

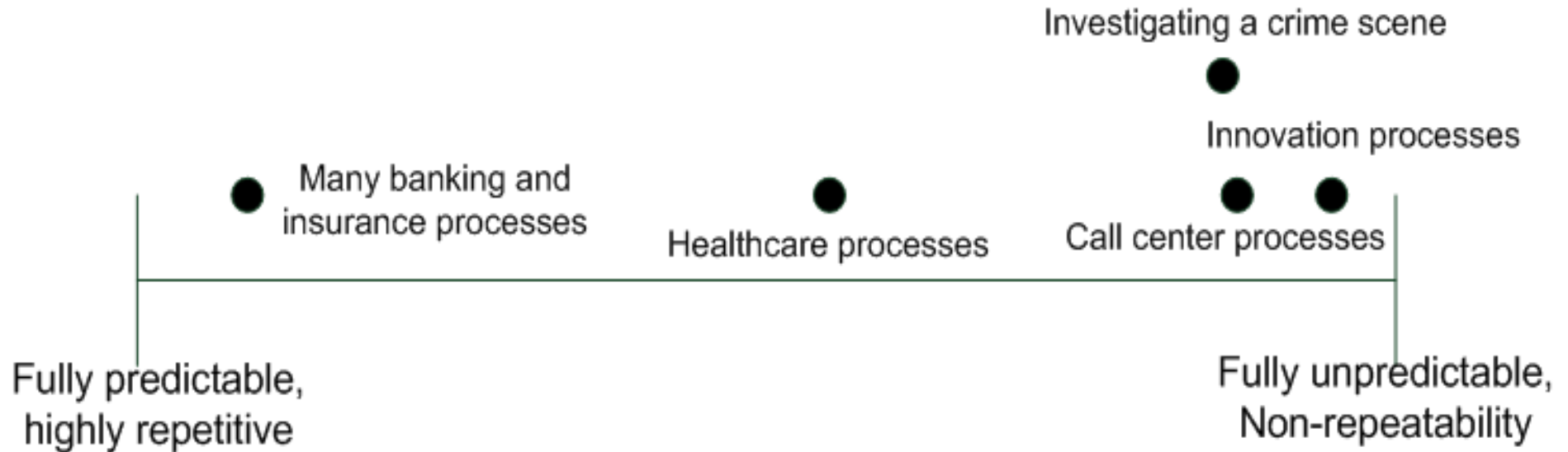


Flexibility Issues in Process-Aware Information Systems

Business Process Management and Flexibility
Barbara Re, Phd

Process Spectrum

- From fully predictable and highly repetitive to
- Fully unpredictable and non repetitive



Knowledge-intensive Processes

- Processes on the right side of the spectrum are mostly knowledge-intensive
- Unpredictability
 - Course of action depends on situation-specific parameters
- Non-repeatability
 - Two process instances hardly look the same
- Emergence
 - Future course of action depends on knowledge gained through activity execution





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Pre-specified Processes

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Perspectives on a Process-aware Information System

Components of a PAIS

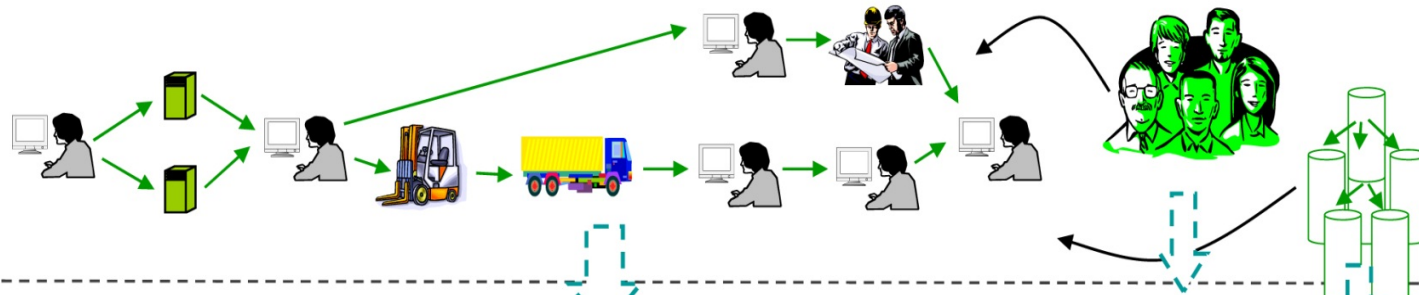
Summary



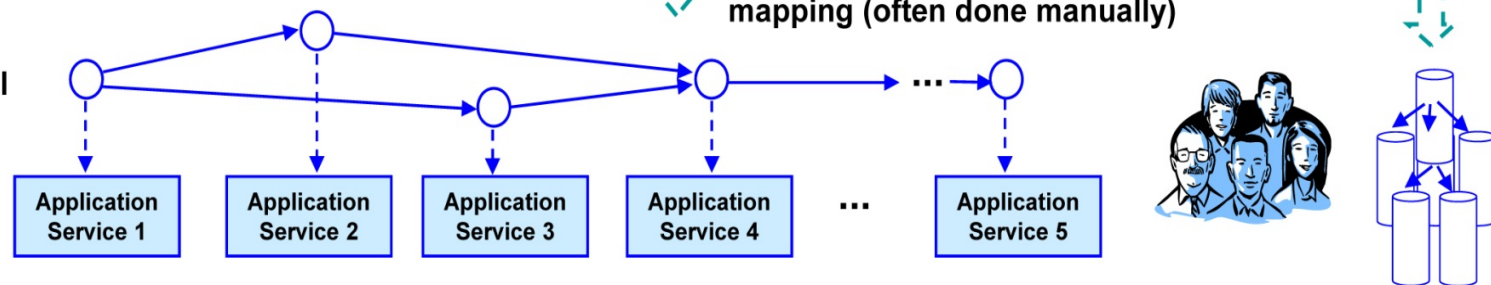
Prespecified and Repetitive Processes

- ▶ Repetitive business processes whose logic is known *prior* to their execution and can therefore be prespecified in process models

Business Process Model

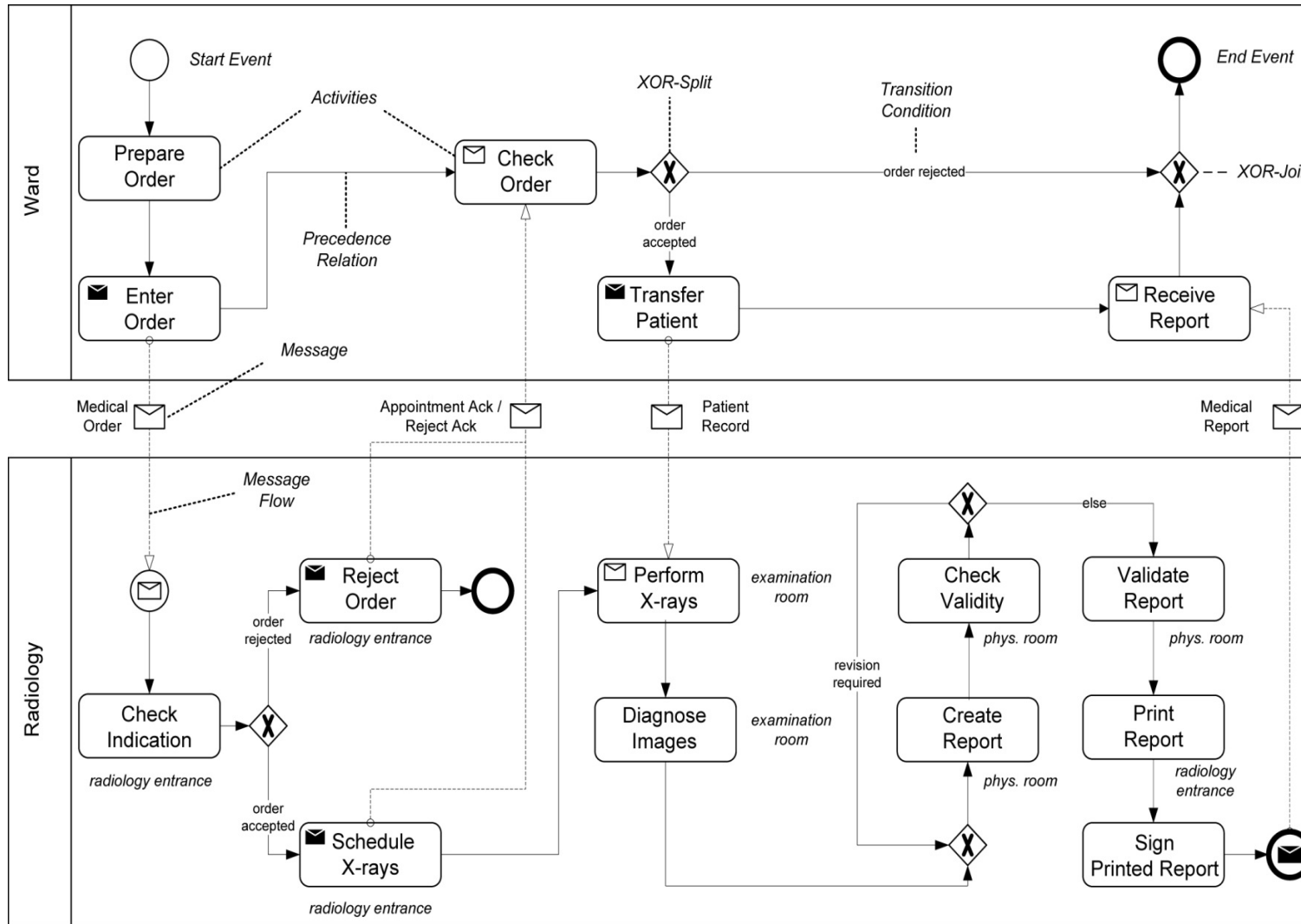


Executable Process Model

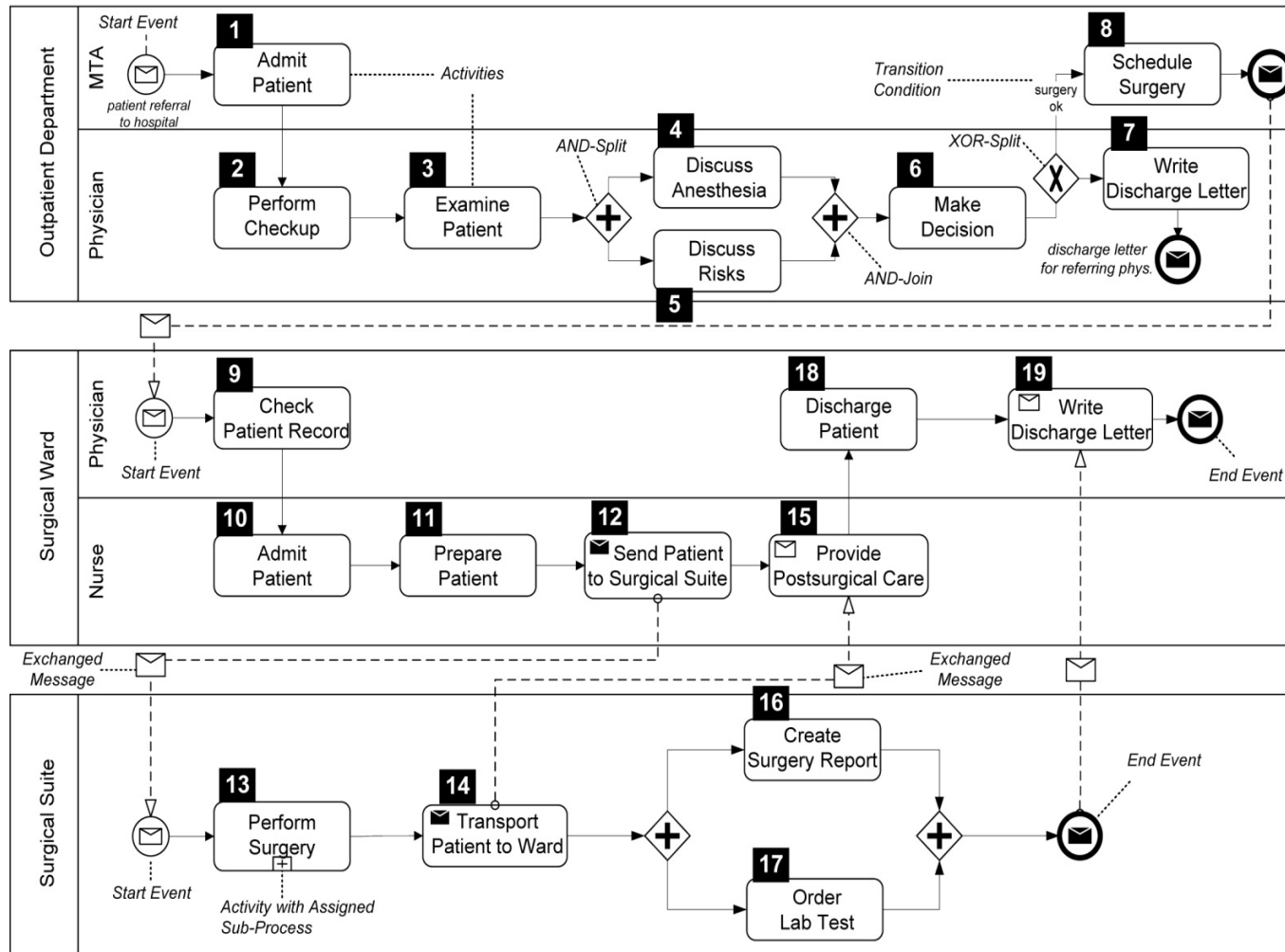


mapping (often done manually)

