Business Processes Modelling

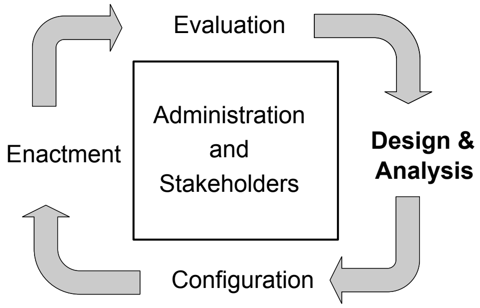
MPB (6 cfu, 295AA)

Roberto Bruni

http://www.di.unipi.it/~bruni

05 - BP Lifecycle

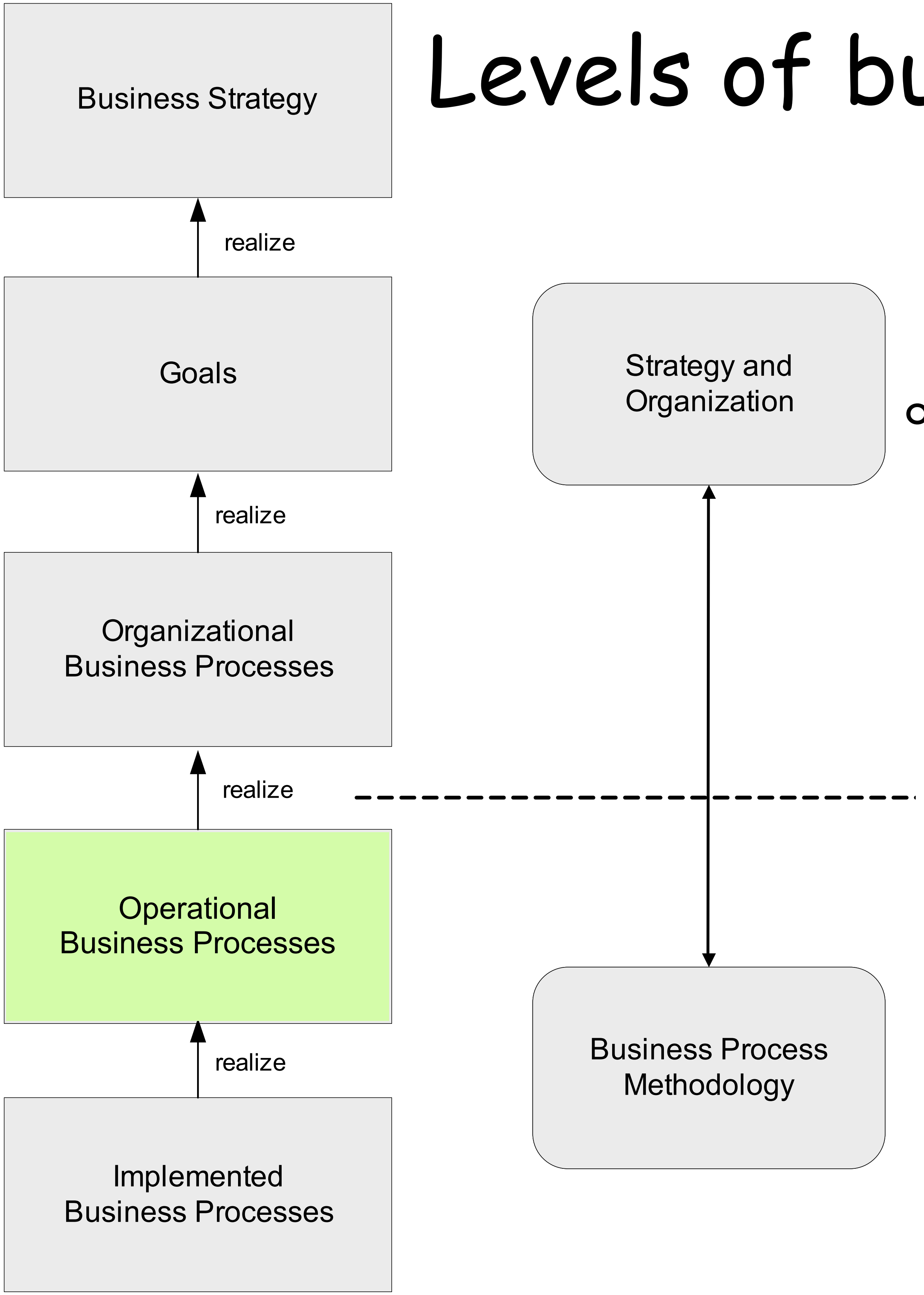
Object



Overview of the business process lifecycle

Ch. 1, 2 of Business Process Management: Concepts, Languages, Architectures

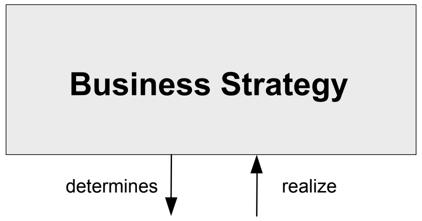
Levels of business processes


Business Strategy
realize
Goals
realize
Organizational Business Processes
realize
Operational Business Processes
realize
Implemented Business Processes
Strategy and Organization
Business Process Methodology

Focus on overall operations of the company

Focus on **individual business processes**

Levels of business processes



long-term company strategies
to develop sustainable success in the market

Some business strategies

Cost Leadership:
compete for the largest number of customers through price

Standardization:
generic goods or services sold at the lowest prices

Minimize costs to the customer
Minimize costs to the company
without decreasing profits

Focus Strategy:
serve a limited group of customers better than competitors

Specialization:
concentrate on particular classes of customers, products, geographical area

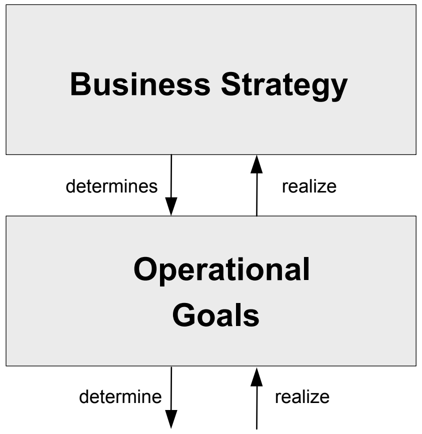
Invest on aggressive marketing

Differentiation Strategy:
set products apart from the competition

Leading scientific research:
highly skilled and creative product development team

Invest on innovation
Invest on marketing

Levels of business processes



long-term company strategies
to develop sustainable success in the market

define **operational goals** that
contribute to the realization of the business strategy

Operational goals

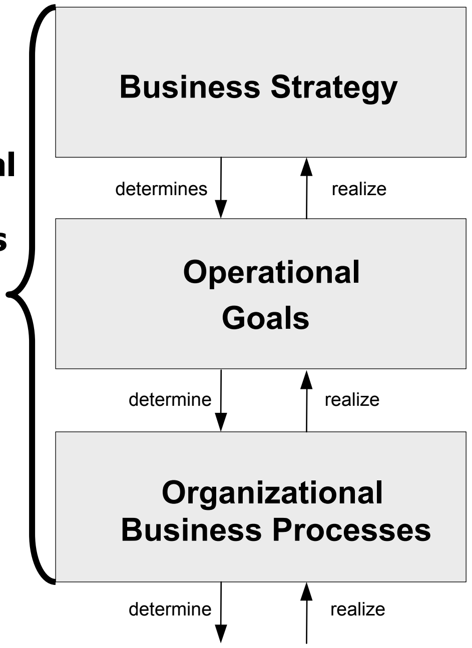
Efficiency (time dimension):
e.g., improve delivery time

Profitability (cost dimension):
e.g., limit expenses to increase revenues

Customer Service (quality dimension):
e.g., improve response time to customer complaints

Levels of business processes

Informal & semiformal techniques: plain text + diagrams + forms-based



long-term company strategies
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define operational goals that
contribute to the realization of the business strategy

high-level **processes in textual form**:
input, output, expected results, dependencies

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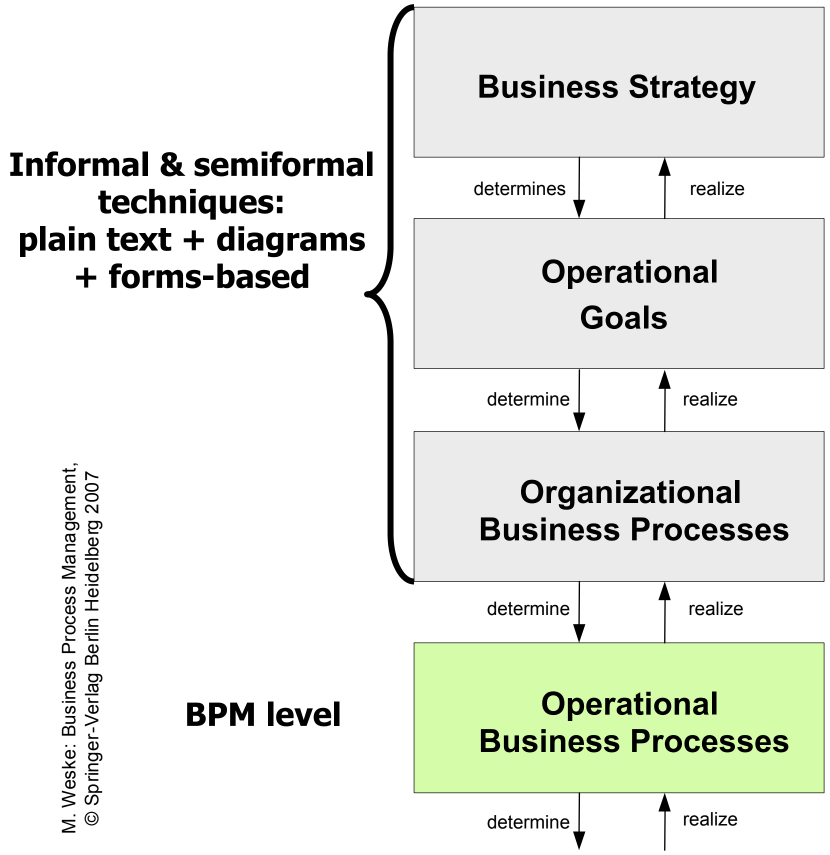
Organizational process

Top-level: Form-based description of organizational business process (black-box view, internal structure not shown)

Process Name: Product Development Process	**Responsible Process Manager:** Dr. Myers
From: Requirements **To:** Rollout	**Type:** Development Project
Process Inputs: Requirements Document, Project Plan, Budget Plan, Prototyps	**Supplier Processes:** Product Planning Process, Innovation Process
Process Results: Integrated and completely tested innovative product with complete documentation	**Customer Processes:** Order Management Process, After-Sales Service Process

Levels of business processes


Informal & semiformal techniques:
plain text + diagrams + forms-based
BPM level
Business Strategy
determines
realize
Operational Goals
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determine
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realize

long-term company strategies
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high-level processes in textual form:
input, output, expected results, dependencies

activities and relationships are specified,
but implementation aspects are disregarded

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Intra-organization process

No interaction with business processes performed by other parties (single organization processes)
e.g. Human Resource Management

Primary focus:
streamlining of internal processes,
eliminating activities that do not provide values,
allocating activities to persons who are competent and skilled enough

Single view: orchestration!

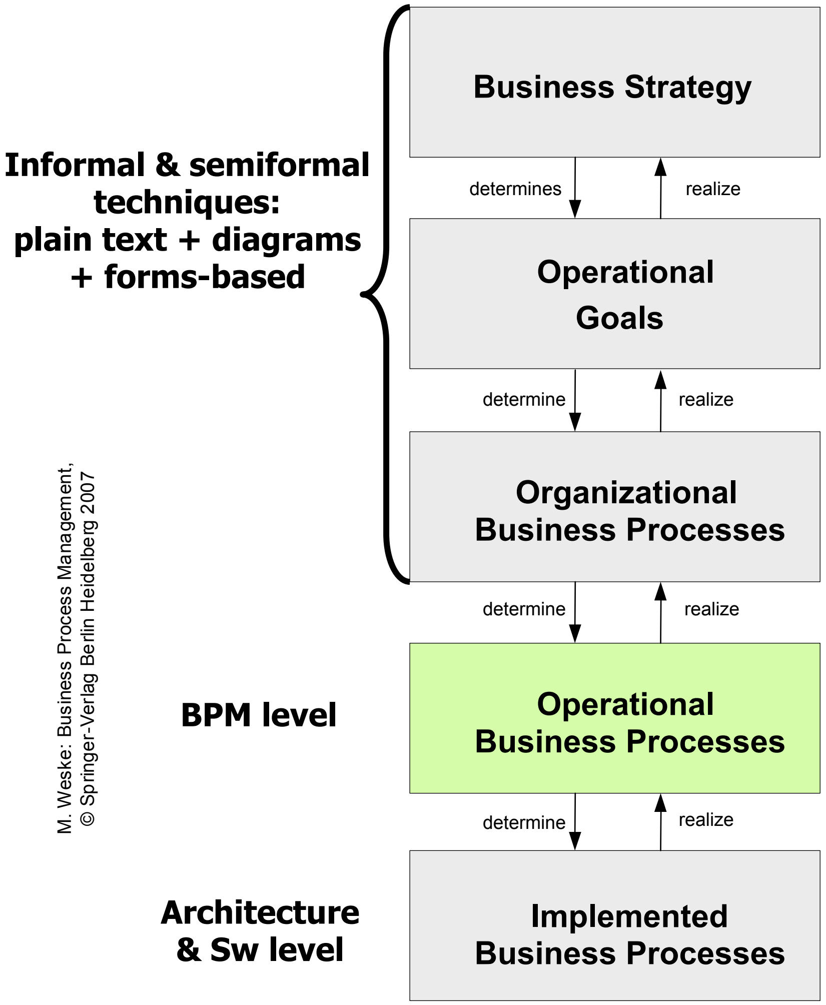
Inter-organization process

Business-to-business process
(multiple organizations)
e.g. Supply Chain Management

Primary focus:
communication aspects, legal matters,
interoperability of heterogeneous SW infrastructures

Multiple views: collaborations and choreographies!

