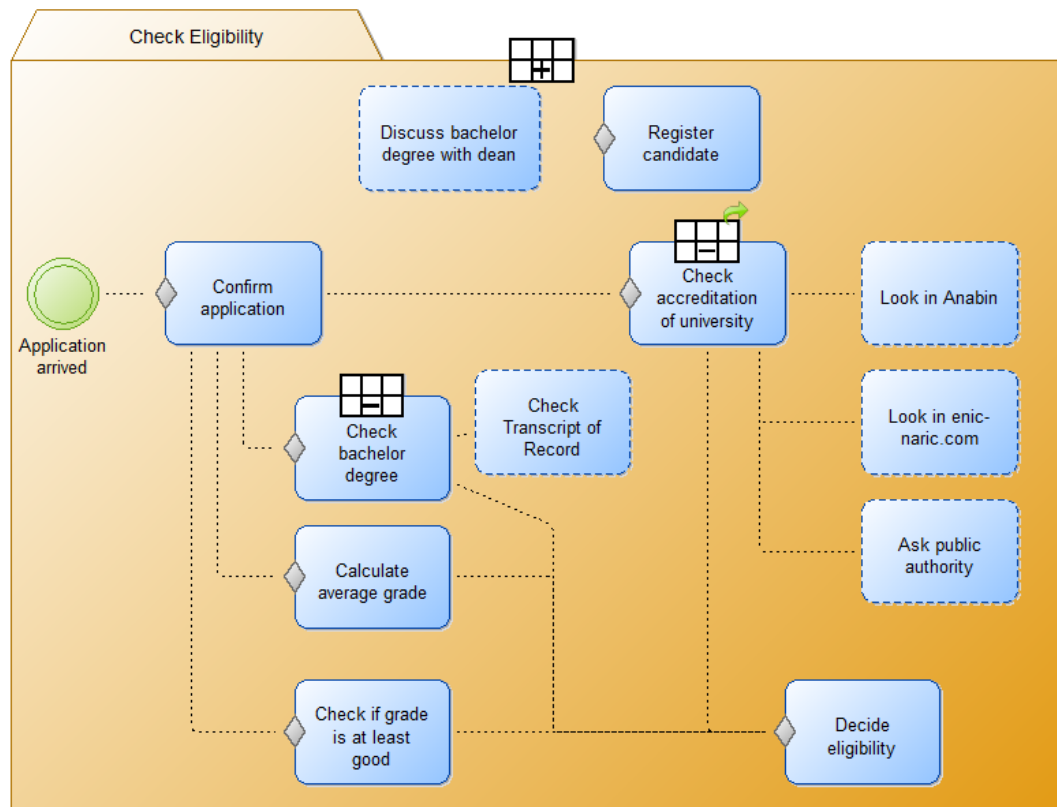


◆ ***Sentries***



◆ ***Planning Tables***

Example of a Case Plan Model



- A case Plan Model is depicted using a “Folder” shape
- The name of the Case can be enclosed into the upper left rectangle.
- The various elements of a case Plan Model are depicted within the boundary of the case Plan Model shape.
- The diagram shows an example of a case Plan Model.

Structured Part of CMMN



Tasks

- There are three types of tasks

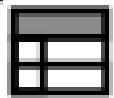
- ◆ **Human Task** - a Task that is performed by a Case worker, they can be



- Blocking: Task is waiting until the work associated with the Task is completed



- Non-Blocking: the Task is not waiting for the work to complete and completes immediately, upon instantiation.



- Business Rules Task** - can be used for Decision Tasks

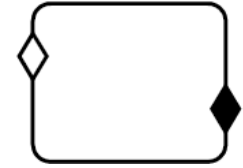


- Process Task** - can be used in the Case to call a Business Process



- Case Tasks** - can be used to call another Case

Sentries - Entry and Exit Criterion



- Plan Items may have associated Sentries.
- Sentries define the criteria according to which the Plan Items are enabled (or entered) and terminated (or exited)
- A Sentry “watches out” for important situations to occur which influence the further proceedings of a Case.

