

A Survey on the Flexibility Requirements related to Business Processes and Modeling Artifacts

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Background & Motivations

Competitive, integrated and **changing** business environments

- ❖ Today, to “integrate” business processes is not sufficient. The architecture of this integration should also be flexible.
- ❖ Needs for flexible and adaptive processes whose execution can evolve
 - ❖ according to situations that cannot always be prescribed, and/or
 - ❖ according to business changes (organizational, process improvement, strategic ...)
- ❖ Process-oriented business management requires concepts
 - ❖ to design (and align) business processes and their supporting IS
 - ❖ ... and to support their (co-)evolution



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My research interests

**IS modelling in the heart of Enterprise Architecture
(wider strategic and organization context)**

=> Enterprise Systems Engineering

- Multi perspectives modelling
- Coherence between models
- Variability
- Dynamicity



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Process flexibility

- Flexibility means fast reactivity to internal and external changes.

"the ability to yield to change without disappearing"
Regev & Wegmann, 2005

- It reflects the easiness to make evolve business process schemes (when required).
- Flexibility is also reflected by the ability that the support systems have to take into account business changes.



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Modeling perspectives

- ❖ **Enterprise modeling** refers to a collection of conceptual modeling techniques for describing different **facets** of the *organisational domain* :
 - **operational (IS)**,
 - **organisational** (business processes, actors, roles, flow of information etc), and
 - **teleological** (purposes) considerations
- ❖ Software modeling usually combined three basic views: **functional, behavioral, structural**.
- ❖ Six modeling perspectives (Van de Aalst et al, 2003 & Daoudi and Nurcan 2007): **intentional, functional, organizational, process, information, operation**.



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Modeling formalisms

- ❖ **Activity-oriented** : activities to be performed and their relationships regarding pre-defined control and data flows.
- ❖ **Product-oriented** : business objects handled during the execution of the process, their flow among activities.
- ❖ **Decision / intention oriented** : addresses the **essential question** regarding business processes, the **"why"**, and allows to define alternative organizational solutions for a given business objective.
- ❖ **Conversation oriented** : conversation relationship between two participants, customer and performer, divided into four phases of interaction - preparation, agreement, performance and acceptance



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Modeling formalisms

- ❖ BP modelling languages still provide concepts for activity-oriented and product-oriented representations.

UML, EPC, EPML, BPML, BPEL, BPMN

- ❖ Need for less detailed, more concise, more usage oriented representations (Saidani and Nurcan, 2006) taking into account social and organizational factors => **goal** and **role** orientation rather than activity one.

- ❖ Need for representing **variability** due to the **context awareness** (Saidani and Nurcan, 2007)

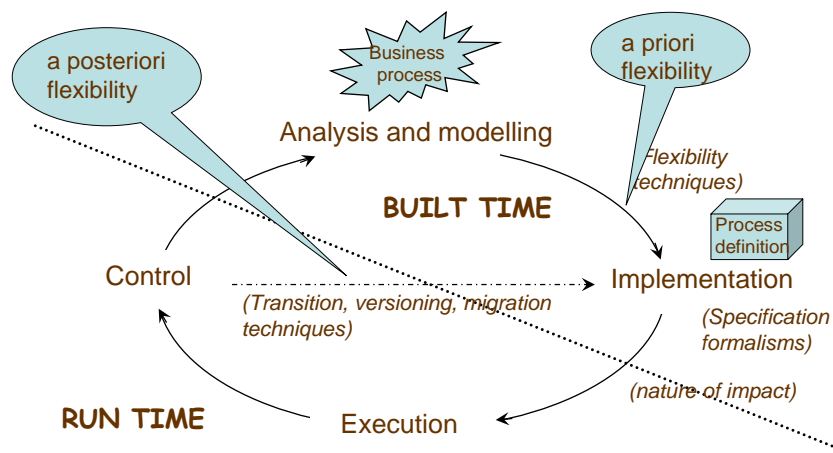


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Building and running

Nature of the flexibility



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Flexibility requirements

Some criteria on build & run times

Nature of the flexibility

by adaptation (a posteriori)

by selection (a priori)

allows adapting the process definition or its instances to their execution; the most common case in the literature

is based on modelling formalisms which can offer the capacity to deal with the environmental change without any evolution of process definitions

the resulting process is really flexible but:

The process definition should be specified in a sufficiently flexible way so that *it will yield under the influence of the environment without breaking.*

The enactment service should be able to execute 'incomplete' specifications of process definitions. It depends on the user decisions for the selection of (i) a process component, (ii) a behaviour to associate to a process component (actor, activity, resource, ..) , (iii) a way-of-performing an activity, ...