Process of Medical Order Handling



Planning and Performing a Keyhole Surgery



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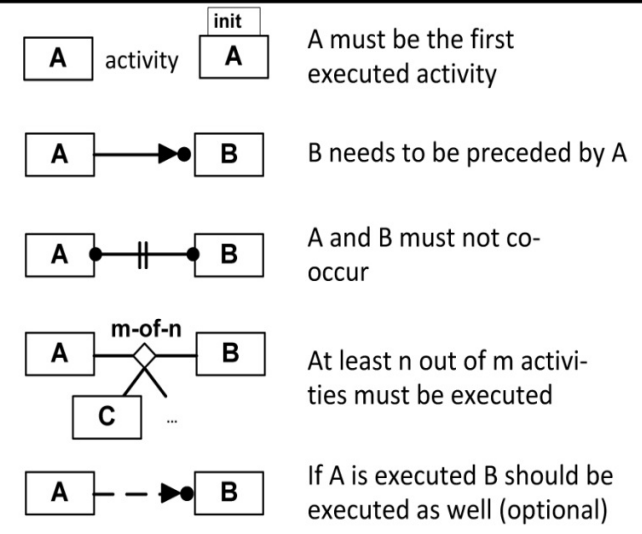
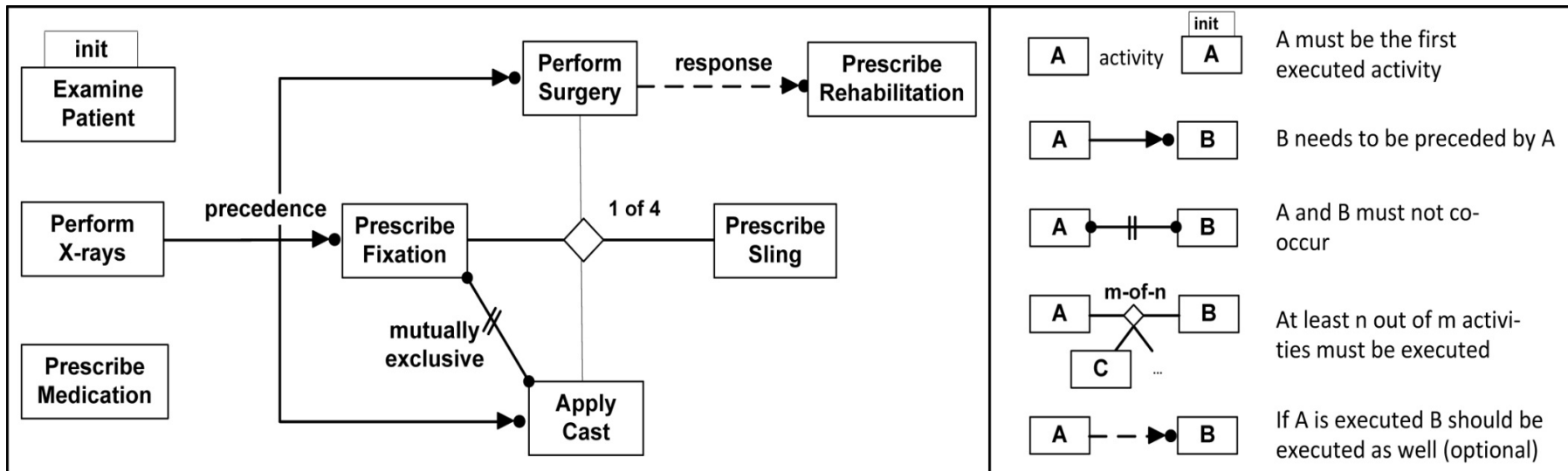
Summary



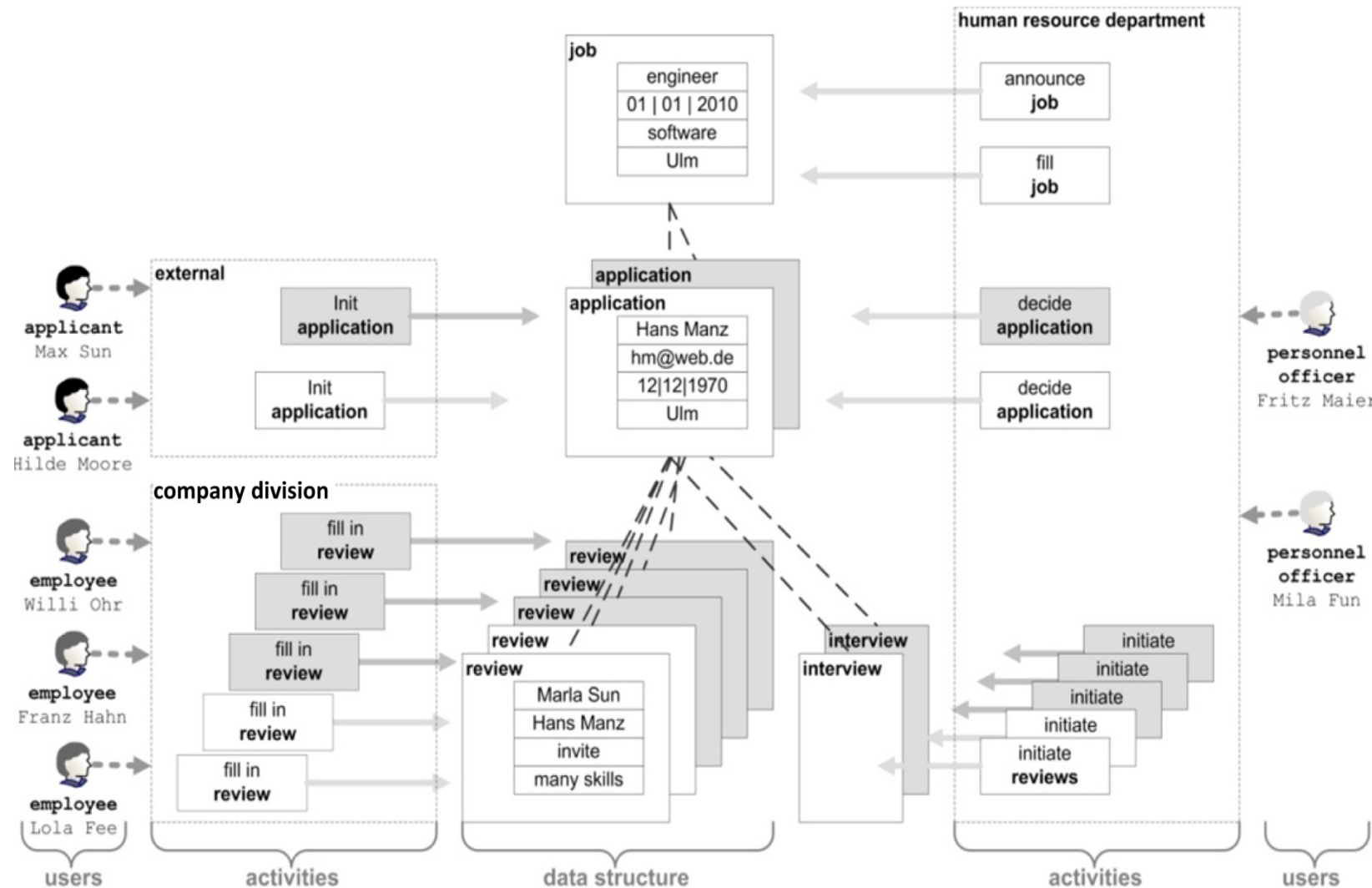
Knowledge-intensive processes

- ▶ **Knowledge-intensive processes are very dynamic!!!**
 - ▶ The concrete activities to be performed, as well as their exact course, may depend on decisions made by process participants during process execution; i.e., knowledge-intensive processes cannot be completely prespecified
- ▶ **More maneuvering room for process participants and looseness of process execution are required.**
 - ▶ This can be achieved by using constraint-based process models focusing on *what* shall be done by describing the activities that may be performed as well as related constraints prohibiting undesired process behavior
 - ▶ There are scenarios in which an activity-centric approach is not suitable at all, but a tighter integration of process and data is required.