Levels of business processes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BPM level
Operational Business Processes
determine
realize
Architecture & Sw level
Implemented Business Processes

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long-term company strategies
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define operational goals that
contribute to the realization of the business strategy

high-level processes in textual form:
input, output, expected results, dependencies

activities and relationships are specified,
but implementation aspects are disregarded

executable/technical/organizational environments
(from written policies and procedures to enactment platforms)

Operational BP lifecycle

Lifecycle

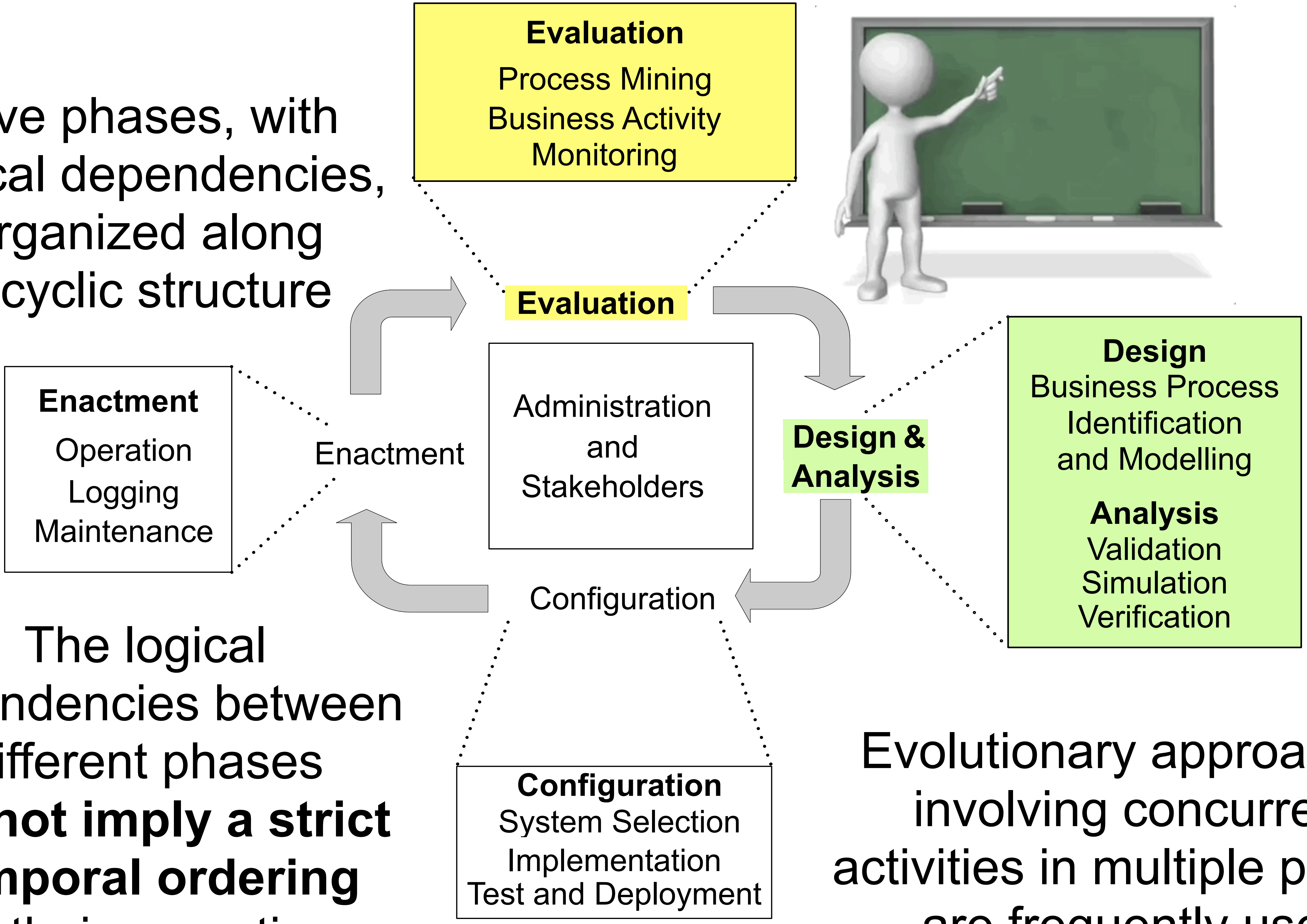
A lifecycle model is a conceptual description of the steps that are involved in building a product

The steps in which the model is broken are called **phases** (logically consistent, easier to understand)

The number of phases can vary from model to model (typically ranging from four to eigth)

BP lifecycle

Five phases, with logical dependencies, organized along a cyclic structure



Evaluation
Process Mining
Business Activity Monitoring

Evaluation

Enactment
Operation
Logging
Maintenance

Enactment

Administration and Stakeholders

Design & Analysis

Design
Business Process Identification and Modelling

Analysis
Validation
Simulation
Verification

Configuration

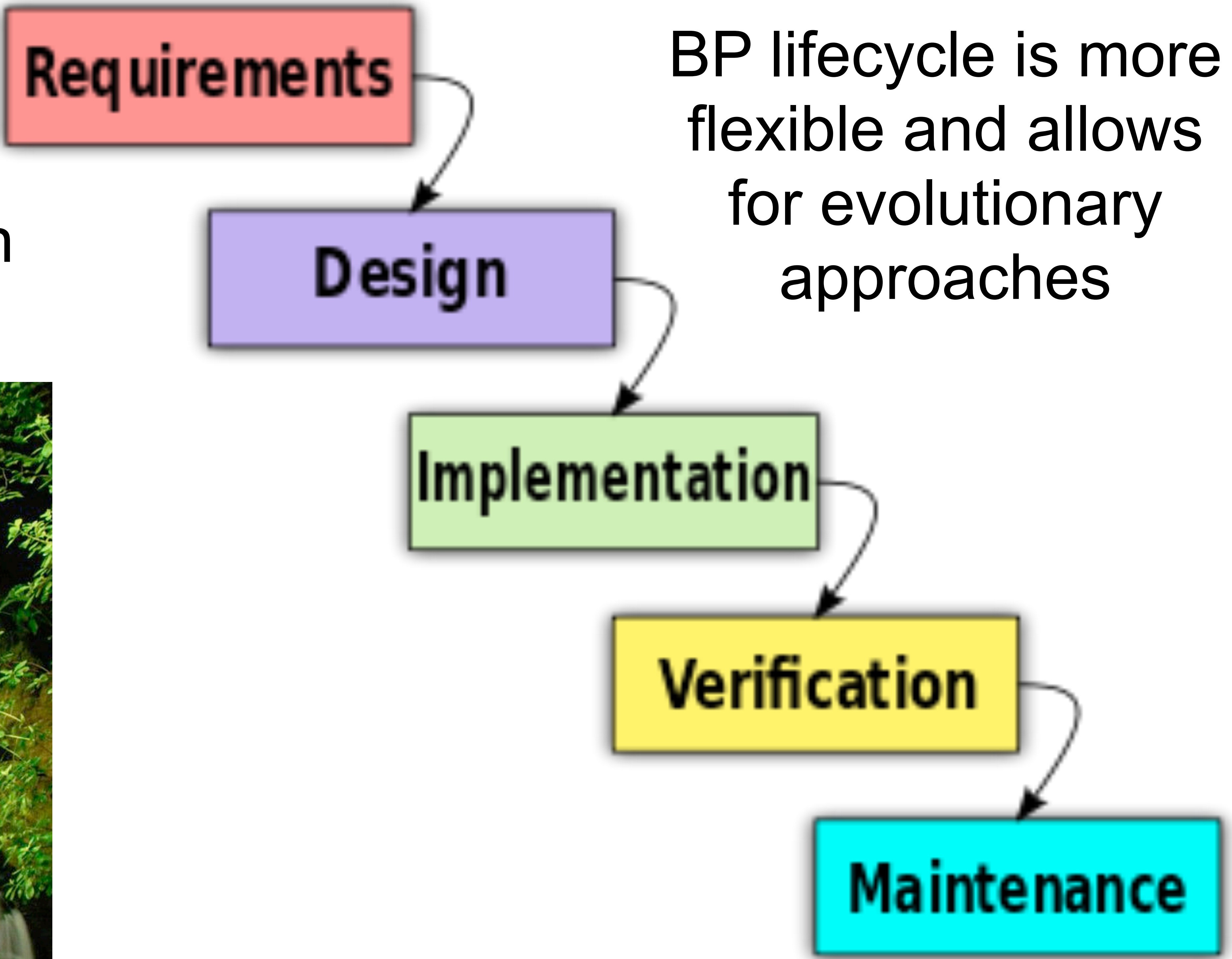
Configuration
System Selection
Implementation
Test and Deployment

The logical dependencies between different phases **do not imply a strict temporal ordering** of their execution

Evolutionary approaches involving concurrent activities in multiple phases are frequently used

BP lifecycle vs waterfall

A sequential SW design process seen as flowing downwards through various phases.

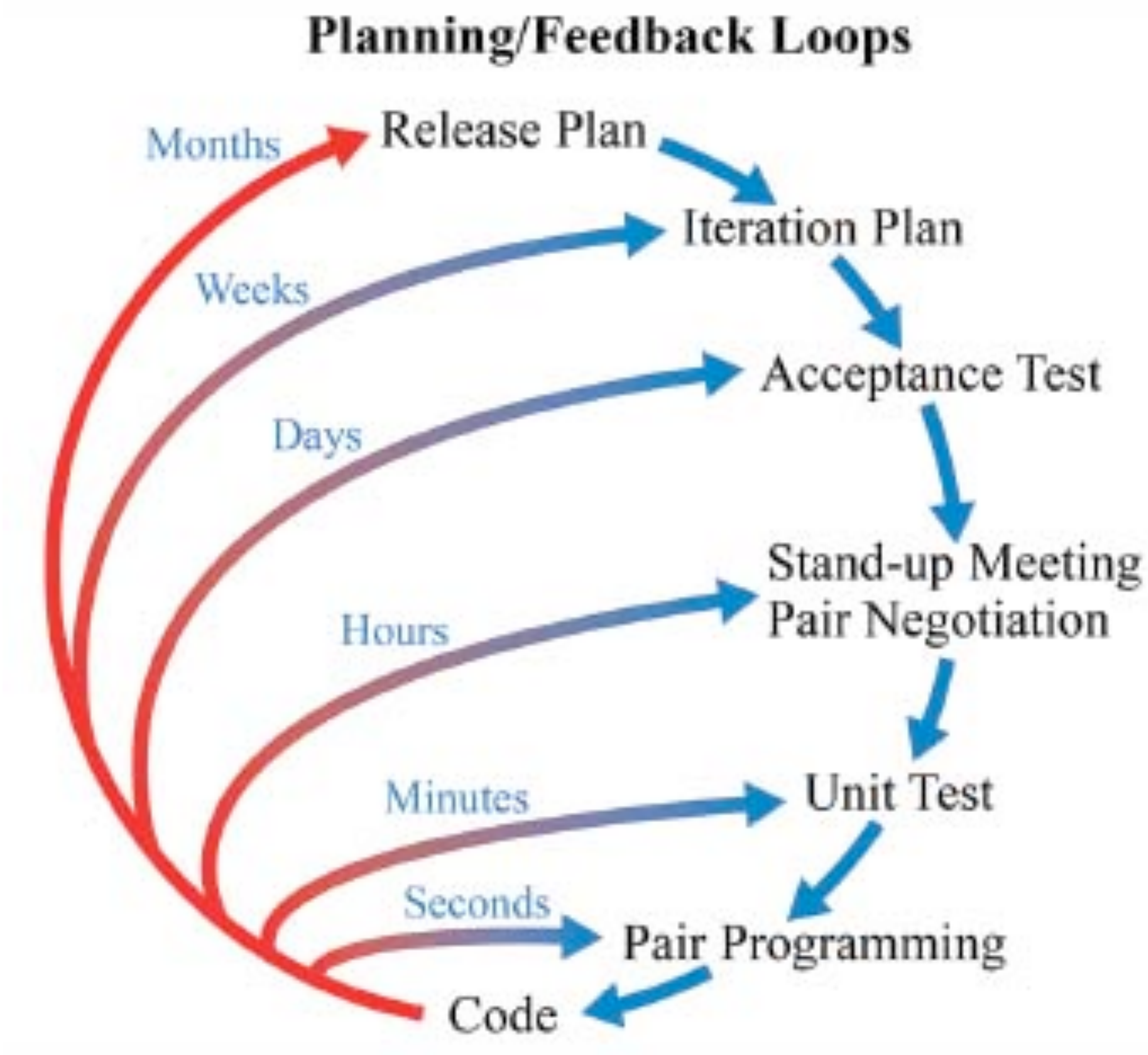


BP lifecycle is more flexible and allows for evolutionary approaches

BP lifecycle vs XP

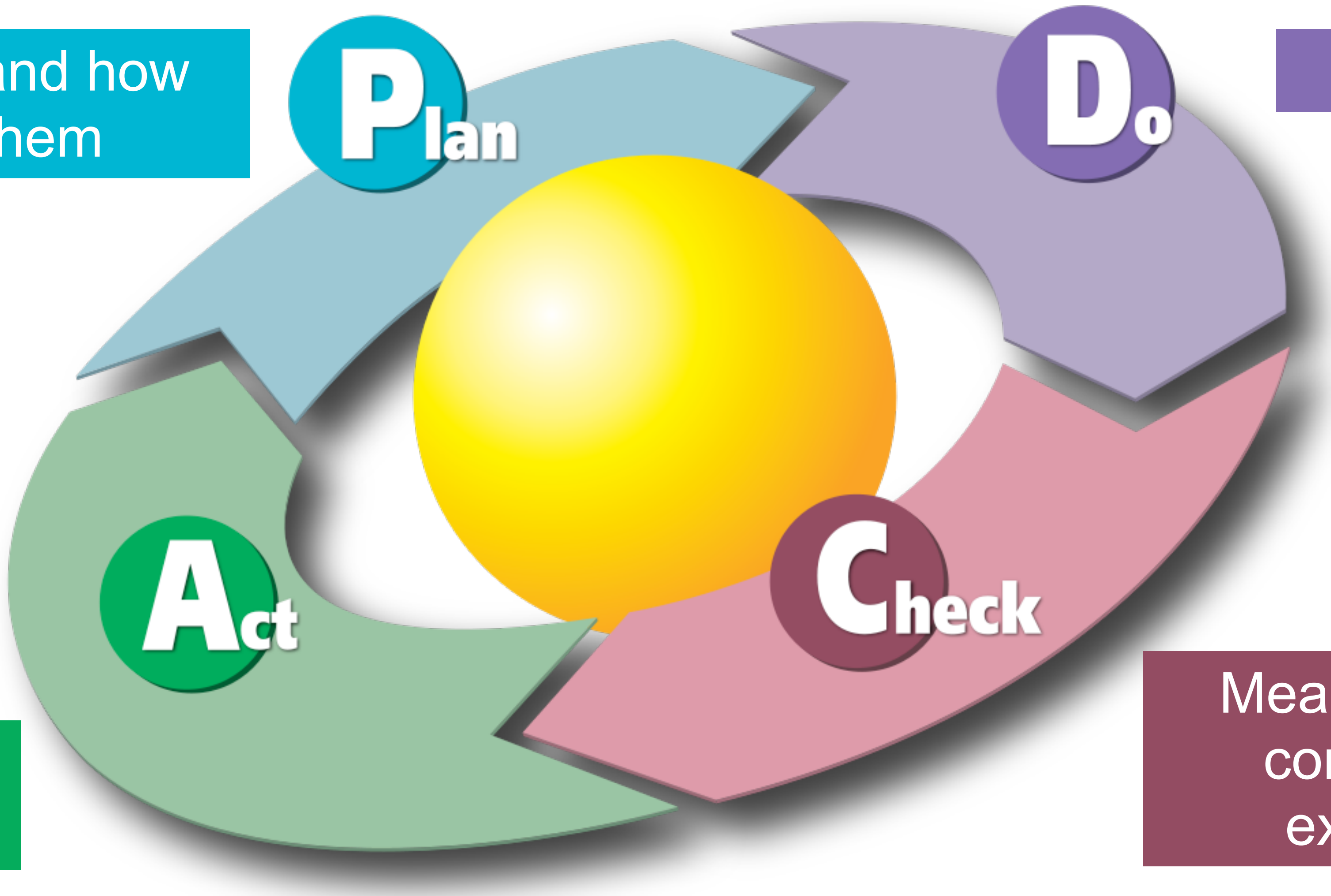
Extreme programming methodology: intended to improve productivity and responsiveness to changing requirements,
advocates frequent releases, adding features when needed

BP lifecycle is better organized



BP lifecycle vs PDCA

Very close to the **PDCA** scheme
(you may have heard of):
a management method for the control and
continuous improvement of products