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Flexibility requirements

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by adaptation (a posteriori)

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Nature of the impact

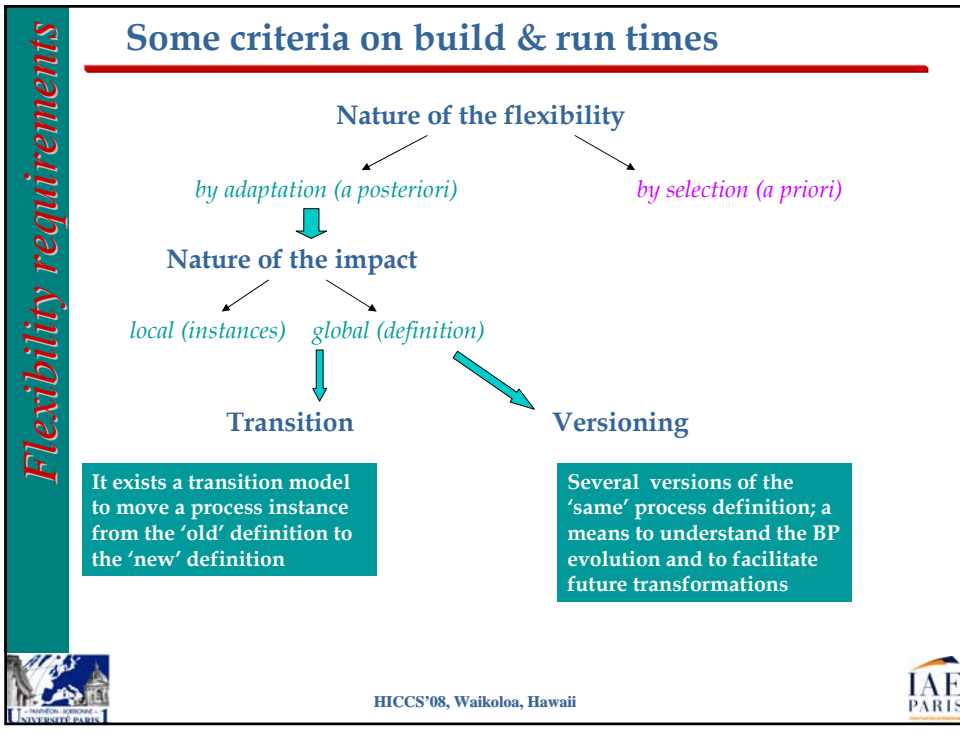
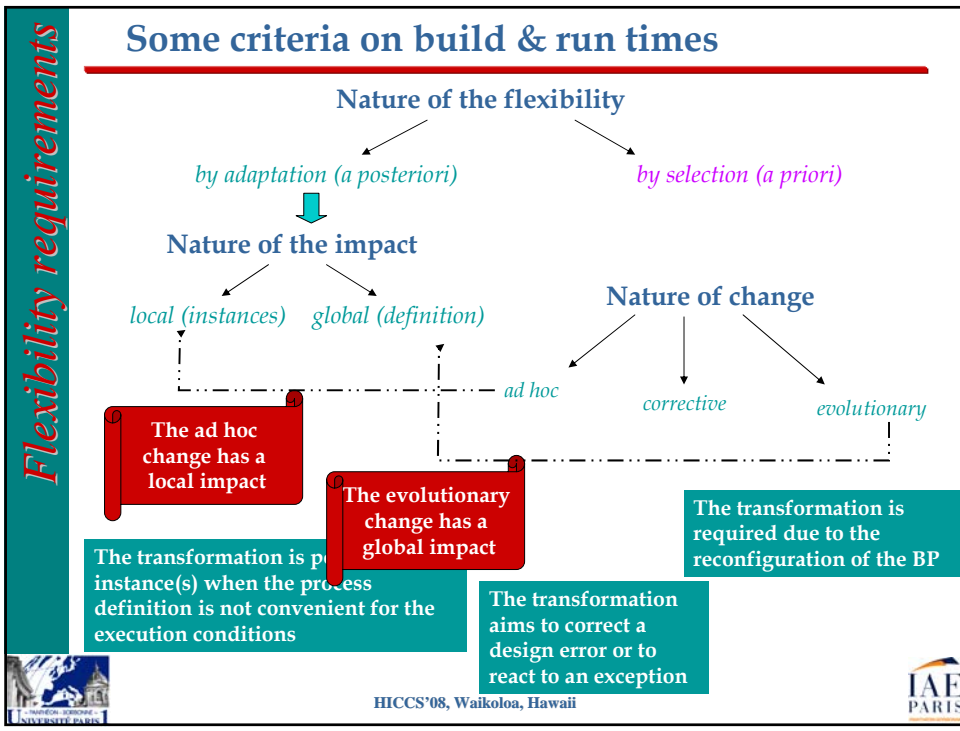
local (instances)

