Model checking & running case

Material for the exam and grading

- All handouts and exercises in it
- All lecture sheets
- Book of van der Aalst chapters 1,2,3,4, Par. 5.1, 5.2., Appendix A (excluding A.5)

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- End grade =
  - (0.35 * grade exercise class) +
  - (0.65 * grade for the exam)

Requirements and grading Exercise class

Minimum requirements

	Exercises In section :
Handout Ex. class 1	1.1., 1.2. ,1.3.,1.4.,1.5.
Handout Ex. class 2	1.1.,1.2.
Handout Ex. class 3	1.1.,1.2.,1.3.
Handout Ex. class 4	1.1.,1.2.

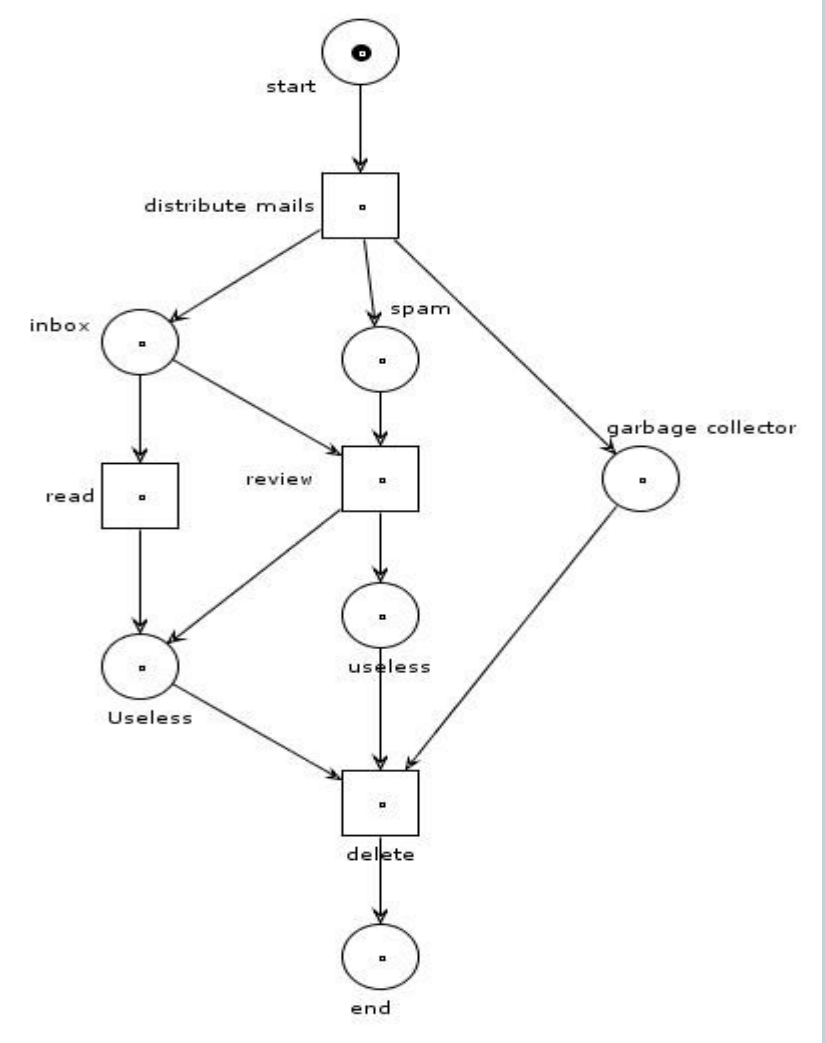
Requirements And grading

Requirements	**Content**	**Grade**
Minimum requirements	See table above	6.0.
Lista case+ participation	Running case exercise in all Handouts	+ (between 0 and 4.0.)