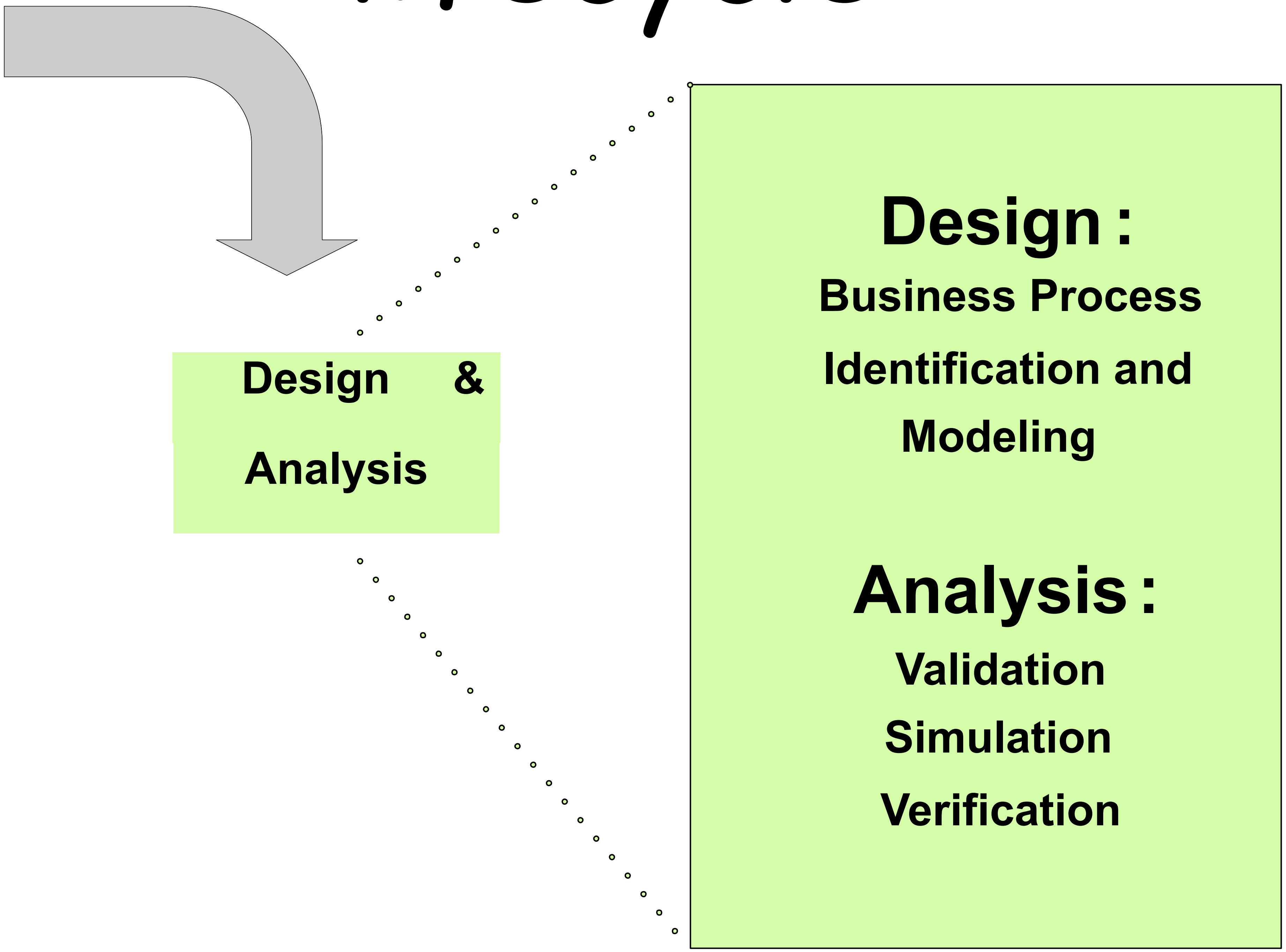
Fix objectives and how to achieve them

Execute plan

Measure results and compare them to expected goals

Detect issues and adjust goals

Business process lifecycle



Design & Analysis

Design :

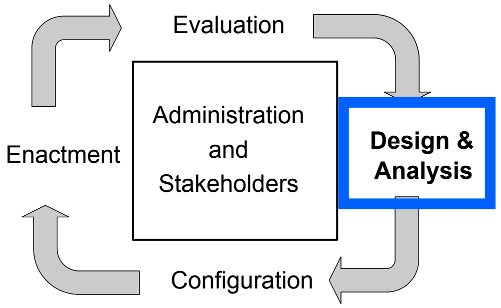
Business Process Identification and Modeling

Analysis :

Validation

Simulation

Verification



Evaluation

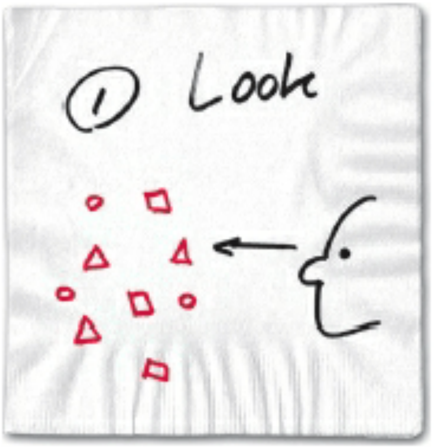
Administration and Stakeholders

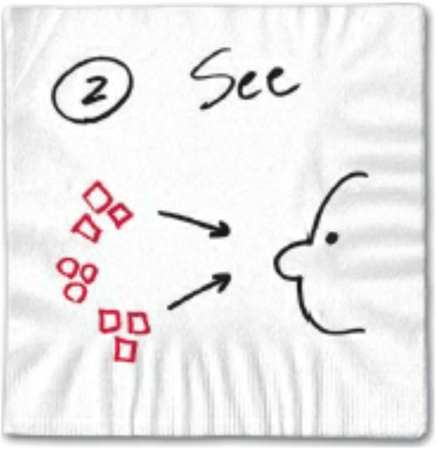
Design & Analysis

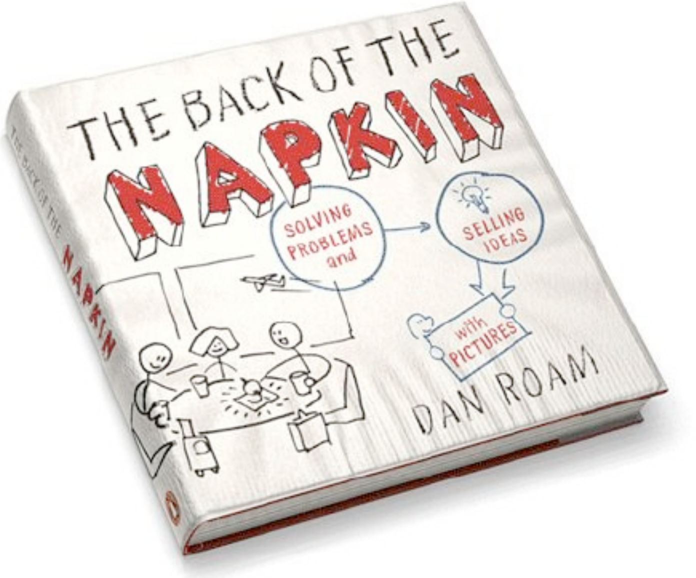
Configuration

Enactment

Design: Identification

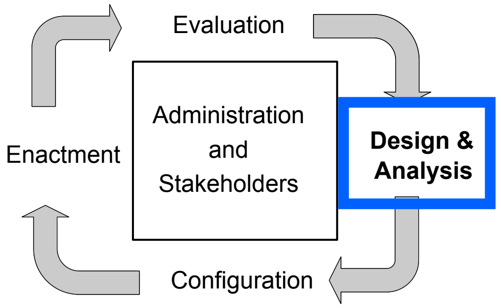






Require **surveys** on:
the business processes
their organizational environment
their technical environment

Based on these surveys, business processes are:
identified
reviewed
validated
represented (by business process models)



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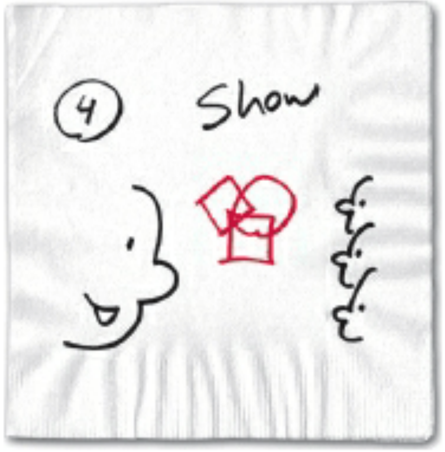
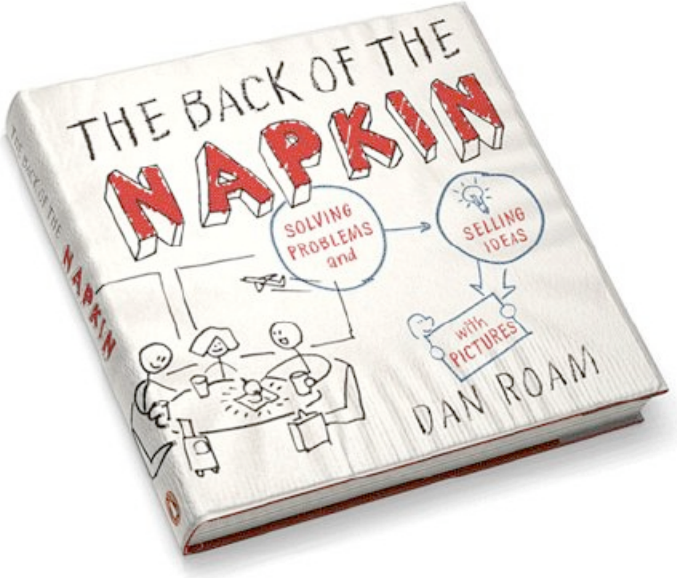
Configuration

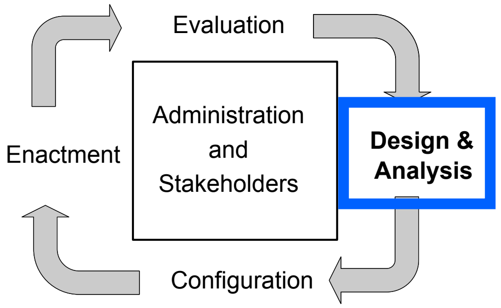
Design: Modeling





Core technical sub-phase:
from informal descriptions
to a particular business process modelling notation

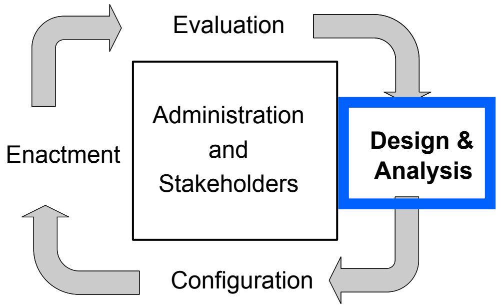
Explicit business process models expressed in a graphical notation facilitate communication about these processes so that different stakeholders can:
communicate efficiently
refine them
improve them



Modelling: Who is the customer?

Each business process starts and ends with a customer who requests a product and who receives the product as a result of the business process

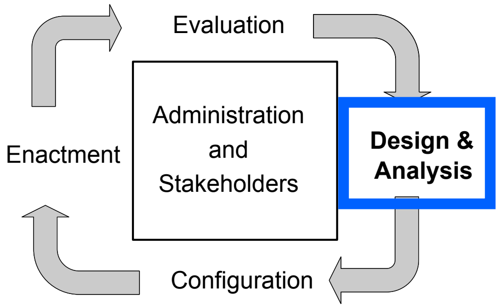
a customer can be internal to the company, e.g. a department



Modelling: Who is the owner?

Each business process is assigned a process owner, who is responsible for the process

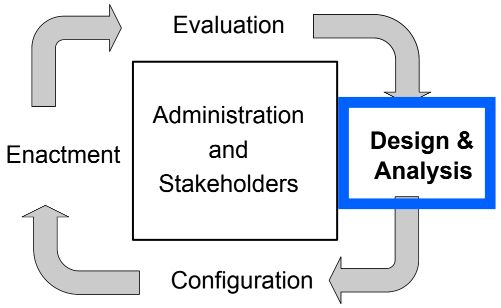
the owner is in charge of making sure
that process instances are conducted correctly,
that business goals are met, and
that process performances are measured and improved



Modelling: Which tasks?

Each business process comprises
a set of activities needed to realize the business goals

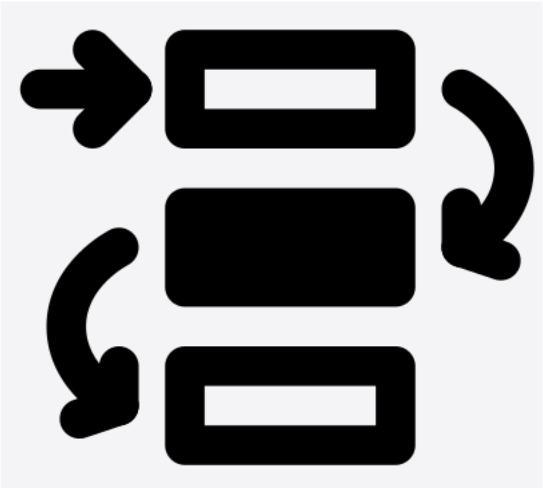
tasks can be expressed at different levels of granularity (each unit of work is seen as an atomic action, possibly with a duration and a cost)

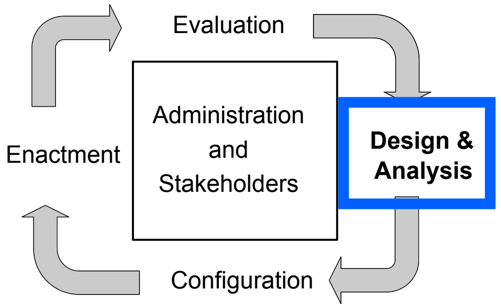


Modelling: Which dependencies?

Execution constraints are used to order activities in a way that enterprise resources are used efficiently and at the same time the business goals are met

process orchestration languages are used to express execution constraints about distribution over *time*





Evaluation

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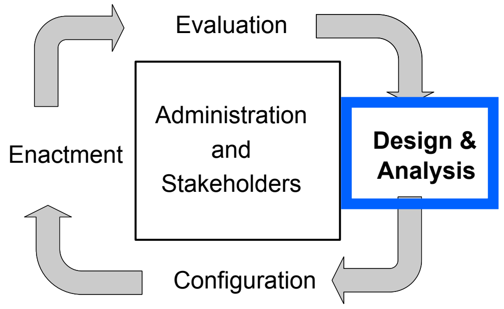
Modelling: Which roles?

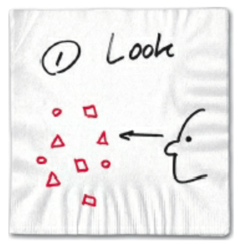
Each task may need some specific abilities (roles) to be carried out

process orchestration languages are used to express execution constraints about distribution over *space*

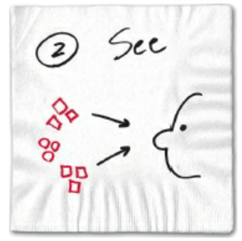


Modelling guidelines

Gather information (in textual format):
about the business process environment, including:
project goals, project team and legislative regulations

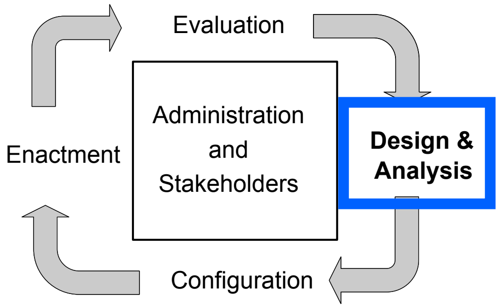


Classify data:
prepare a domain ontology to fix a common understanding of terms and concepts in the application domain



Validate findings:
Represent the (textual) gathered information as business process model(s), as a communication basis with stakeholders to collect feedback and to improve the organizational and technical environments (new skills and platforms required)

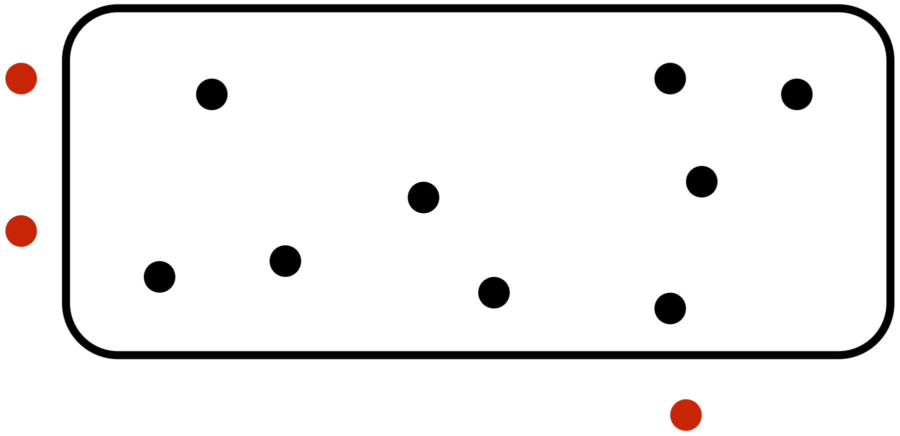
Refine artefacts:
repeat the above as many times as needed



Analysis: Validation

The initial design must be validated by checking that **all valid process instances are reflected** by the business process model

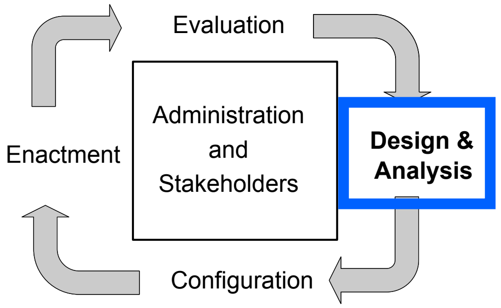
Useful instrument: a **workshop** where the persons involved can discuss the business process model



