



# Business Process Management Systems and Challenges in their Adoption

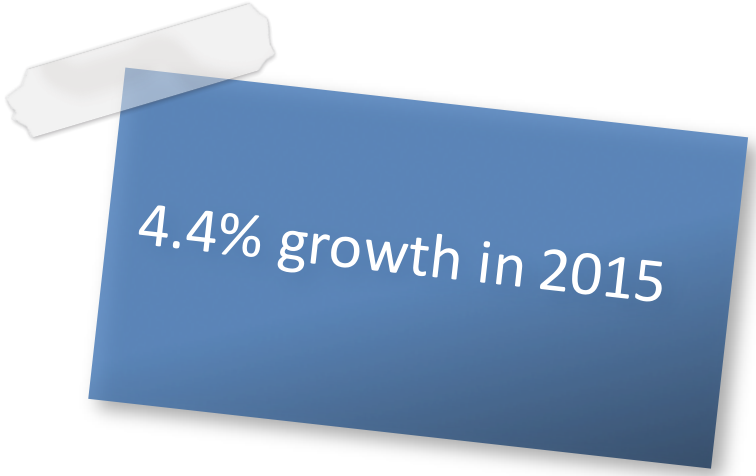
**presented by Barbara Weber**

BPMuy, Montevideo, Uruguay, September 29, 2016

# Business Processes Matter

# Growth of Investments in BPMS

Gartner Says Spending on Business Process Management Suites to Reach $2.7 Billion in 2015 as Organizations Digitalize Processes




http://www.gartner.com/newsroom/id/3064717

# Worldwide IT Spendings

Worldwide IT Spending Forecast (Billions of U.S. Dollars)

| | 2014 Spending | 2014 Growth (%) | 2015 Spending | 2015 Growth (%) |
|---|---|---|---|---|
| Devices | 696 | 3.8 | 732 | 5.1 |
| Data Center Systems | 141 | 0.8 | 143 | 1.8 |
| Enterprise Software | 317 | 5.8 | 335 | 5.5 |
| IT Services | 956 | 2.7 | 981 | 2.5 |
| Telecom Services | 1,626 | -0.1 | 1,638 | 0.7 |
| **Overall IT** | **3,737** | | | **2.4** |

Source: Gartner (January 2015)

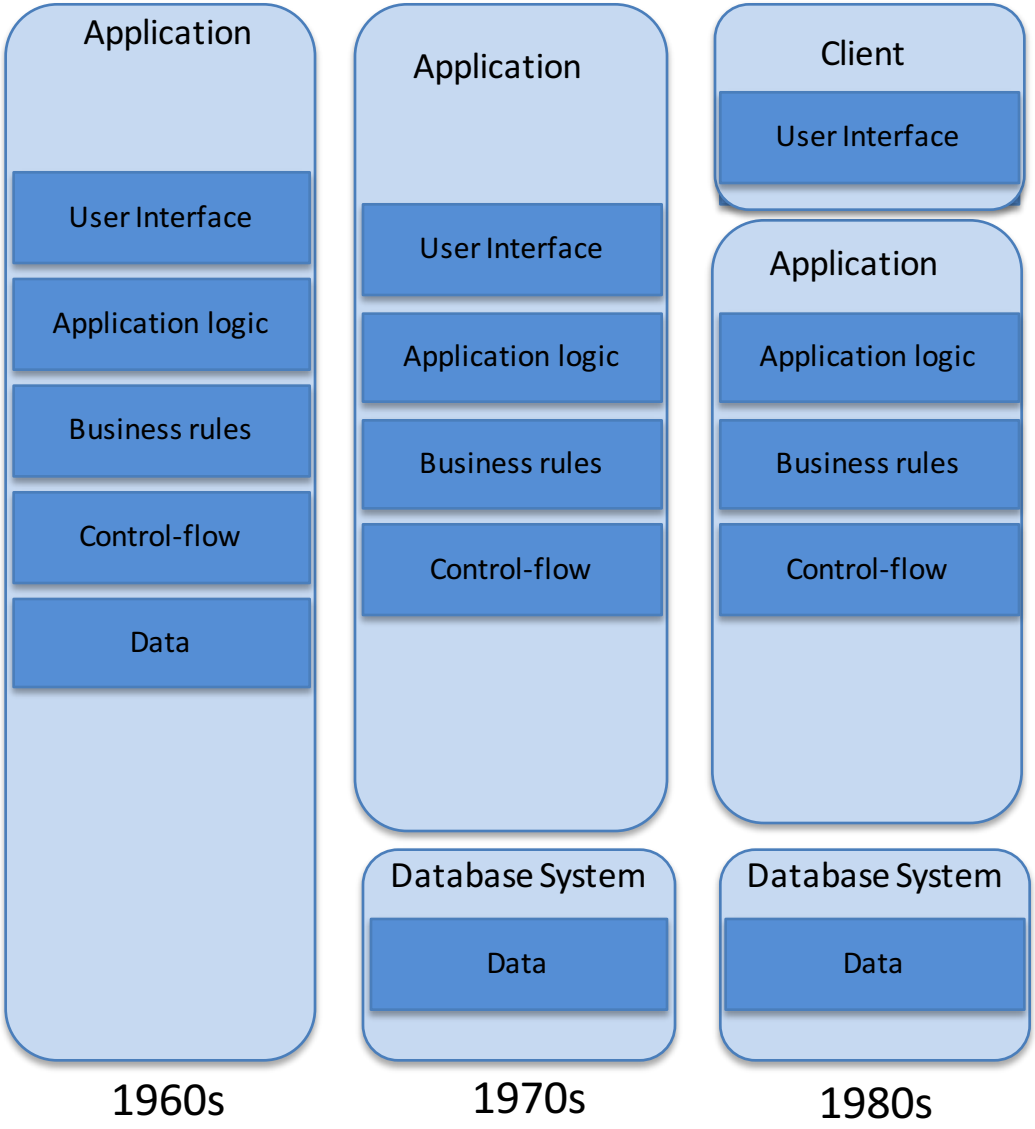
BPMS account for a relatively small portion of spendings on enterprise software

# Evolution of Enterprise Applications

Organizations built software to support their core and support processes themselves