Lecture Outline

- Recap 4th lecture/concept check
- Classroom exercise
- Running case

Recap 4th lecture

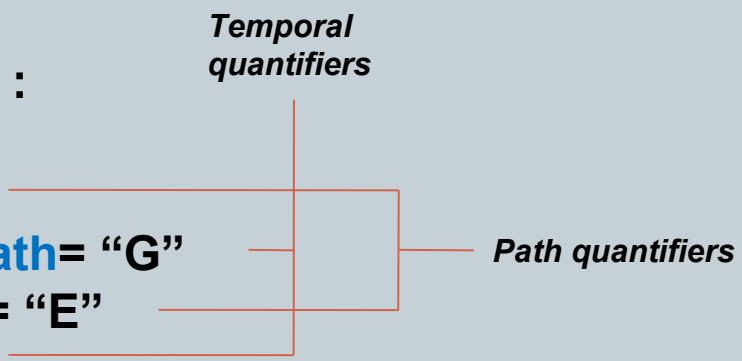


Recap 4th lecture

Option to complete + proper completion:

for all paths in the RG from the initial state to any state M along that path, there exists a path from M that eventually leads to the end state (without leaving tokens behind in the net) ?

Translated into CTL :



All paths = "A"
Any state along a path= "G"
There exists a path= "E"
Eventually = "F"
The end state = (0000010)

So thee formula AG EF (current state=0000010) is a way to post the question of "option to complete" + "proper completion" in the formal language CTL

Recap 4th lecture

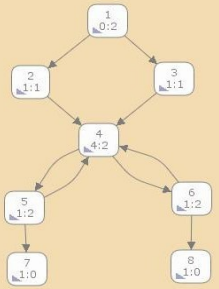
- Translations CTL ➔ ASK-CTL (CPN-Tools):
  - AG(p)= INV(p)
  - EF(p) = POS(p)
  - AF(p)= EV(p)
  - EG(p)= ALONG(p)

  - ***AG EF (p) = INV (POS (p))***

Recap 4th lecture

Specification :
- Liveness
- Soundness
- Etc.

Model of system



CPN Tools

Yes/No

CPN Tools allows you to specify any property, using ASK-CTL, including soundness, while Woped is dedicated to check only soundness

Lecture Outline

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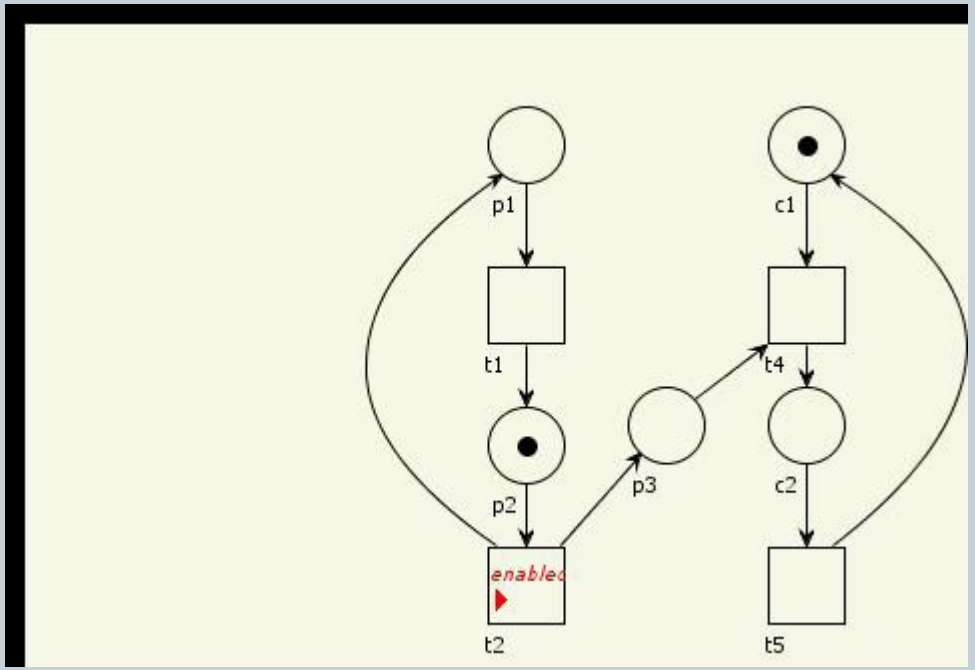
Formal vs. Graphical notation
EN systems (see Handout 1, p. 5 and 6)



ENS = (P, T, A, I)

P = {p1; p2; p3; c1; c2}

T = {t1; t2; t4; t5}

A = { (p1, t1), (p2, t2), (p3, t4),
(c1, t4), (c2, t5) }
∪
{ (t1, p2), (t2, p1), (t2, p3),
(t4; c2), (t5, c1)) }