● desired instances

● undesired instances

▭ proposed process



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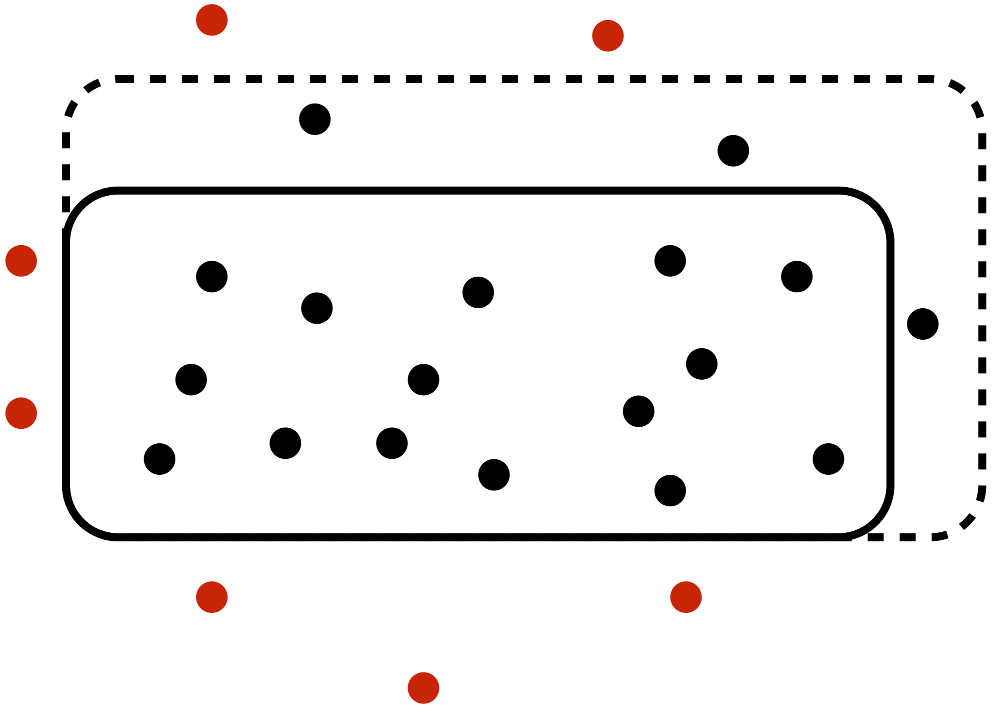

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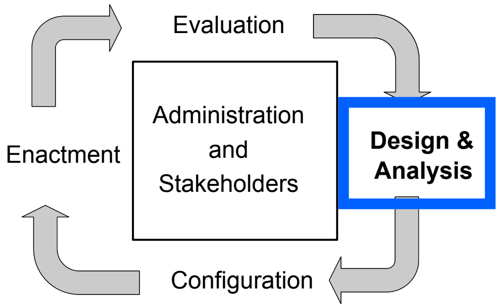
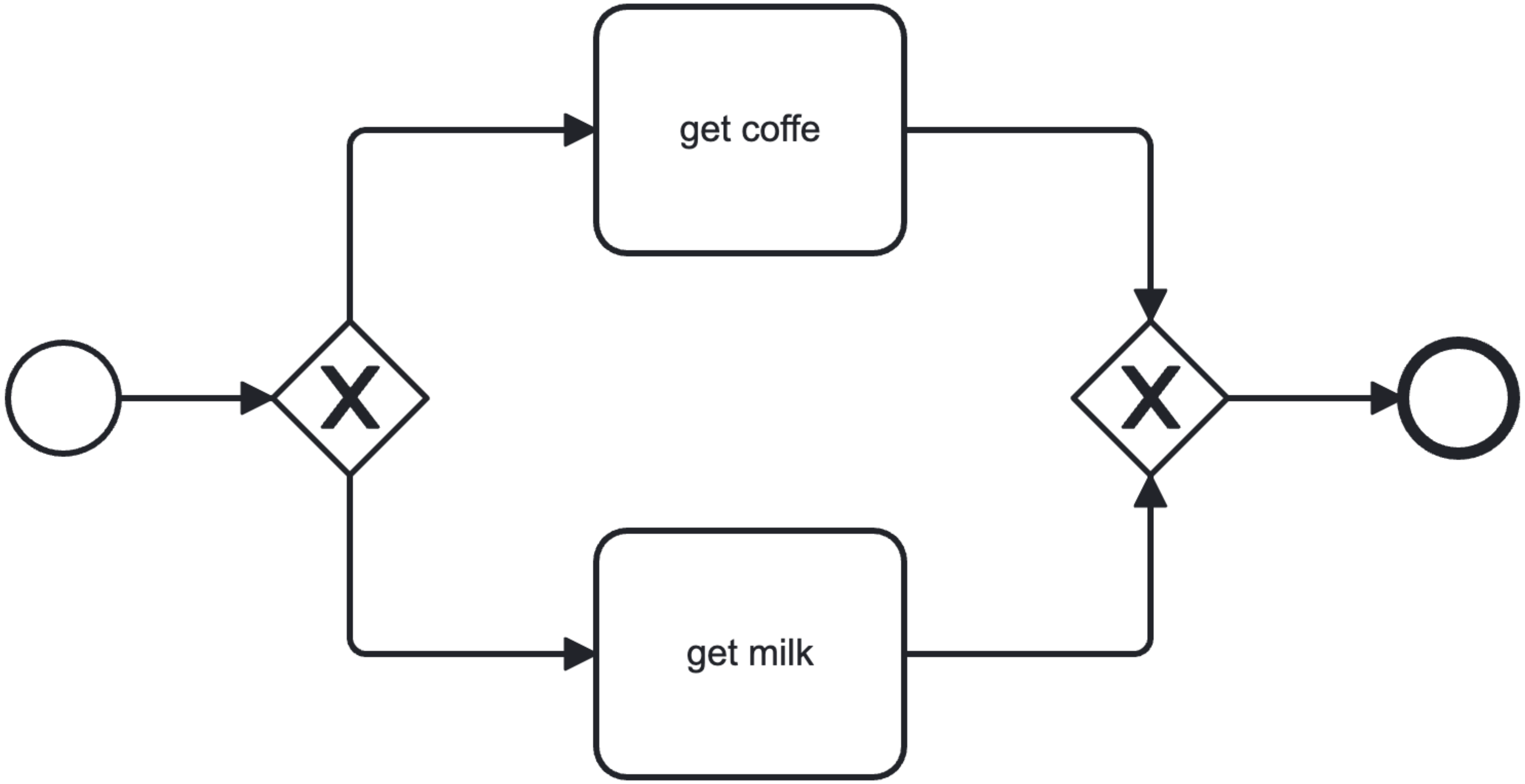
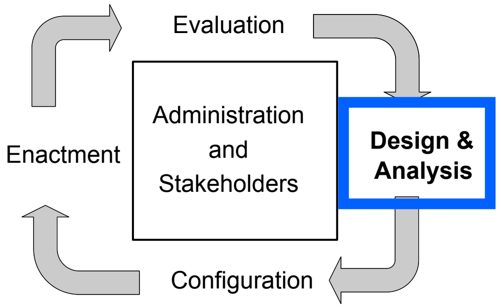


Question time

Desired instances:
[get coffee]
[get milk]

Undesired instances:
[get milk, get coffee]





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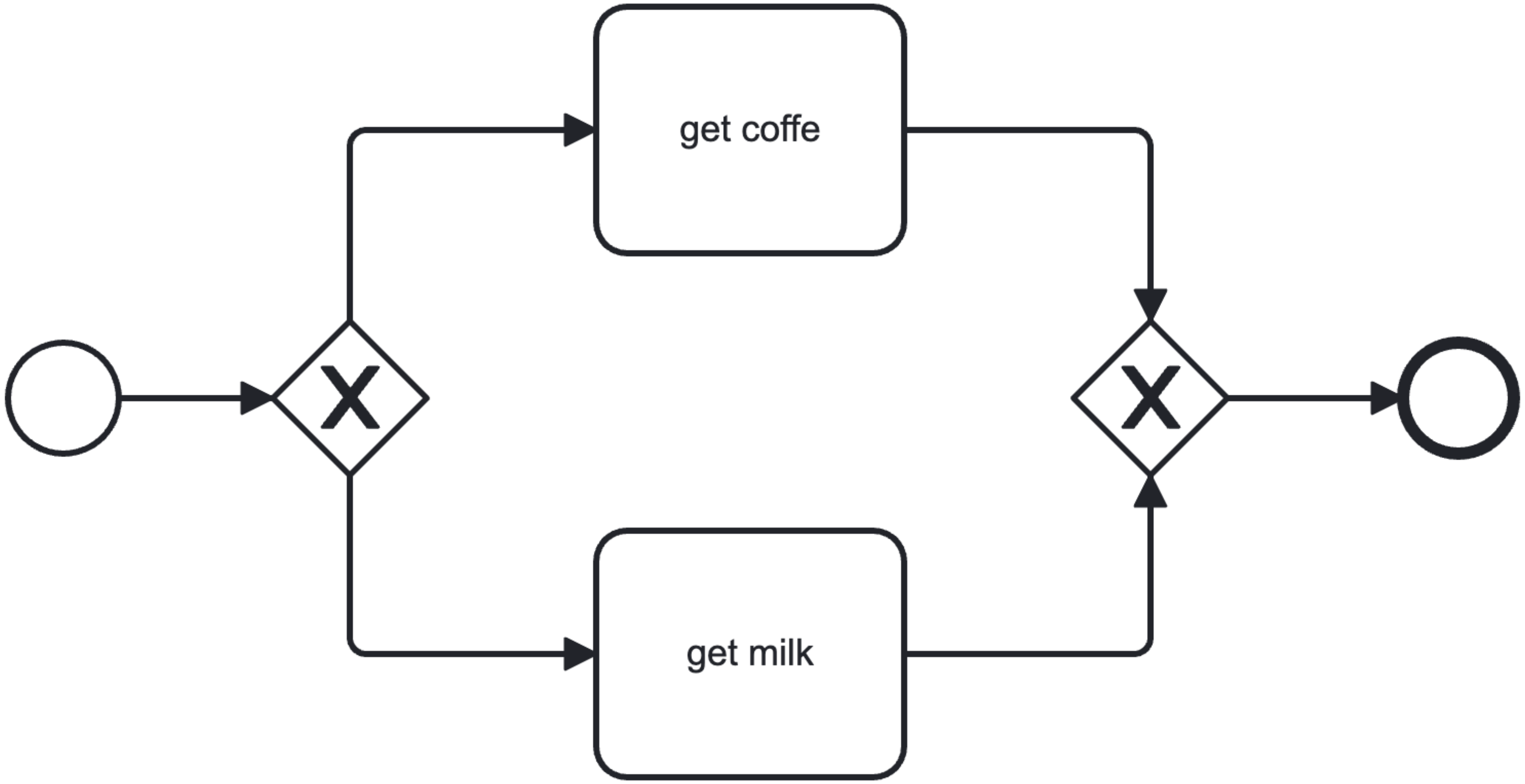

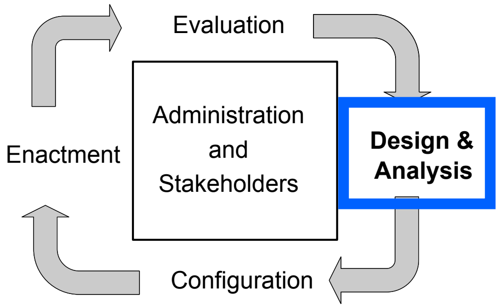

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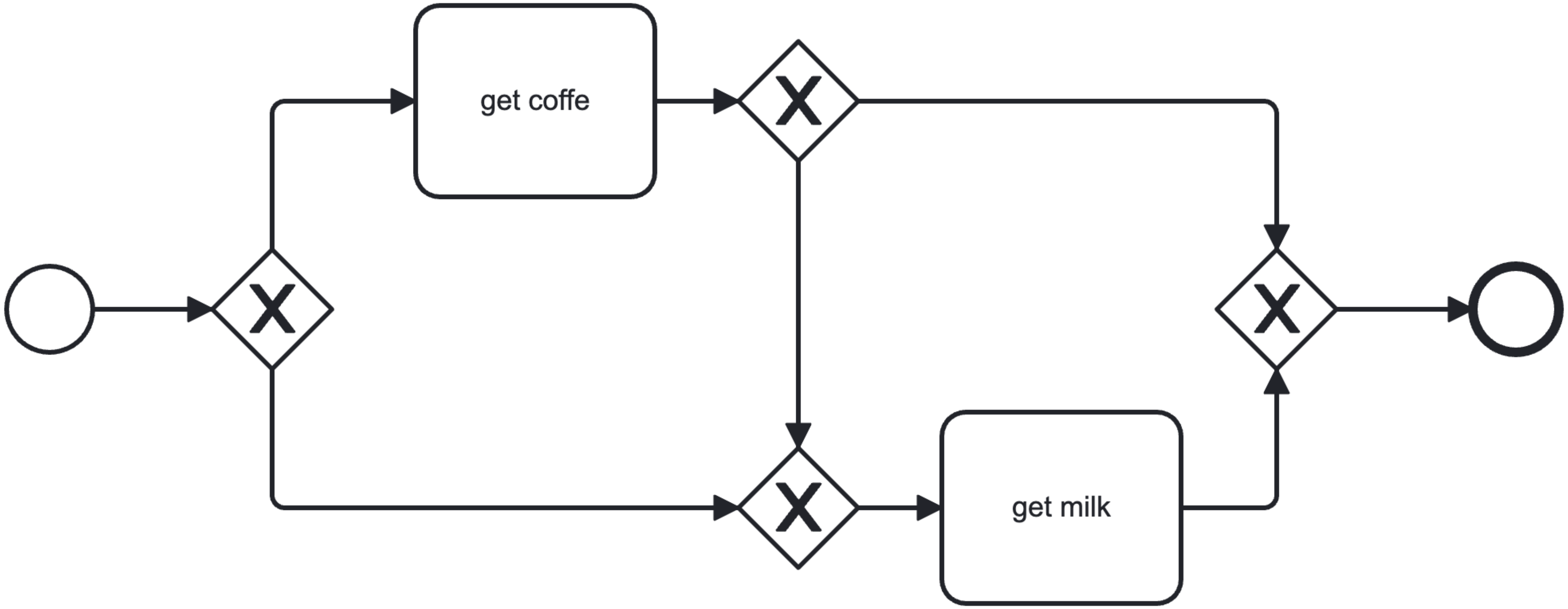

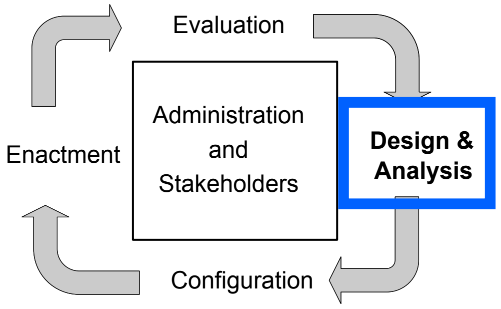

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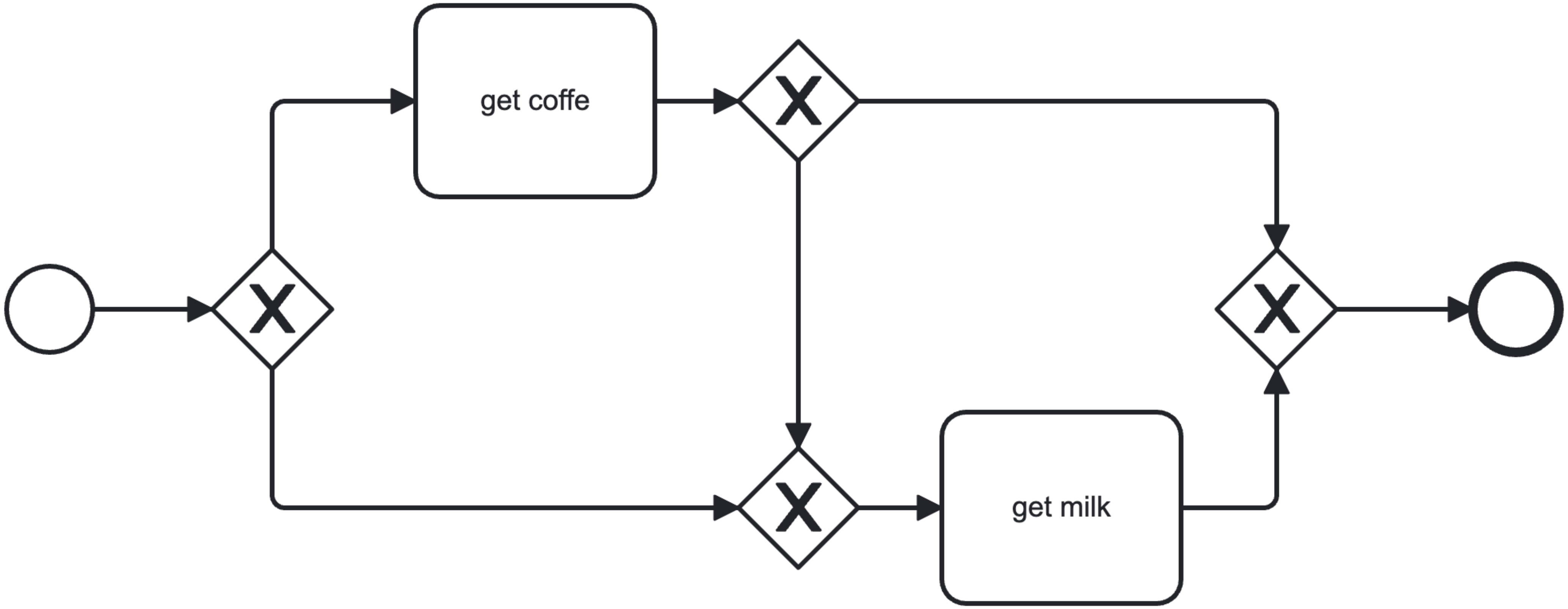

