

Dynamic Structures




Petri nets (1/2) - Basic Reference Sheet

FMC



FMC diagrams for dynamic structures are based on transition-place Petri nets. They are used to express system behaviour over time depicting causal dependencies. So they clarify how a system is working and how communication takes place between different agents.

Here only the basic notational elements are covered whereas the rest is located on another - more advanced - reference sheet (2/2).

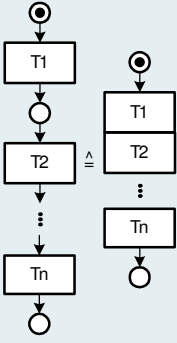
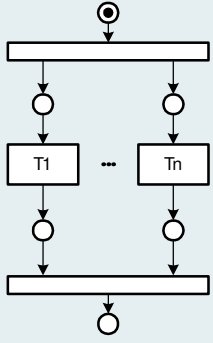
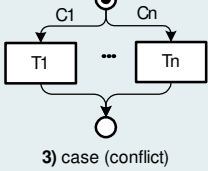
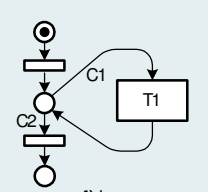
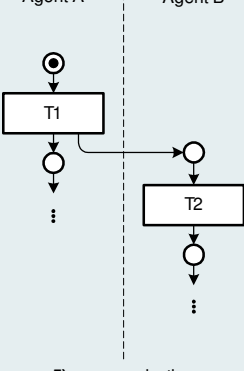
basic elements

	transition	Stands for an operation, an event or an activity. (Note: verb should be used for identifier "T")
	place	Represents a control state or an additional condition. (Note: capacity = 1)
	directed arc	Connects a place and a transition.

further elements

	NOP	A transition meaning No Operation. (Note: often used to keep the bipartiteness)
	swimlane divider	Distinguishes competences of agents.

common structures

 <p>1) sequence</p>	 <p>2) concurrency</p>	 <p>3) case (conflict)</p>  <p>4) loop</p>	 <p>5) communication</p>
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- 1) Defines that transition T1 fires first, followed by transition T2, followed by transition T3 ...
- 2) Means that transitions have no causal ordering. The transitions T1, ..., Tn are concurrent, the firing of T1, ..., Tn has no special order.
- 3) Is used to choose one transition among others. Only one of the transitions T1, ..., Tn will fire, depending on the conditions C1, ..., Cn associated to the arcs.
- 4) Is used to repeat the firing. Transition T1 will be repeated as long as condition C1 is fulfilled. Often C2 is not mentioned as it is assumed to be "else".
- 5) Whenever a swimlane divider is crossed communication takes place. Upon this structure all possible communication types can be expressed (synchronous, asynchronous etc.).