

# An algorithm for the identification of ERP systems misalignment

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# Context

**Information systems (IS)** more and more based on “off-the-shelf” products



**Alignment with the enterprise's needs:** critical issue that influence the success of an ERP project

Focus on **ERP** systems (Enterprise Resource Planning)

# Overview

- 1) The ERP system alignment problem
- 2) Review and analysis of the literature
- 3) Contribution: an algorithm to identify misalignment situations
- 4) Illustration of the contribution
- 5) Conclusion and perspectives

ERP system specificity:

It offers a **generic solution**



It has to be customized by a  
specific company

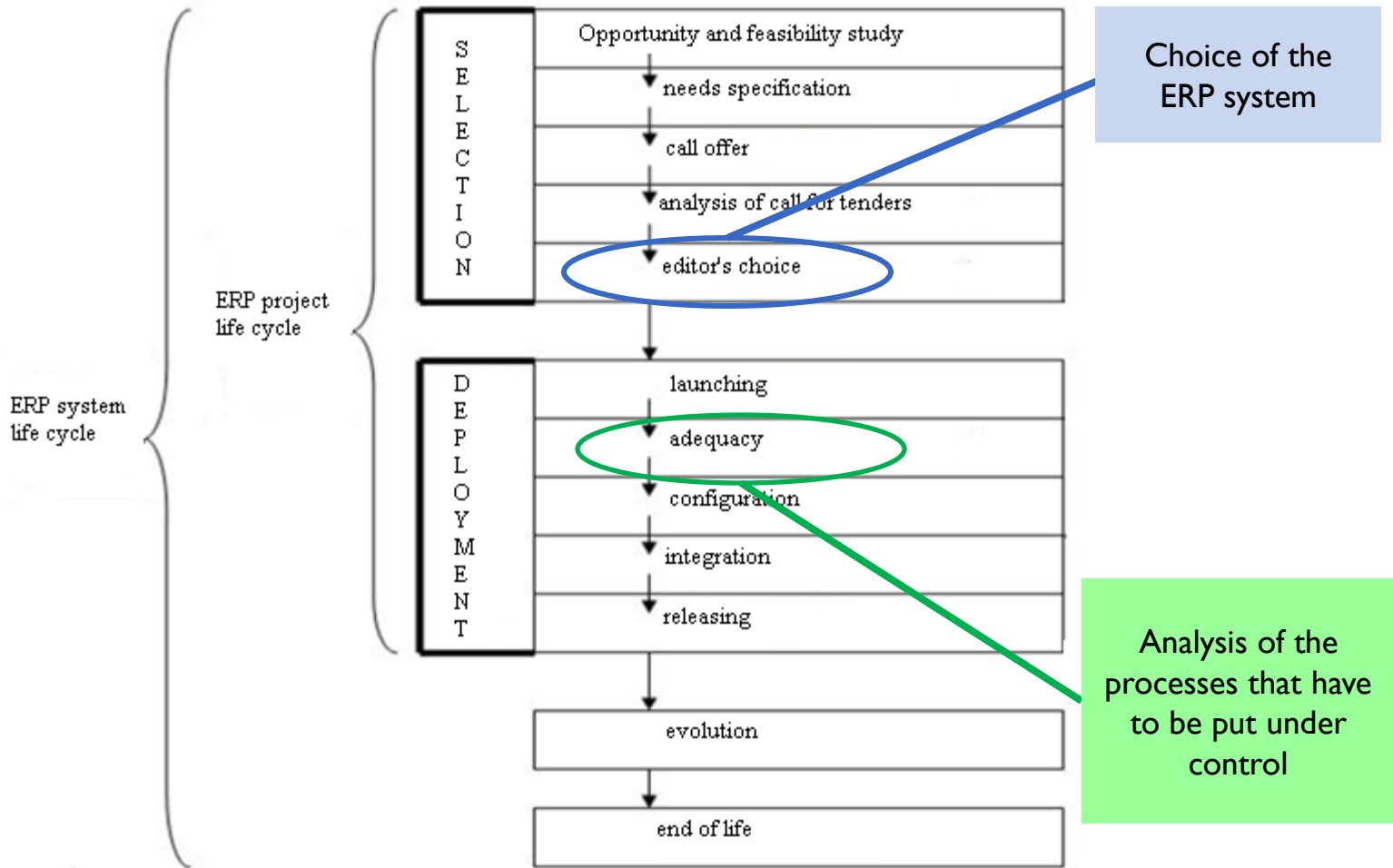


“alignment between the ERP system and the company”

To reach this alignment



Which decisions make during the  
ERP project life cycle?