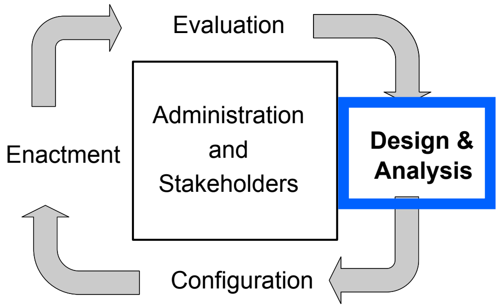

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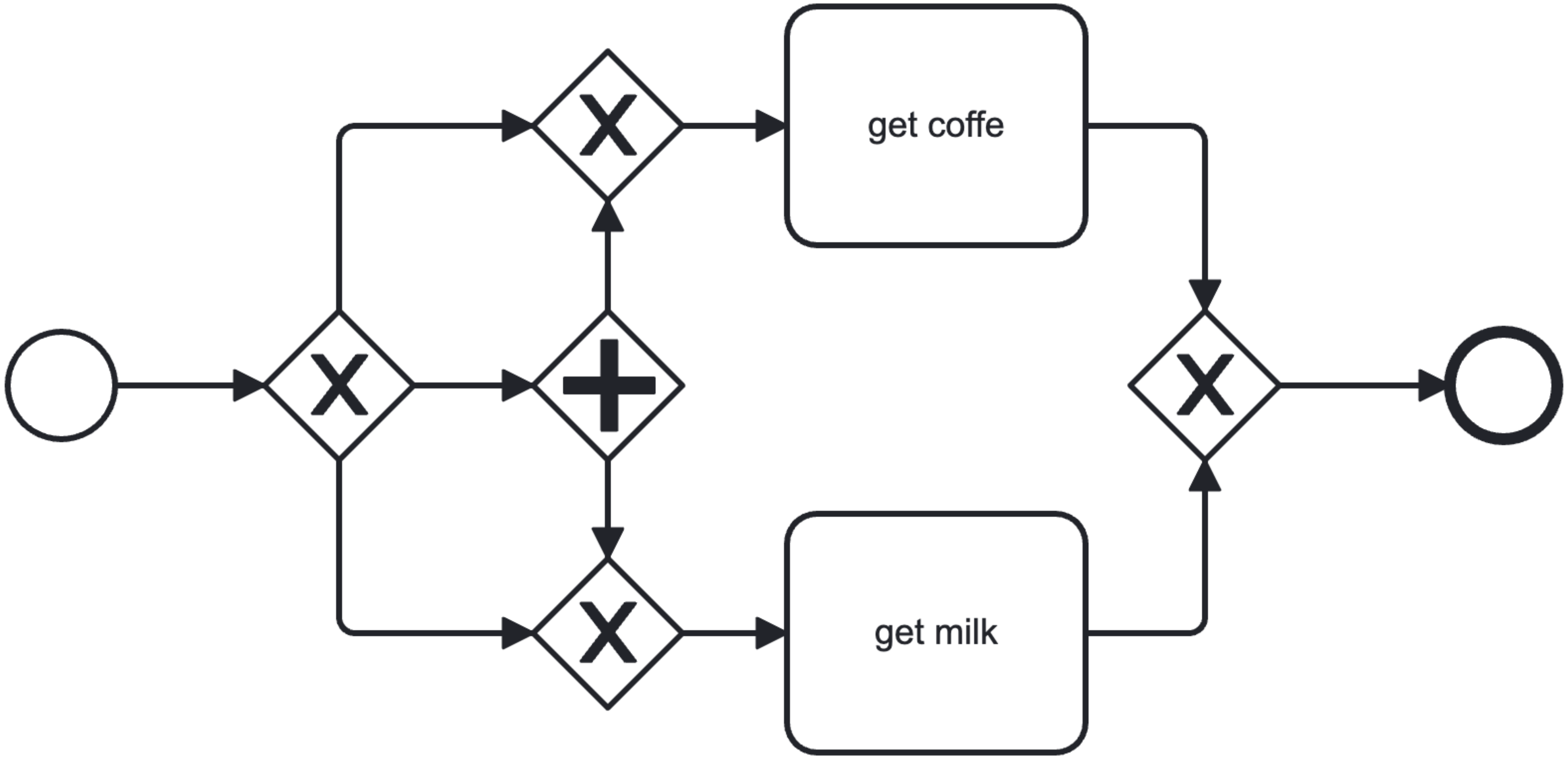

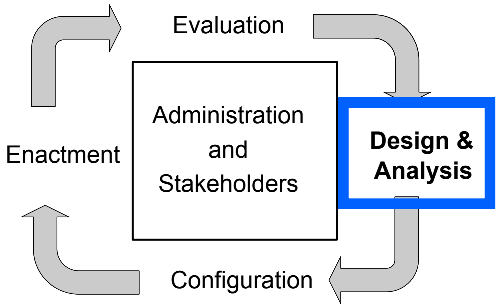

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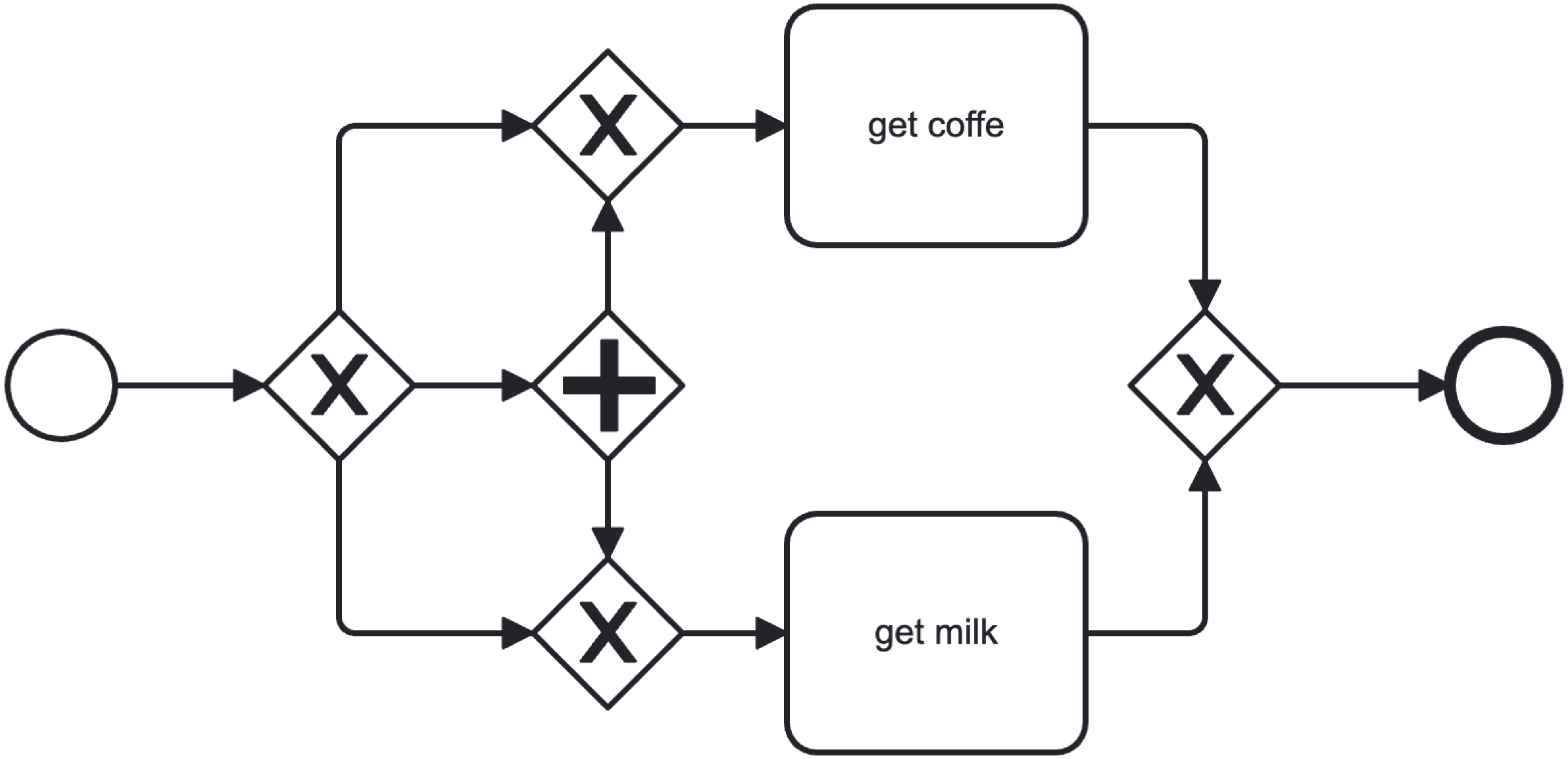

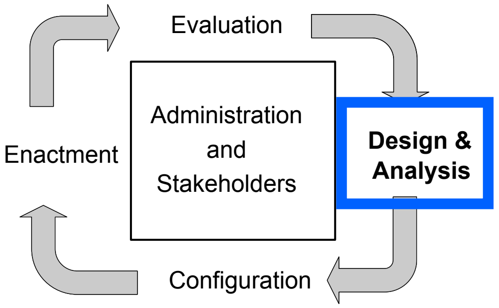

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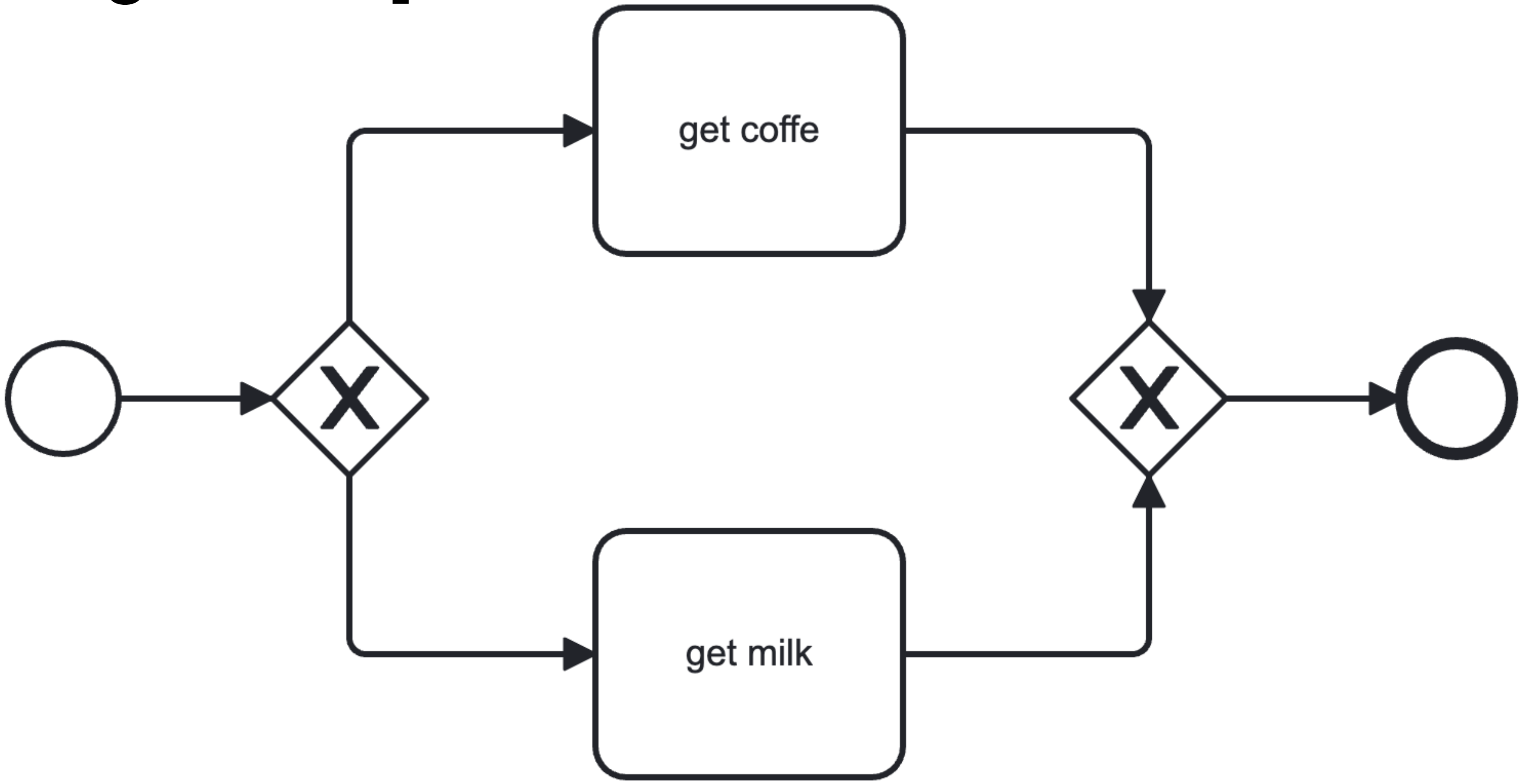