I = {(p1, false), (p2, true), (p3,false),

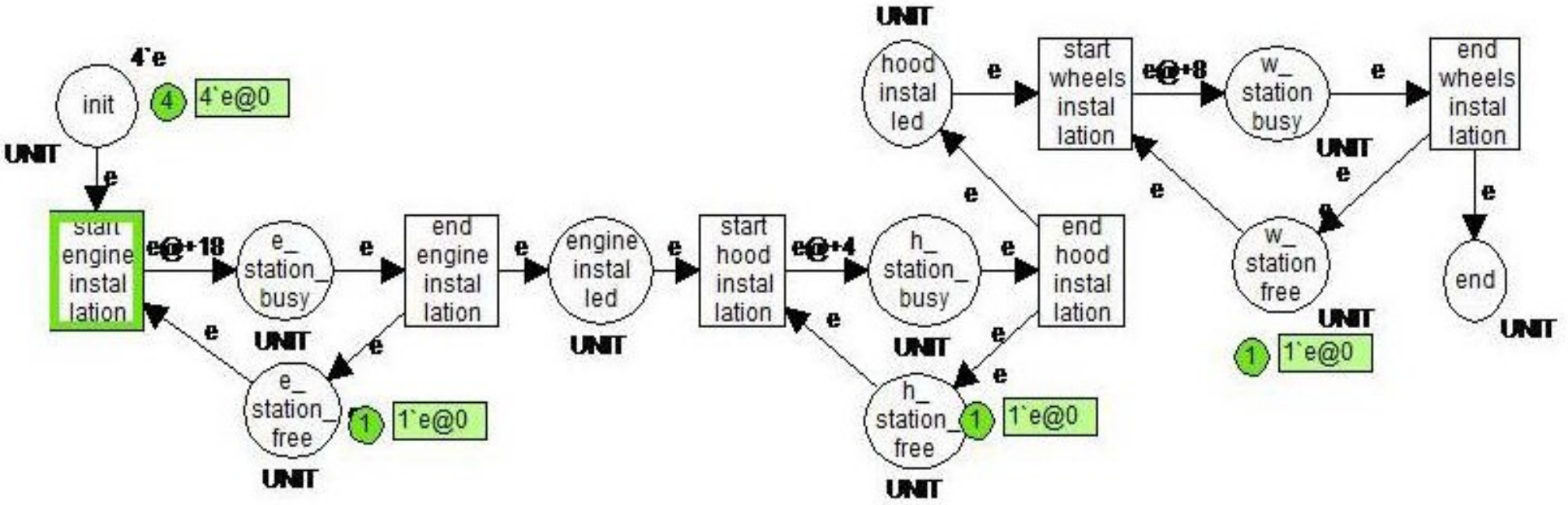
(c1, true),(c2,false)} (*)

(*) different notation in CPN tools :

I = {(p1, 1`e), (p2, 1`e), (p3,empty),
(c1, 1`e),(c2,empty)}

But it amounts to the same thing

Classroom exercise



Give the marking at:

1: 9.00 (t=0)
2: 9.30 (t=30)
3: 9.50 (t=50)
4: 10.10 (t=70)

Give :

- **Average completion time**
- **Throughput per day**

Lecture Outline

- Recap 4th lecture/concept check
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Business process modelling in the Project start up phase

BUSINESS EXECUTIVE

Validate solution
Verify requirements

Model of Solution (Project result)