Authors that propose methods dealing with the ERP system/ enterprise alignment problem:

### Selection phase

Wei et al. 2002  
Tournant et al. 2003  
Yazgan et al. 2009

Questionnaire-based

Darras 2004  
Wu et al. 2007

Model-based

### Deployment phase

Prakash et al. 2001  
Scheer et al. 2002  
Darras 2004  
Soffer et al. 2005  
Millet 2008

Model-based

Focus on these methods

**Model-based  
methods**



**Analysis of the modelling formalism**

- ↳ Modelling formalism
- ↳ Modelling views
- ↳ Nature of use



**Analysis of the alignment process**

- ↳ Models chosen to implement the alignment
- ↳ Alignment process
- ↳ Measurement techniques



## Analysis of the modelling formalism

Modelling Formalism	View(s)	Nature of Use
<ul style="list-style-type: none"> <li>❖ MAP</li> <li>❖ UML</li> <li>❖ EPC</li> <li>❖ Integration graph</li> <li>❖ GRAI grid</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>All the views expect the intentional one:</b> → Millet (integration graph) and Scheer et al. (EPC)</li> <li>❖ <b>Informational and functional views:</b> → Darras and Soffer et al.</li> <li>❖ <b>Intentional and functional views:</b> → Prakash et al.</li> </ul>	<p><b>Enabling the communication</b></p>

Models Chosen	Measurement Techniques	Alignment Process
<ul style="list-style-type: none"> <li>❖ <b>Model of the needs of the company</b></li> <li>❖ <b>Model of what the ERP system proposes</b></li> <li>❖ <b>Model of what will be implemented in the ERP system</b></li> <li>→ All the authors</li> <li>❖ <b>Model of the company As-Is</b></li> <li>→ Only Prakash et al.</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>Fuzzy detailed in:</b></li> <li>→ Prakash et al., Darras, Millet</li> <li>➤ Visually</li> <li>➤ Match of similar elements</li> <li>➤ Comparison</li> <li>❖ <b>Fully detailed in:</b></li> <li>→ Soffer et al. and Wu et al.</li> <li>➤ similarity measurement</li> <li>➤ comparison algorithm of diagrams</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>Focus on the:</b></li> <li>➤ Order of model use</li> <li>➤ Role of each model in the process</li> <li>➤ Process steps</li> </ul> <div style="border: 2px solid brown; padding: 10px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>❖ <b>But not on the:</b></li> <li>➤ Alignment and misalignment situations</li> <li>➤ Decisions to tackle these situations</li> </ul> </div> <div style="background-color: #90EE90; border: 2px solid green; padding: 10px; margin-top: 10px;"> <p><b>Proposition:</b> algorithm to identify the alignment and misalignment situations as well as the related decisions</p> </div>

## Alignment

Decisions

Modelling views

Matching process

Alignment and misalignment situations



## Decisions

- D1: the ERP system configuration
- D2: the ERP system adaptation
- D3: the addition of an applicative component
- D4: the manual supported process