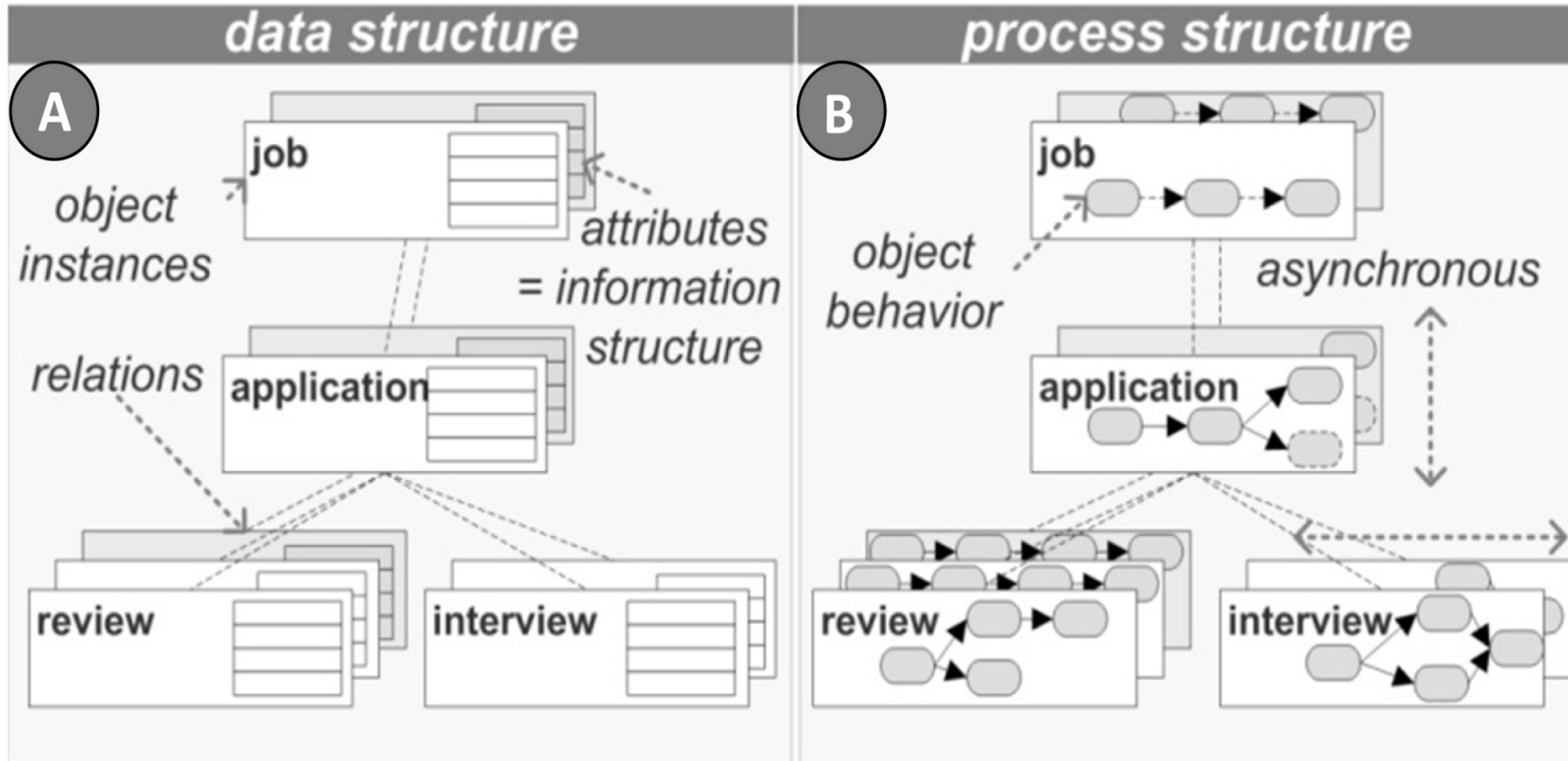
Loosely-specified Processes



Object- and Data-driven Processes



Relation between Data and Process Modeling



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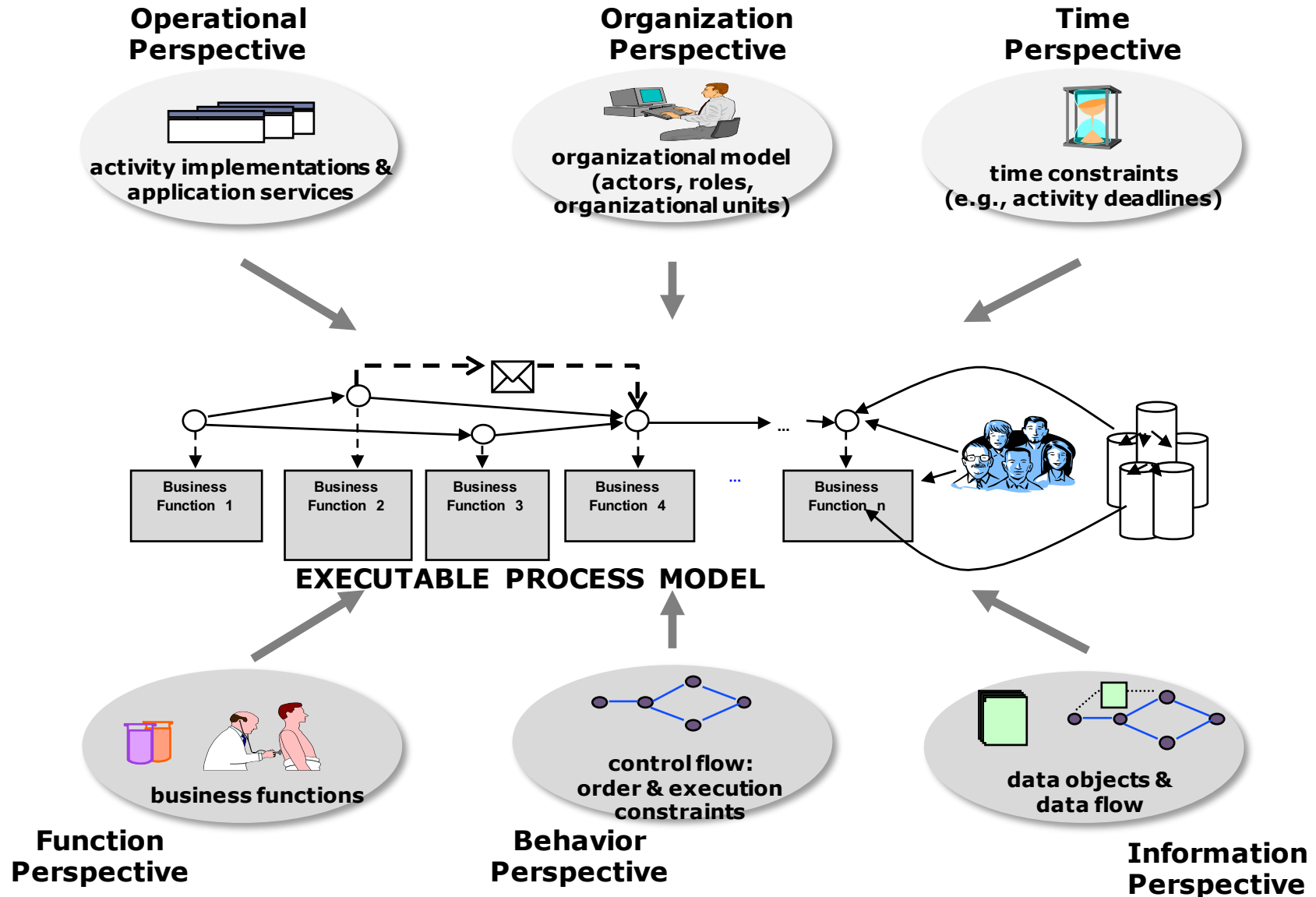
Perspectives on a Process-aware Information System

Components of a PAIS

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Perspectives on a PAIS



Perspectives of PAIS

The *operation perspective* of a PAIS that is based on activity-centric process models covers the implementation of the process activities.

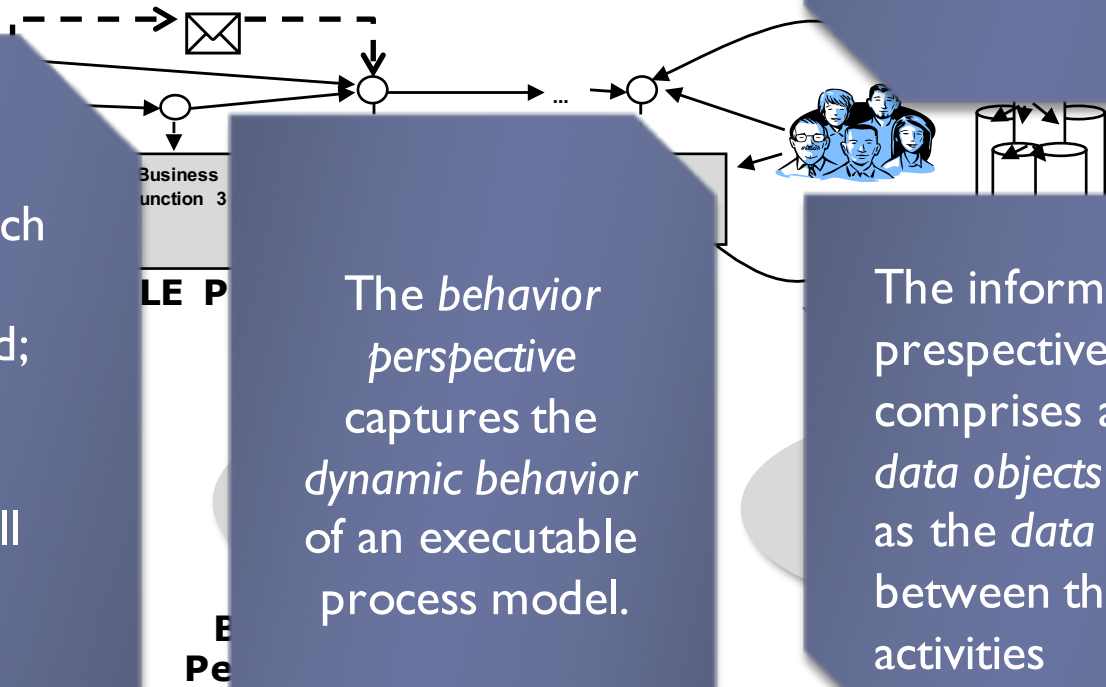
The *organization perspective* deals with the assignment of human activities to organizational resources.

The *time perspective* captures temporal constraints that need to be obeyed during process execution

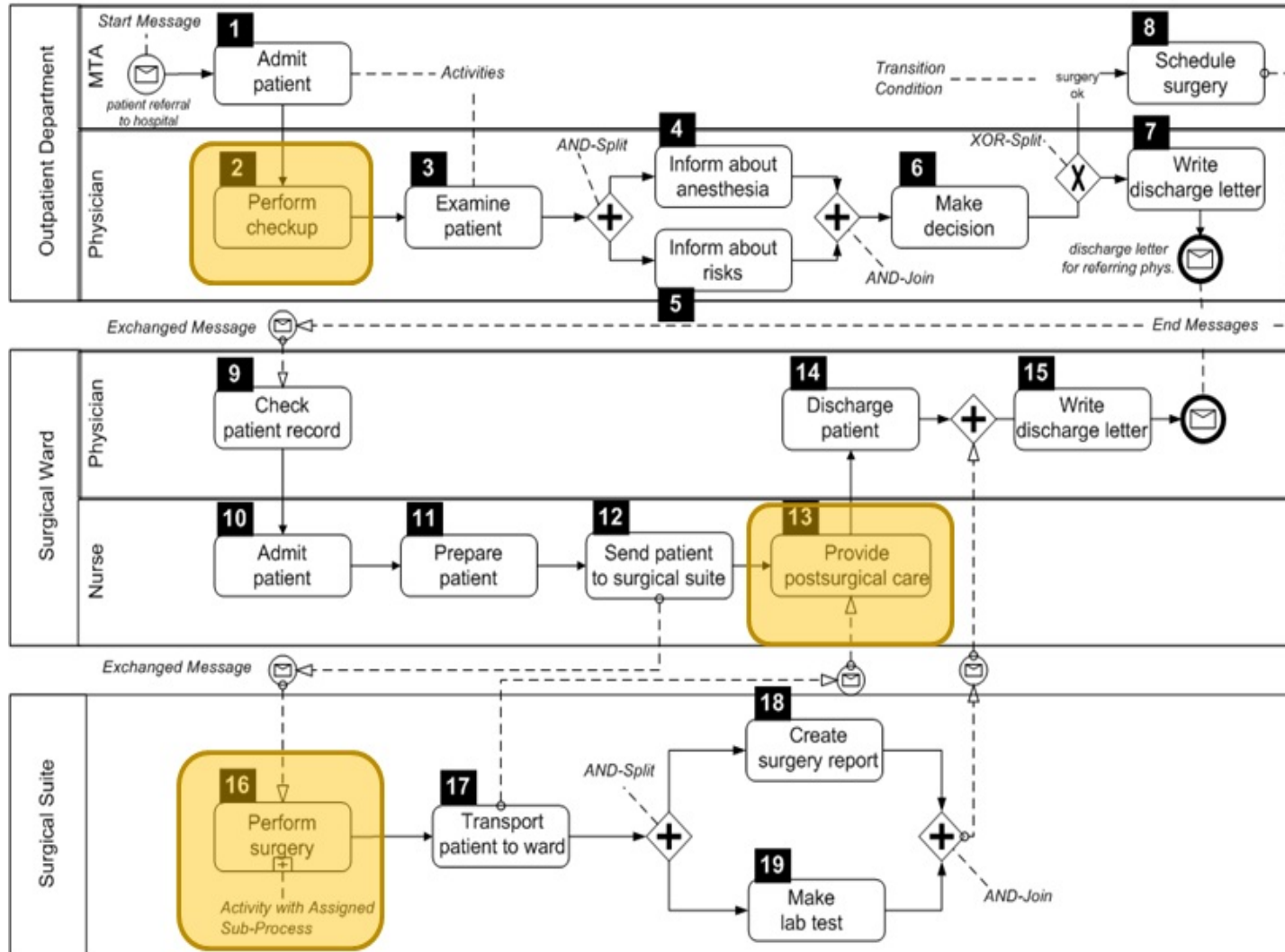
The *function perspective* covers the functional building blocks from which activity-centric process models can be composed; i.e., *atomic activities* representing elementary business functions as well as *complex activities* representing subprocess models.

The *behavior perspective* captures the *dynamic behavior* of an executable process model.

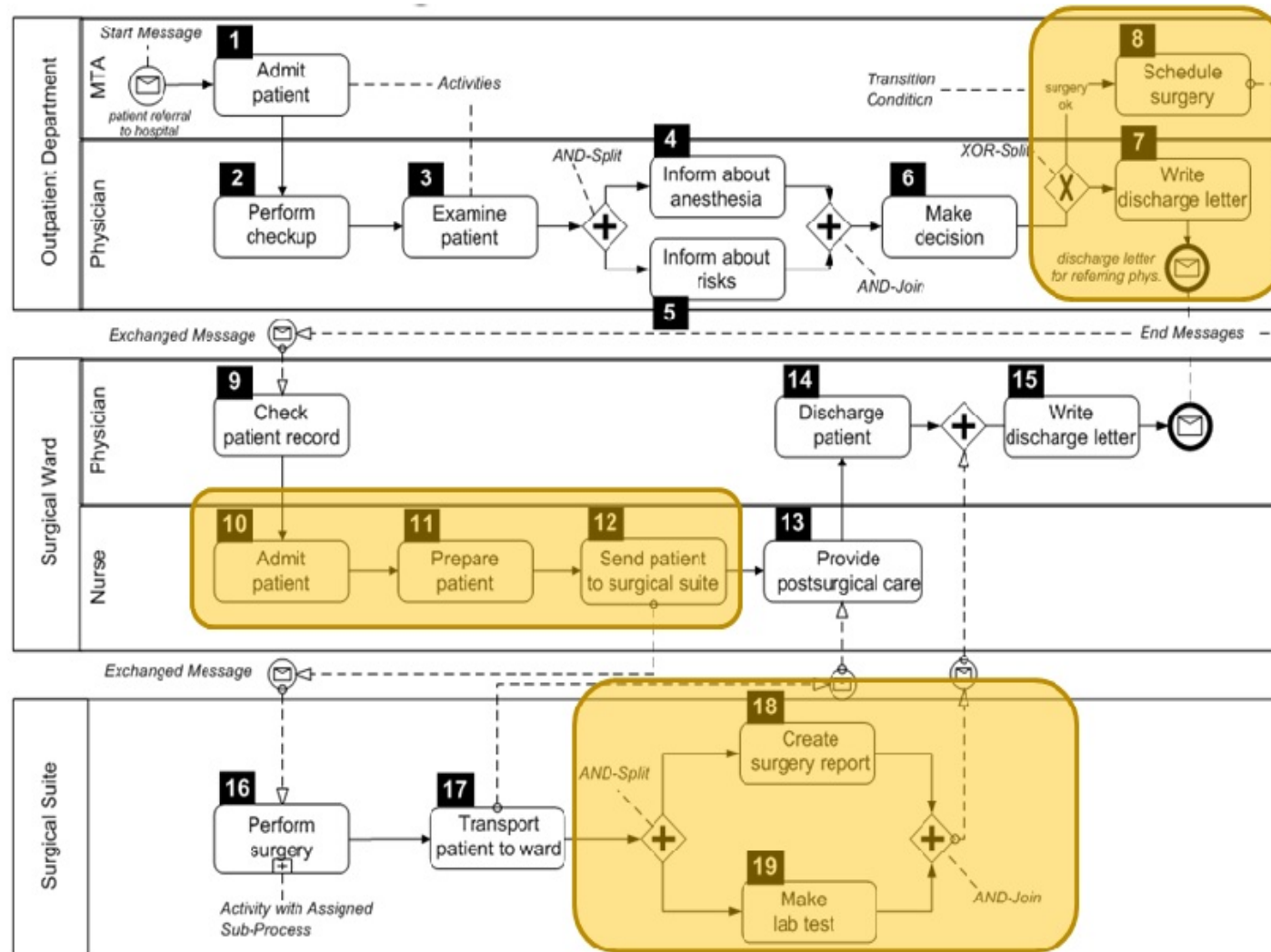
The *information perspective* comprises a set of *data objects* as well as the *data flow* between the activities



