Process oriented modelling

- There are two basic approaches to model information systems that reflect business processes:
  - Data Flow Analysis:
    - ***Interchange*** of information objects and information objects themselves are the center of the analysis
    - The information system is contemplated ***statically***
  - Control Flow Analysis:
    - ***Interaction*** of the information objects is the center of the analysis.
    - The IS is analized ***dynamically***.
    - To analize the dynamical behaviour of an integrated IS, the processes are modeled as to be triggered by events: **EPCs**!

Event-driven Process Chains

- Semi-formal graphical notation used primarily to represent business processes
- Developed by “Institut für Wirtschaftsinformatik” (IwI) at the University of Saarland.
- Used in ...
  - industrial practices (e.g. SAP R/3)
  - academical field (e.g. ARIS - Architecture of Integrated Information Systems framework).

EPCs: Goal/Motivation

- EPCs can be used to ...
  - model business processes of a company
    - to represent the existent tasks with regards to their current execution
    - potentially represent their future execution (based on optimizations/introduction of a new system).

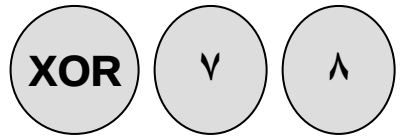
Events

- Label: object + verb in perfect tense describing the stated reached.
- An event can be:
  - a trigger for a certain function detailing a state that has to be fulfilled prior to executing a function (“input” to a function)
  - state reached after an activity has been executed (“output” of a function)

Functions

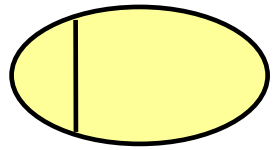
- Label: Verb + Object
- They can be a detailed activity or an abstract task…
  - to be executed by a certain person
  - requiring a certain input
  - executed in order to reach a certain state
  - potentially producing a certain output.
- Examples:
  - Abstract task “Process order”
  - Detailed activity “choose supplier”

Logical operators



- Used to connect functions and events
- Can be used to indicate:
  - Decisions or choices...
    - XOR: only one of several choices is possible
    - OR: more than one choice is possible
  - Parallel execution of functions (AND)
- Example: An order can be processed by telephone XOR by mail.

Organizational unit

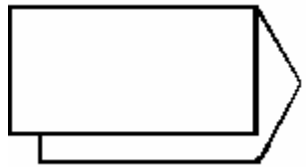


- No labeling conventions
- Represent roles or persons that are responsible for a certain function.
- Example:
  - Sales dept. is responsible for processing the order