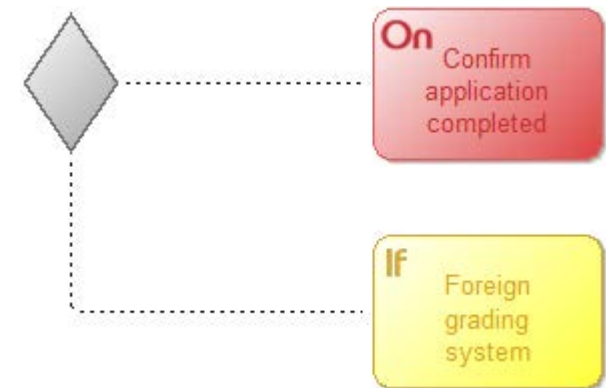
◊ a Sentry used as an entry criterion is depicted by a shallow “Diamond”

◆ a Sentry used as an exit criterion it is depicted by a solid “Diamond”

Sentry

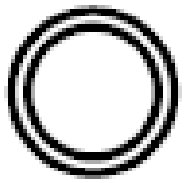
- A Sentry is a combination of an event and/or a condition.
 - ◆ An On-Part specifies the event that serves as trigger.
 - ◆ The If-Part specifies a condition that evaluates over the Case File.
- Sentries may take one of the following forms:

1. An event part and a condition part in the form
on <event>
if <condition>
2. An event part in the form
on <event>
3. Just a condition part in the form
if <condition>



- An Sentry and the task correspond to an ECA (Event-Condition-Action) rule.

(CMMN 1.0, p. 23f)



Events

CMMN distinguishes three kinds of events:

- Anything that can happen to information in the CaseFile
 - ◆ a case file time created, deleted, modified,
- Anything that can happen to Tasks, Stages and Milestones.
 - ◆ a task is started, cancelled, finished, ...
- Event Listeners to model events that do not happen to plan items.
 - ◆ Event Listeners are specialized to



Timer Event Listener



User Event Listener

(CMMN 1.0, p. 18f, 52f)

Milestones



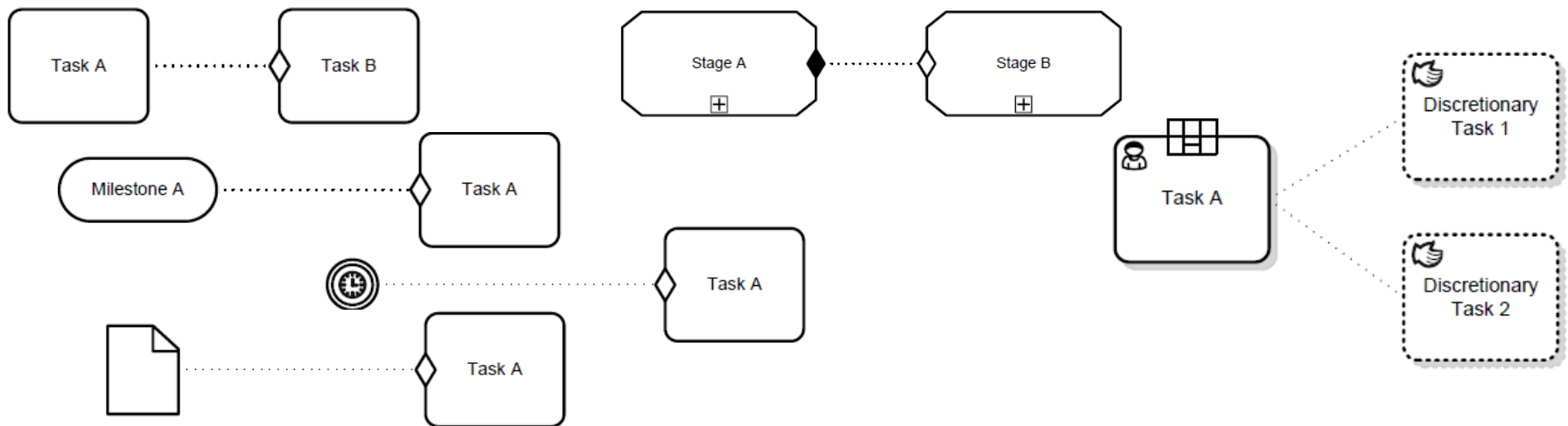
- A Milestone represents an achievable target.
- No work is directly associated with a Milestone, but
- Completion of set of tasks or the availability of key deliverables (information in the CaseFile) typically leads to achieving a Milestone.
- A Milestone may have zero or more entry criteria, which define, when a milestone is reached



(CMMN 1.0, p. 21, 52)