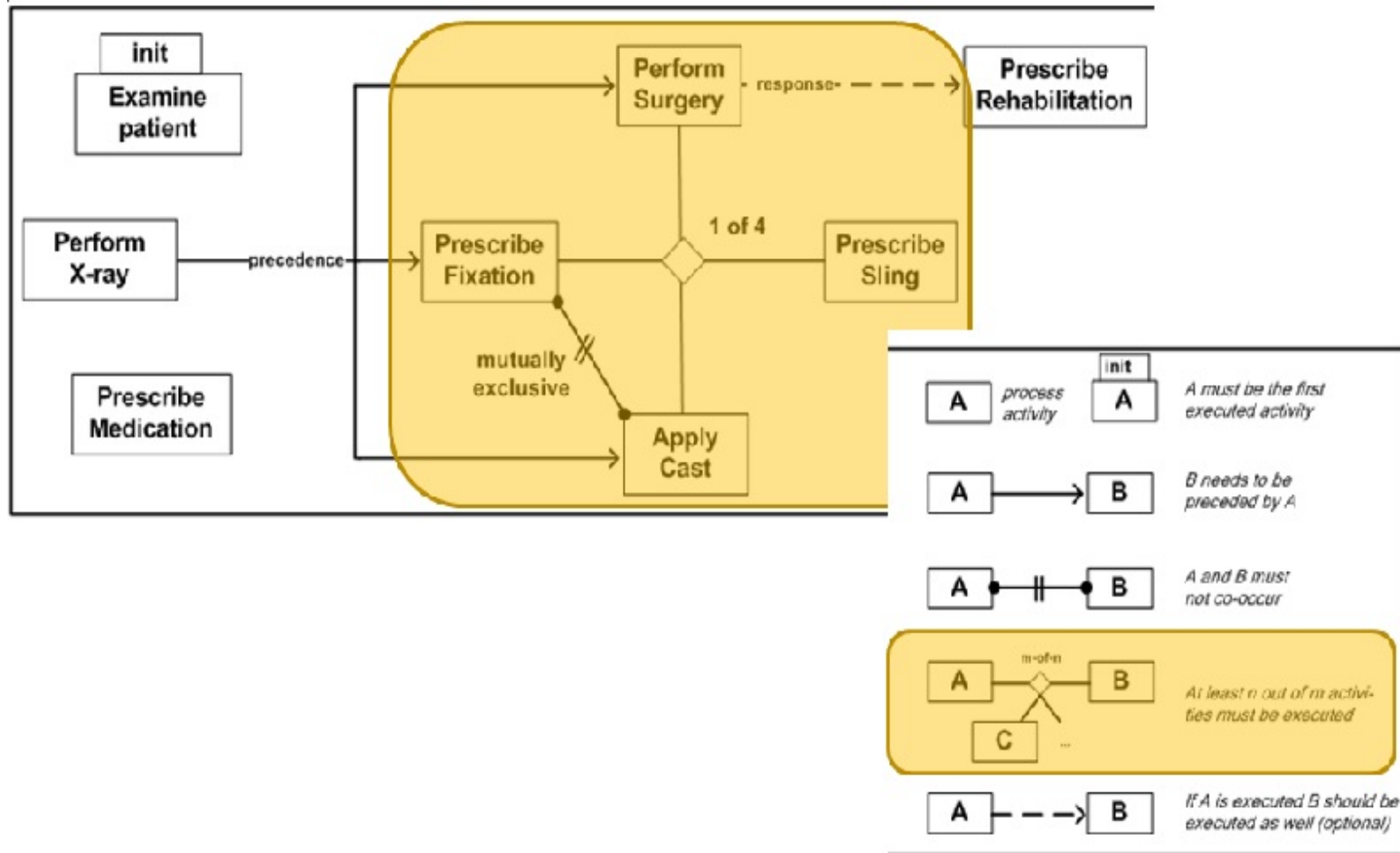
Function Perspective



Behavior Perspective



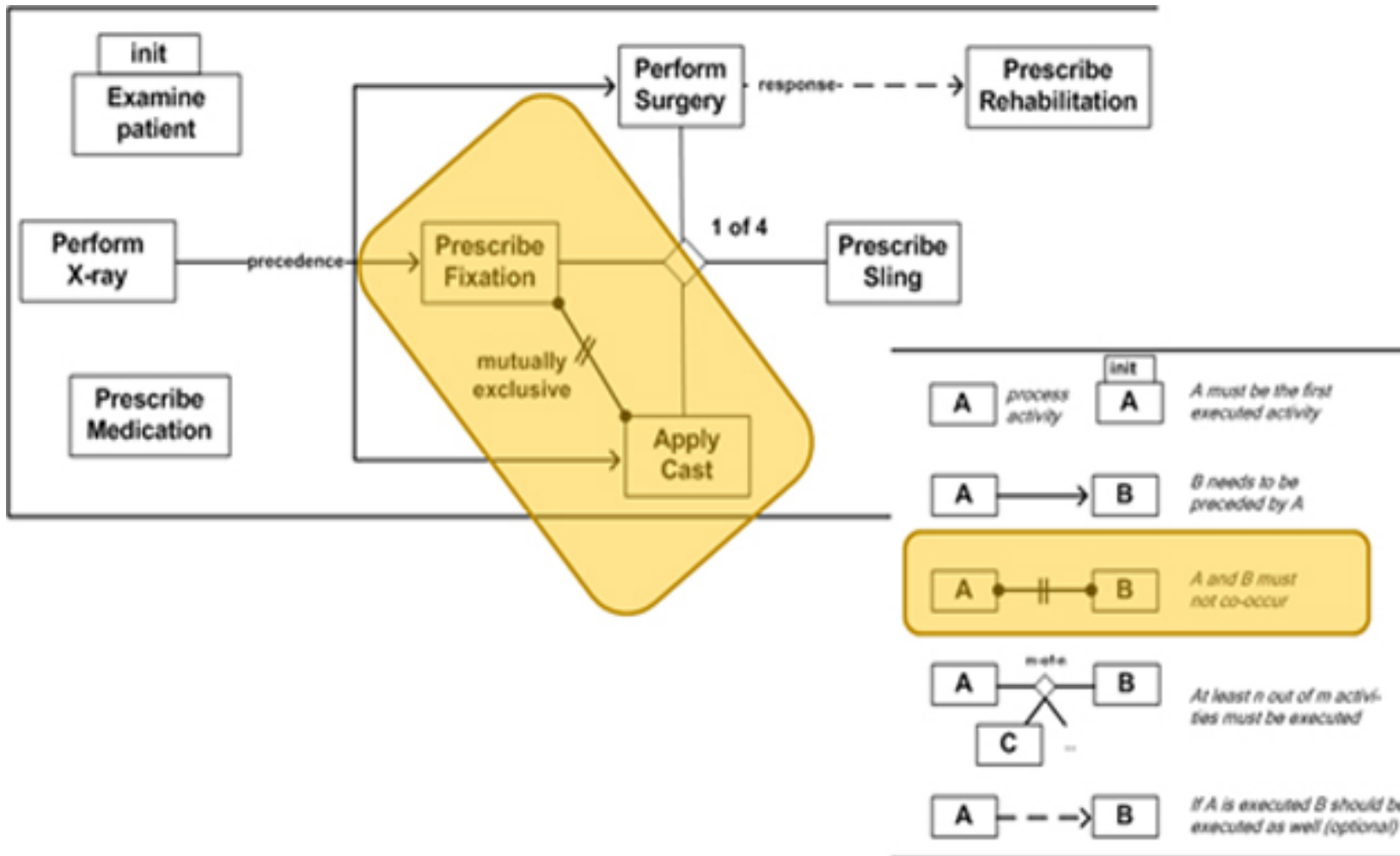
Behavior Perspective



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Enabling Flexibility in Process-Aware Information Systems,
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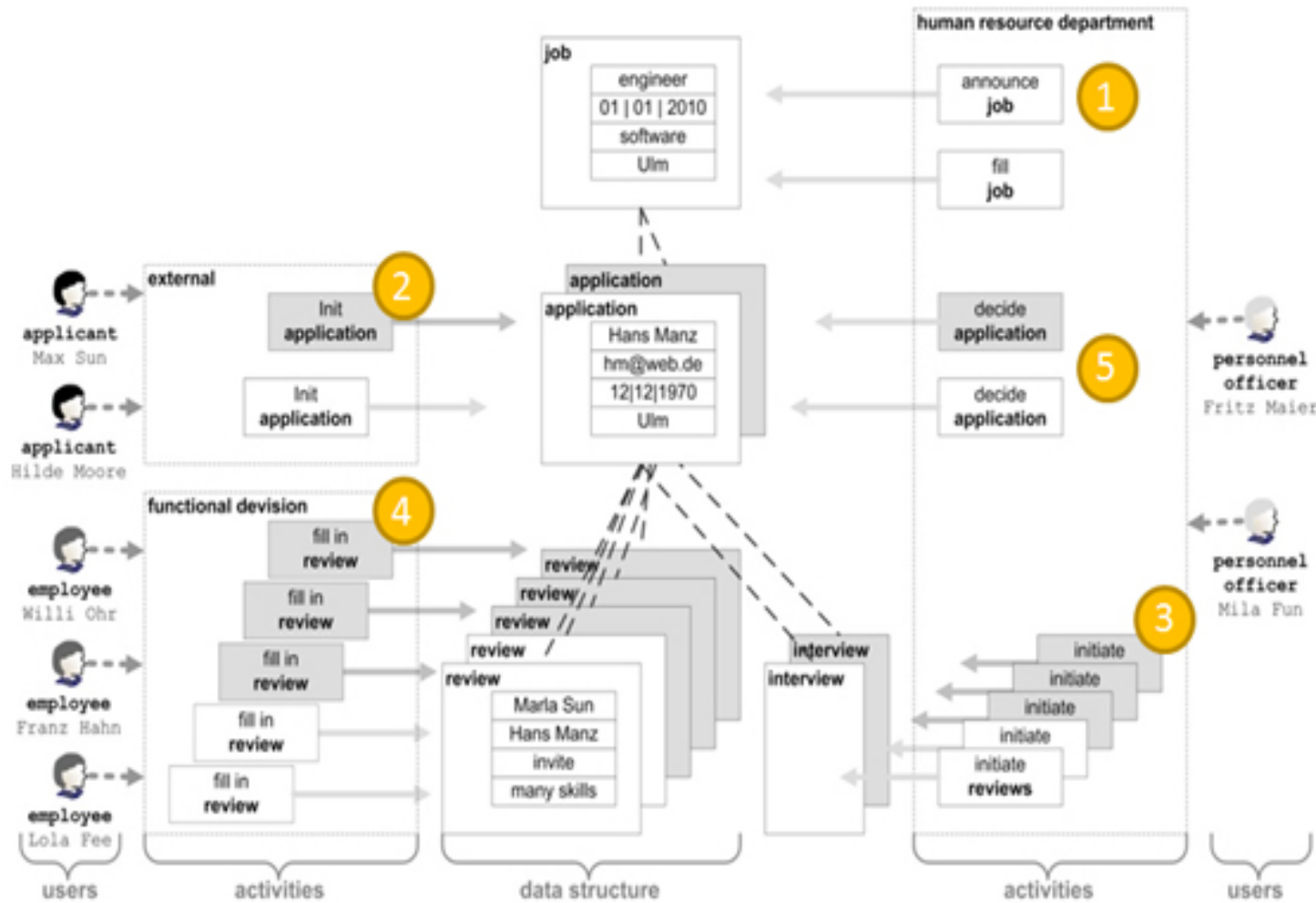
Behavior Perspective