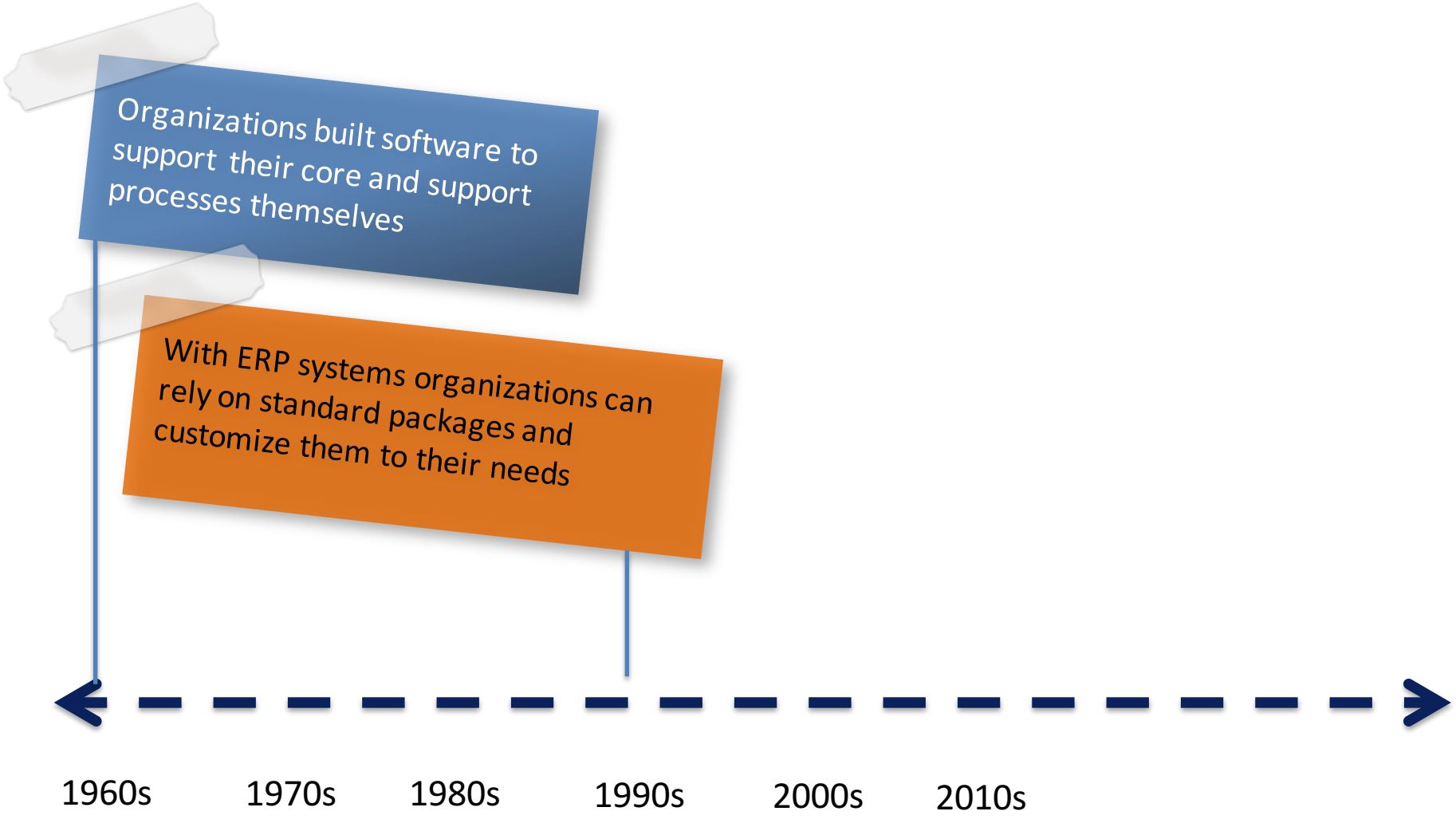
1960s 1970s 1980s 1990s 2000s 2010s

# Evolution of Enterprise Applications

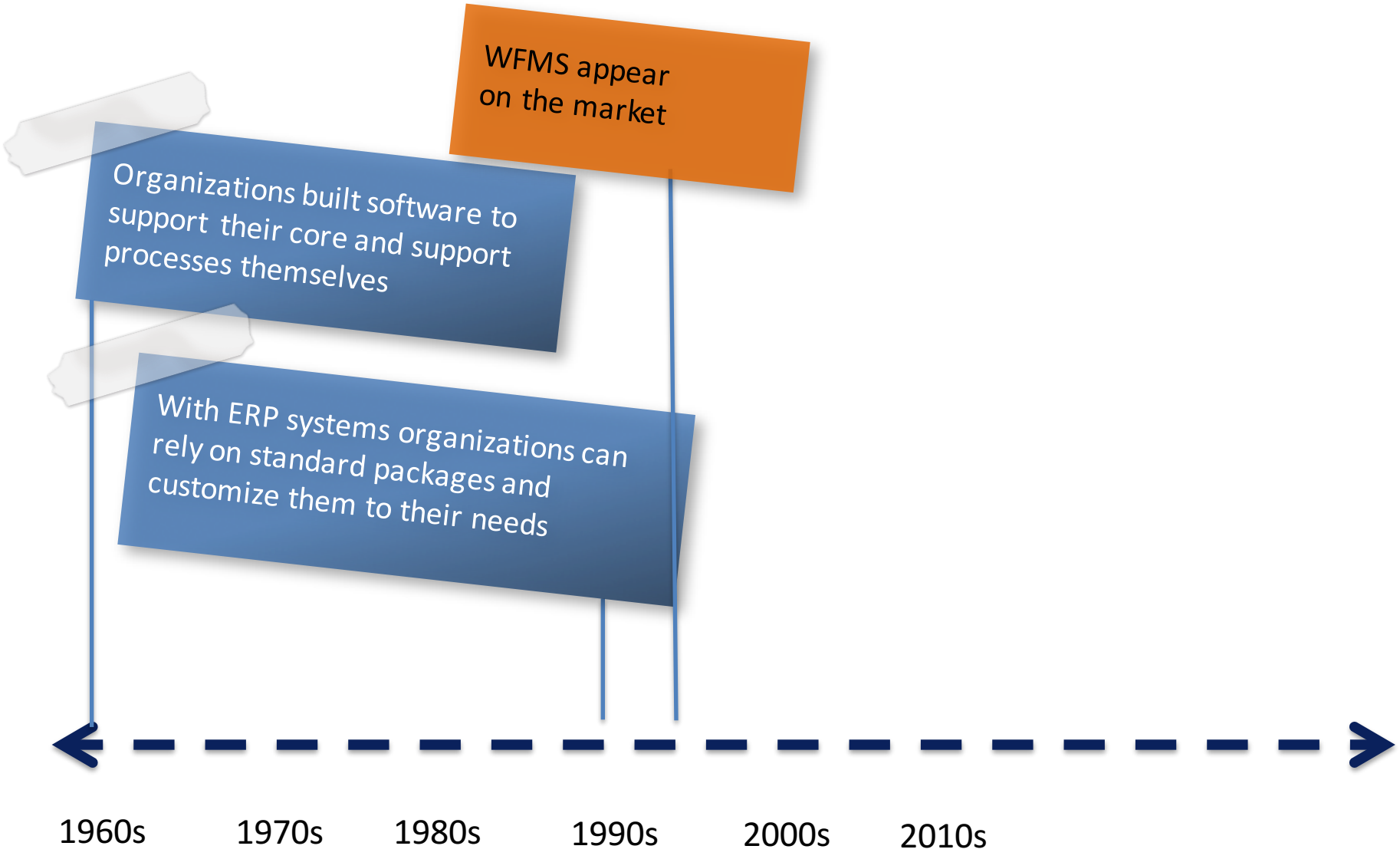



Aalst 2013

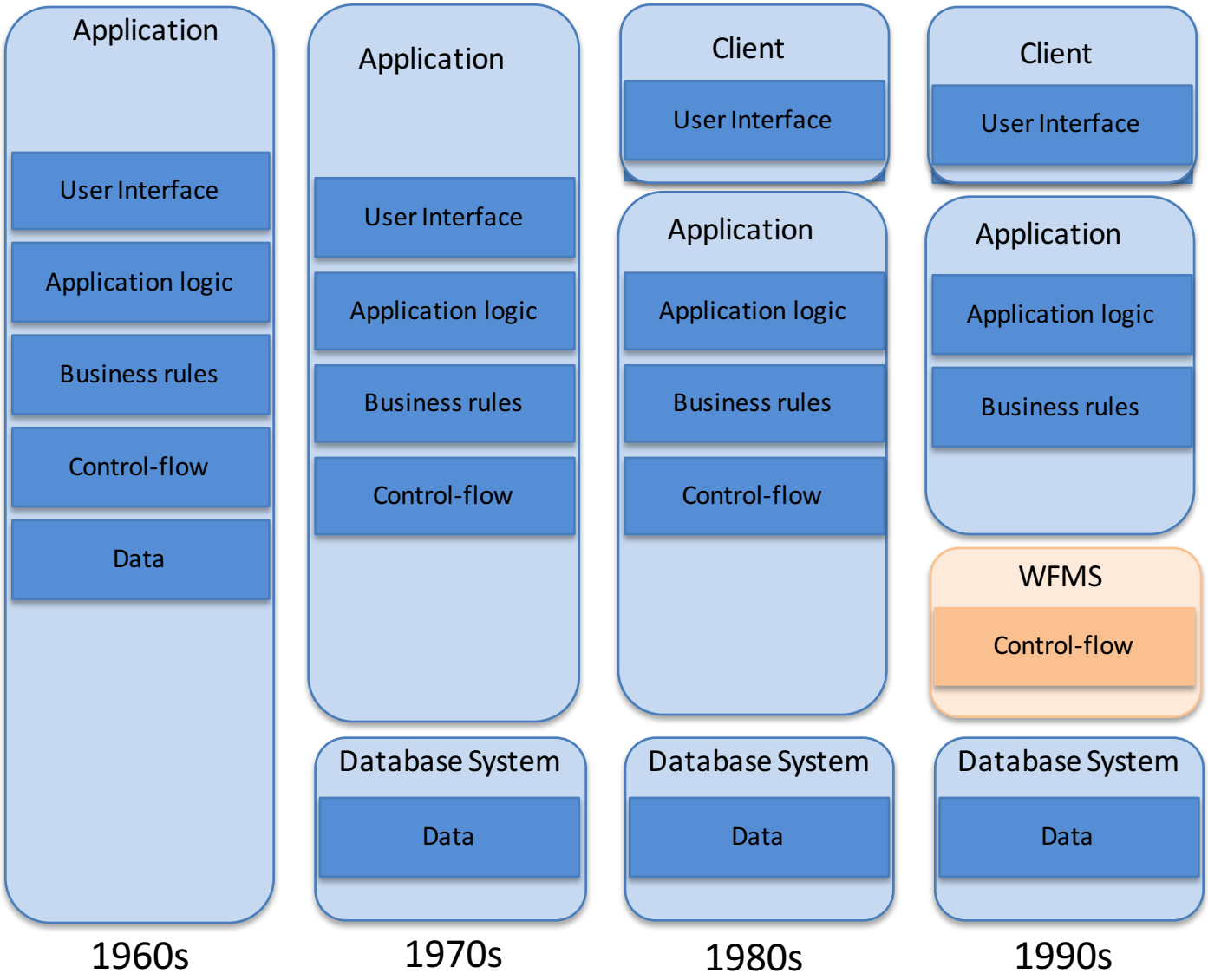
# Evolution of Enterprise Applications



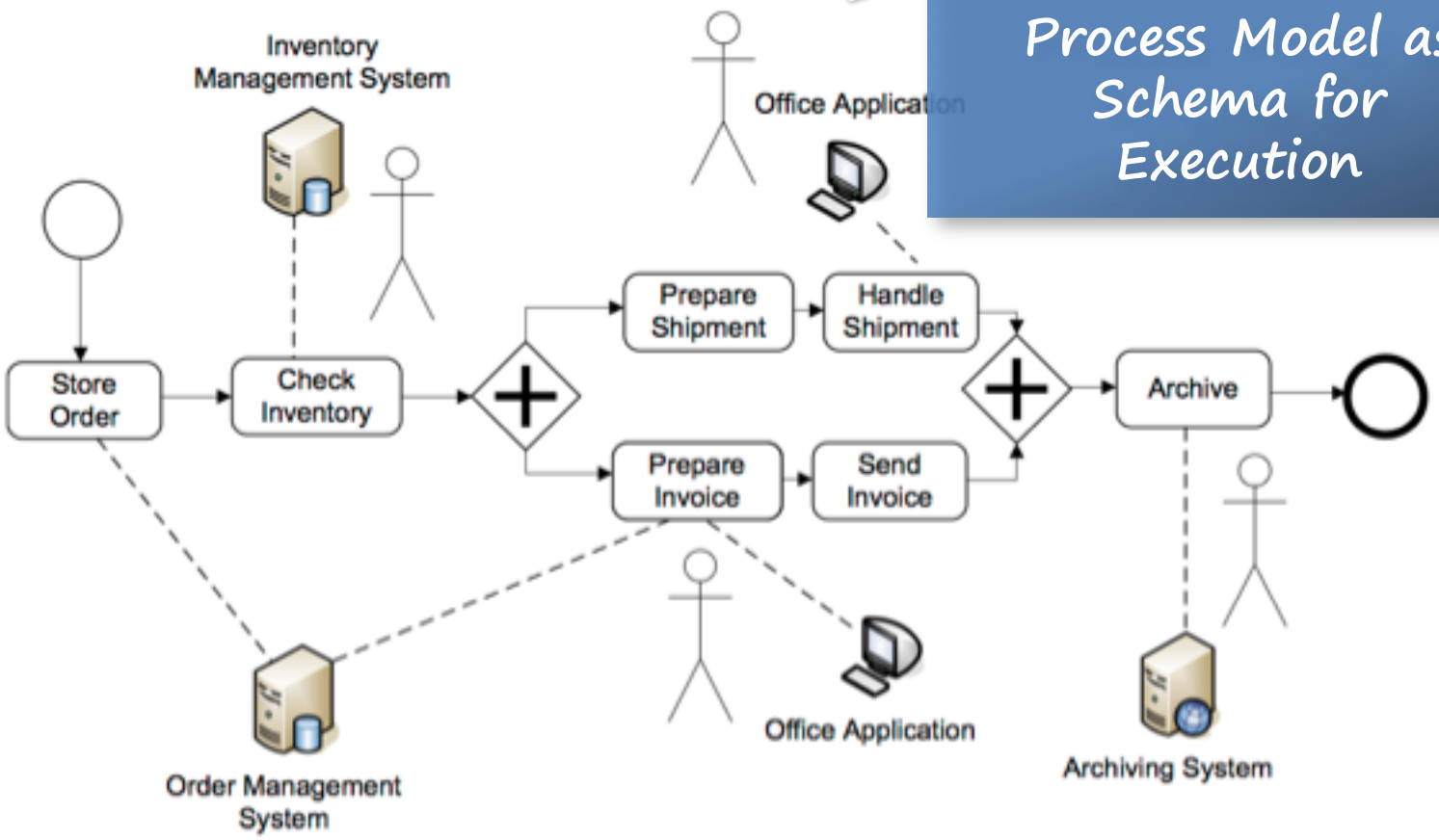
# Evolution of Enterprise Applications



# Evolution of Enterprise Software



# Pre-defined Process Model

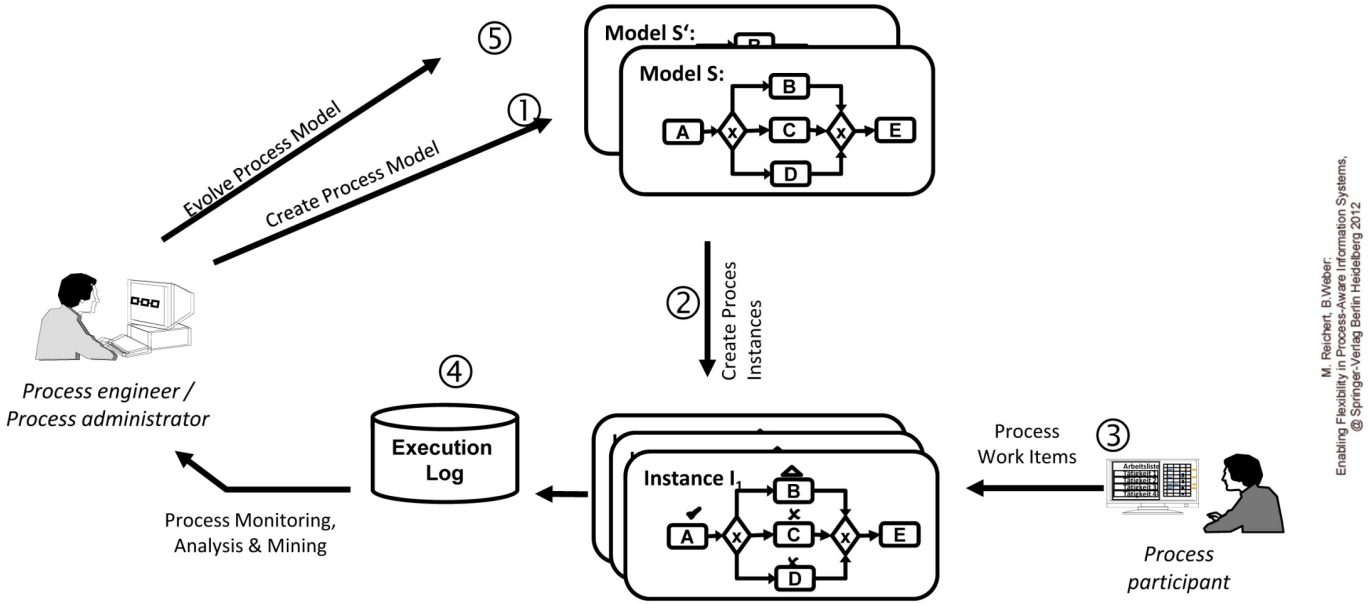


# Workflow Management System (WFMS)

Software package to support the

- definition,
- management and
- execution

of business processes



# From Monolithic to Service-based Architectures

Evolution in the technology space

**Monolithic architecture**

(one piece of software in a single deployable unit)

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Evolution in the technology space

**Monolithic architecture**

(one piece of software in a single deployable unit)

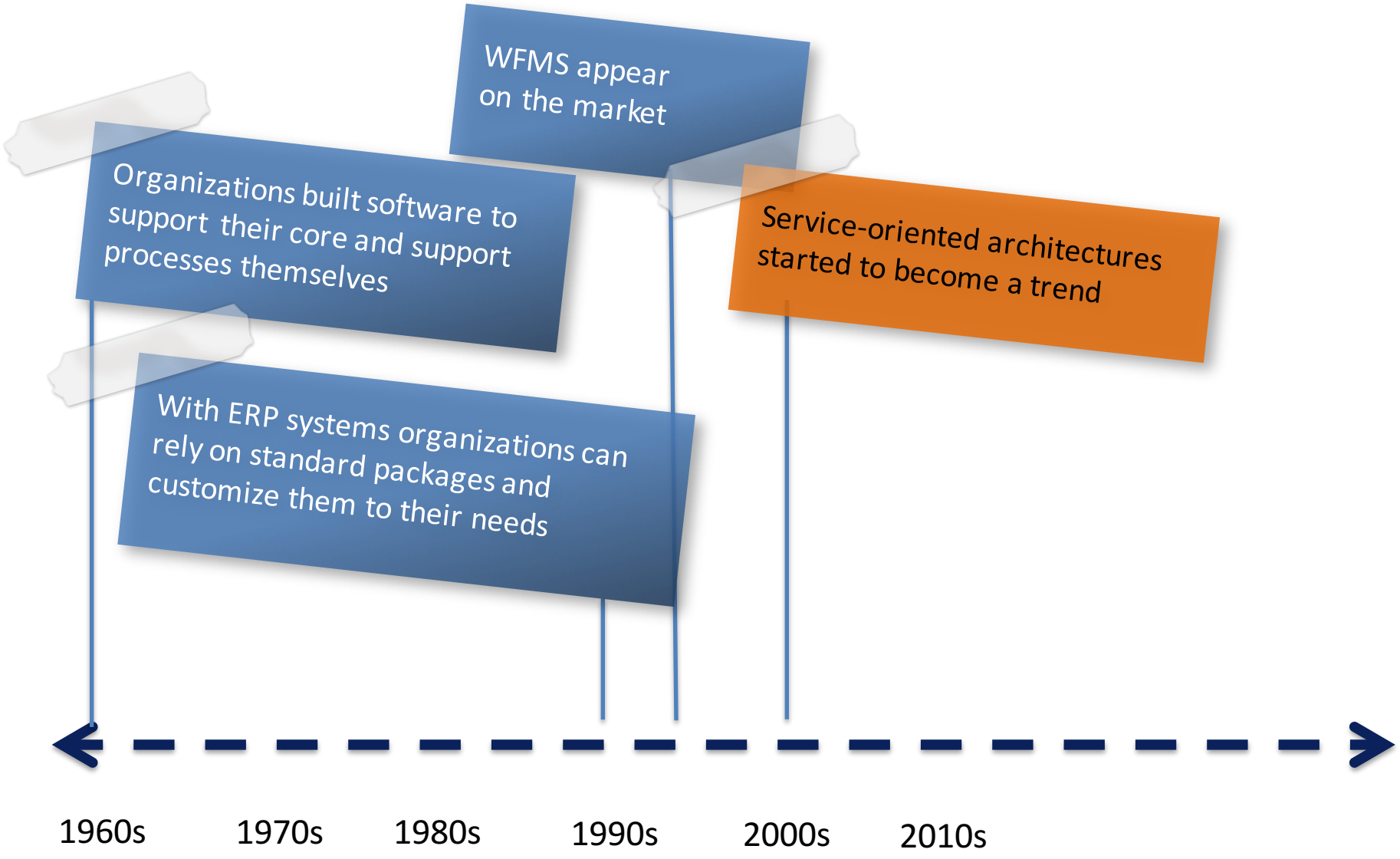
**The Middle Way**

(components in single deployable unit)