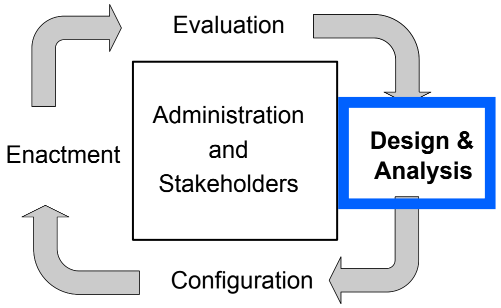

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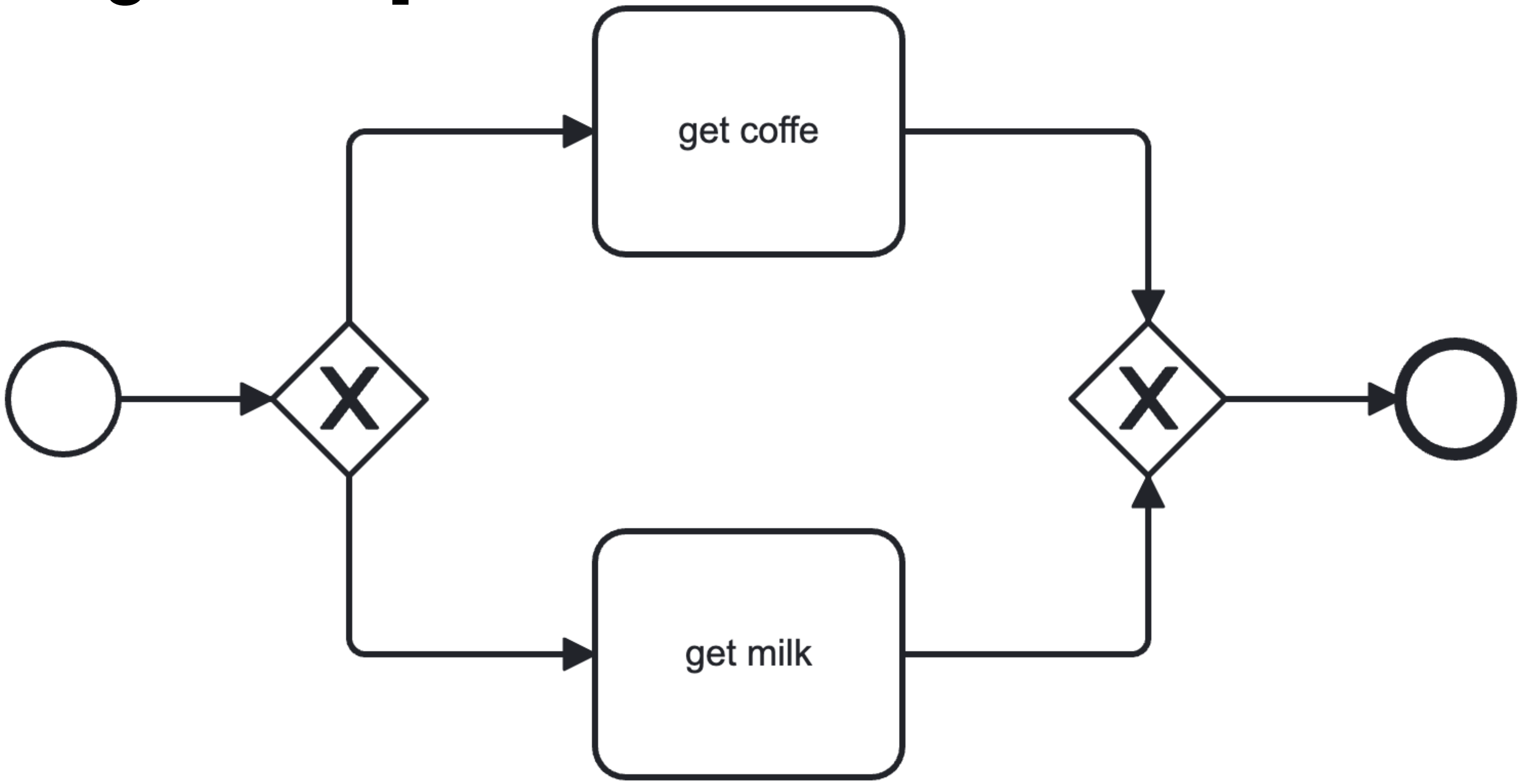

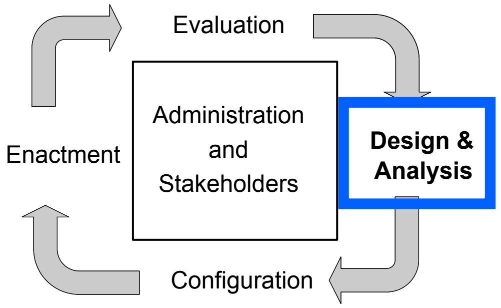

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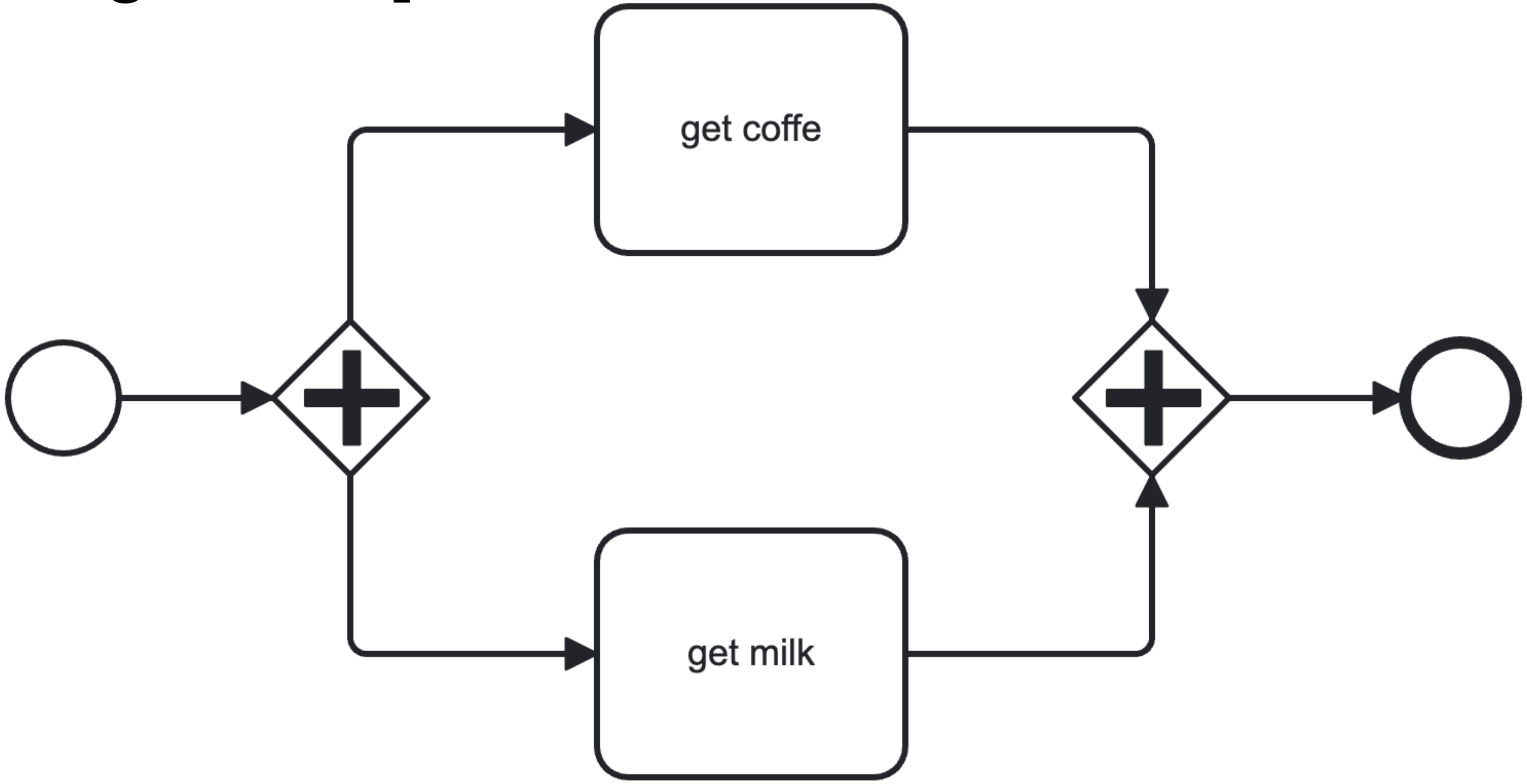

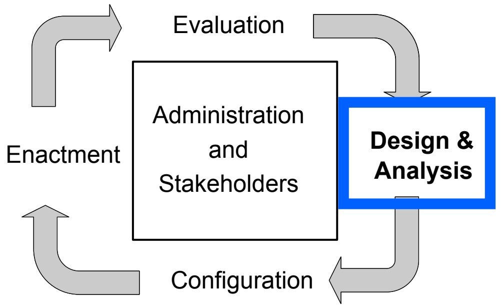

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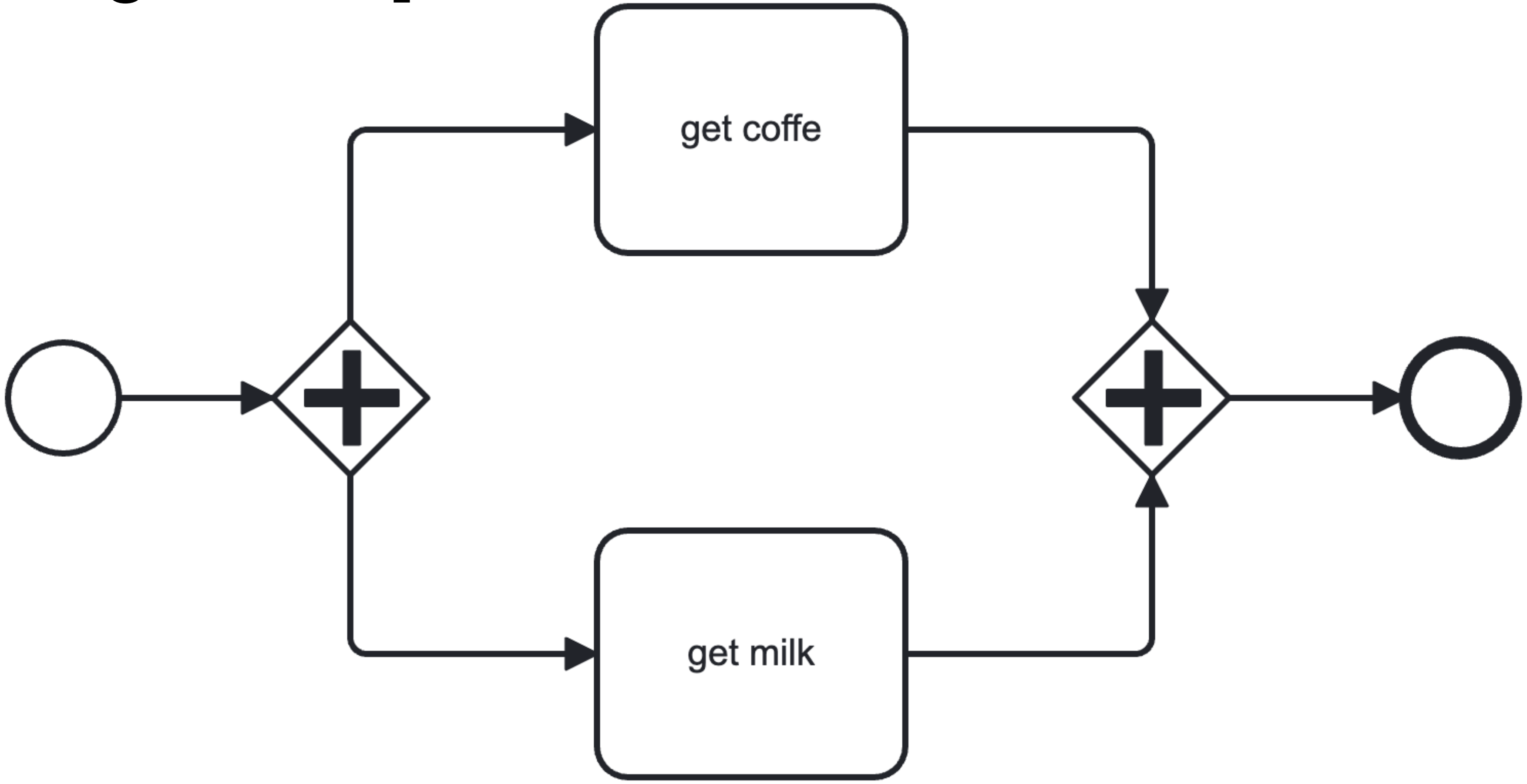
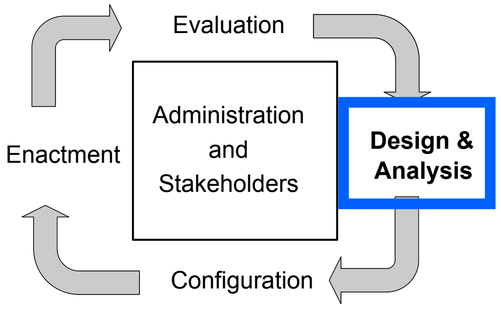
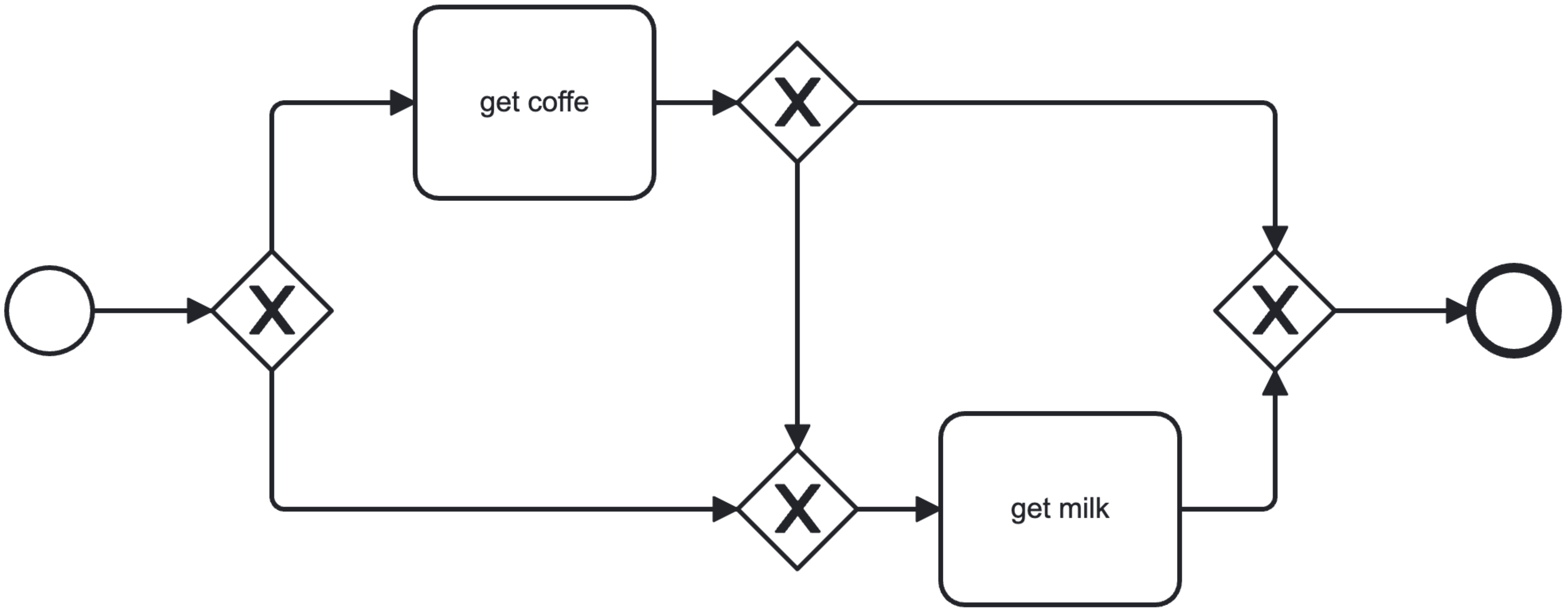


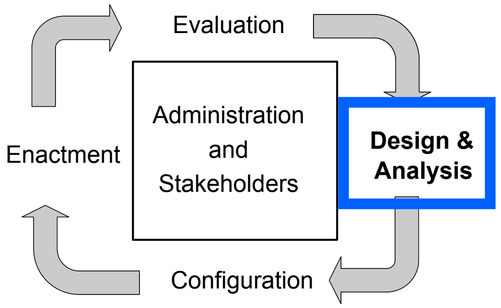


Question time

Desired instances:
[get coffee]
[get milk, get coffee]
[get coffee, get milk]

Undesired instances:
[get milk]





Question time

Desired instances:
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[get coffee, get milk]