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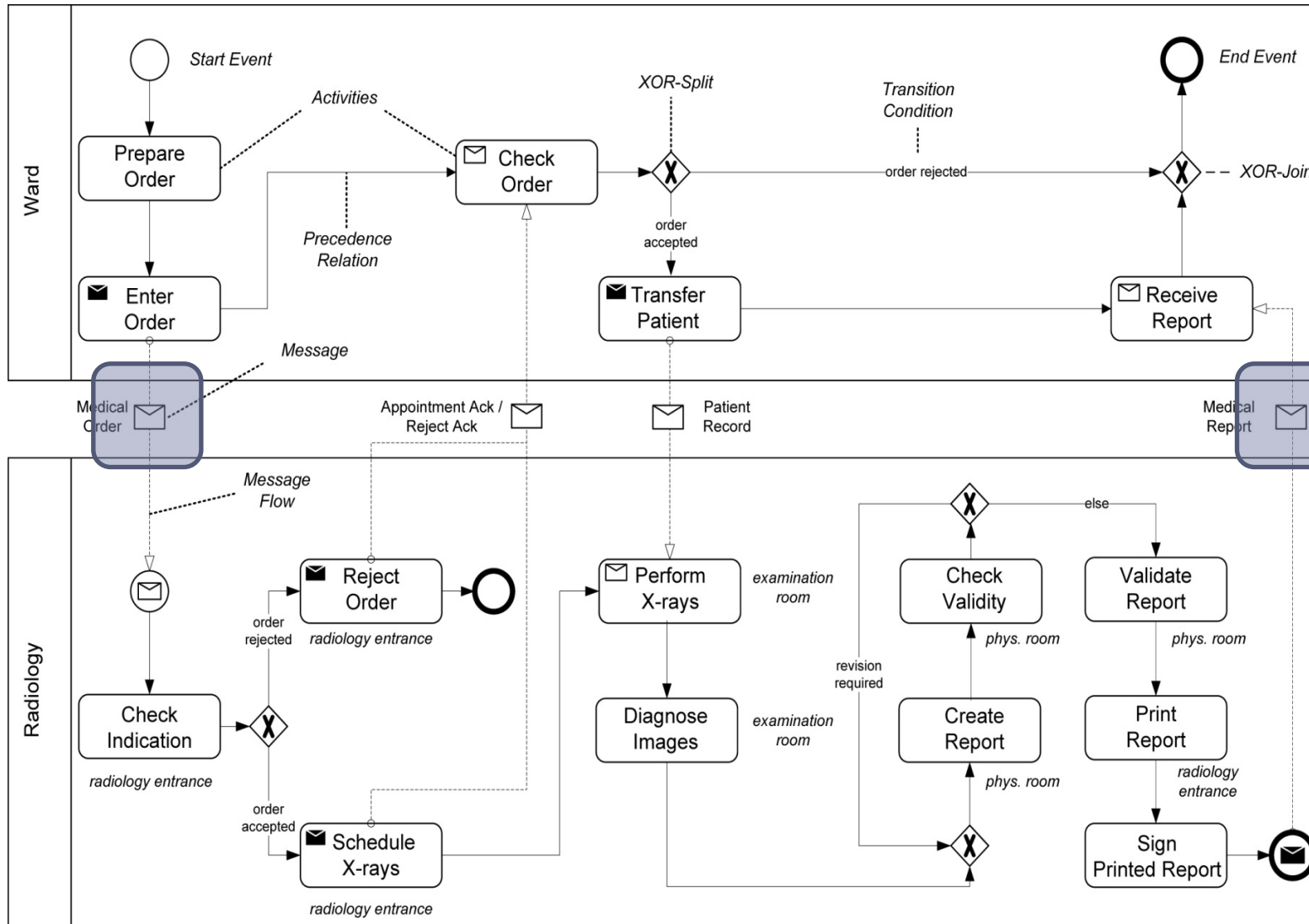


Behavior Perspective Object Interactions

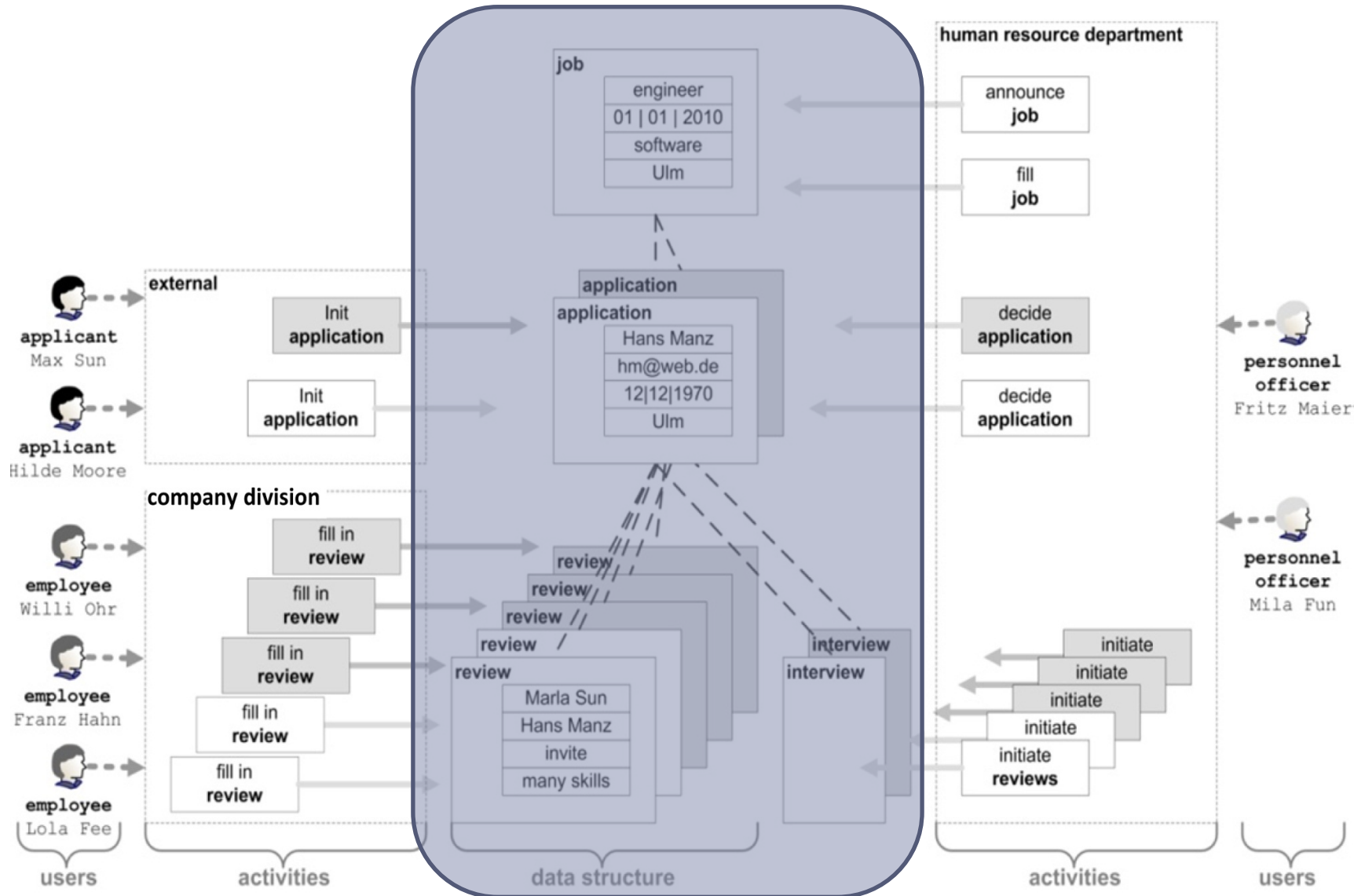


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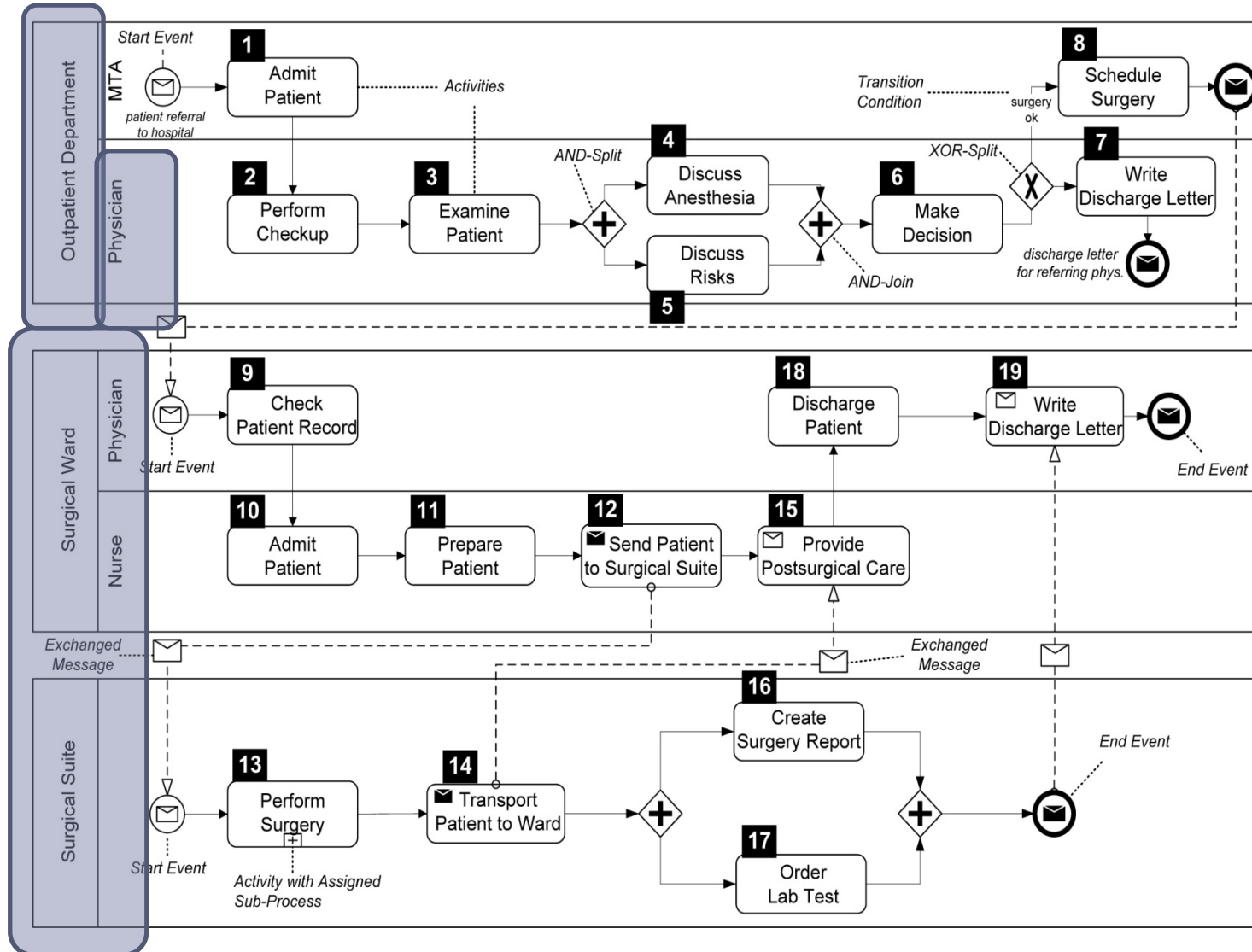
Information Perspective