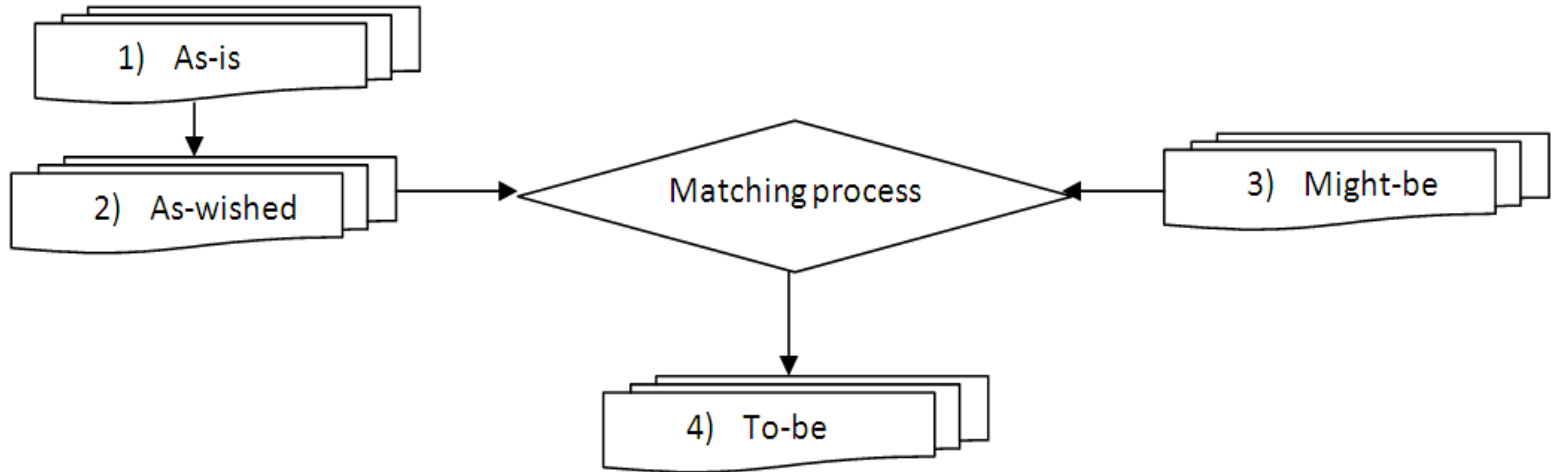
(Continuation of the work of Soffer et al.)



## Modelling views

- Intentional
- Functional
- Informational

## ★ Alignment process, Matching process



### Matching process → Algorithm:

1) Intentional view

2) Functional view

3) Informational view

- Each processes of the as-wished model

+

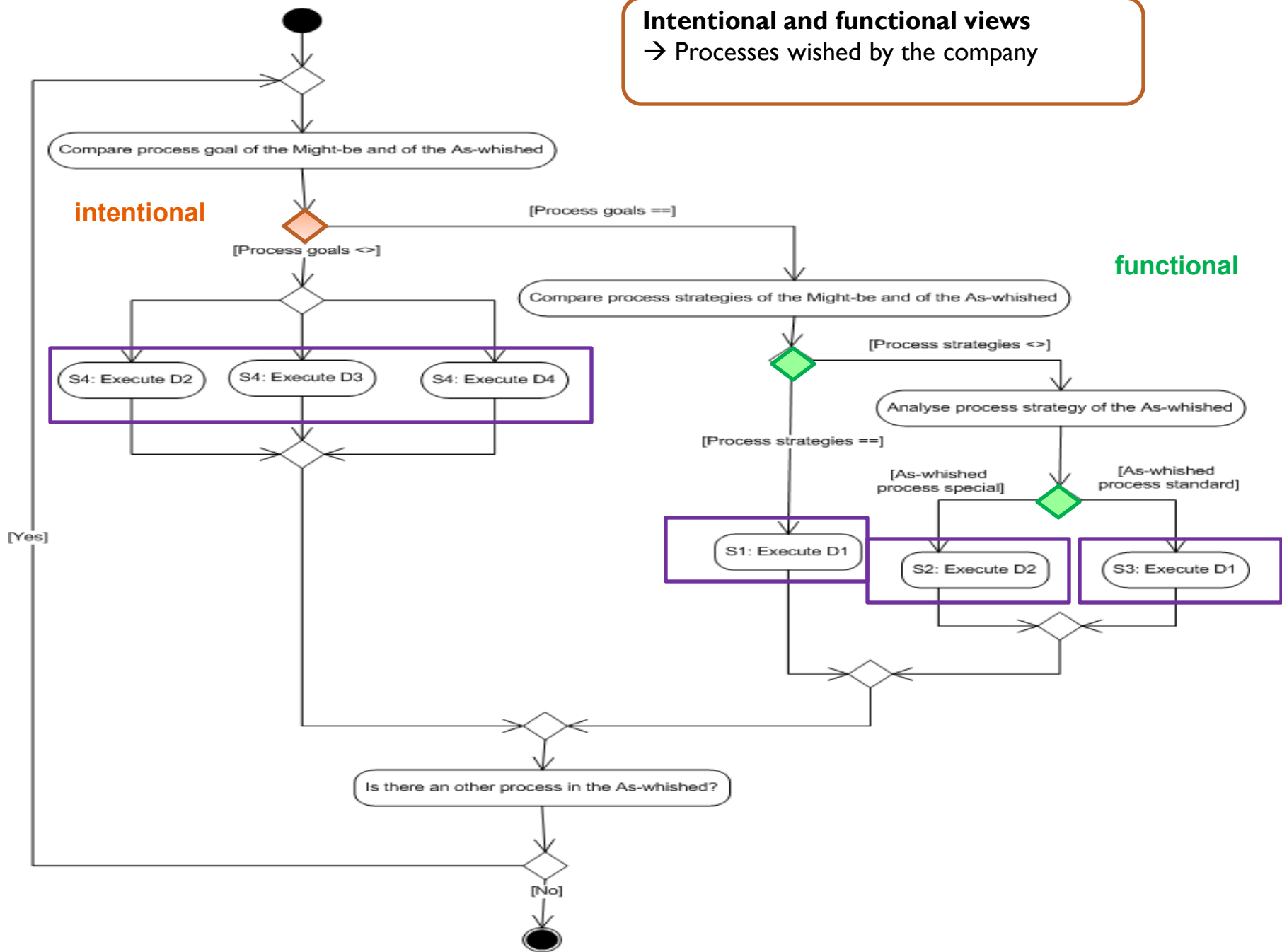
- Each processes discovered in the Might-be model