# From Monolithic to Service-based Architectures

Evolution in the technology space

# Evolution of Enterprise Applications



# From Monolithic to Service-based Architectures

Evolution in the technology space

**Monolithic architecture**

(one piece of software in a single deployable unit)

**Service-based architecture**

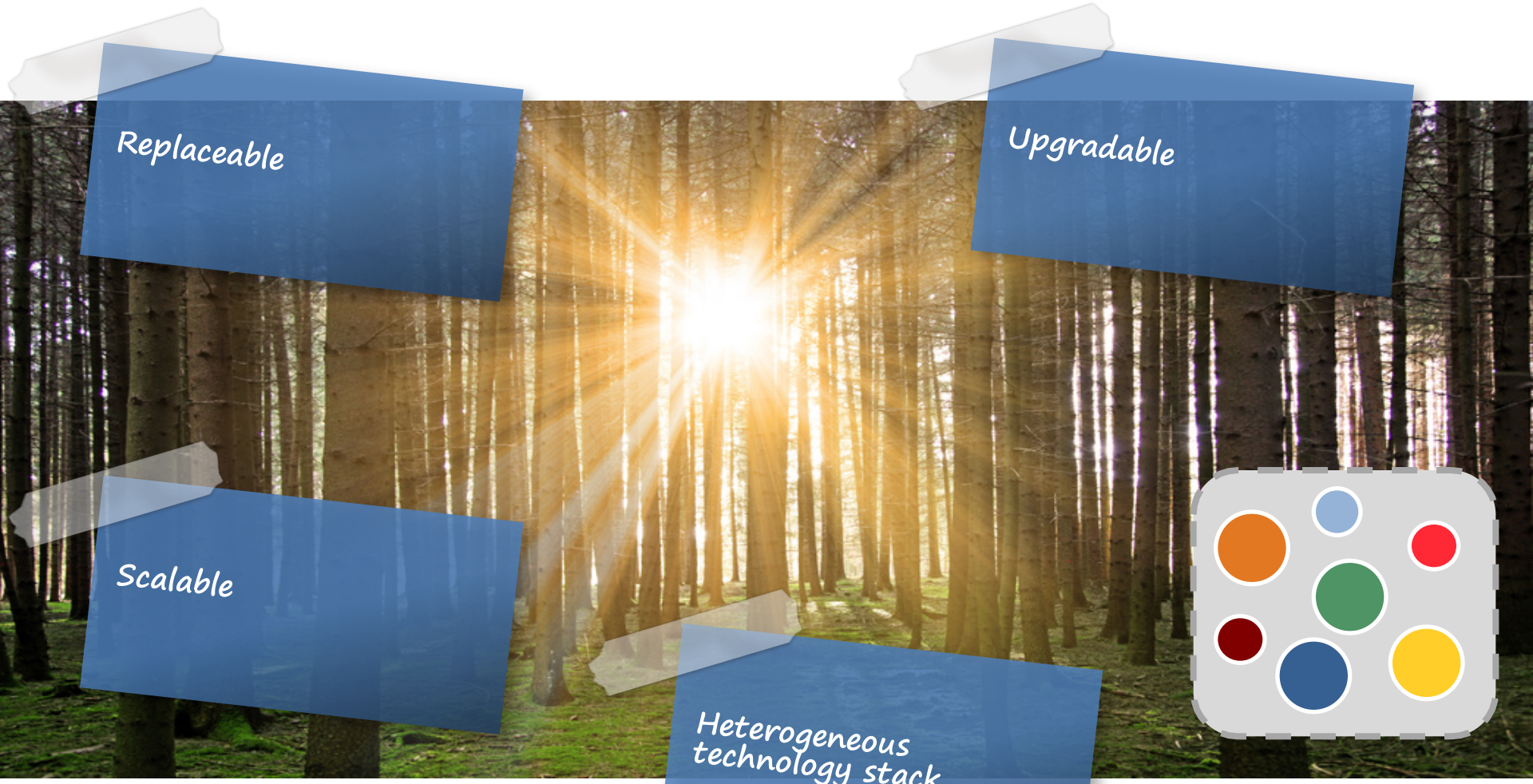
(SOA, micro services, etc. deployed separately)

**The Middle Way**

(components in single deployable unit)

# From Monolithic to Service-based Architectures

Evolution in the technology space



# Assembling Services for Realizing Business Process Support

Orchestration vs. Choreography

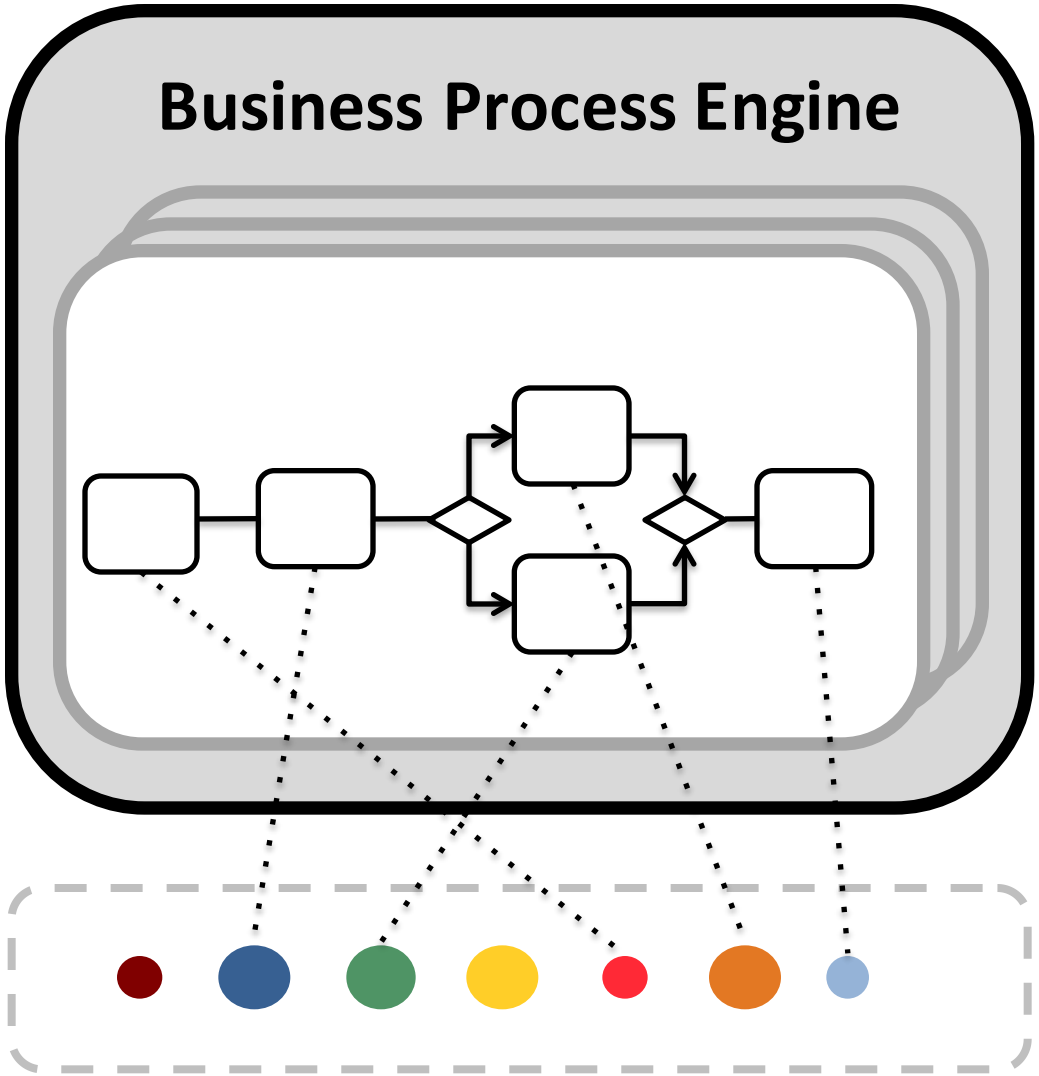
Programming in the large

# Assembling Services for Realizing Business Process Support

Code-based Orchestration

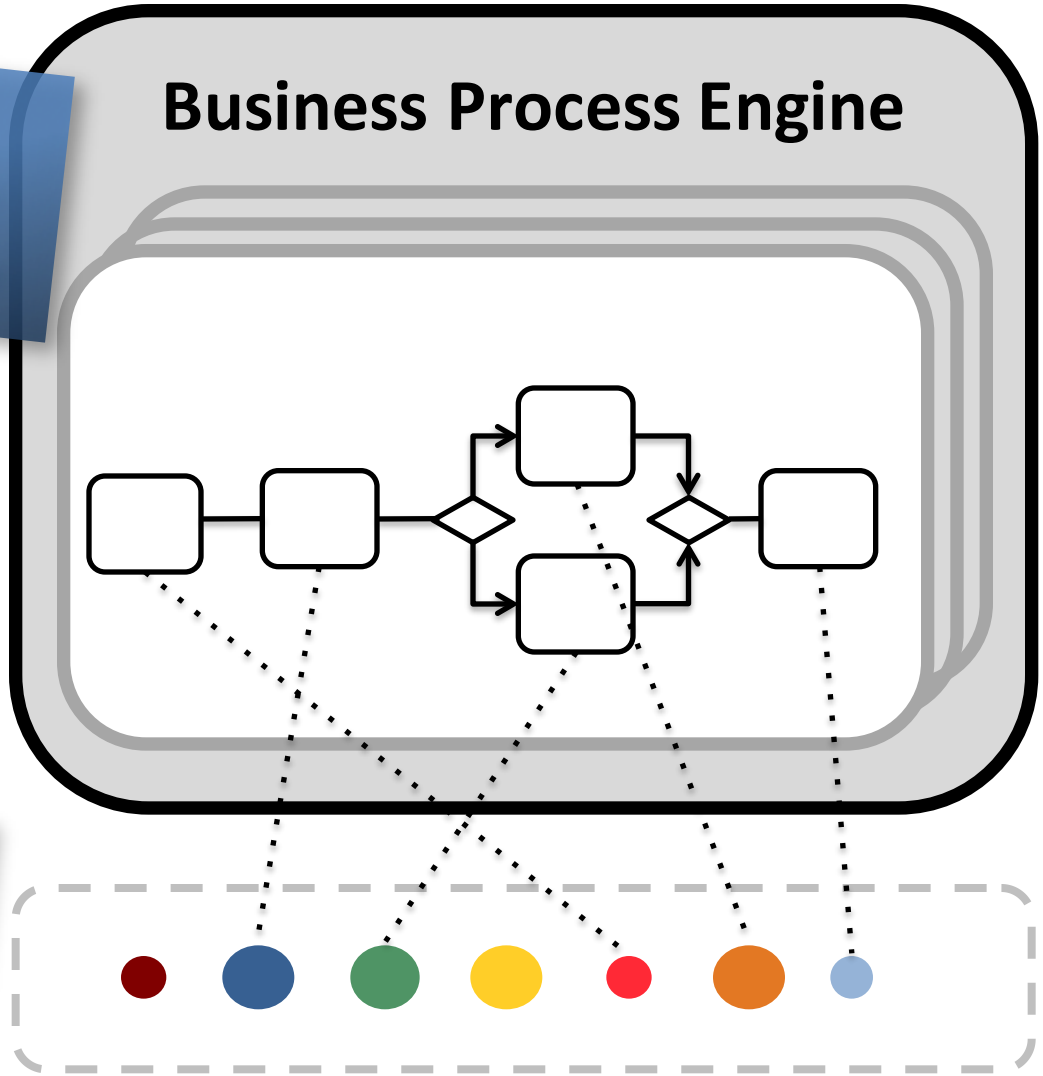
# Assembling Services for Realizing Business Process Support