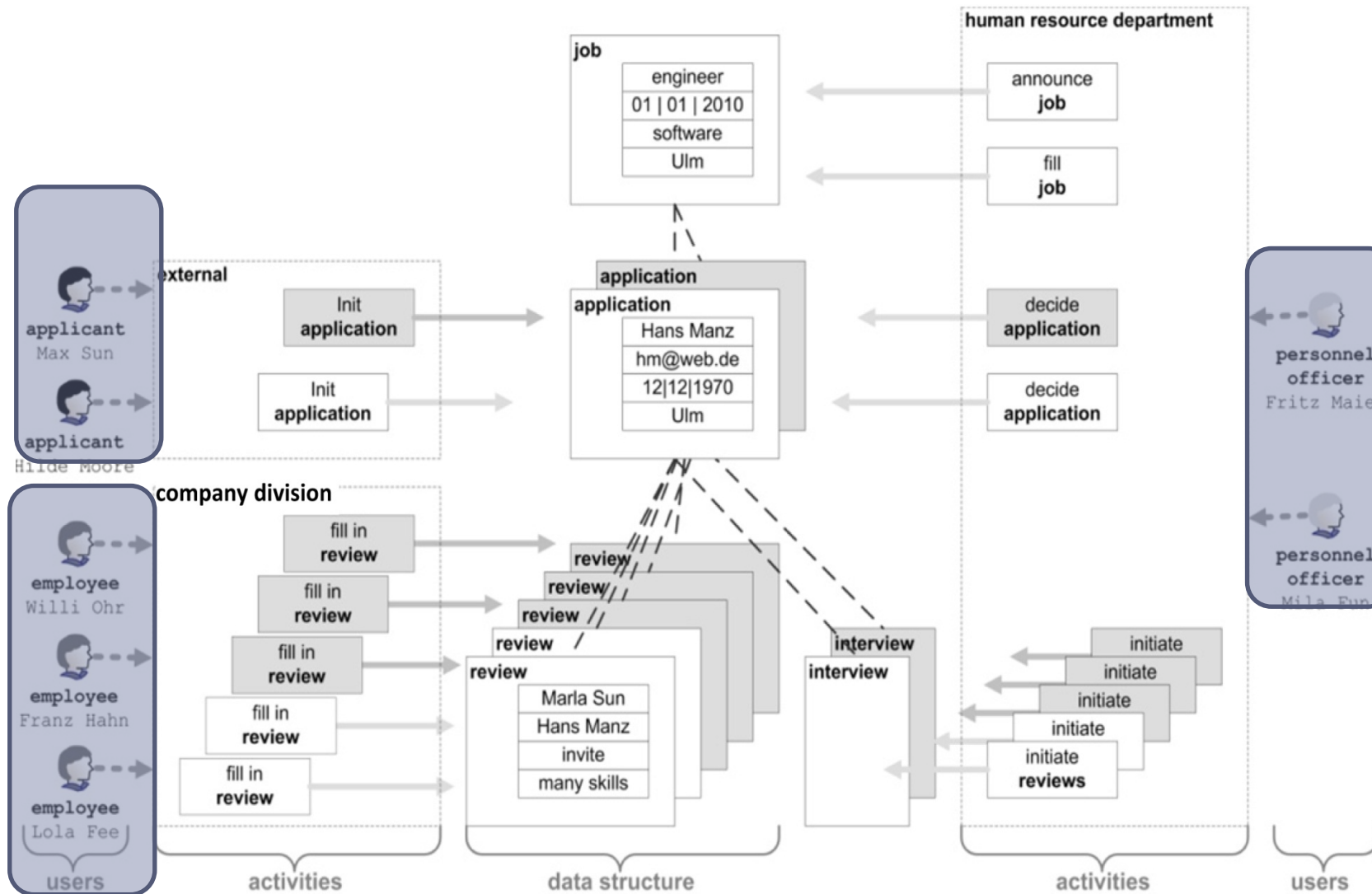
Information Perspective



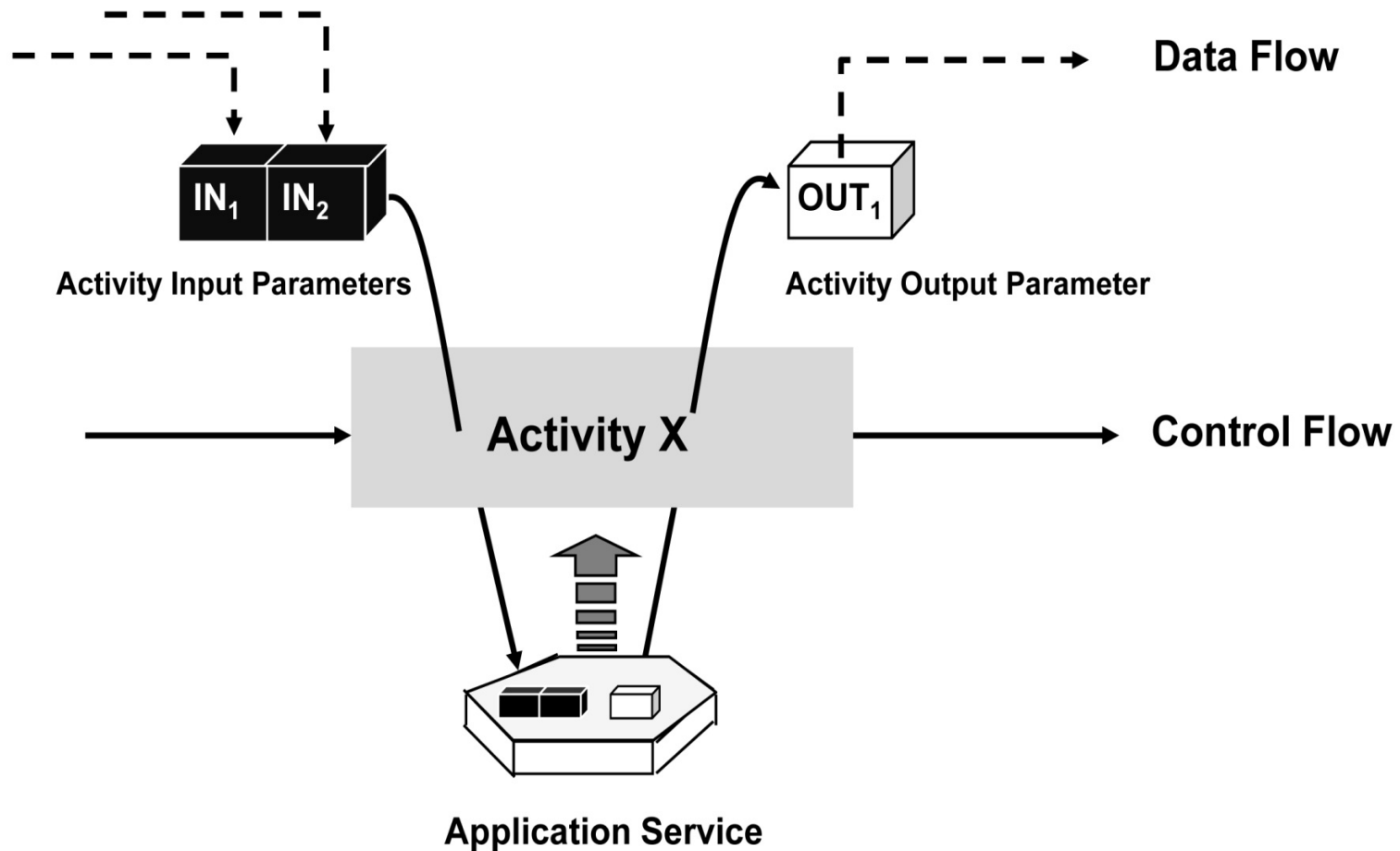
Organizational Perspective



Organizational Perspective



Operational Perspective





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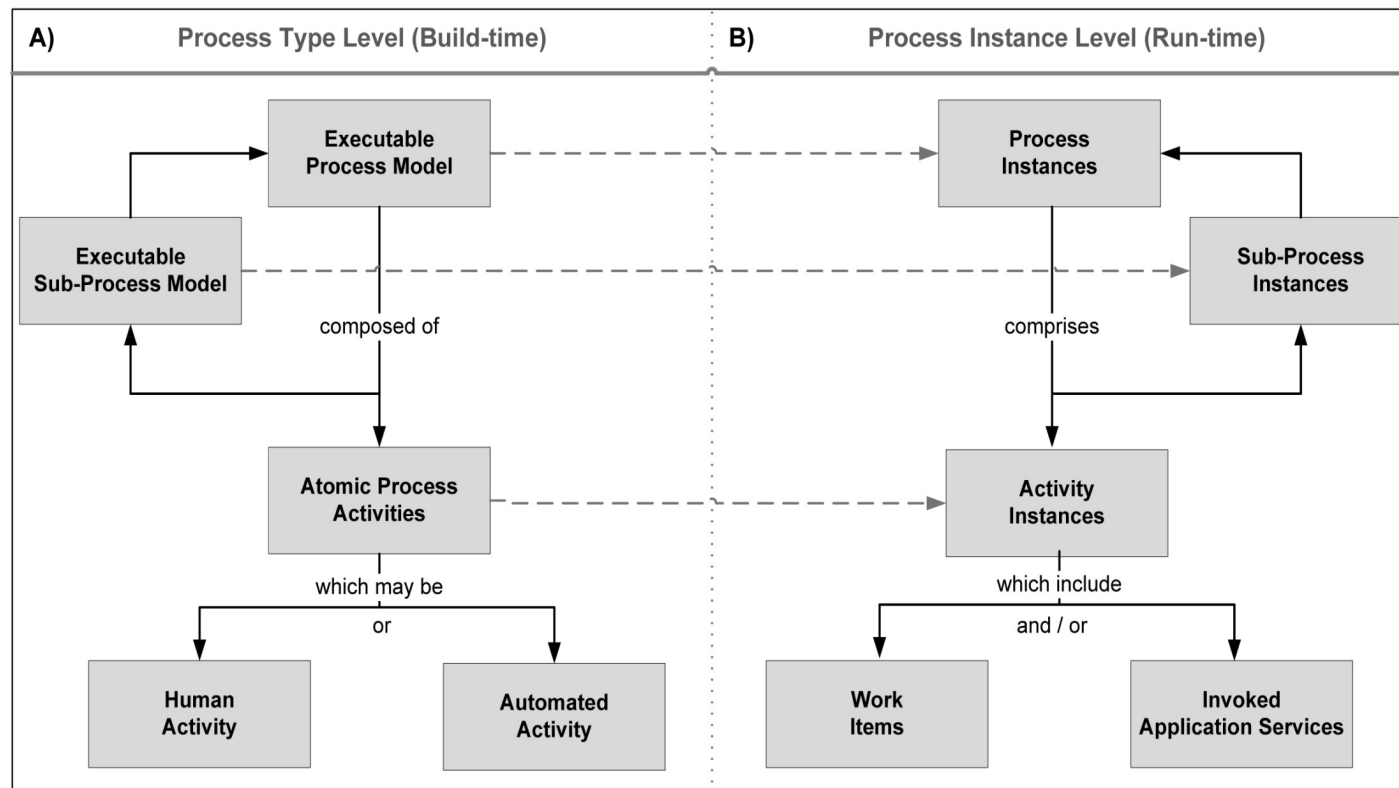
Components of a PAIS

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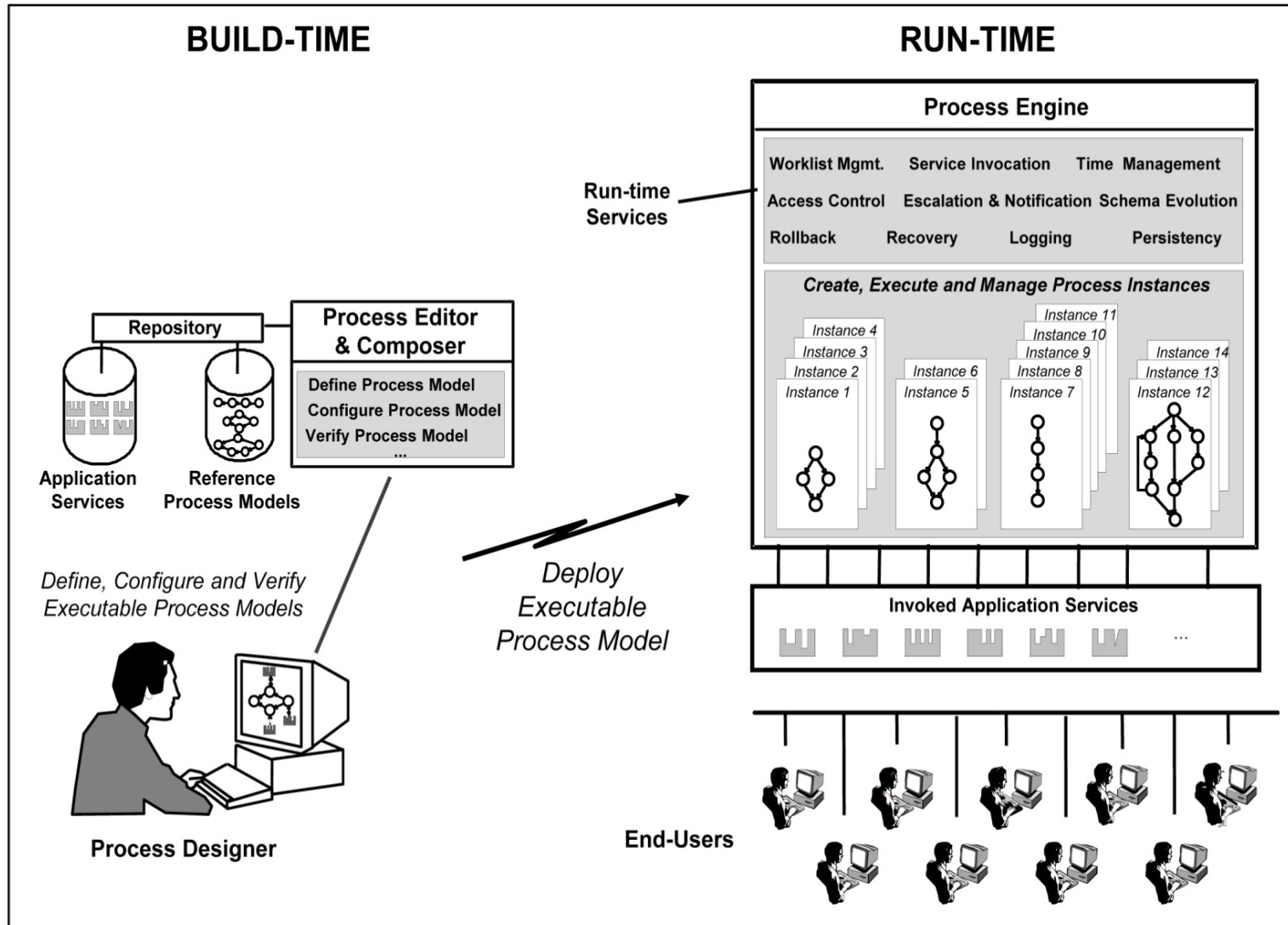