- Each chosen processes

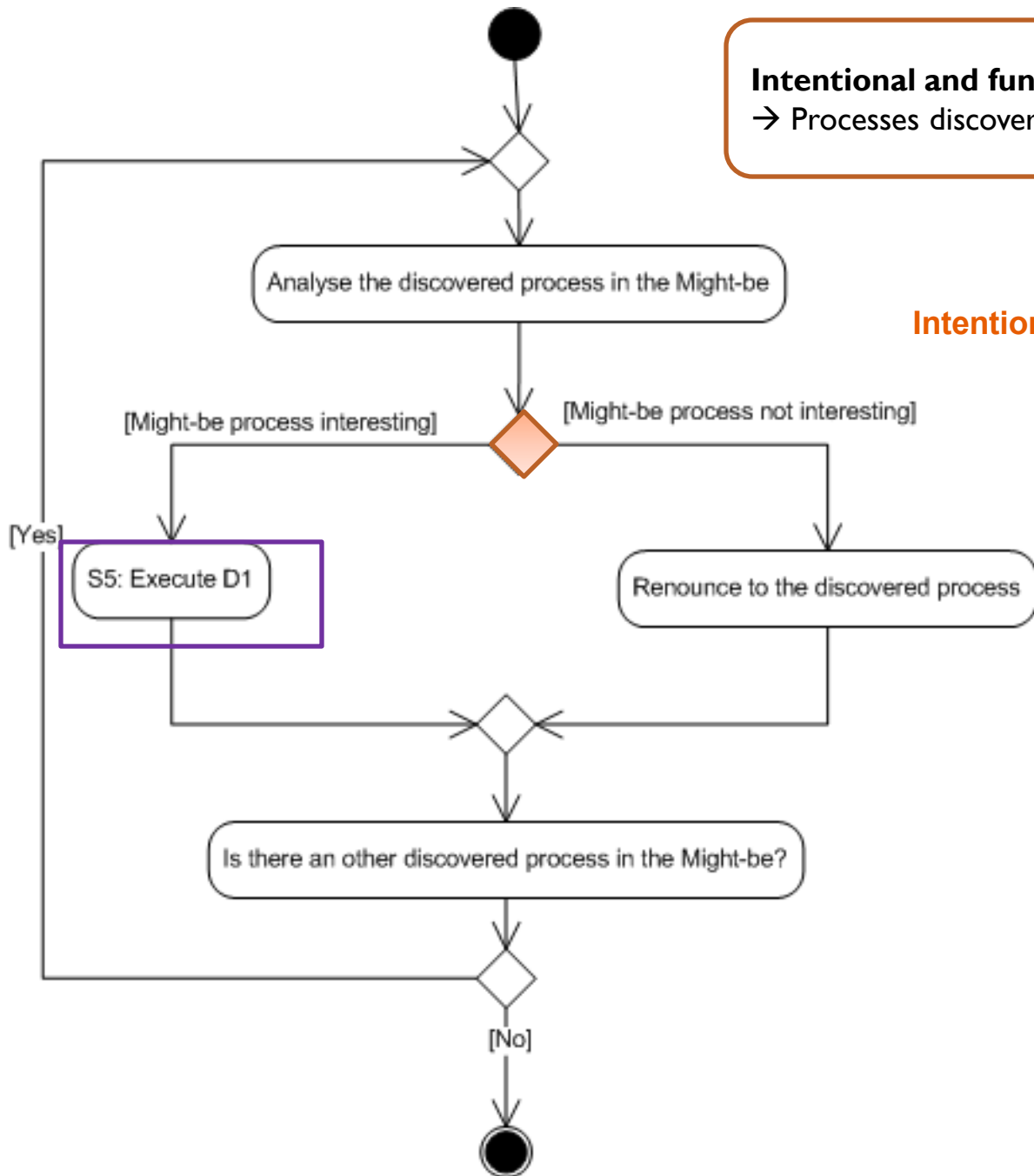
3 UML  
activity  
diagrams

# Intentional and functional views

→ Processes