Connectors

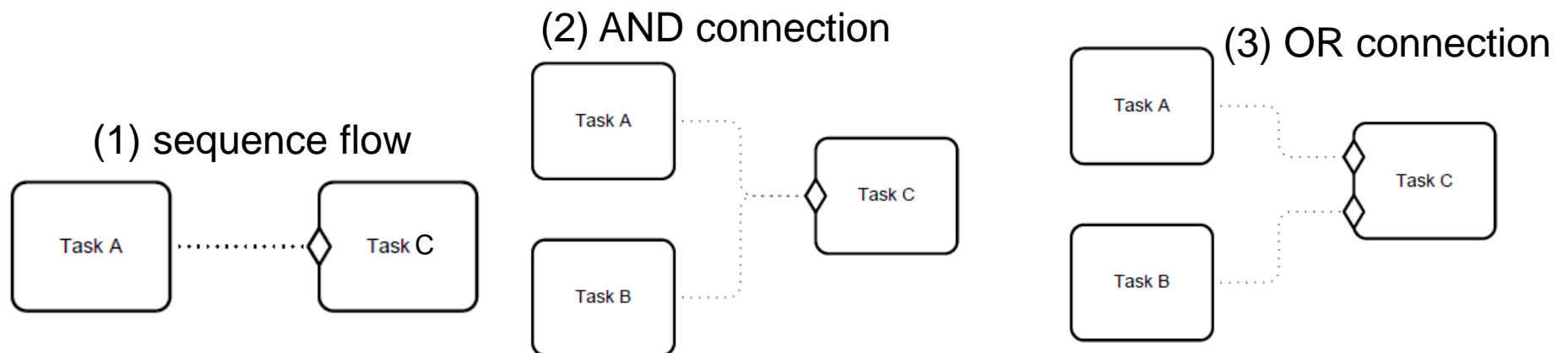
- Connectors can be used to visualize dependencies between Plan Items, in particular
 - ◆ The dependency of the On-Part of a Sentry
 - ◆ between a Human Task and Discretionary Items



(CMMN 1.0, p. 53ff)

Connector Usage

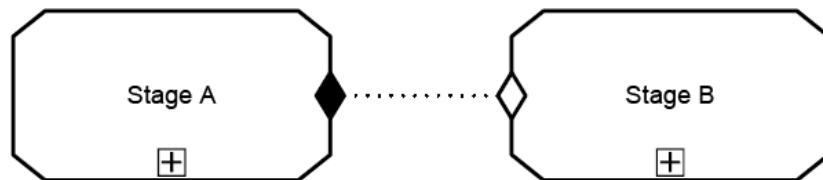
- Connectors that represent Sentry On-Parts can be used to visualize dependencies between Plan Items.
- The following pictures illustrates situations where Task C can be activated only
 - (1) if Task A is complete
 - (2) if Task A and Task B are complete
 - (3) if Task A or Task B are complete



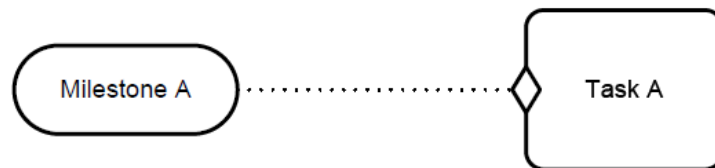
(CMMN 1.0, p. 54)

Connector Usage

- Stage B depends on the exit criterion of Stage A



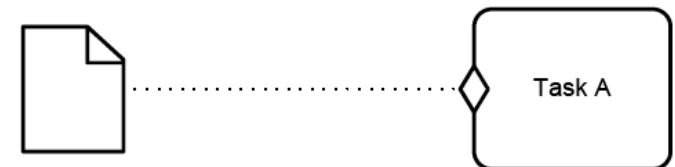
- Task A depends on the achievement of Milestone A.



- Task A depends on a TimerEventListener



- Task A depends on a CaseFileItem

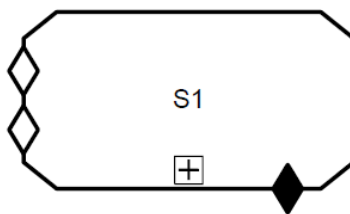


(CMMN 1.0, p. 55)