Build-time and Run-time Artifacts of a PAIS

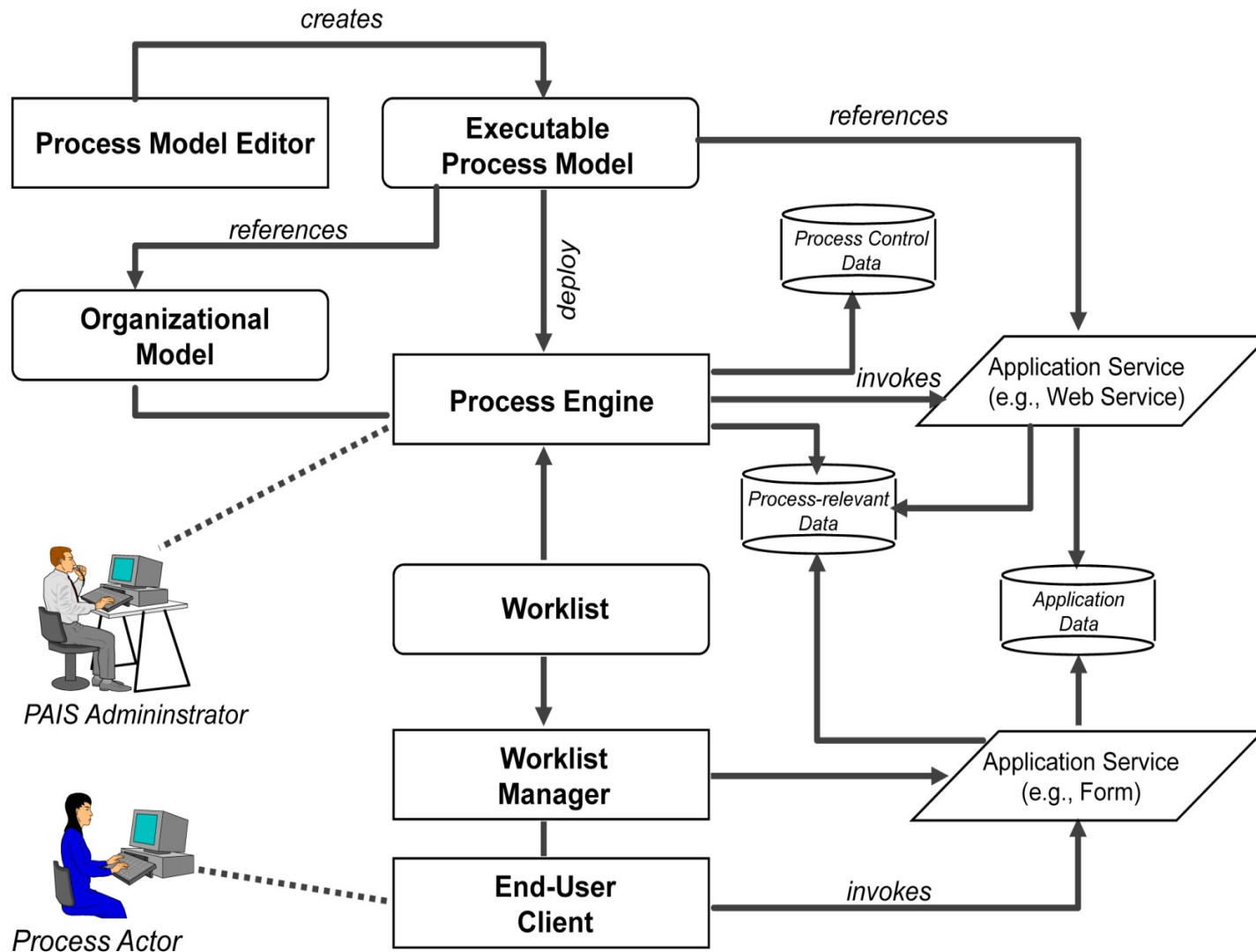
- ▶ *Build-time* components enable the creation and management of the type-level artifacts of the PAIS
- ▶ *Run-time* components refer to the process instance level and support the creation, execution, and management of process instances.



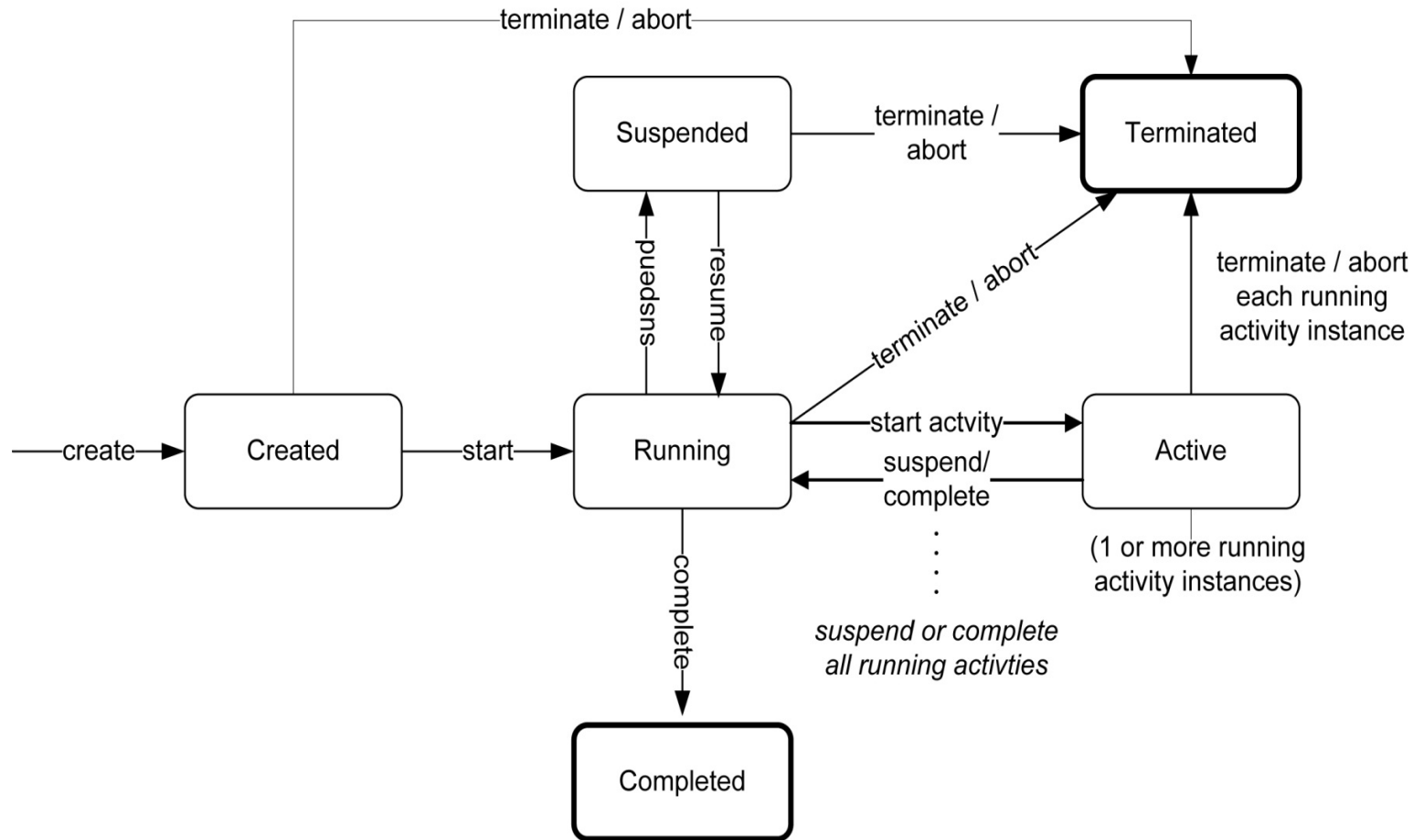
Build-time and Run-time Environment of a PAIS