Information object

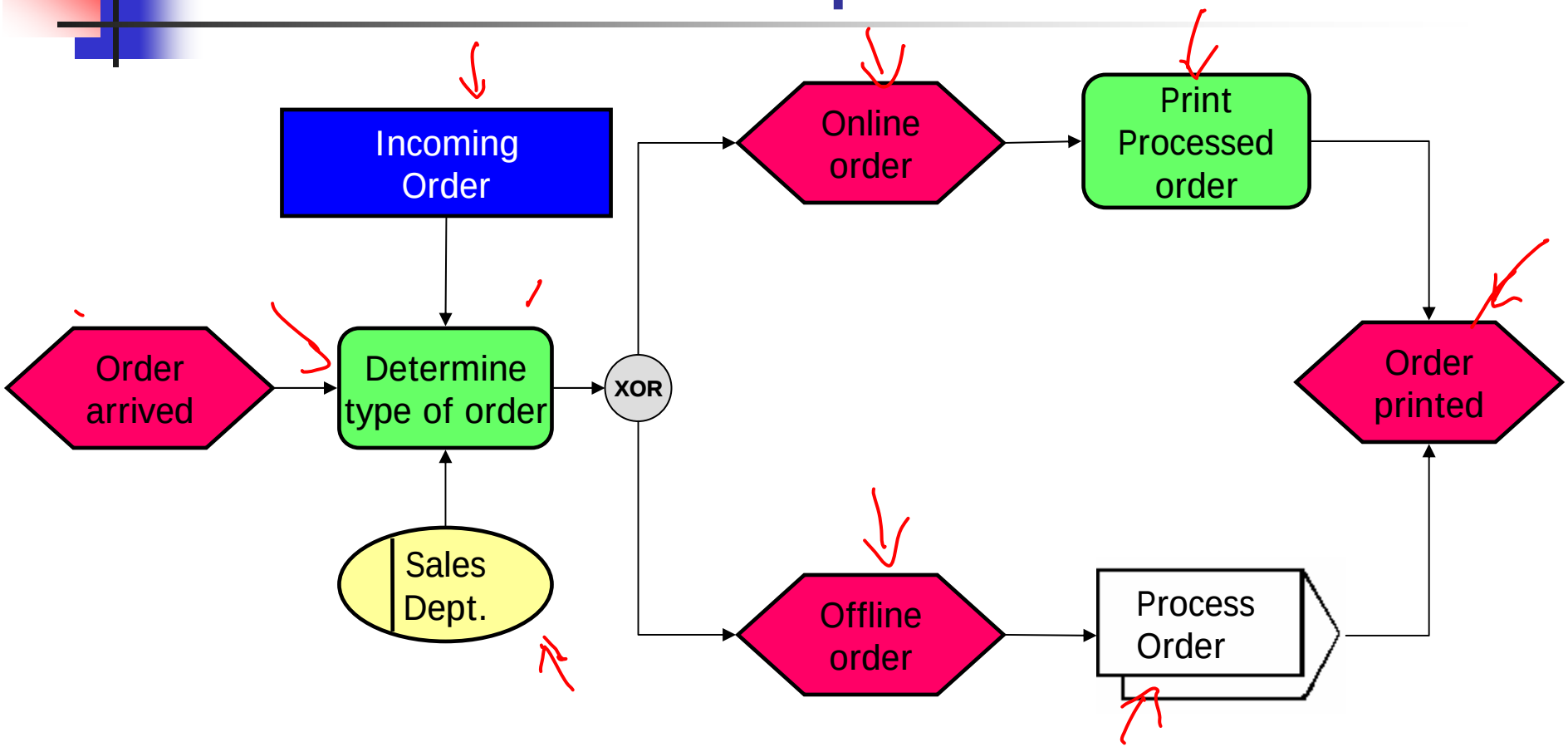
- Can be seen as input or output to functions
- Example:
  - Input: Order template
  - Output: Invoice

Process path



- More or less the same element as a ***function***.
- It has been introduced to reflect that EPCs can be hierarchically described, beginning with a very abstract description and further detailing several functions.
- Example: Detailed EPC for “Process order”

Notation Example:

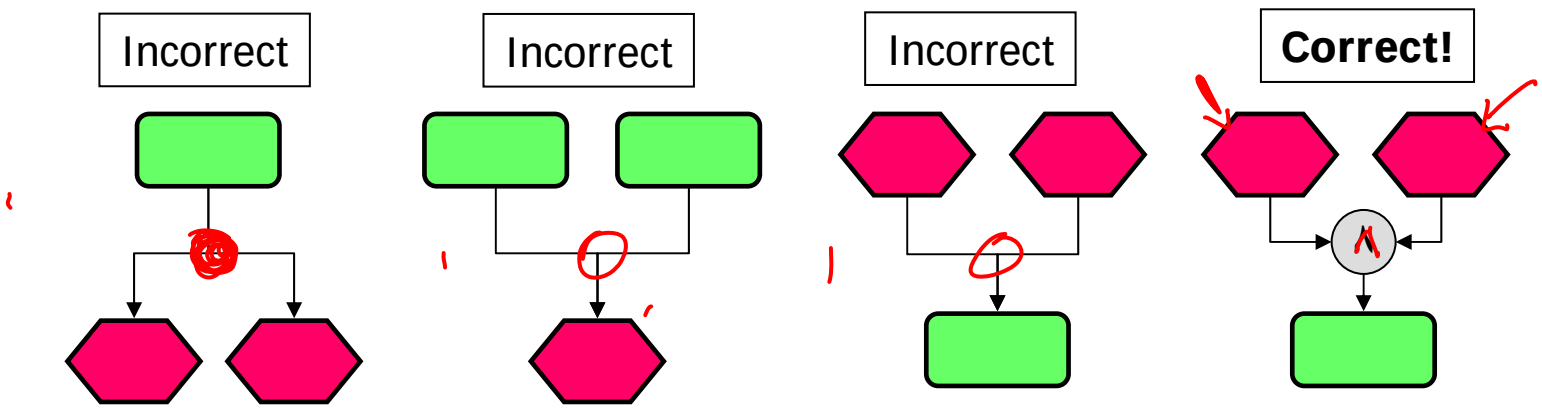


5 Rules (I)

- Connections between objects and the overall notations must follow these rules and conventions:
  - Rule 1: An EPC model has to start with an event
  - Rule 2: An EPC model has to end with an event
  - Rule 3: Functions and Events should be alternated