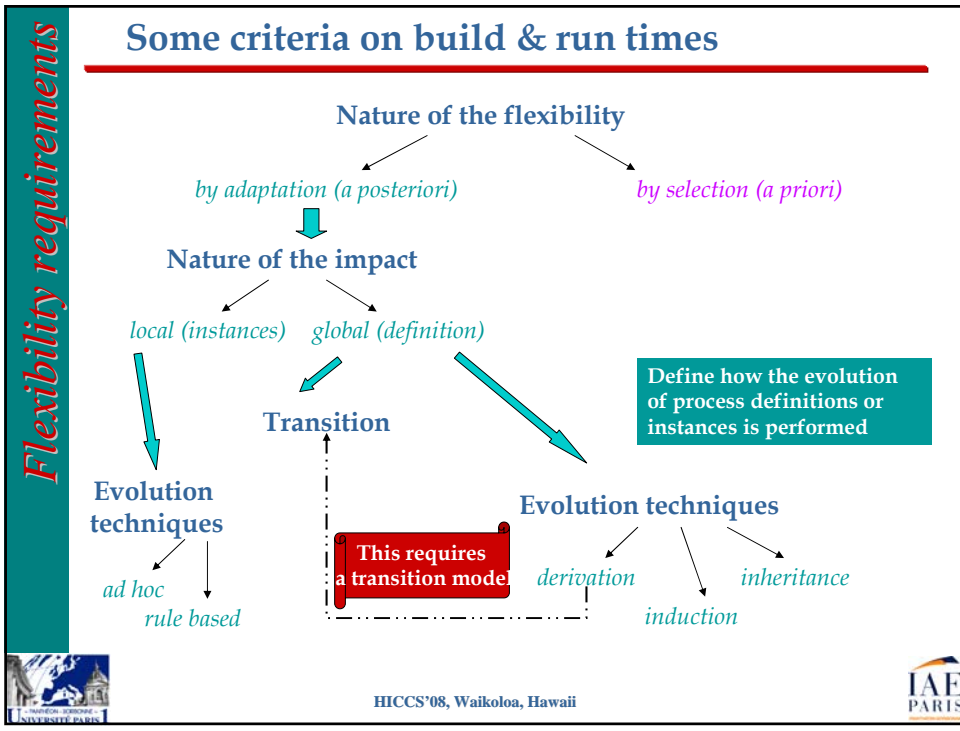
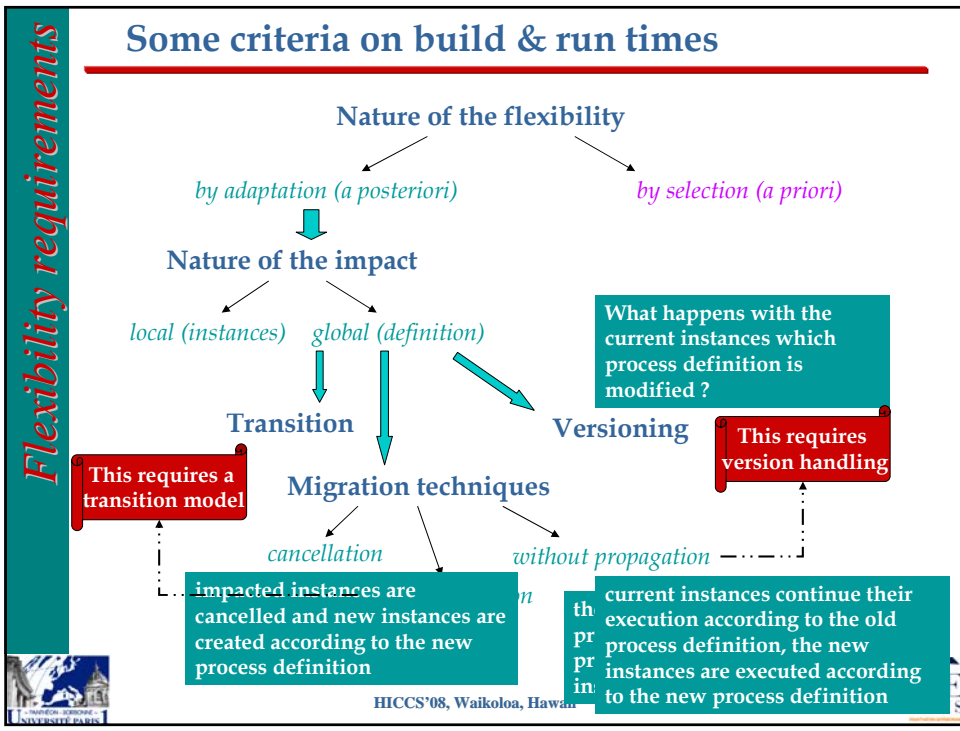
global (definition)