wished by the company



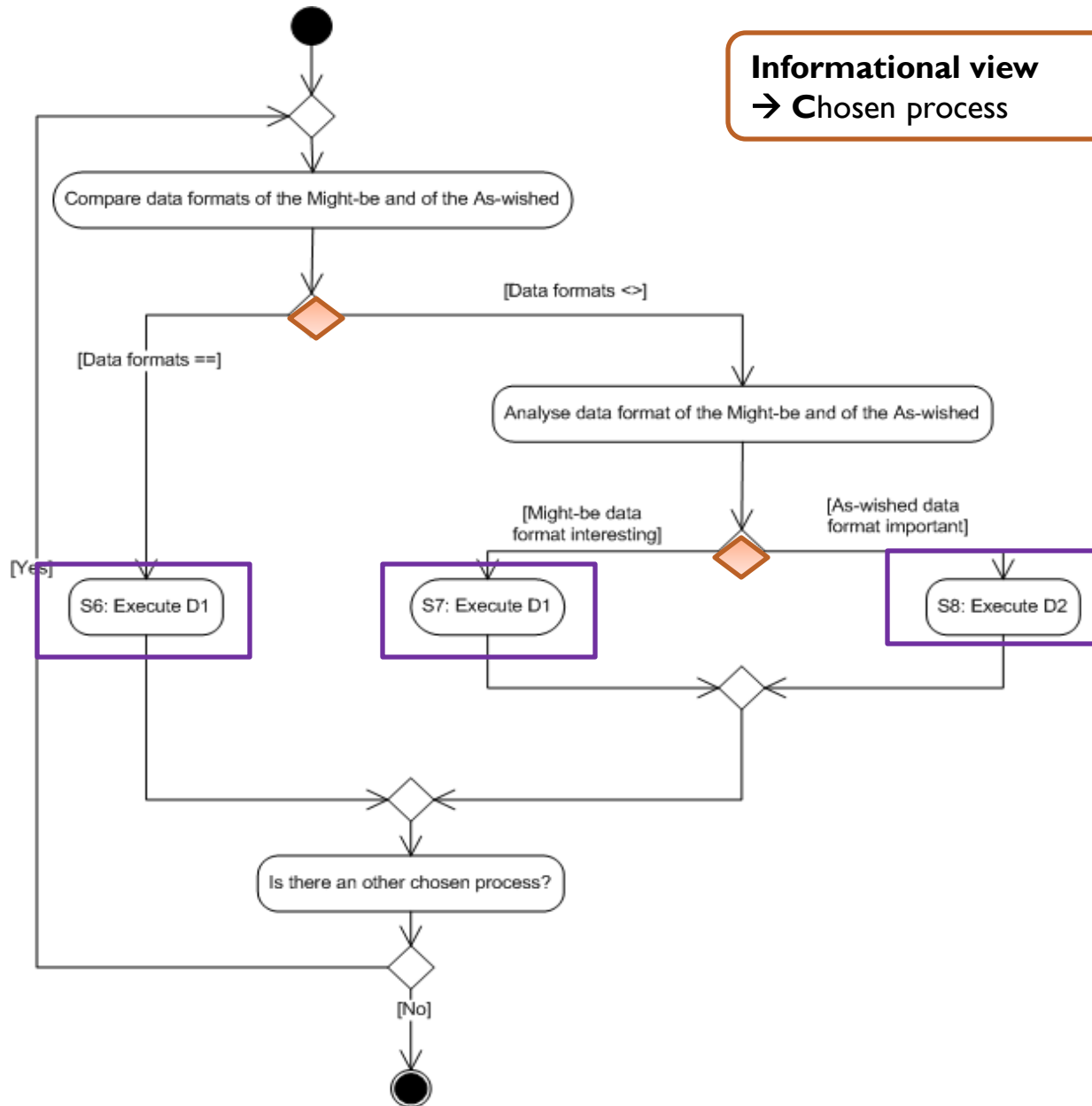
**Intentional and functional views**  
→ Processes discovered in the ERP system