BPM Technologies for Orchestration

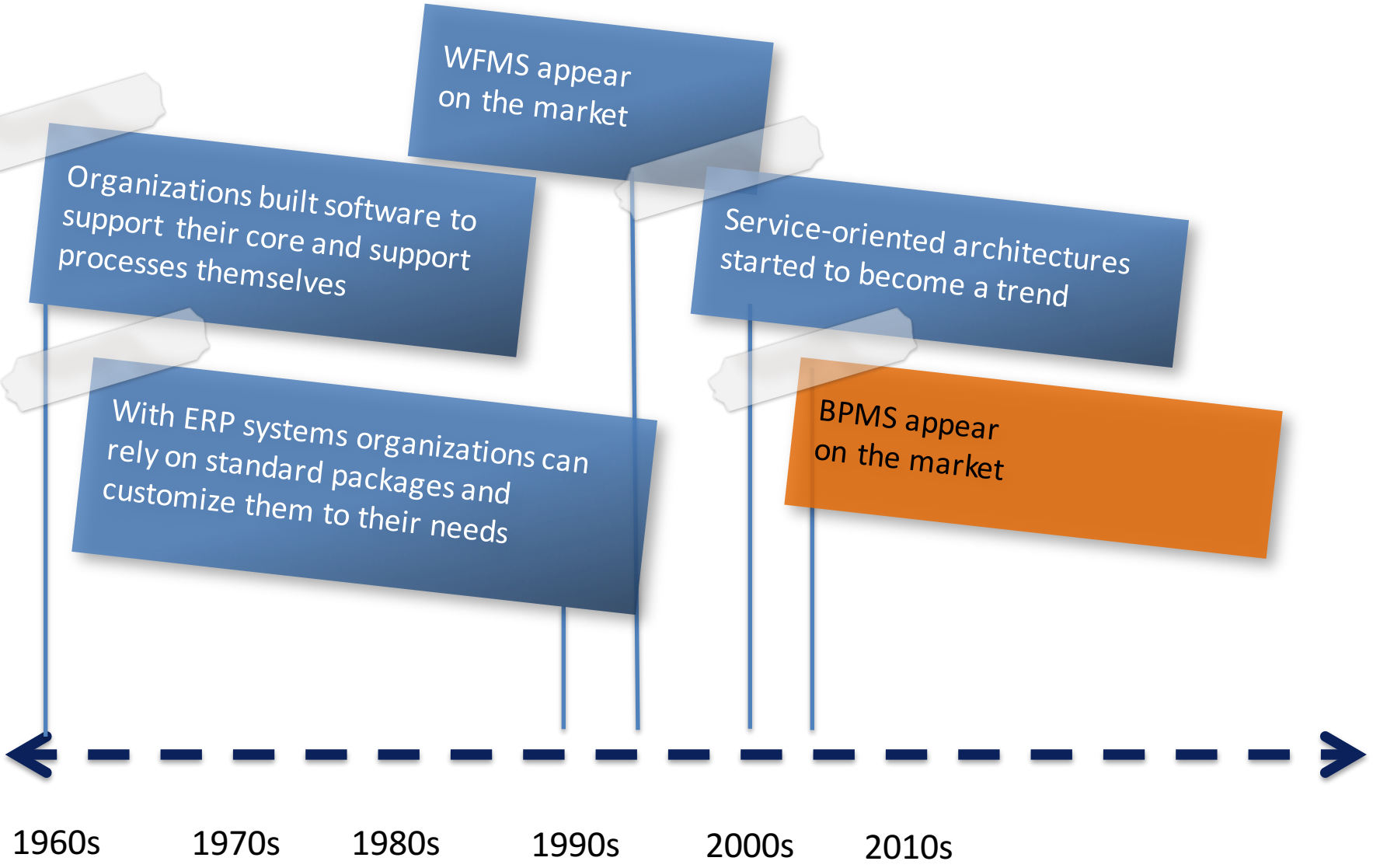


# Assembling Services for Realizing Business Process Support

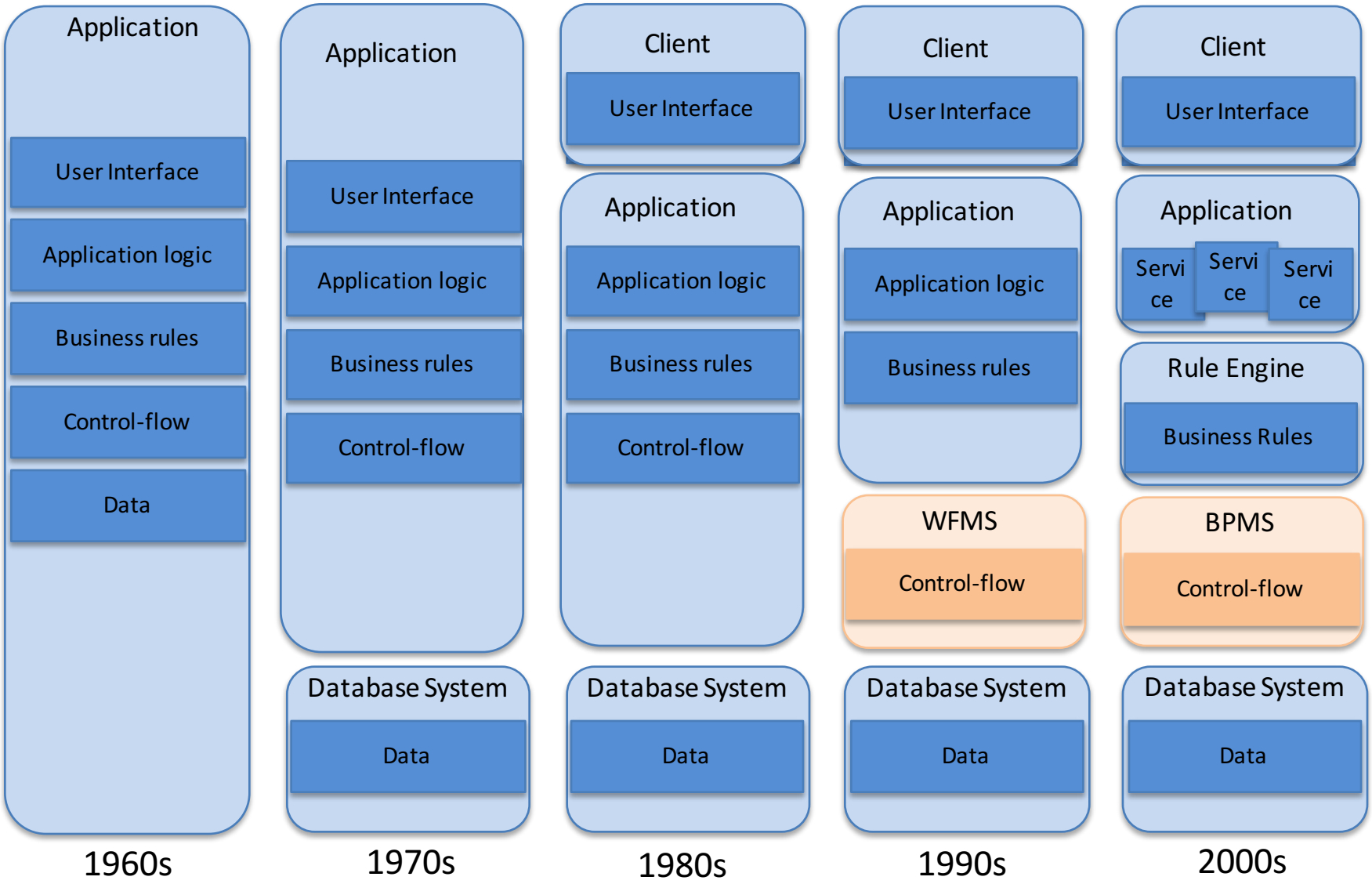
BPM Technologies for Orchestration

# Evolution of Enterprise Applications

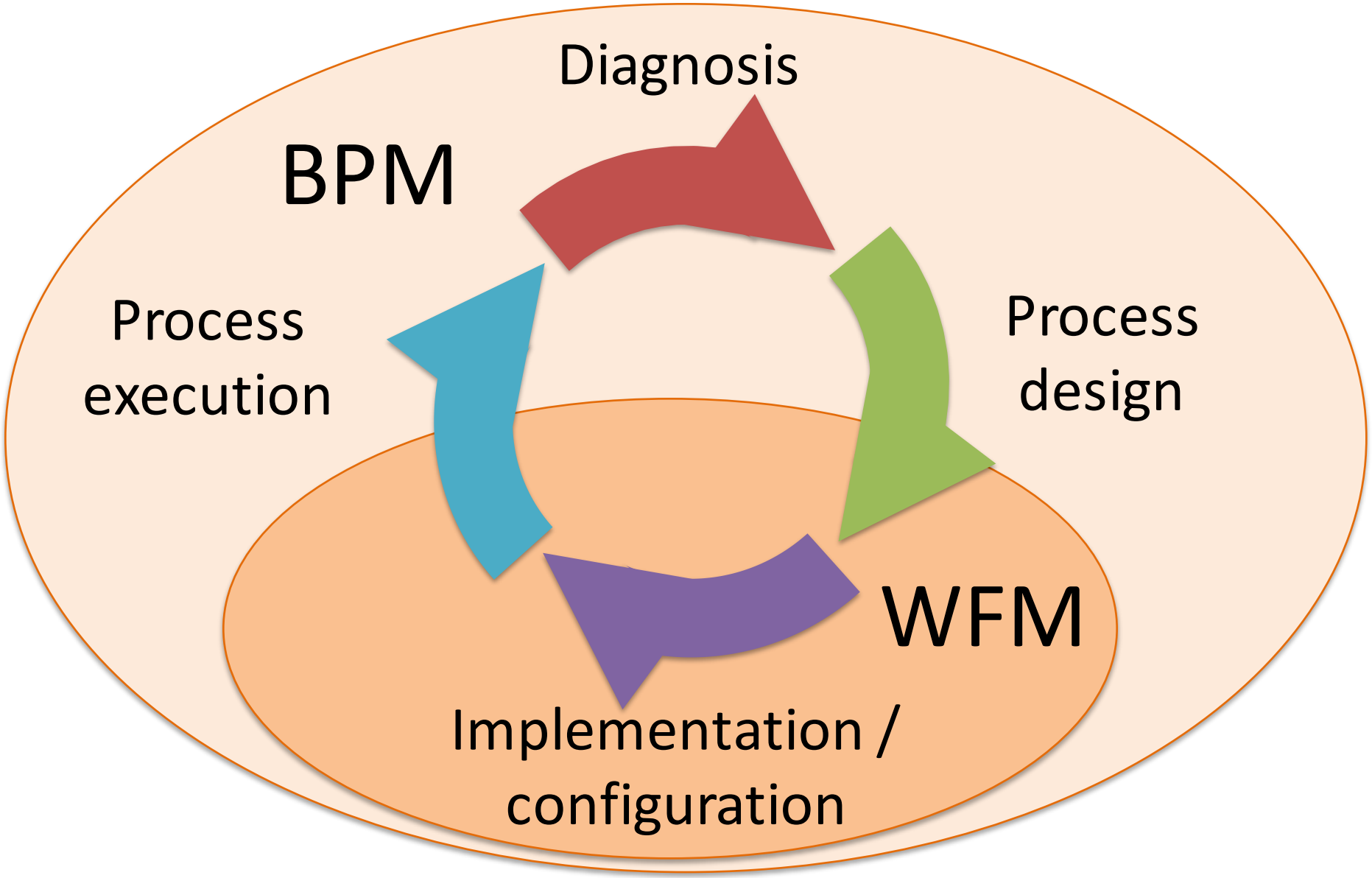


# Evolution of Enterprise Software

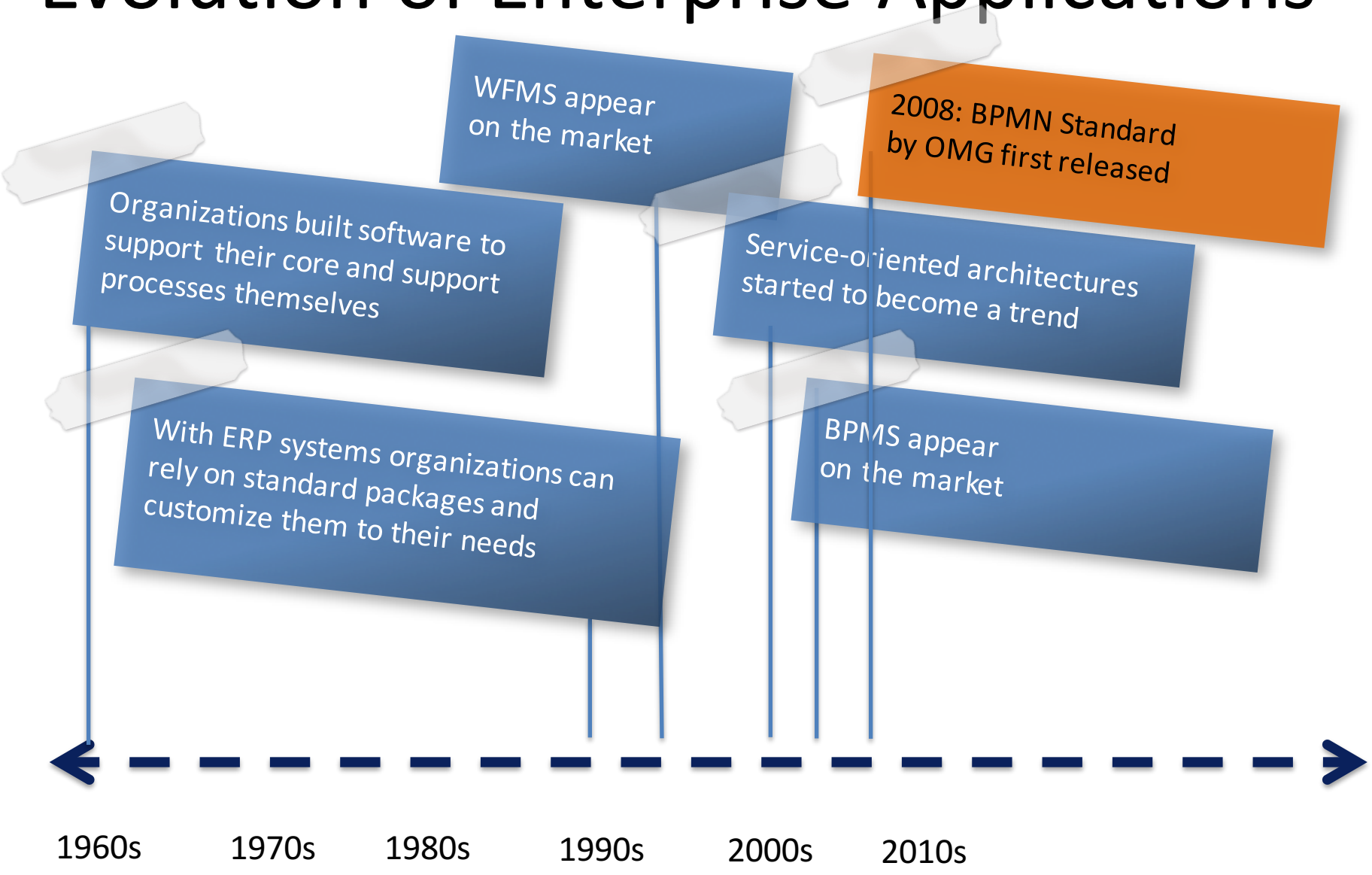


# Evolution of Enterprise Software

From WFM to BPM



# Evolution of Enterprise Applications



# Why have BPMS still not fully taken off?

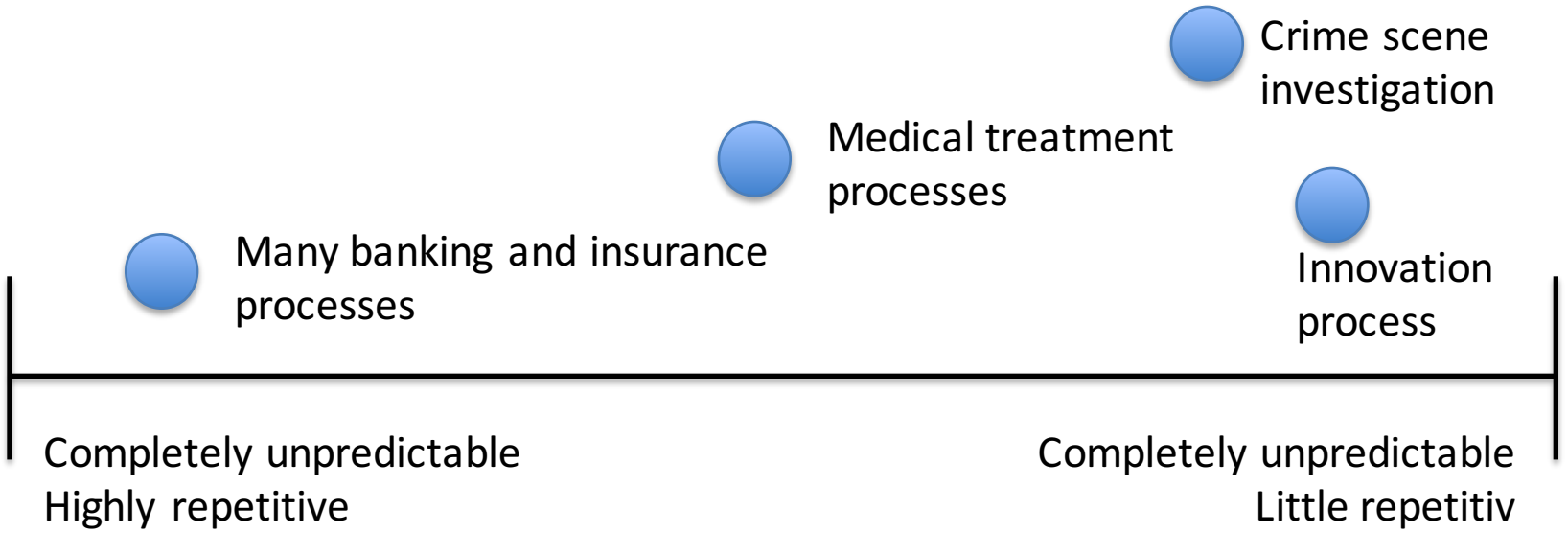
# Challenge:
# BPM support rarely developed on the green field

- Organizations
  - have made huge IT investments since the 1960s, which are today legacy applications
  - and not fully transitioned to service-oriented architectures

- To avoid the creation of new silos BPMS need to be able to integrate into the existing IT landscape

# The process spectrum

- The process spectrum reaches from
  - completely predictable and highly repetitive
  - to completely unpredictable and little repetitive



# The process spectrum

- The process spectrum reaches from
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Completely unpredictable
Highly repetitive