5 Rules (II)

- Rule 4: When connecting functions and events, such nodes can only have one input and one output.
- The following cases are not valid:

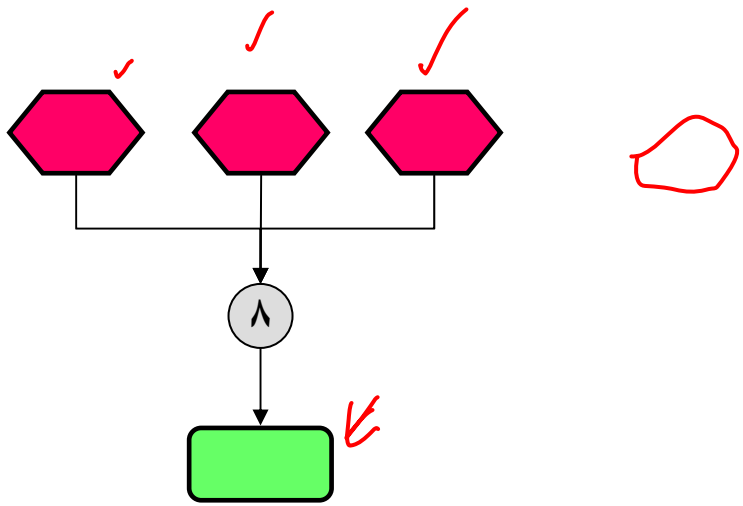


5 Rules (III)

- Rule 5: An Event is a passive element that does not have any decision competency!
  - This rule primarily affects the usage of logical operators and the connection of functions and events based on this connection.
  - Two types of connections can be distinguished, Splits and Joins.