**Intentional and functional**

# Informational view

→ Chosen process



## Study of the case of a SME localised in Strasbourg region :

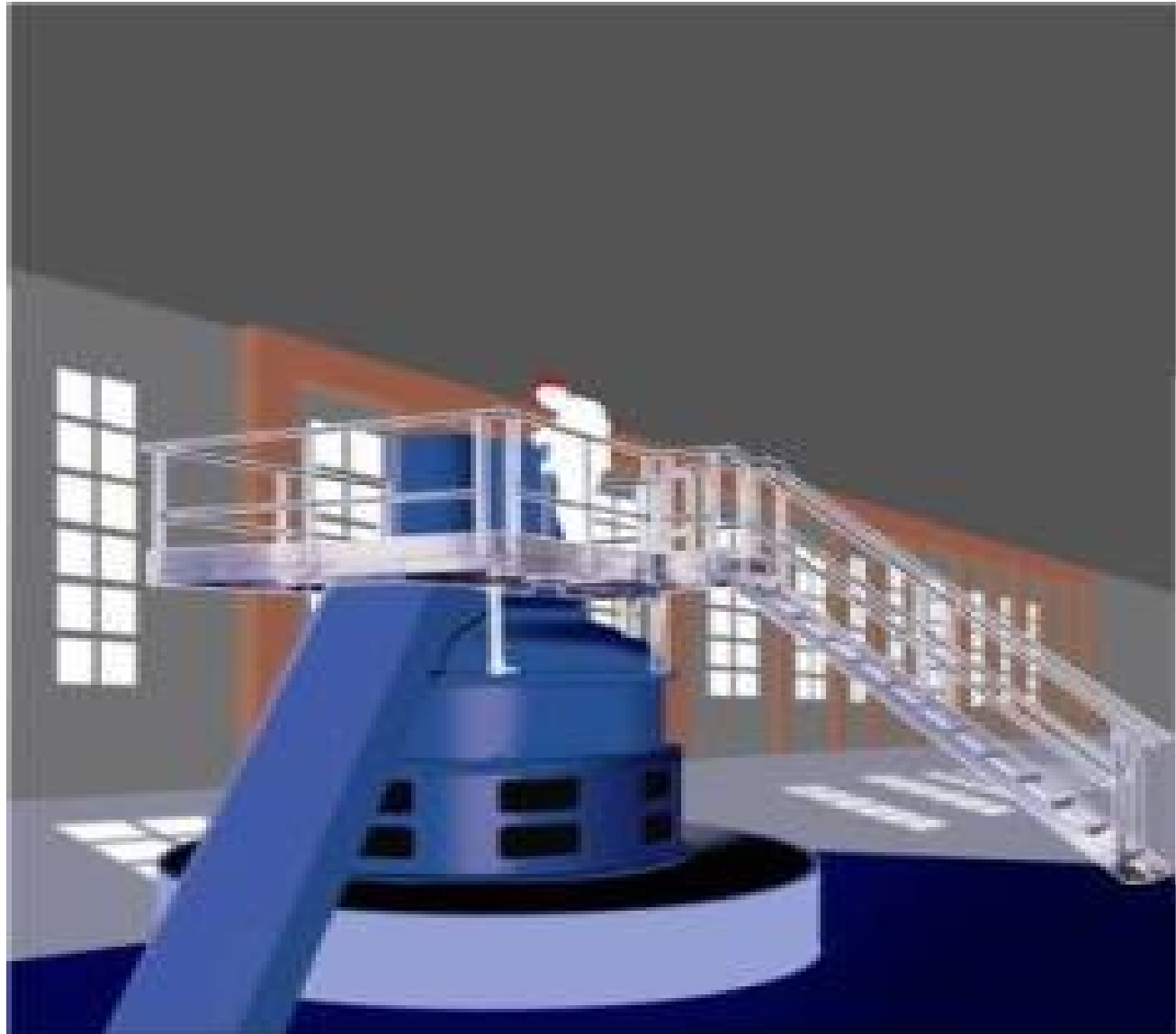
### The SME:

- Established in 1952
- 120 persons
- Sales = 23.000.000 Euros in 2008
- Specialized in height access and personal safety equipment for the building and manufacturing industries (scales or scaffolds)

### ERP project of the SME:

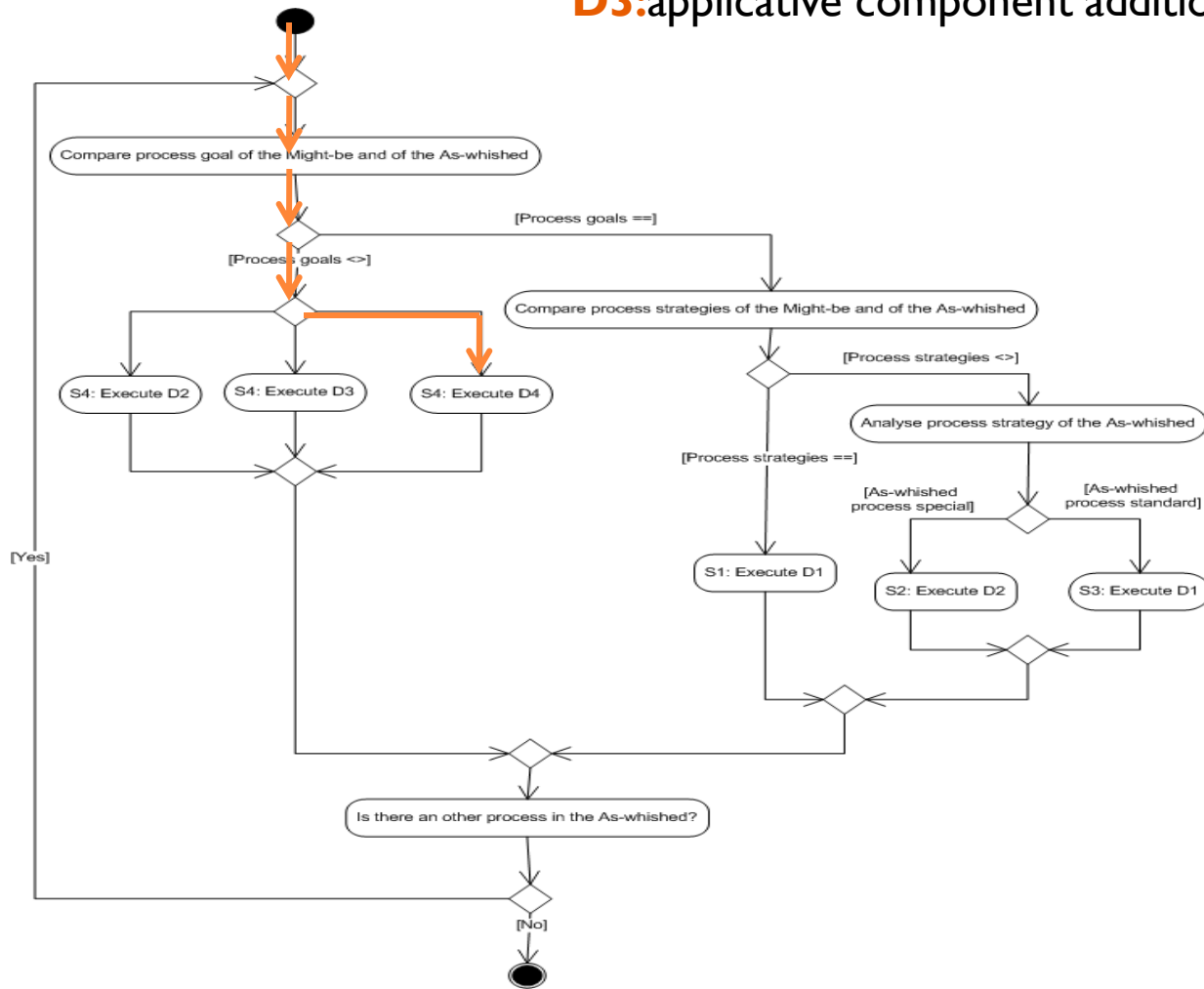
- End 2008:** selection of the ERP system
- January 2009 → June 2009 :** adequacy stage
- July 2009 → now:** configuration and integration stages