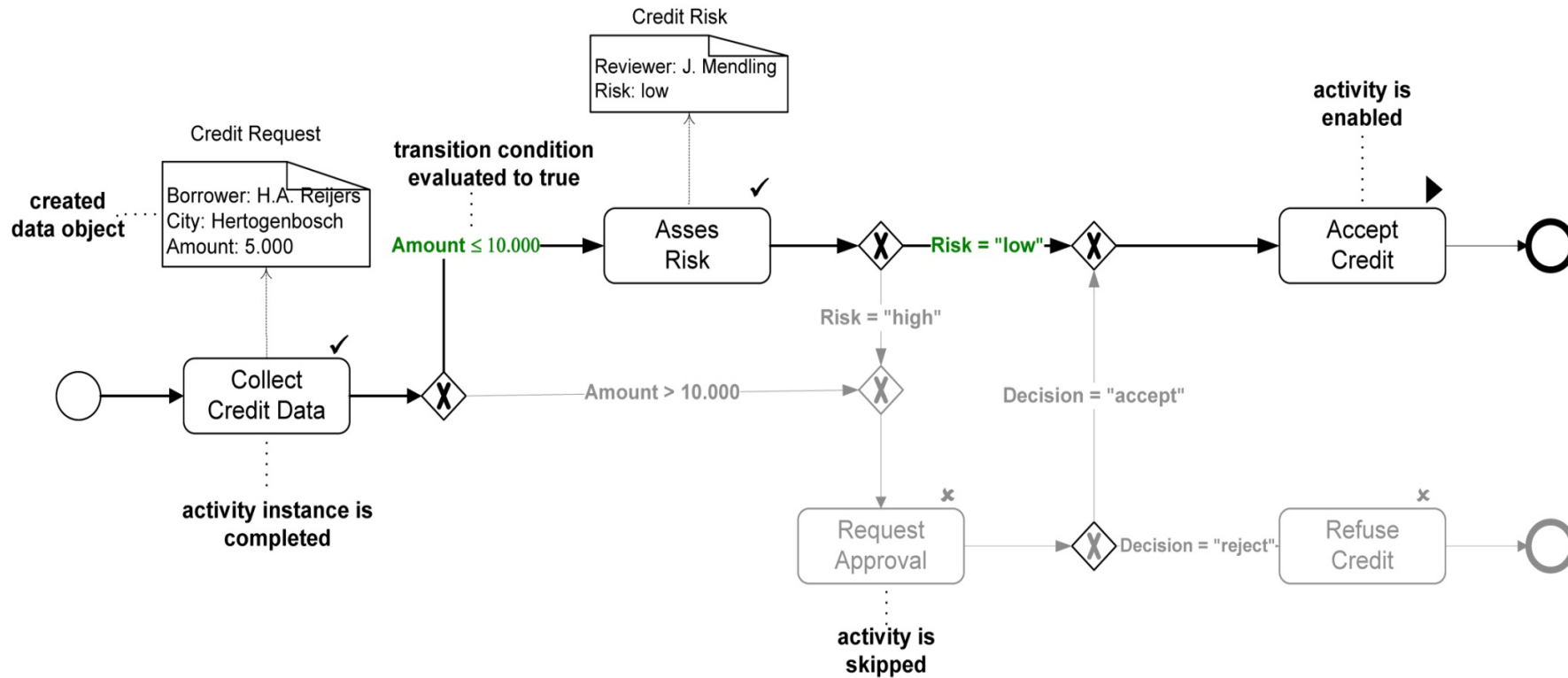
Basic Components of a PAIS



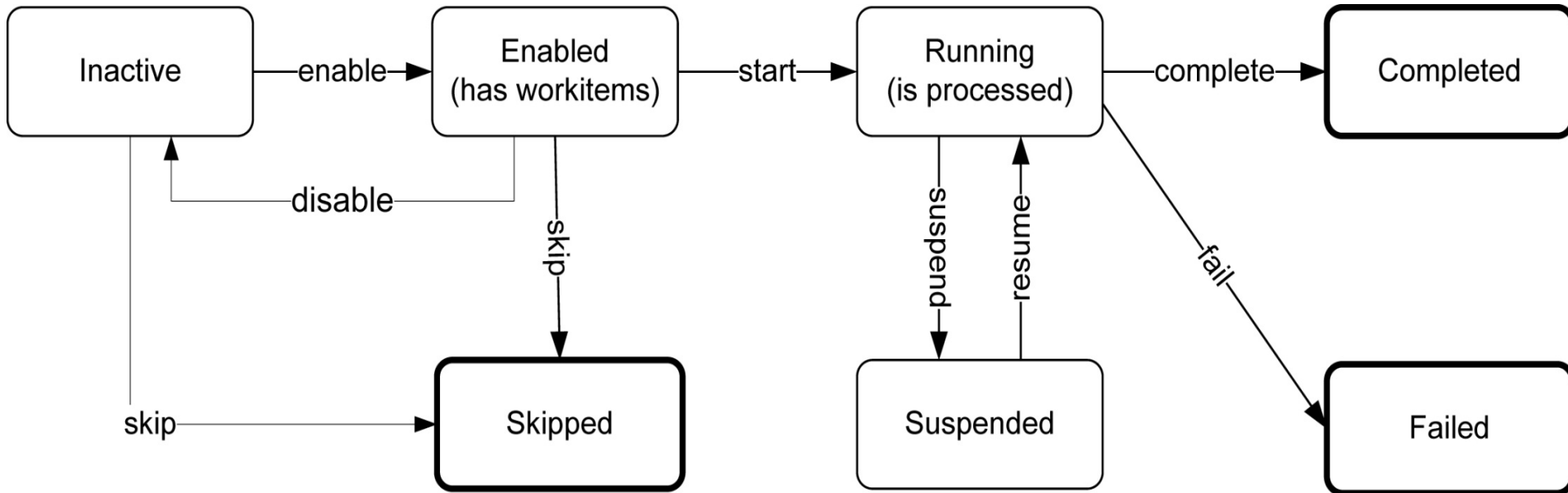
Process Instances and their Lifecycle



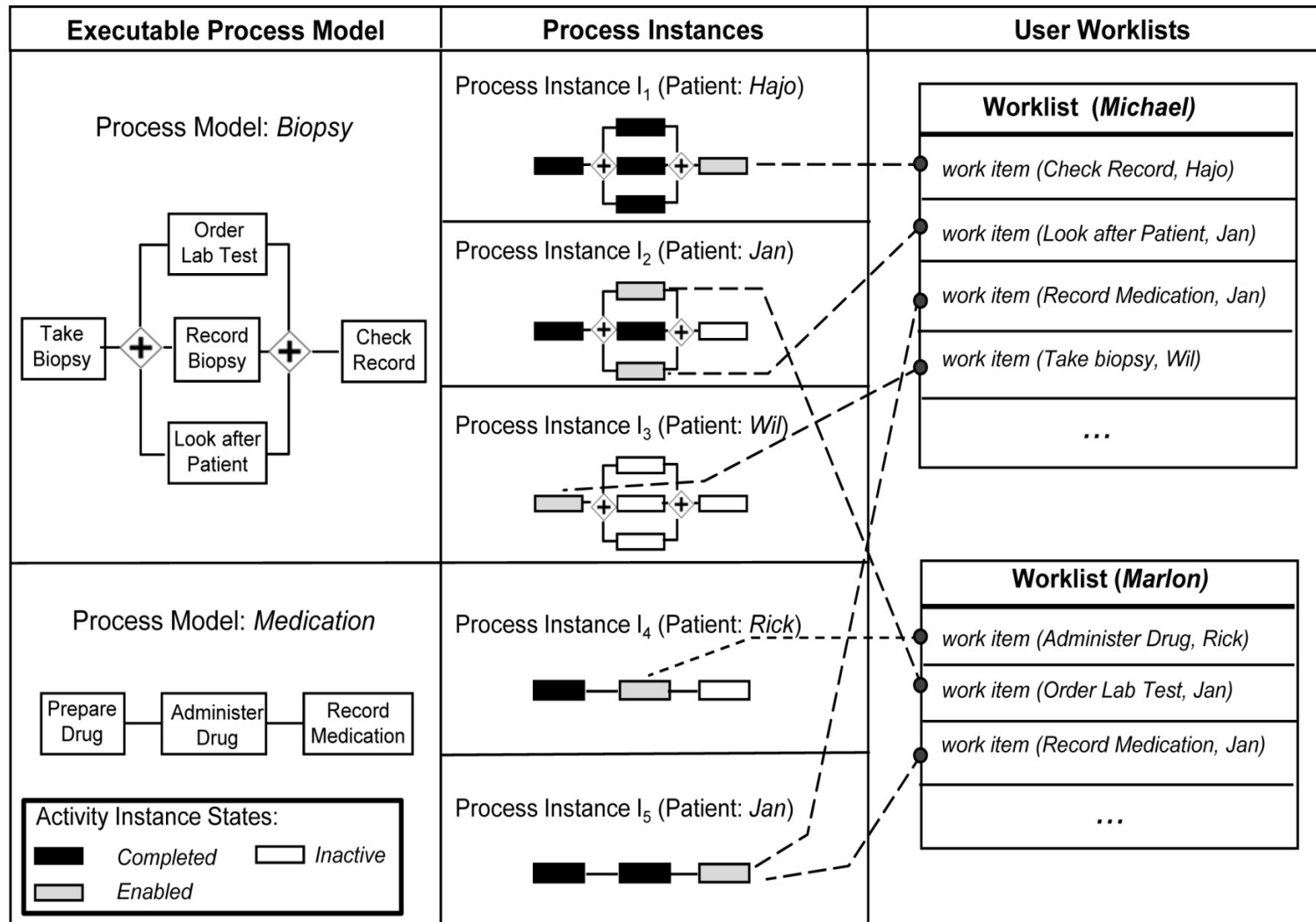
Internal State of a Process Instance



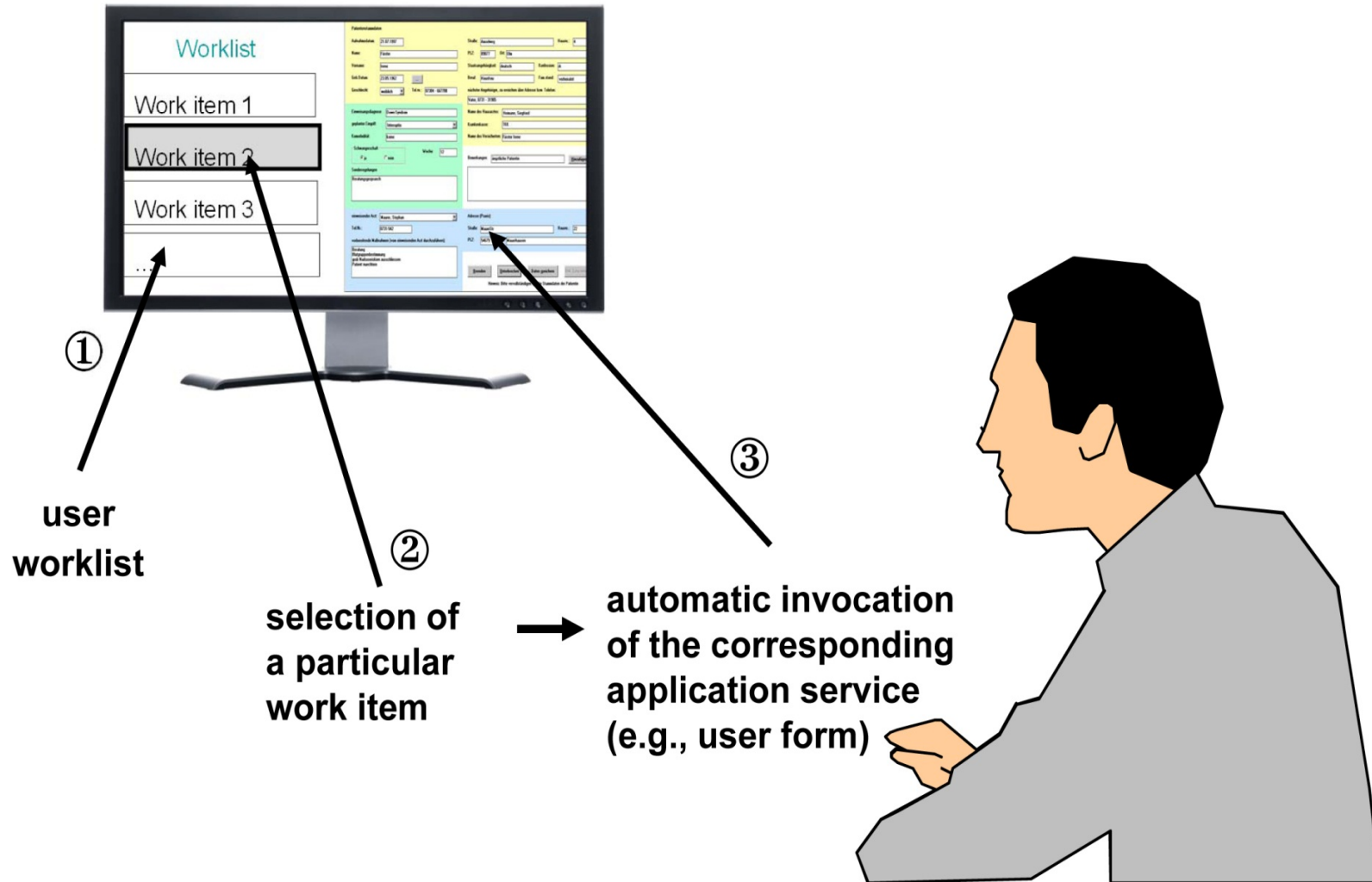
Activity Instances and their Lifecycles



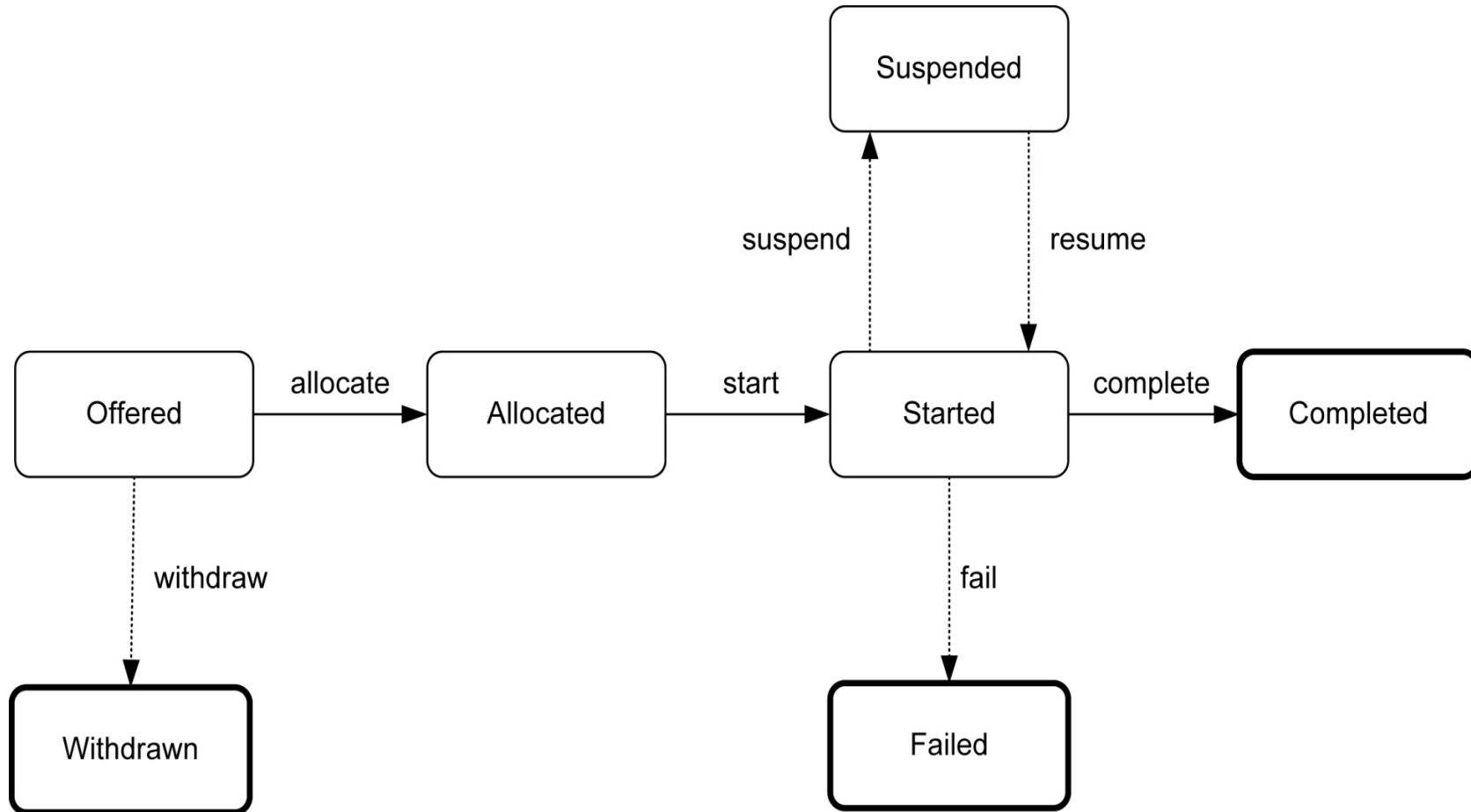
Worklists and Work Items



Selecting a Work Item from a Worklist



Work Item Lifecycle





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Process-aware Information Systems: Summary

- ▶ Know the logic of the supported processes
- ▶ Ensure that activities are executed in the specified order or considering the specified constraints
- ▶ Controls the flow of data between activities
- ▶ Knows the application service to be invoked when an atomic activity is started
- ▶ Assigns work items related to human activities to the work-lists of authorized users and manages these work-lists
- ▶ Enables end users to monitor the progress of process instances and to trace their previous execution



Traditional Process Lifecycle Support