❌

Undesired instances:
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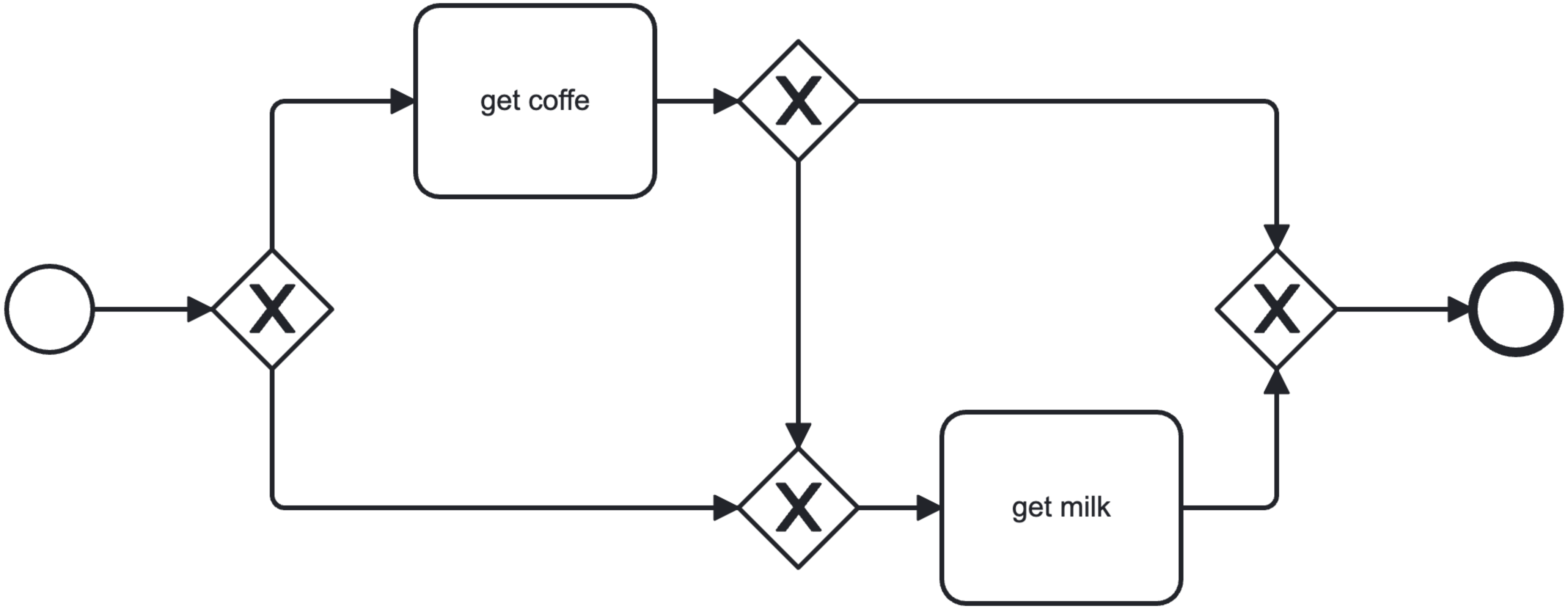

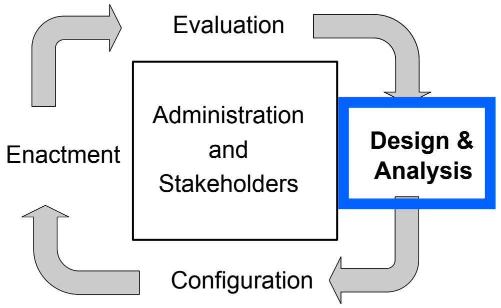

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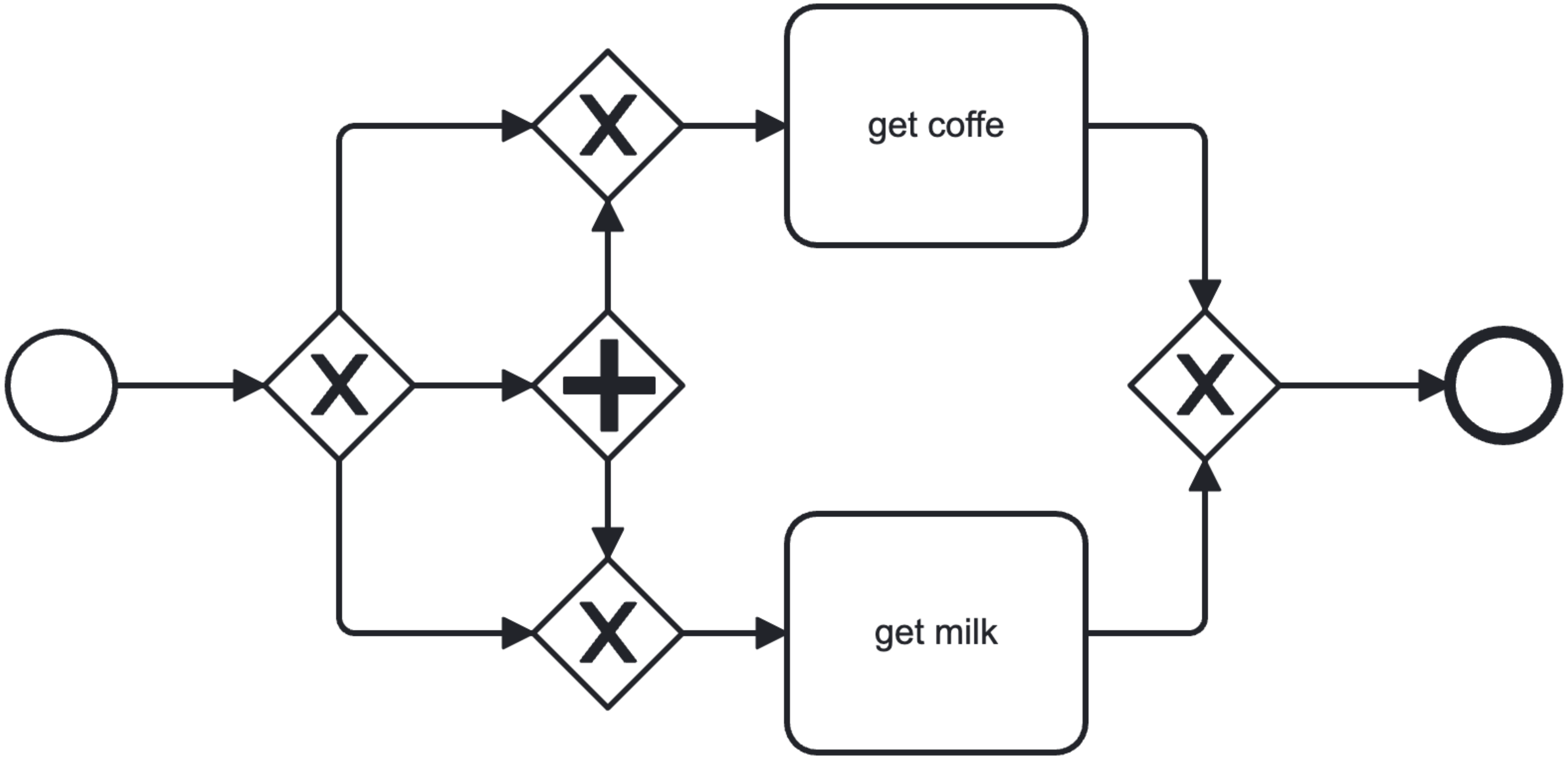

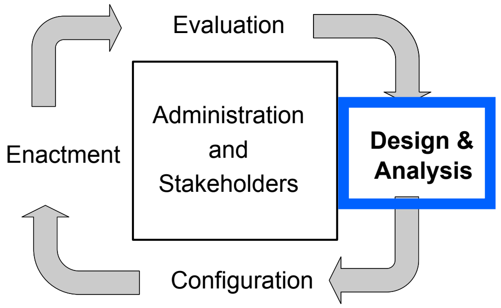

Question time

Desired instances:
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[get coffee, get milk]

✗

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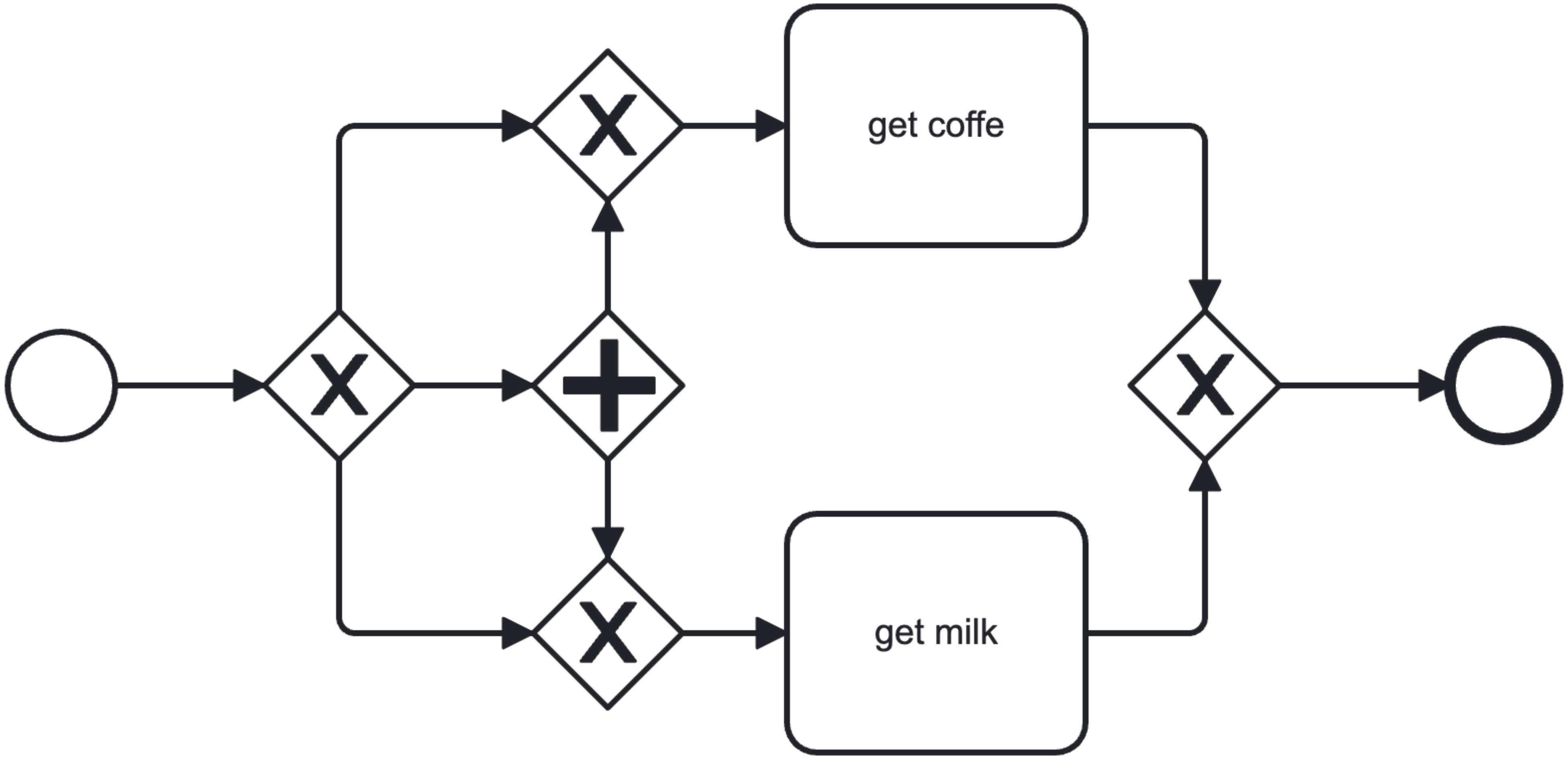

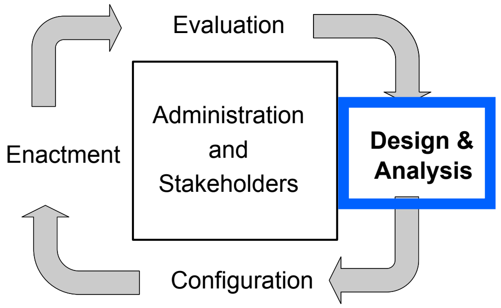

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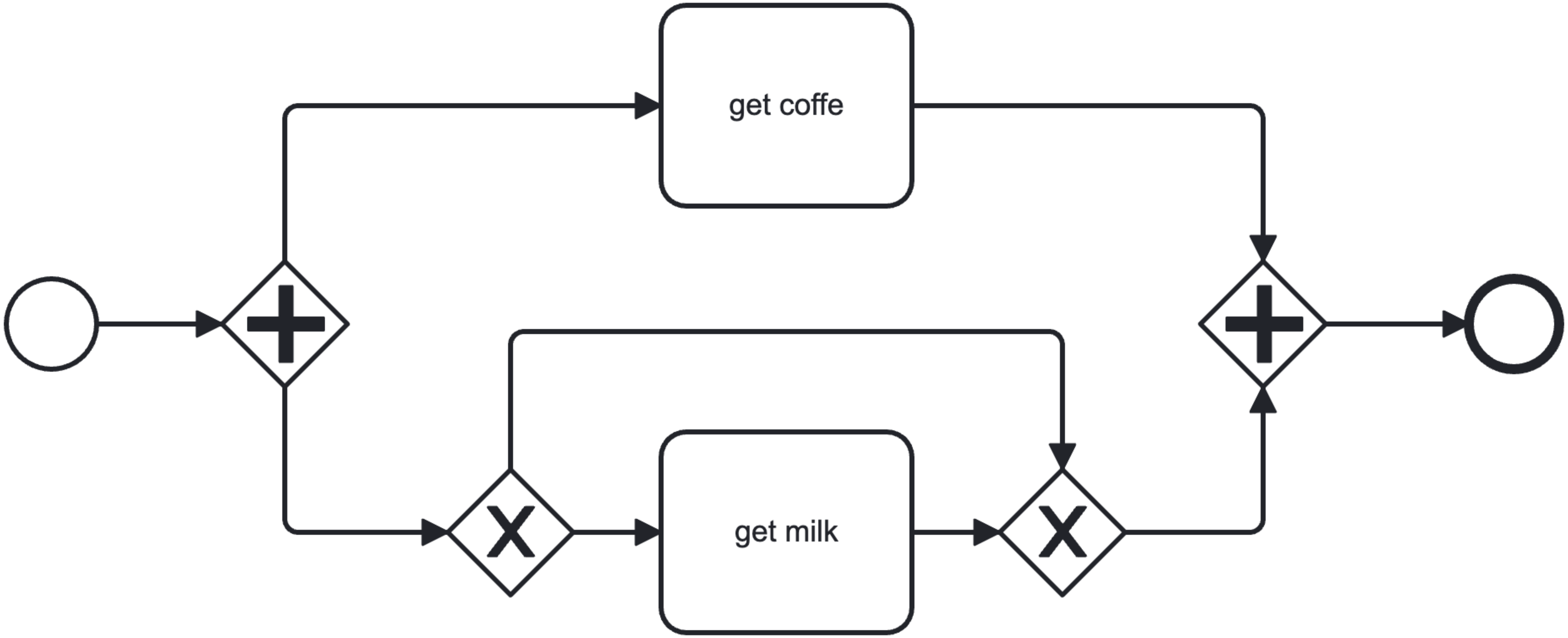

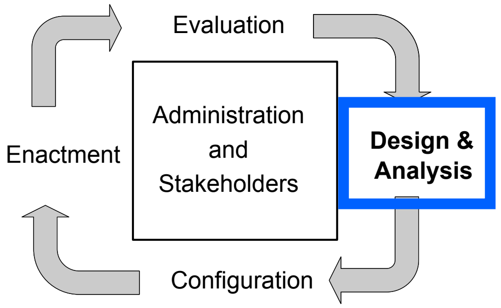

Question time

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✓

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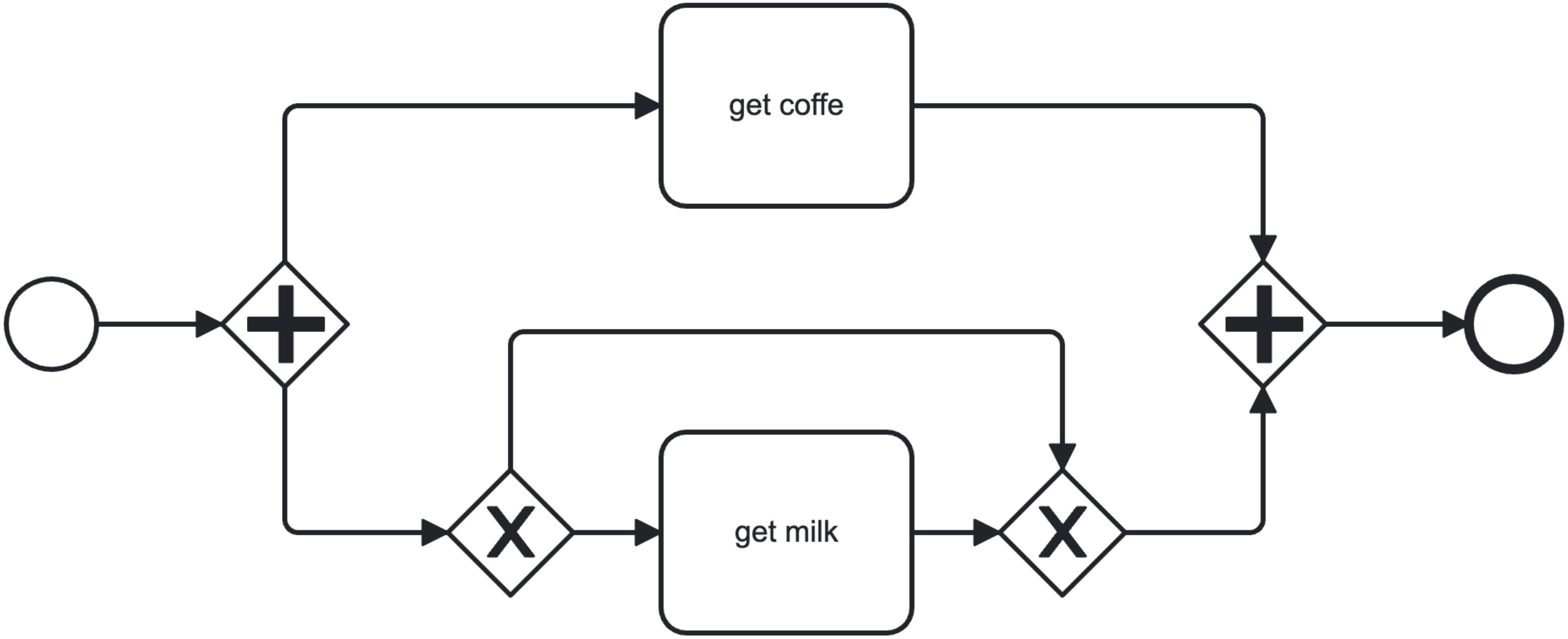
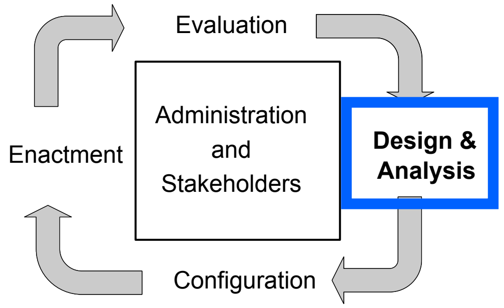