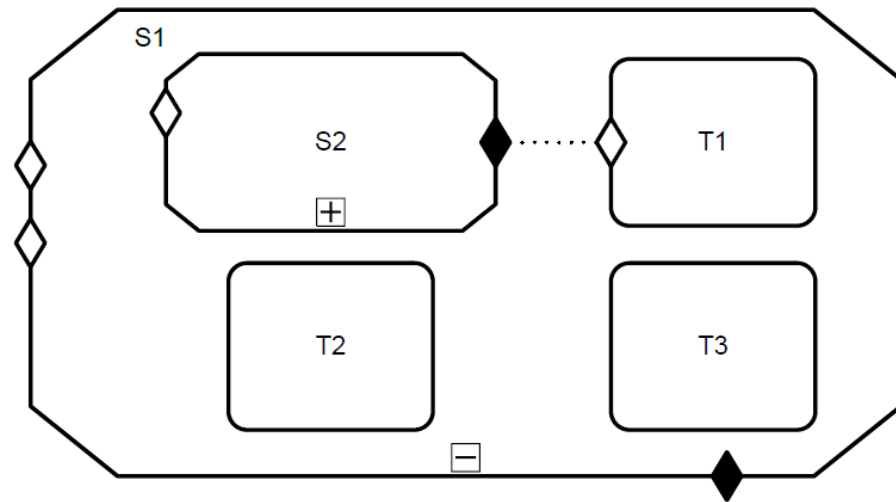


Plan Fragments and Stages

- A Plan Fragment is a container of Plan Items and the Sentries
- Stages are Plan Fragments that can be tracked.
- Stages maybe considered “episodes” of a Case.
- A Stage has a marker in the form of a “+” or “-” sign to designate expanded or collapsed stages.



collapsed stage with
two entry and one
exit criterion



Expanded versions of the Stage with one
sub Stage and three Tasks

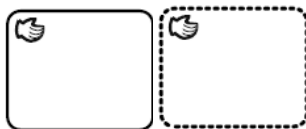
(CMMN 1.0, p. 46f)

Non-Structured/Flexible Part of CMMN

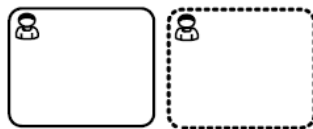
Discretionary Tasks



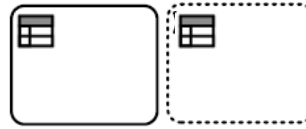
- Discretionary Tasks are available to the Case worker, to be applied to his/her discretion
- It is up to the Case worker
 - ◆ whether he/she want to execute a discretionary task
 - ◆ when to execute a discretionary task
 - ◆ how often he/she wants to execute a discretionary task
- Any task type can be discretionary



Non-Blocking
Human Task



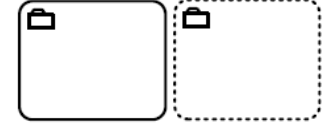
Blocking
Human Task



Business Rule
Task



Process Task



CaseTask



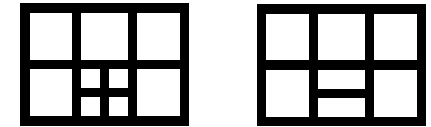
Planning at Run Time: Applicability Rules

- PlanningTables can be assigned to a Stage or a HumanTask.
- Case workers are said to “plan” (at run-time), when they select Discretionary Tasks
- A Planning Table can have applicability rules for Discretionary Tasks.
- Applicability Rules are used to specify, whether a Discretionary Task is “applicable” (“eligible”, “available”) for planning, based on conditions that are evaluated over information in the Case File.
- At run-time only Discretionary Items, for which the ApplicabilityRule evaluates to “true”, must be shown to the Case Worker

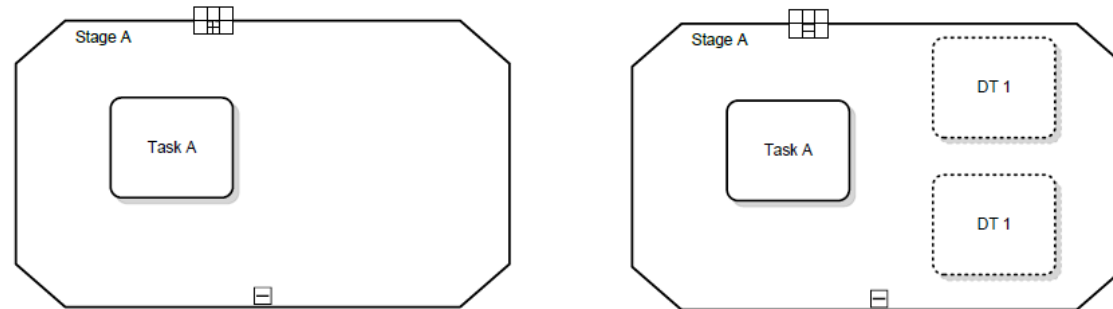
(CMMN 1.0, p. 29, 56)



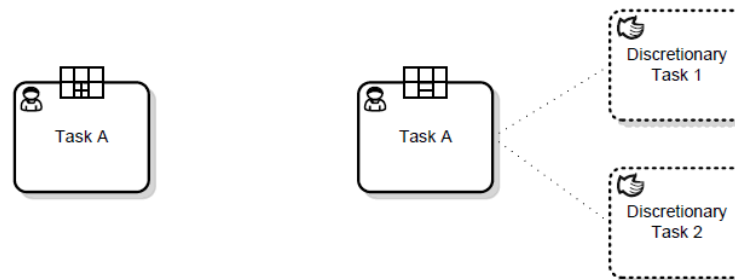
Planning Tables



- The marker at the center bottom cell of the Planning Table indicates if the Discretionary Items are visualized (+) or not (-).
 - ◆ When a user “expands” a Planning Table, its contained Discretionary Items become visible within the Stage