Formalizing

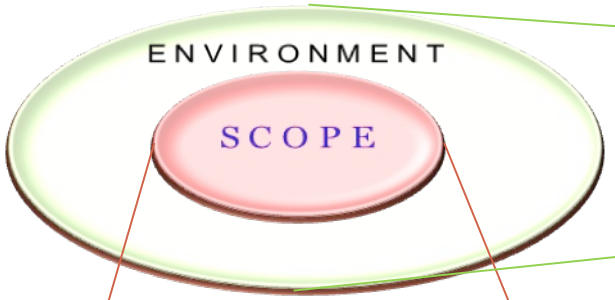
ASSIGNMENT:
- Problem
-Requirements

PROJECT DEFINITION

PROJECT EXECUTION

CONSULTANT/PROJECT MANAGER

Project definition : Scope



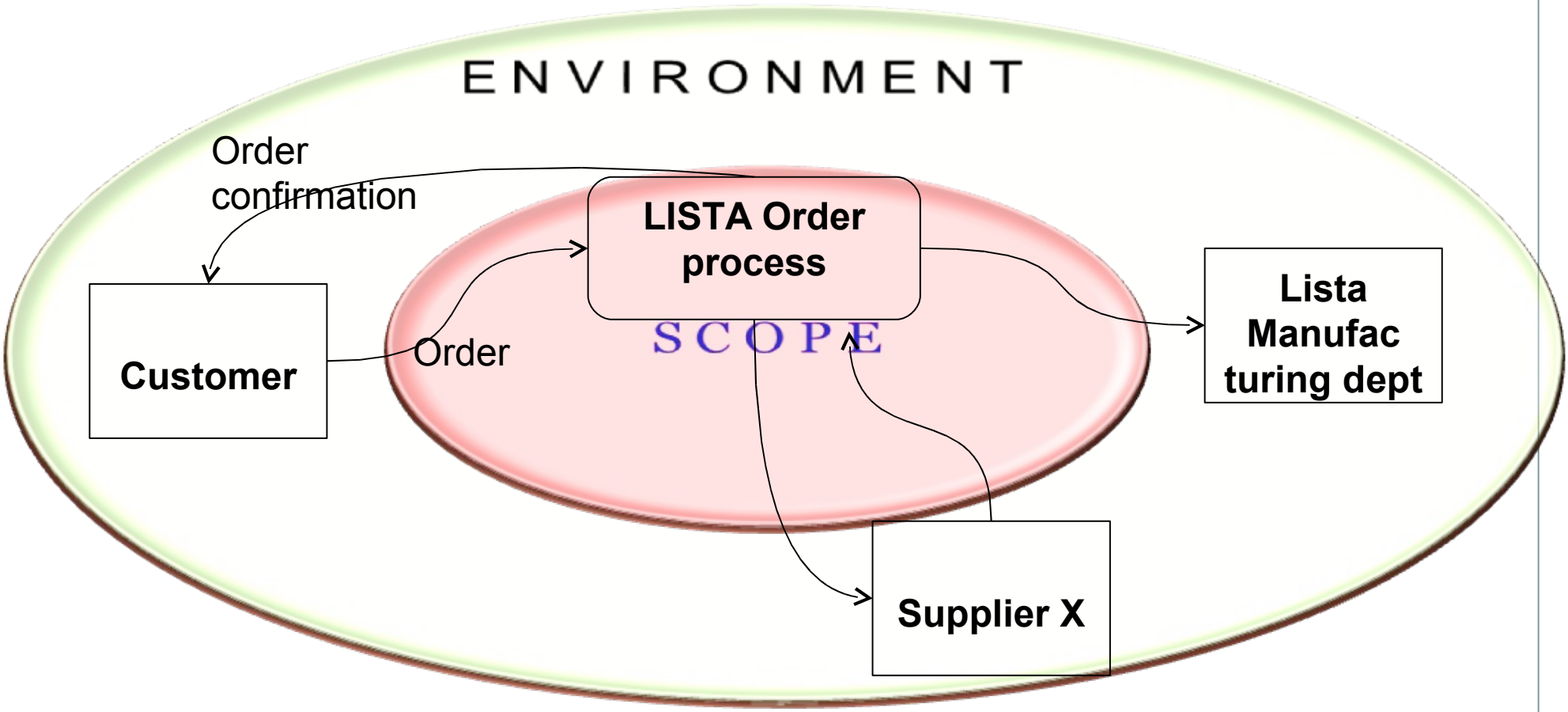
Relevant external parties (Suppliers, Customers, departments etc.)