Completely unpredictable
Little repetitiv

# Technology Support for BP

- The process spectrum reaches from
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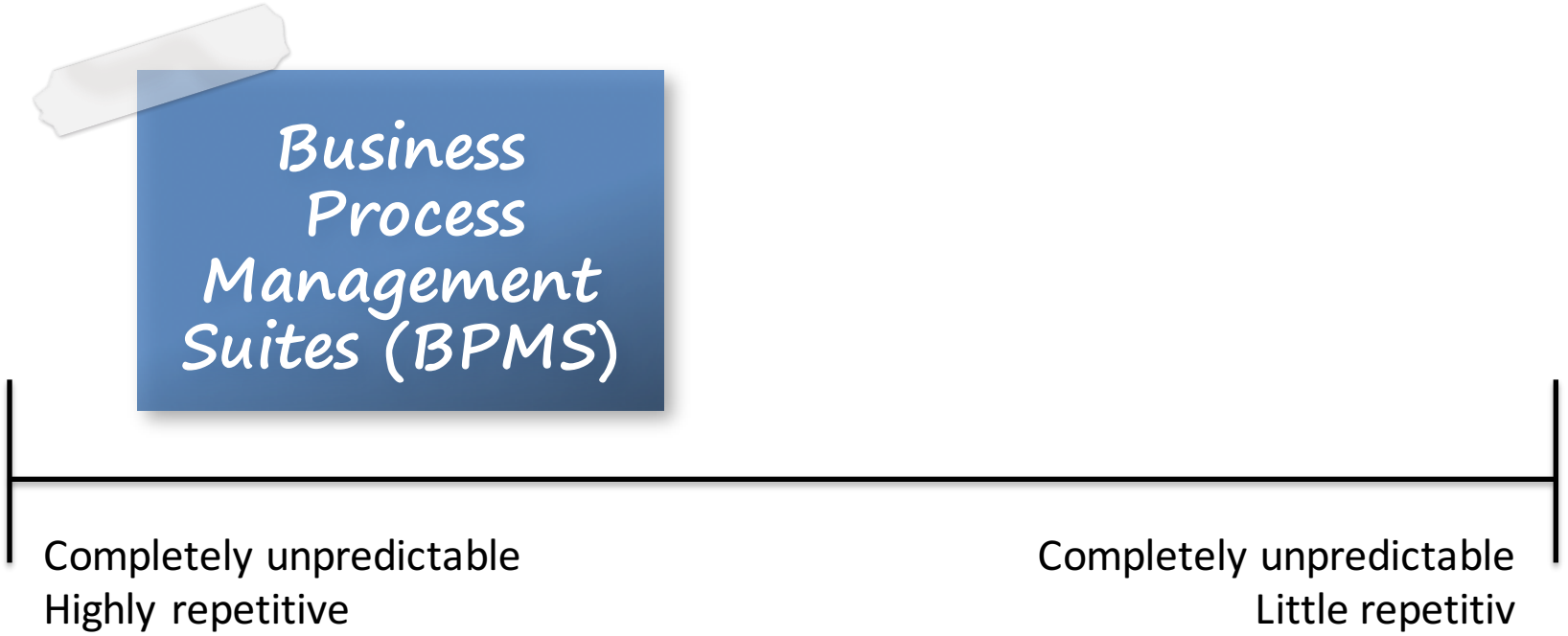


# Challenge: Flexibility

- The process spectrum reaches from
  - completely predictable and highly repetitive
  - to completely unpredictable and little repetitive

Completely unpredictable
Highly repetitive

Variability

Adaptation

Evolution

Completely unpredictable
Little repetitiv

# Adaption

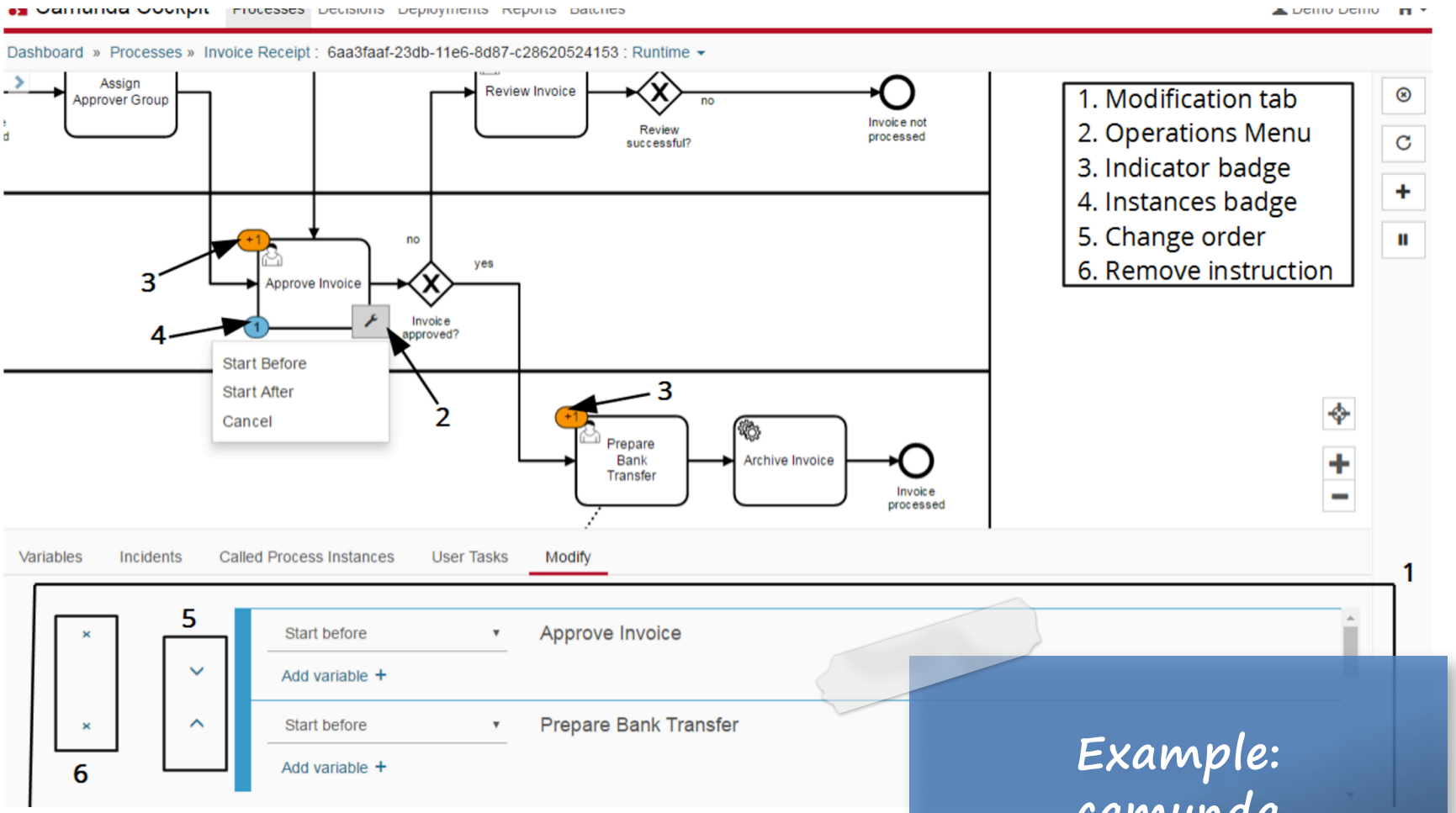
- Ability to adapt process and its structure to temporary events
  - Special cases, exceptions

Example: Road blockage

# Adaption in BPMS

- Planned adaptations typically addressed via exception handling
- Approaches for unplanned exceptions in academic research known since years
- Unplanned exceptions in many commercial BPMS not sufficiently supported
  - Exceptions: Adaptive BPMS like AristaFlow or camunda

# Adaptation of Running Instances




Example: camunda

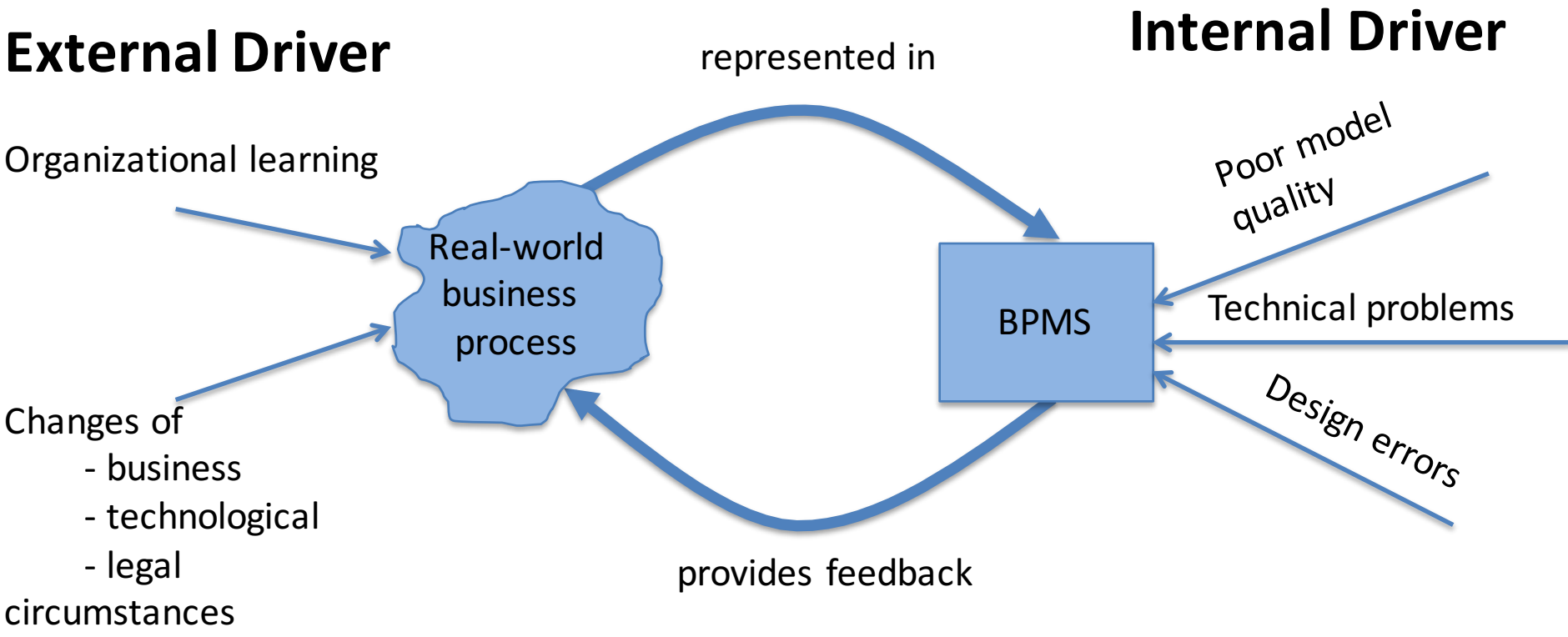
# Evolution

- Ability to change the implemented process when the real-world process changes

Example: New road

# Evolution

- Typical Driver




(Reichert und Weber 2012)