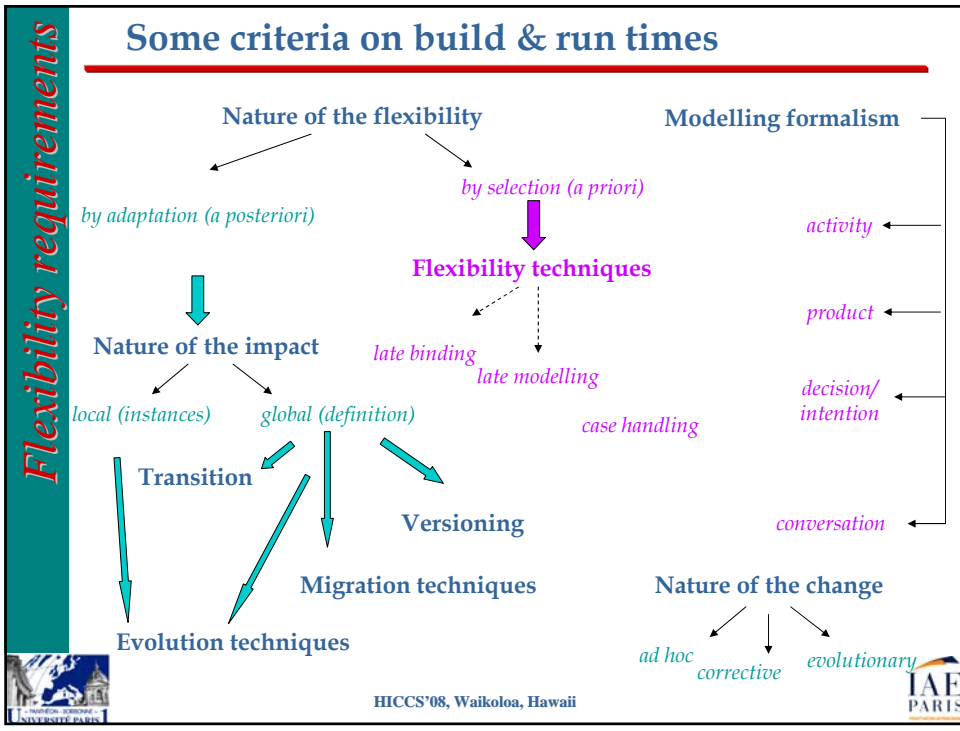
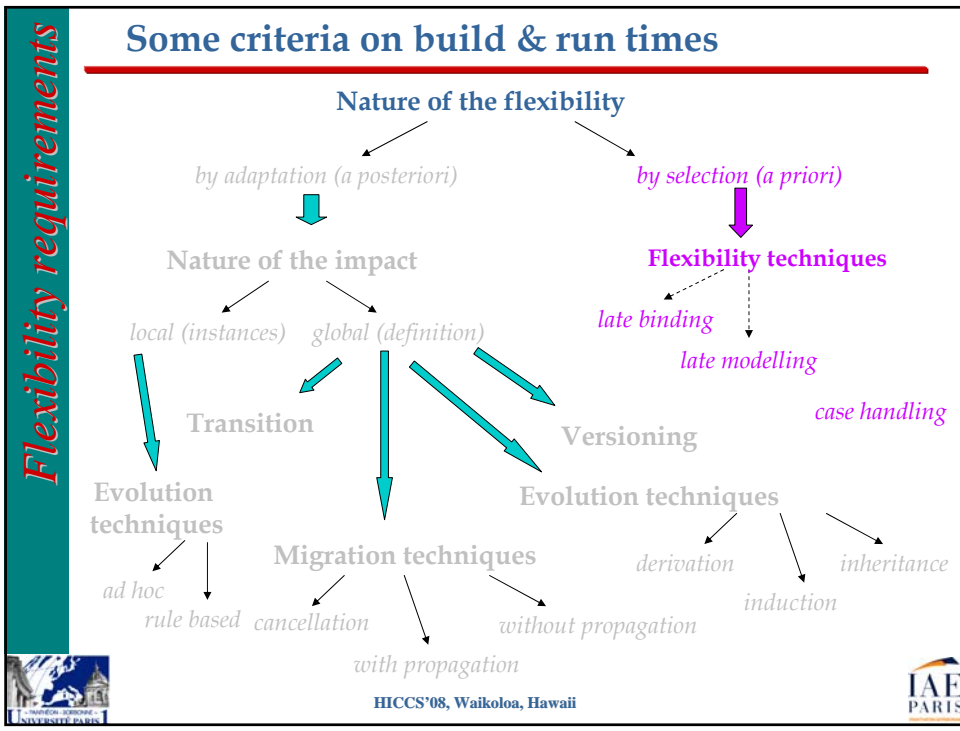
necessary to detect if it can have indirect impacts on other instances