- Products/services
- Markets
- Departments
- **Business processes**

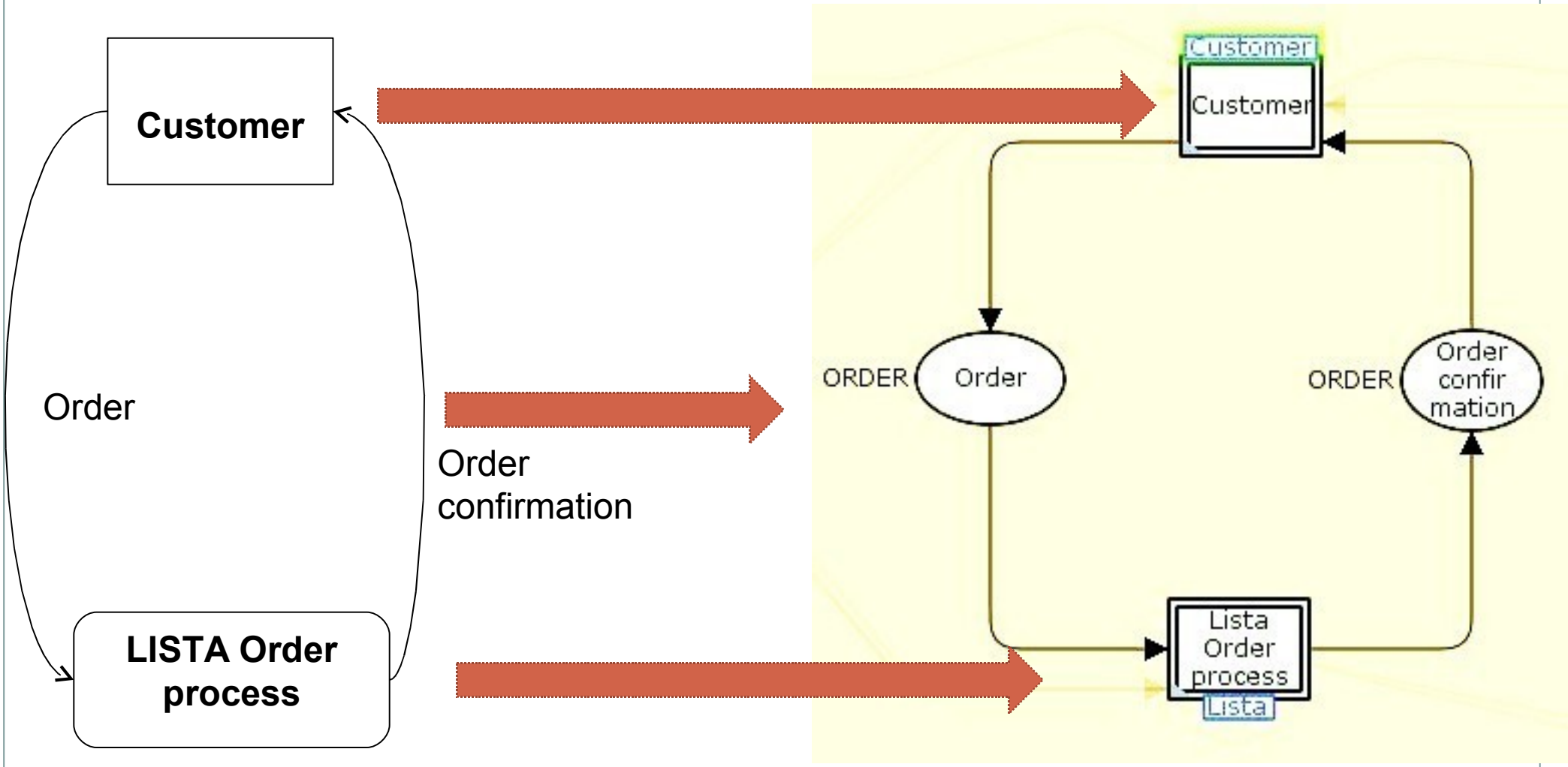
Informal description of business proceses and their environment :

- Natural language
- Informal Diagrams

Business process within scope : Lista order process



Formalizing the model (1)



Formalizing the model (2)

THE ORDER IS THE "CASE" THAT IS RUNNING THOUGH
THE LISTA ORDER PROCESS

DEFINING THE "CASE ATTRIBUTES" IS AN IMPORTANT MODELLING DECISION

ONE POSSIBILITY :

- Order :
- (1) Start time
- (2) Order route

colset Order=product INT* ROUTE
(1) (2)