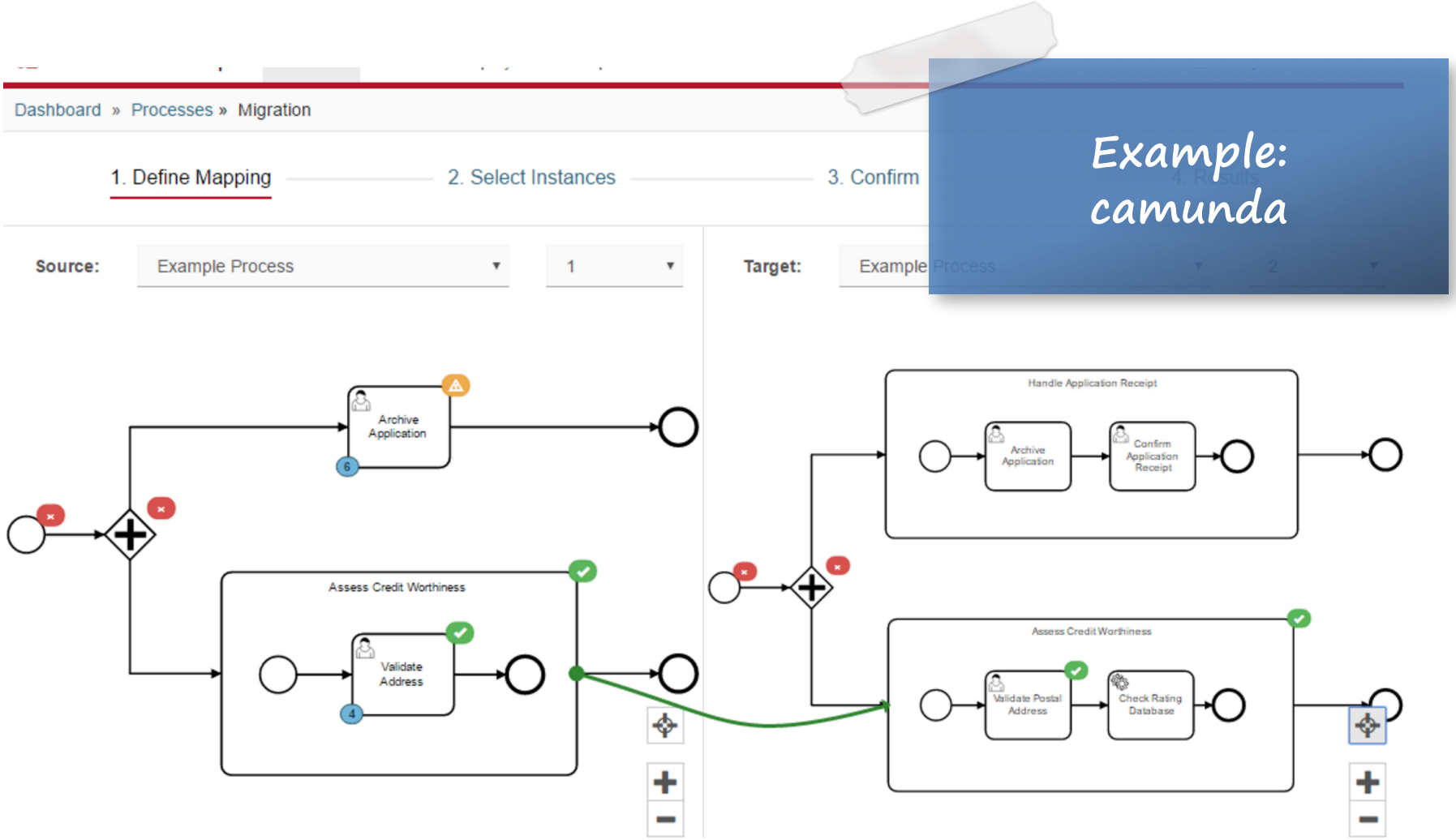
# Evolution

- Immediateness of evolution
  - deferred
    - Running instances not affected
  - immediate
    - Running instances affected
    - Requires migration of instances

# Evolution in BPMS

- Deferred evolution of business process typically supported
- Approaches for immediate evolution in academic research known since years
- Immediate Evolution in commercial BPMS not sufficiently supported
  - Exception: Adaptive BPMS like AristaFlow or camunda

# Immediate Evolution



# Variability

- Variability requires that processes, depending on the context, are treated differently
- Example: hiking path versus highway



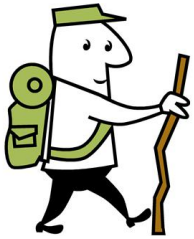
# Variability

- Context factors known

  Example:

  Transportation Method

- Selection of variants is context-dependent



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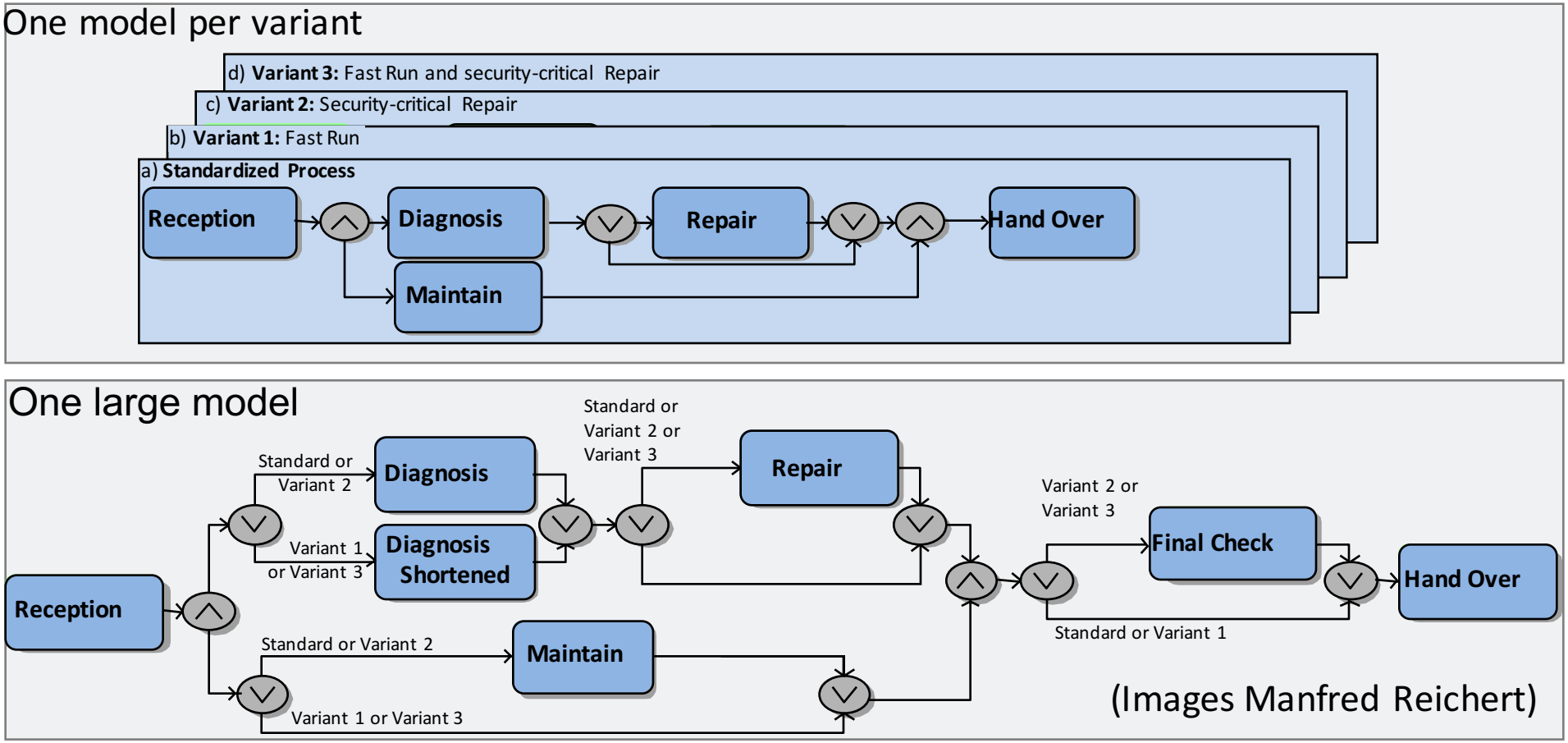
# Variability

- Typical Driver
  - Product and Service Variability
  - Country-specific (legal) regulations
  - Different customer groups
  - Seasonal differences

# Variability in BPMS

- Not explicitly supported in commercial BPMS




- Very recent research topic

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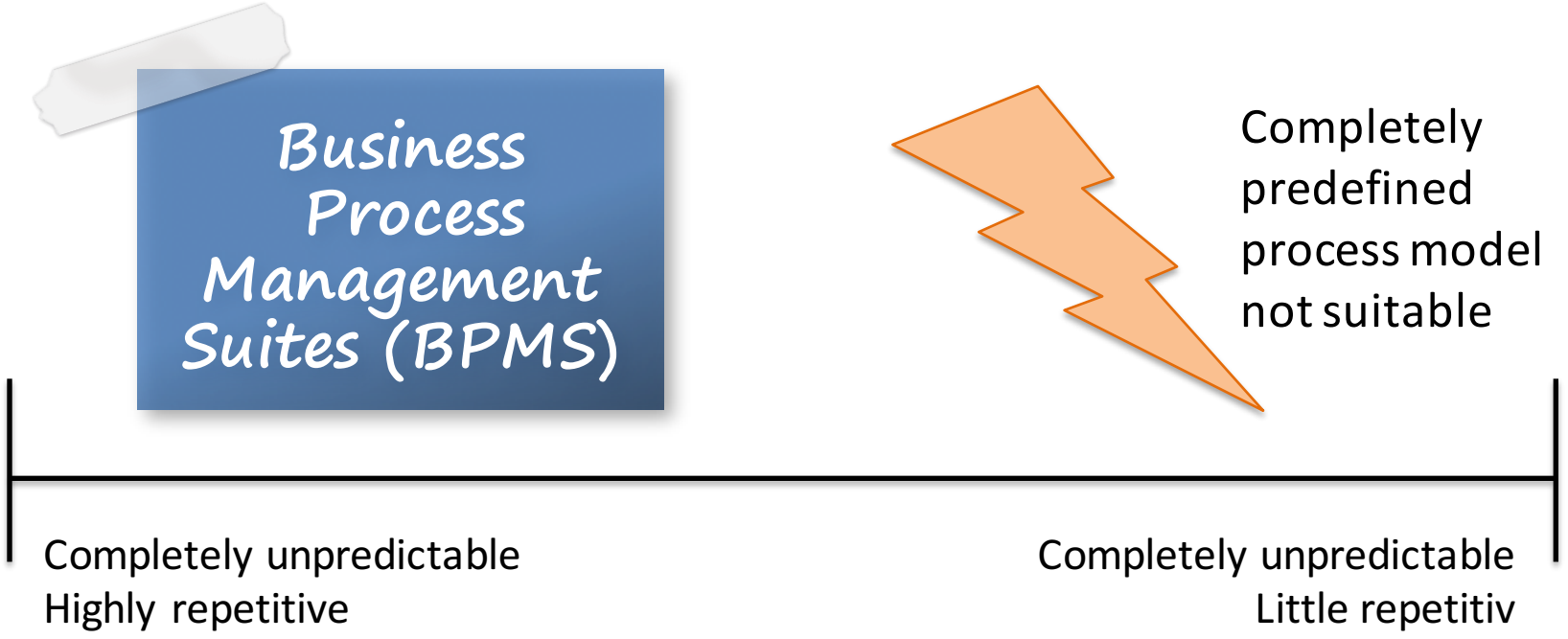

# The process spectrum

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Specific property: **Emergence**