 **Focus on the adequacy stage (deployment phase)**



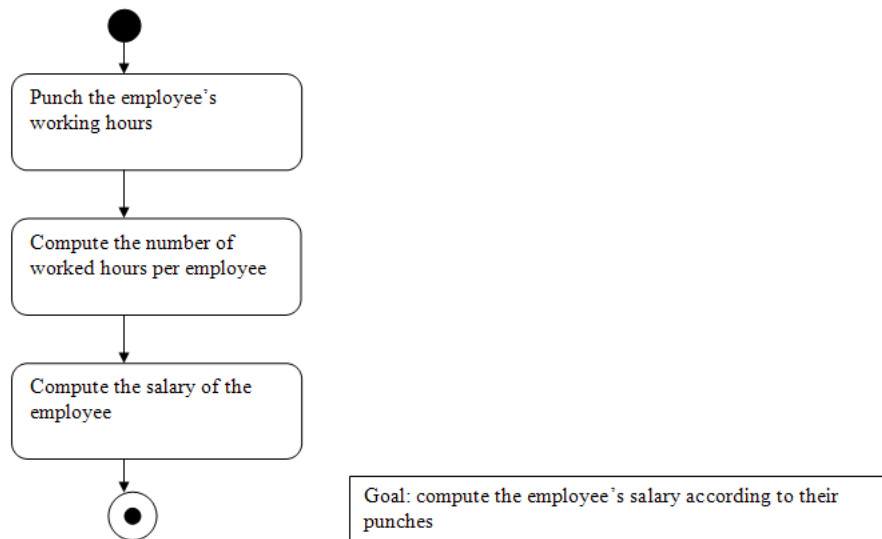
Study of one situation:

**S4:** no process equivalence in the Might-be  
**D3:** applicative component addition



➔ process “employee pay management”

### As-wished model



### Might-model model

No module that supports this process=  
No process with the same goal

**S4:** no process equivalence in the Might-be



**D3:** applicative component addition to support the process

→ We have illustrated 1 situation on the 8 situations of our algorithm.

→ The case of the SME allowed us to also illustrate the situations:

Situations	Decisions
<b>S1:</b> perfect equivalence of Might-be and As-wished processes goals and strategies	<b>D1:</b> ERP system configuration
<b>S2:</b> equivalence of the processes goals but not strategies and As-wished process strategy special	<b>D2:</b> ERP system adaptation
<b>S3:</b> equivalence of the processes goals but not strategies and As-wished process strategy standard	<b>D1:</b> ERP system configuration
<b>S4:</b> no process equivalence in the Might-be	<b>D2:</b> ERP system adaptation <b>D3:</b> applicative component addition <b>D4:</b> manual supported process
<b>S5:</b> Might process goal and strategy interesting for the company	<b>D1:</b> ERP system configuration
<b>S6:</b> perfect equivalence of the Might-be and A-wished data format	<b>D1:</b> ERP system configuration
<b>S7:</b> no format equivalence in the Might-be and the Might-be format interesting	<b>D1:</b> ERP system configuration
<b>S8:</b> no format equivalence in the Might-be and the As-wished format important	<b>D2:</b> ERP system adaptation

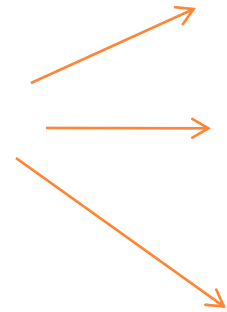
Conclusion (I)

Implementation  
of ERP systems



“Alignment between the ERP  
system and the company”

**Contribution**



List of alignment decisions

Matching process (intentional, functional  
and informational views)

Algorithm to make the connection between the  
misalignment situations and the related  
alignment decisions

## Conclusion (2)

### Concerning the algorithm

- Free modelling formalism choice
- Visual matching
- Detailed study of all the processes

## Perspectives

### **Improving the performance of the algorithm:**

- matching automation (measurement techniques)
- focusing on the processes that represent a risk
- modelling formalism choice