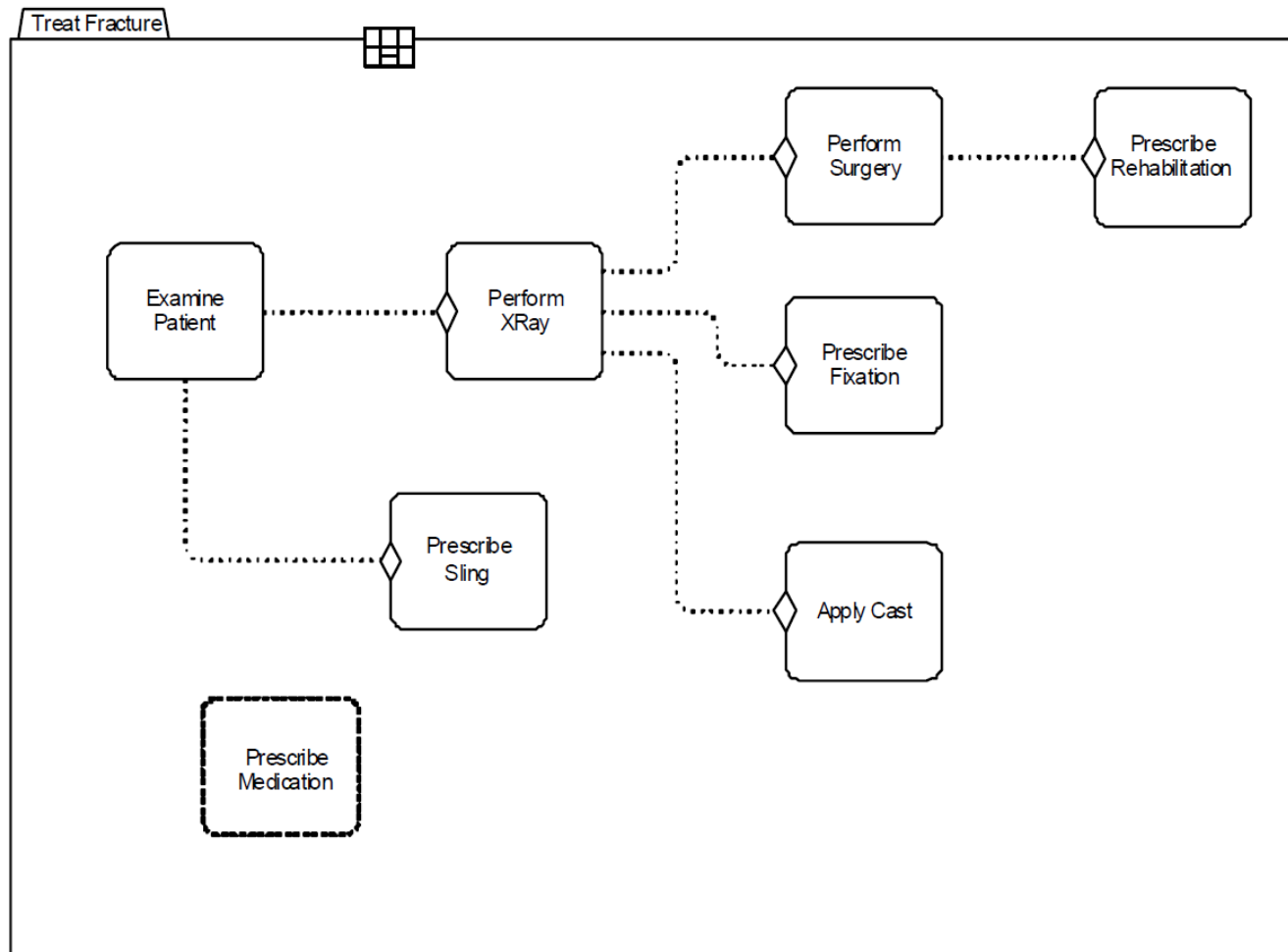


- ◆ When the PlanningTable of a HumanTask is expanded, its contained Discretionary Items are visualized outside the HumanTask shape



(CMMN 1.0, p. 56f)

What is the meaning of this model?



(Gagne 2013) at <http://www.cmmnwebmodeler.com/>

(CMMN 1.0, p. 46)

What is the meaning of this model?