Completely unpredictable
Little repetitiv

# Technology Support for BP

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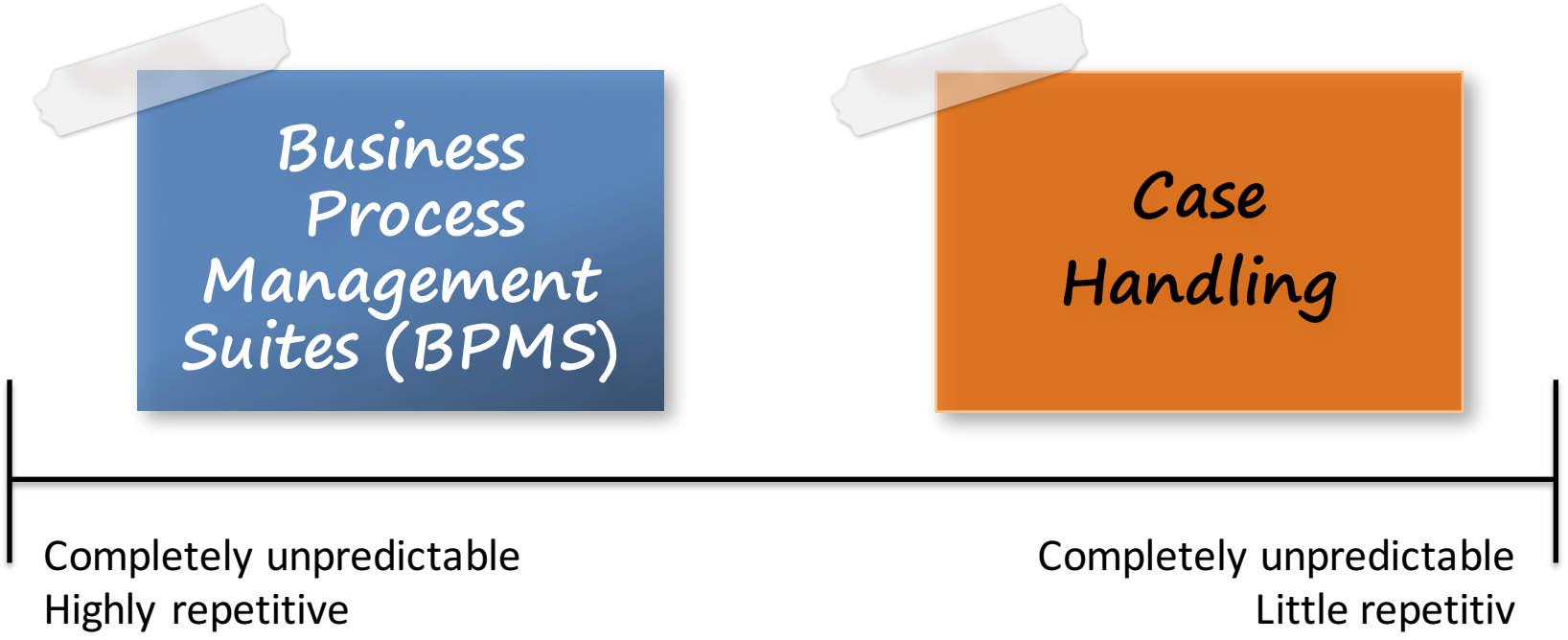
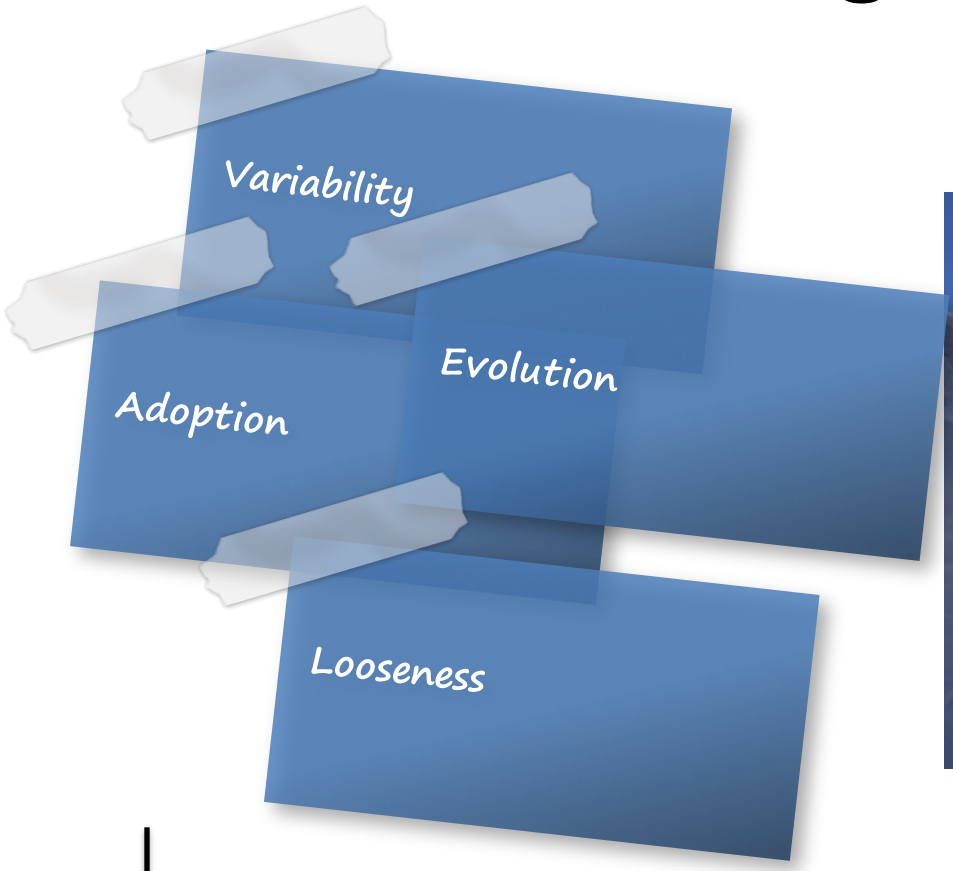


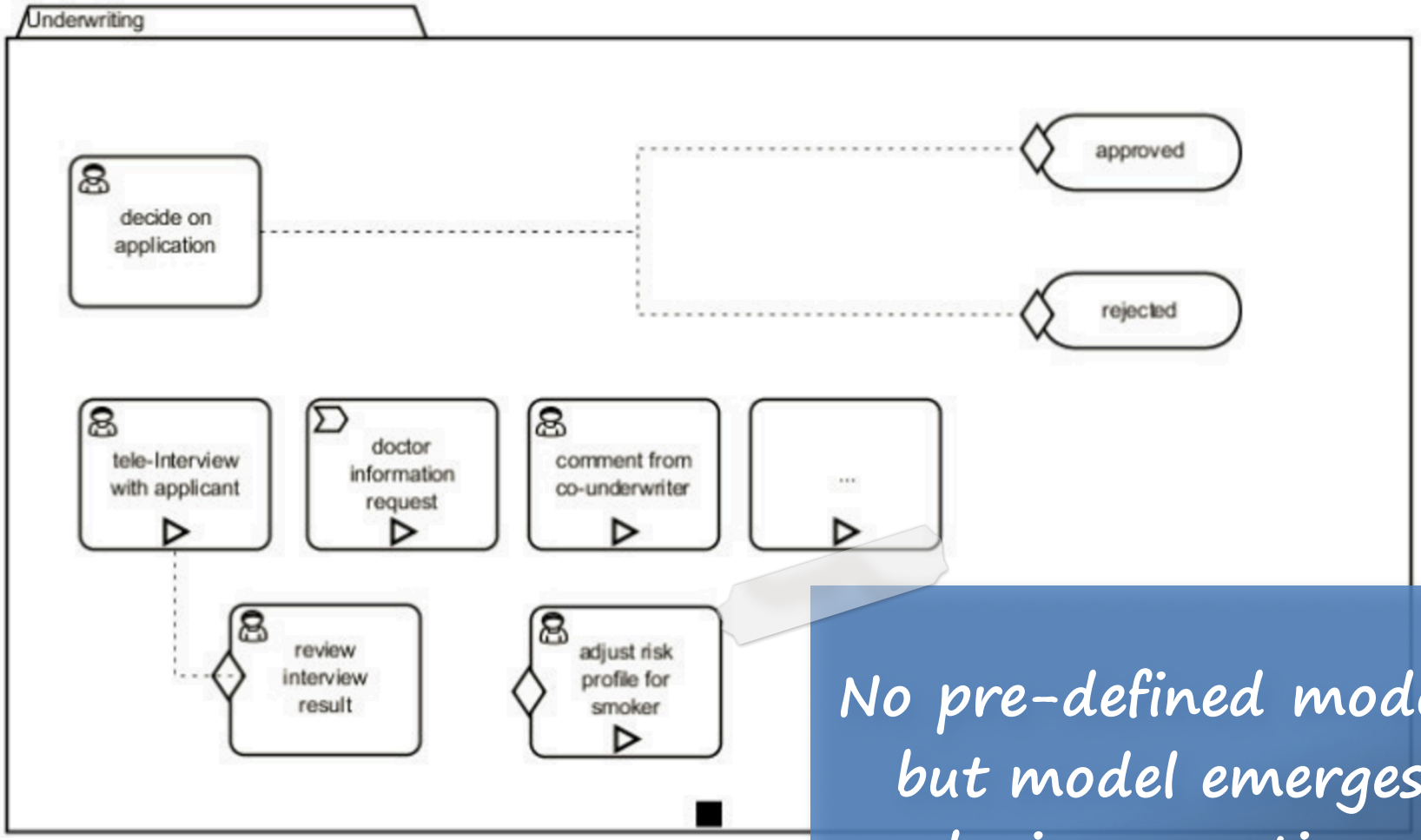
# Challenge Flexibility




Highly predictable
Highly repetitiv

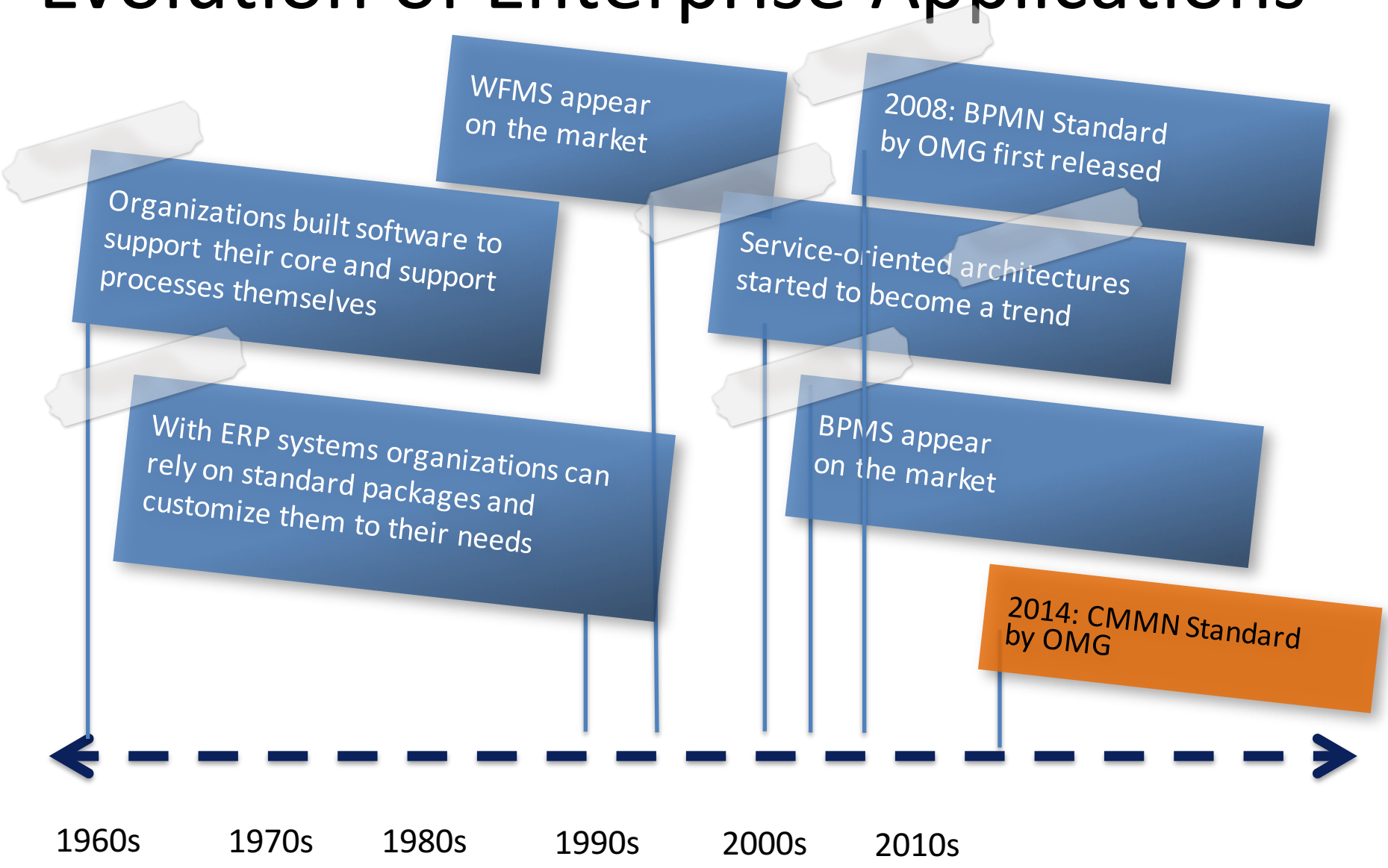
Highly unpredictable
Little repetitive

# Looseness




No pre-defined model, but model emerges during run-time

# Evolution of Enterprise Applications



# The Need for Hybrid Approaches

- The process spectrum reaches from
  - completely predictable and highly repetitive
  - to completely unpredictable and little repetitive
- Processes many times cannot clearly be positioned on one side of the spectrum
  - Parts that are predictable and repetitive and
  - Other parts that are unpredictable and little repetitive
- The process portfolio of an organization typically comprises processes at both sides of the spectrum