what to do with the current instances ? propagate change ?

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Conclusion

- ❖ Using models to represent the enterprise allows a coherent and complete description. *"The task is not so much to capture a process in order to automate it, as to comprehend a process ..."* (Odeh et al, 2002).
- ❖ Most of the BP models concentrate on *Who* does *What*, *When*, i.e. on the description of the organizational and operational performance of business activities to produce results.
- ❖ The **intention** driven process modelling highlights the *'Why'*, provides basis for understanding and supporting the enterprise objectives, the alternative way-of-workings, and when required, the reasons of change and its impact on the processes and systems.
- ❖ A great amount of flexibility is brought by the concepts of **role** and **context**. Changes in pieces of works of several granularities can be done at the BP type and instance level. **Context** sensitive BP models fit better variability requirement of the BPs.



Our future work concerns the *usage perspectives* of the BP modeling

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Perspectives

- ❖ Do the various kinds of business processes (operational, control, strategic, support) require the same kind of flexibility? Should we provide the same methodological and technological means to achieve it?
- ❖ Do the dimensions of change (for instance dynamism, adaptability and flexibility according to Sadiq, 2002) depend on this organizational categorization of the business processes?
- ❖ What are the goals of the stakeholders which push them to develop business process management systems able to change? Do they wish to innovate, to improve, to personalize, to obtain guidance...
- ❖ Which perspectives of the organization require change: a domain, a process, an activity, responsibilities, an application component, etc...
- ❖ How the modeling artifacts should be adapted to deal with the flexibility requirements related to those issues?



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