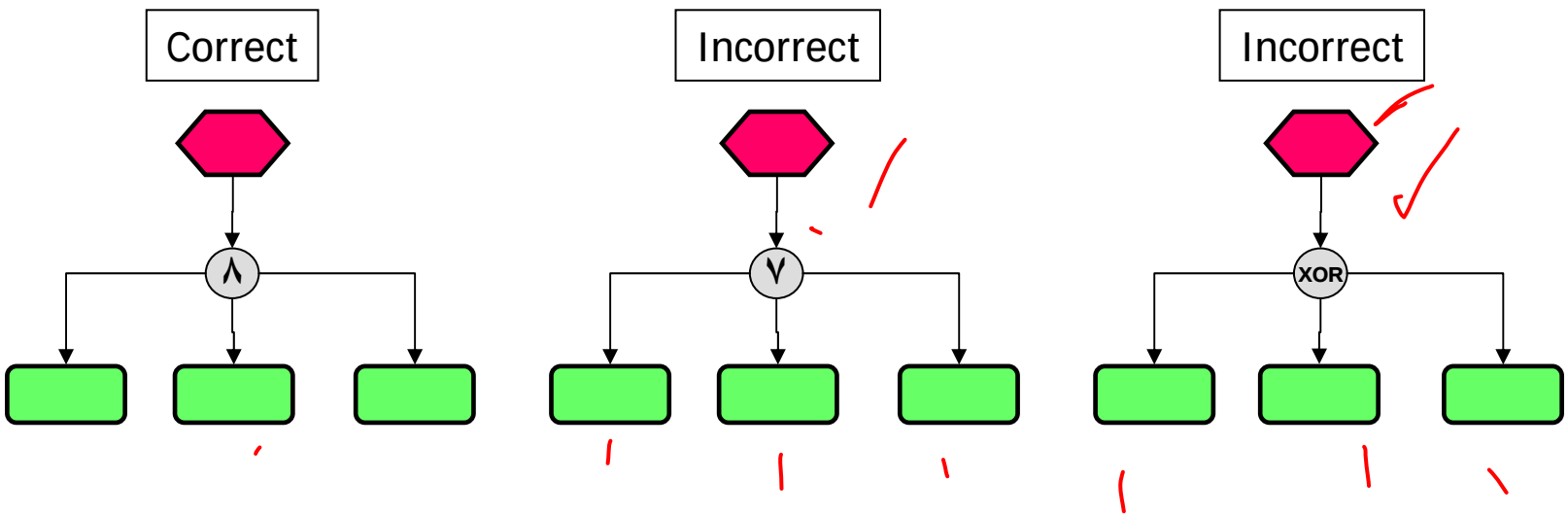
Rule 5: Join

- Join: **n-functions/events** *respectively connected to* **1-event/function**

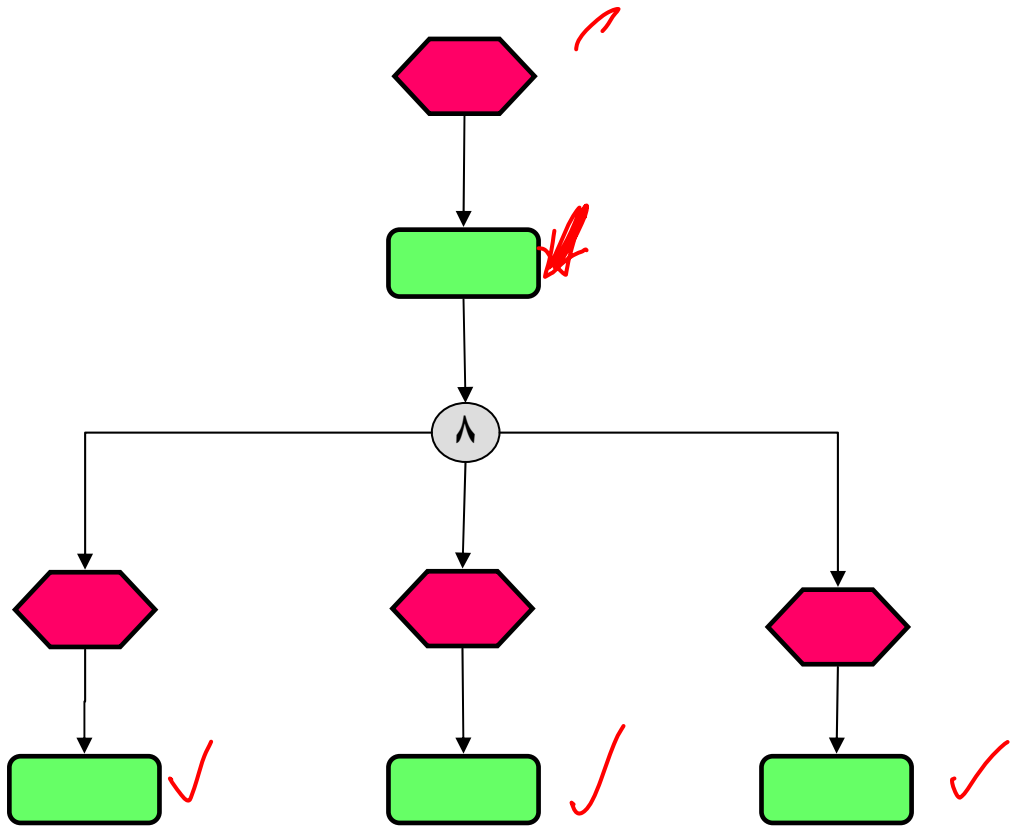


Rule 5: Split

- Split:1-**event/function** *respectively connected to* **n-functions/events**



Solution to the last incorrect cases



Interchanging EPCs

- An XML based language named EPML – (EPC Markup Language) has been developed to interchange EPCs by the EPC community
- Due to numerous mappings it is possible to exchange EPC models between different tools as for example the ARIS toolset.
- There are supplemental tools that allow to syntactically check an EPML document.

Simulation of EPCs

- Even though EPCs are based on Petri-nets it is not implicitly possible to simulate the business processes modelled with EPCs, due to the fact that the definition of EPCs does usually not include a formal syntactical and semantical definition
- Several approaches exist that weaken this problem by introducing a more formal definition of EPCs.
- Tool named EPC Tools:
  - University of Paderborn in Germany
  - Enables a user to either model an EPC or integrate an existing EPC model and simulate this model