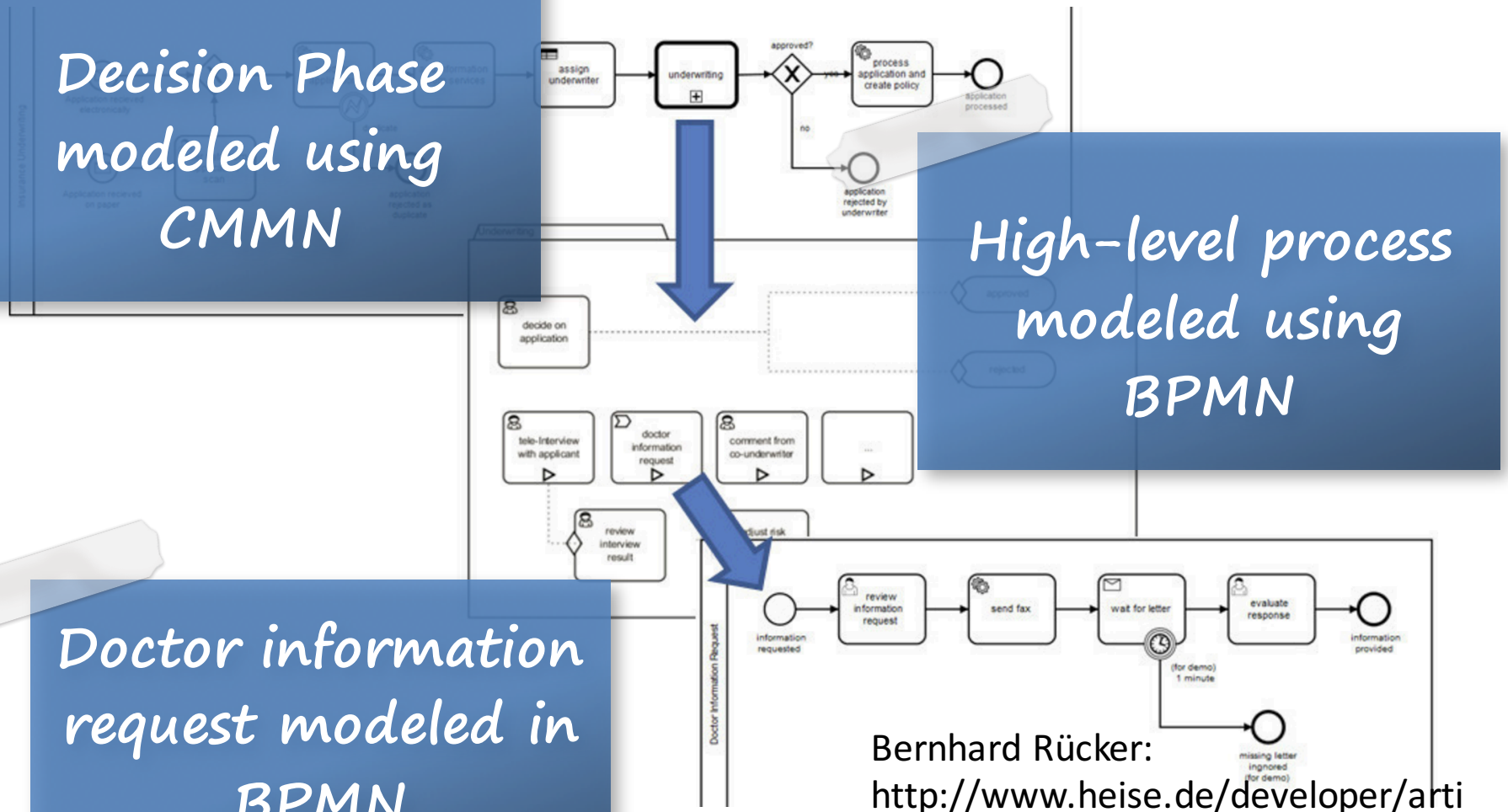
*Need for hybrid approaches*

# Vendors Start Picking Up This Need

Decision Phase modeled using CMMN

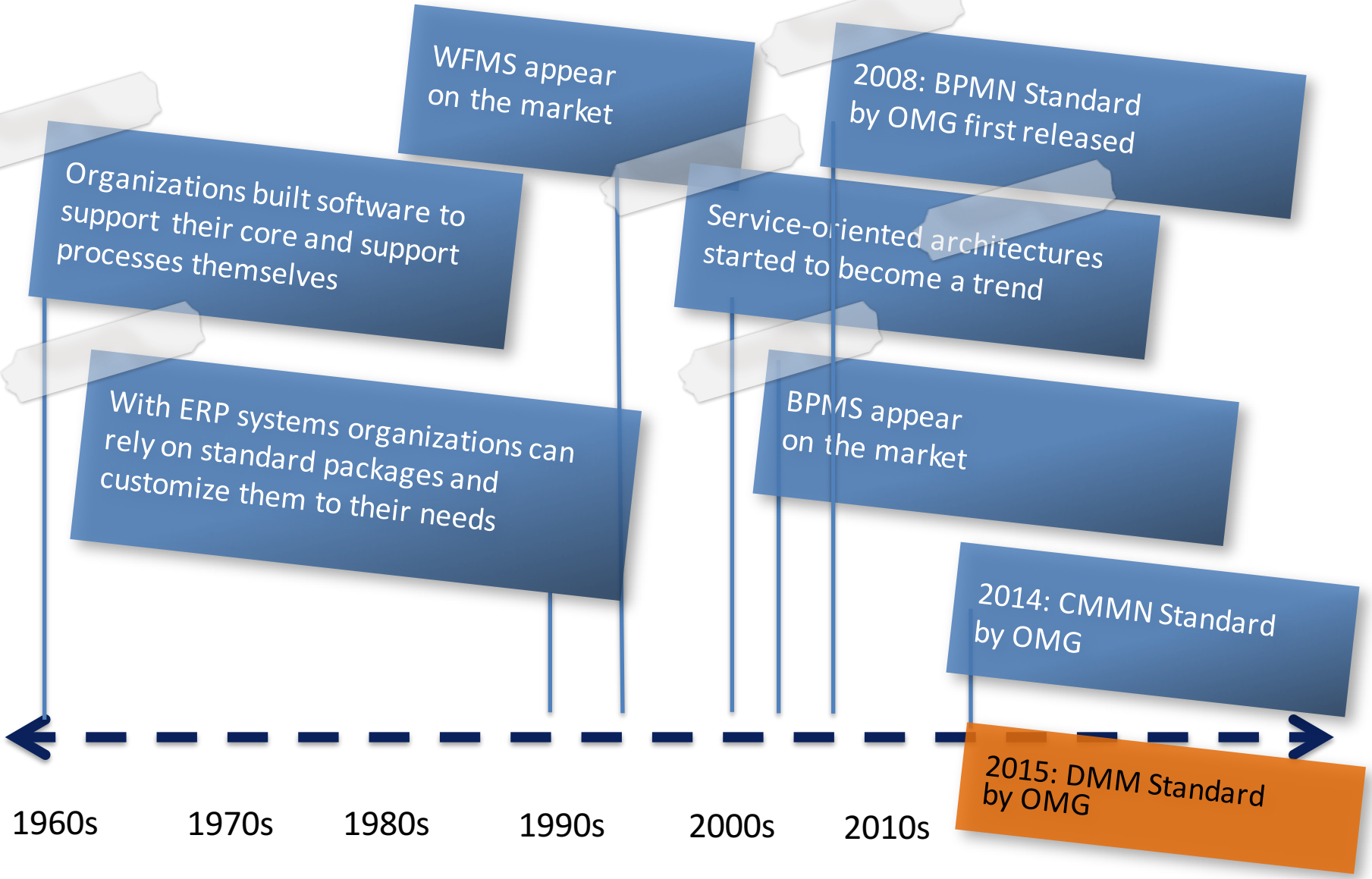
High-level process modeled using BPMN

Doctor information request modeled in BPMN

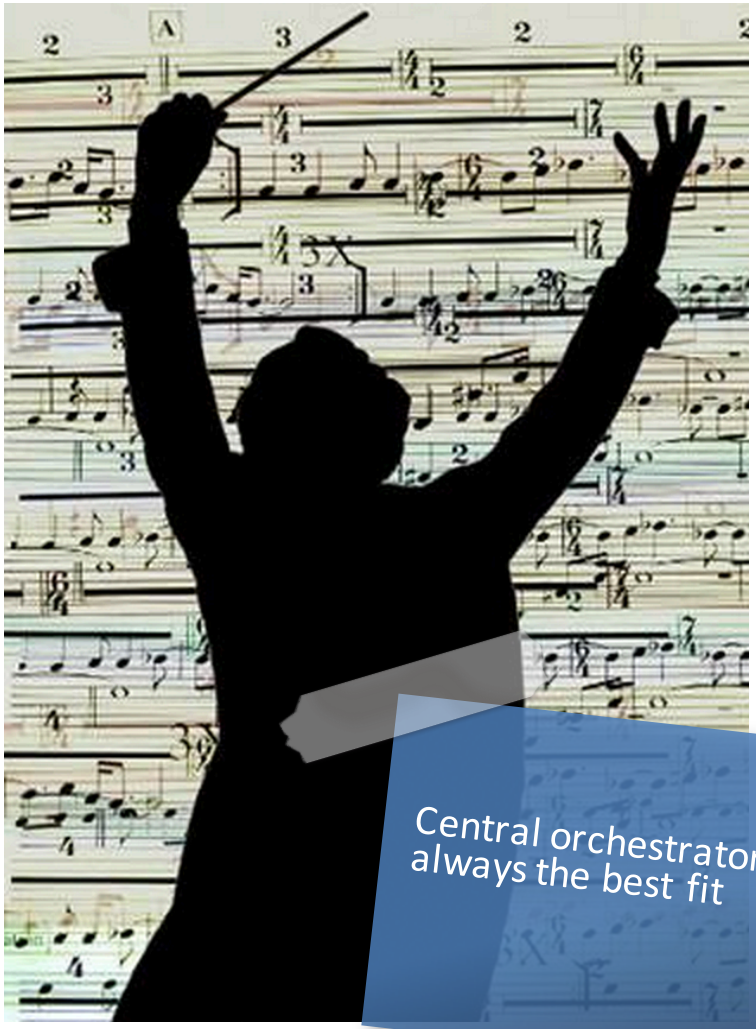



Bernhard Rücker: http://www.heise.de/developer/artikel/Case-Management-und-CMMN-fuer-Entwickler-2569883.html

# Evolution of Enterprise Applications



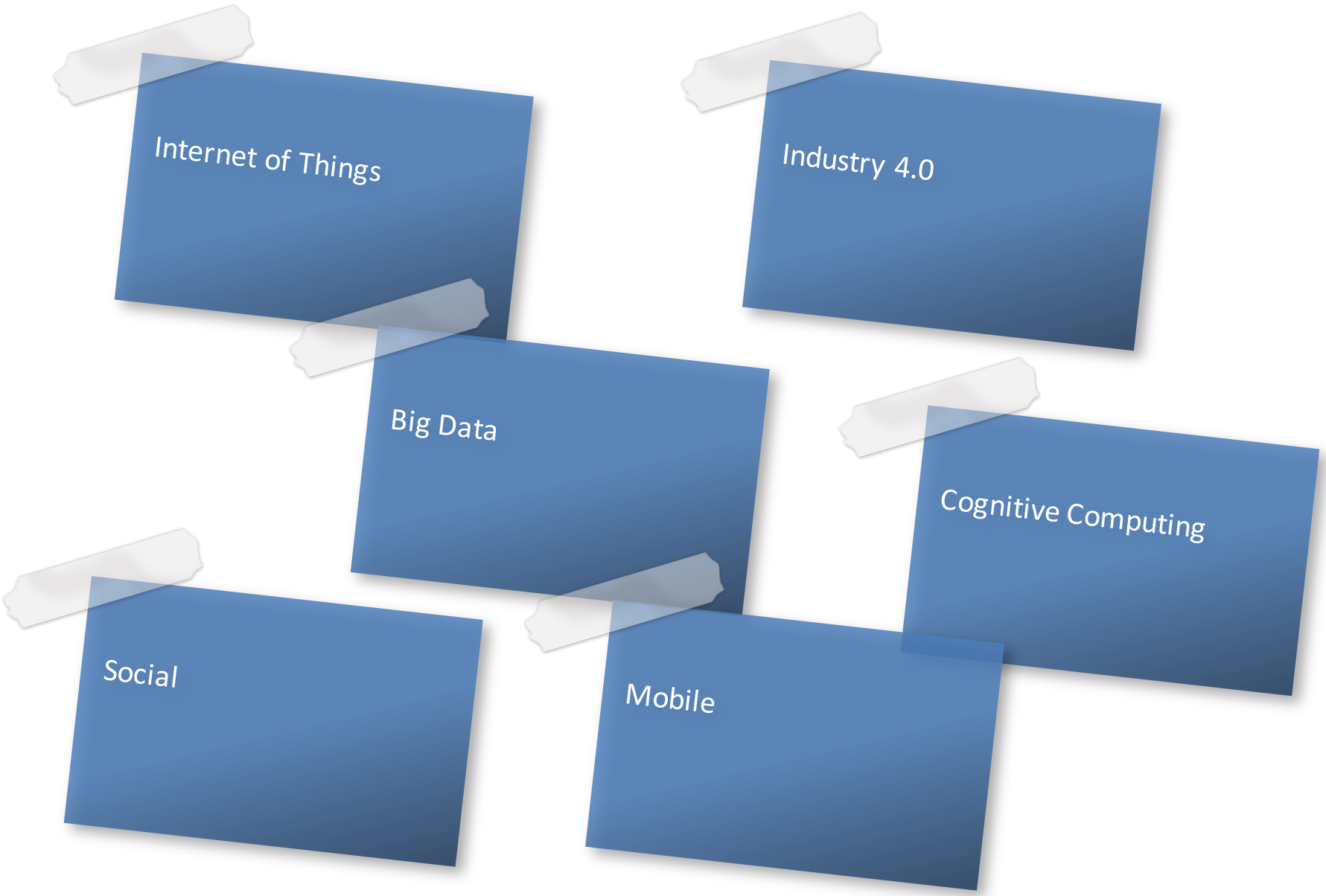
# Model of a Central Orchestrator not Always Fits



Central orchestrator not always the best fit

- B2B scenarios
- Highly dynamic and goal-seeking processes
- Very high number of components

# Challenge: New Technological Trends



# New Generation of intelligent BPMS


Source: Gartner (August 2016)

# Summary

- Business processes matter
- BPMS offer promising perspectives for the assembly of services, but are up to now still a niche solution
- Several open challenges that need to be addressed for BPMS to take off

# THANKS FOR YOUR ATTENTION!

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