Evaluation

Enactment

Administration and Stakeholders

Design & Analysis

Configuration

Analysis: Simulation

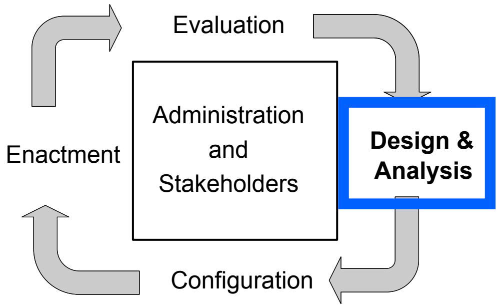
Simulation techniques can support validation: Stakeholders can walk through the process in a step-by-step manner

Check whether processes expose all desired behaviour

Estimate performance measures (e.g., time, cost,…)

Discover undesired execution sequences to show deficits in the process model

Error-prone activities, to be repeated several times, for which automatic tools are necessary



Analysis: Verification

Models must be analyzed and improved to make sure:

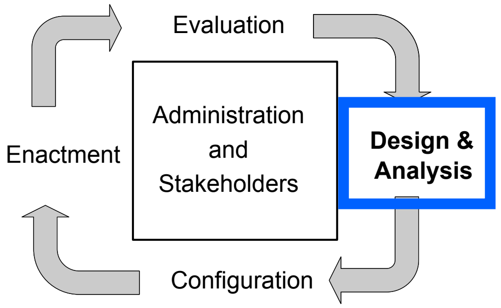
(validity) it actually includes all desired instances
it does not allow any undesired instance

all tasks can be used in some instance

it can always come to an end (e.g., deadlock free)

no pending activities left after completion

Error-prone activities, to be repeated several times, for which automatic tools are necessary



Question time

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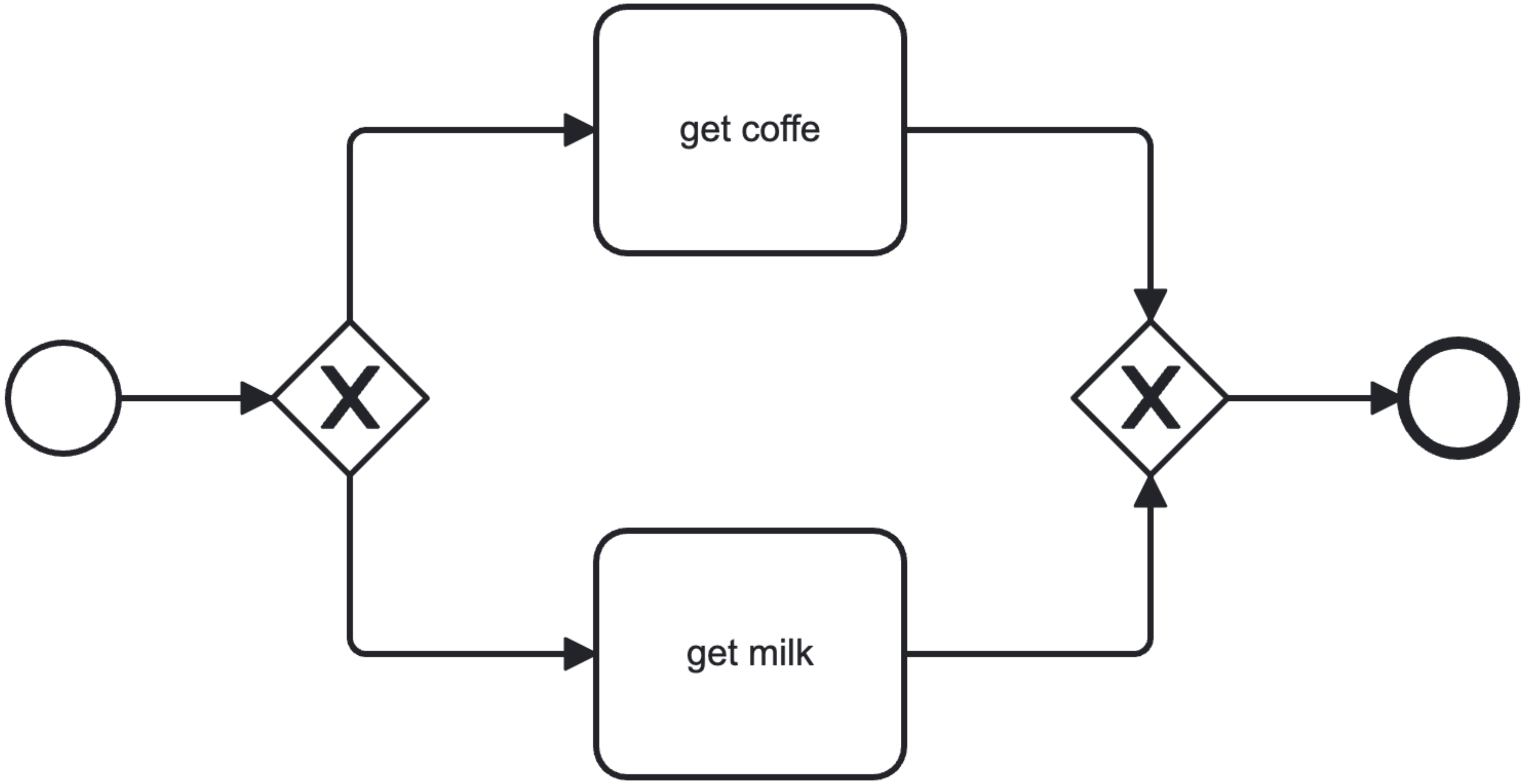
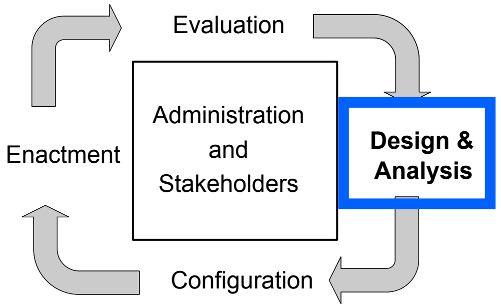
get coffee
get milk

Undesired instances:
get milk, get coffee



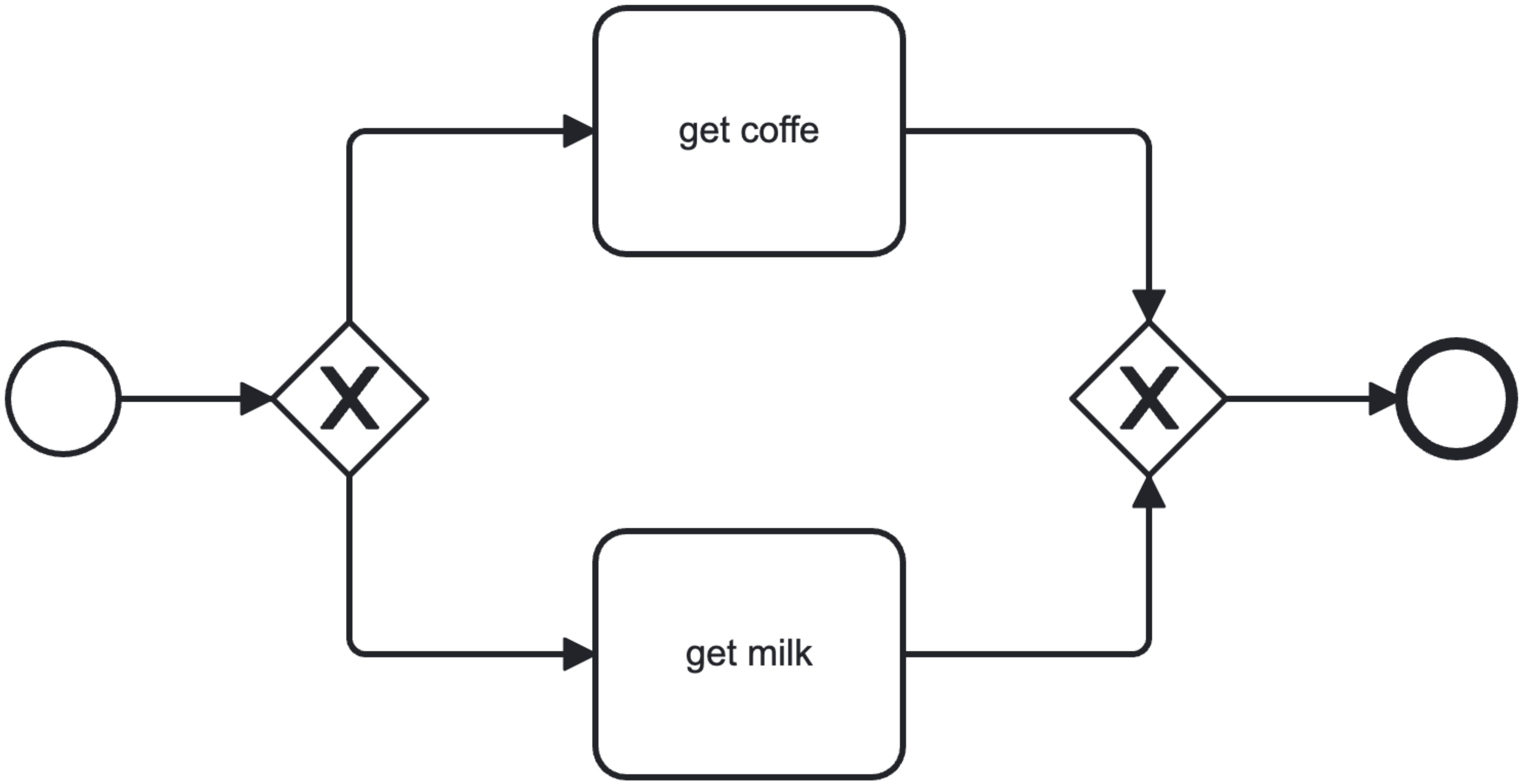


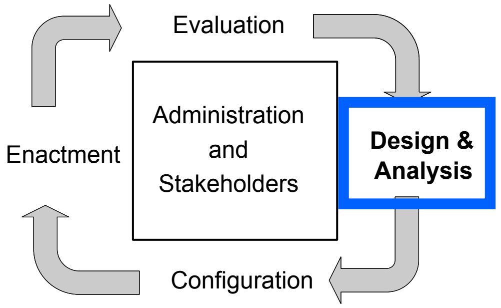
Question time

Desired instances:
get coffee
get milk

✓

Undesired instances:
get milk, get coffee





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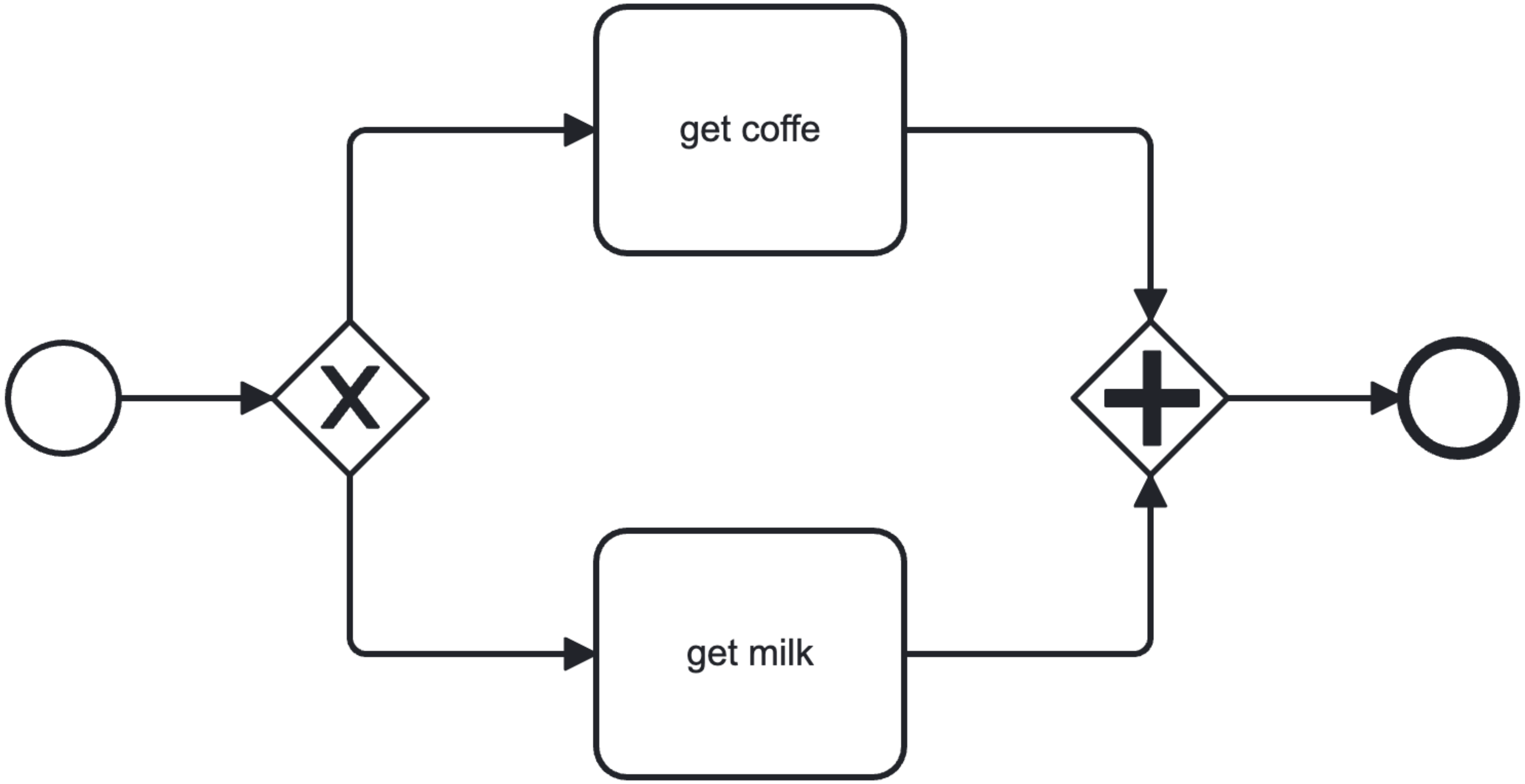
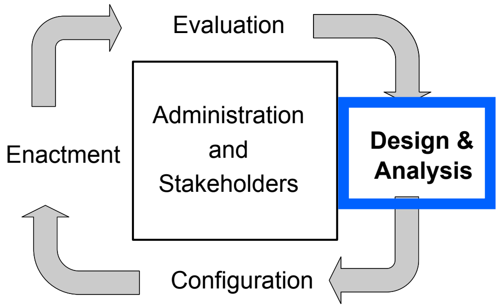


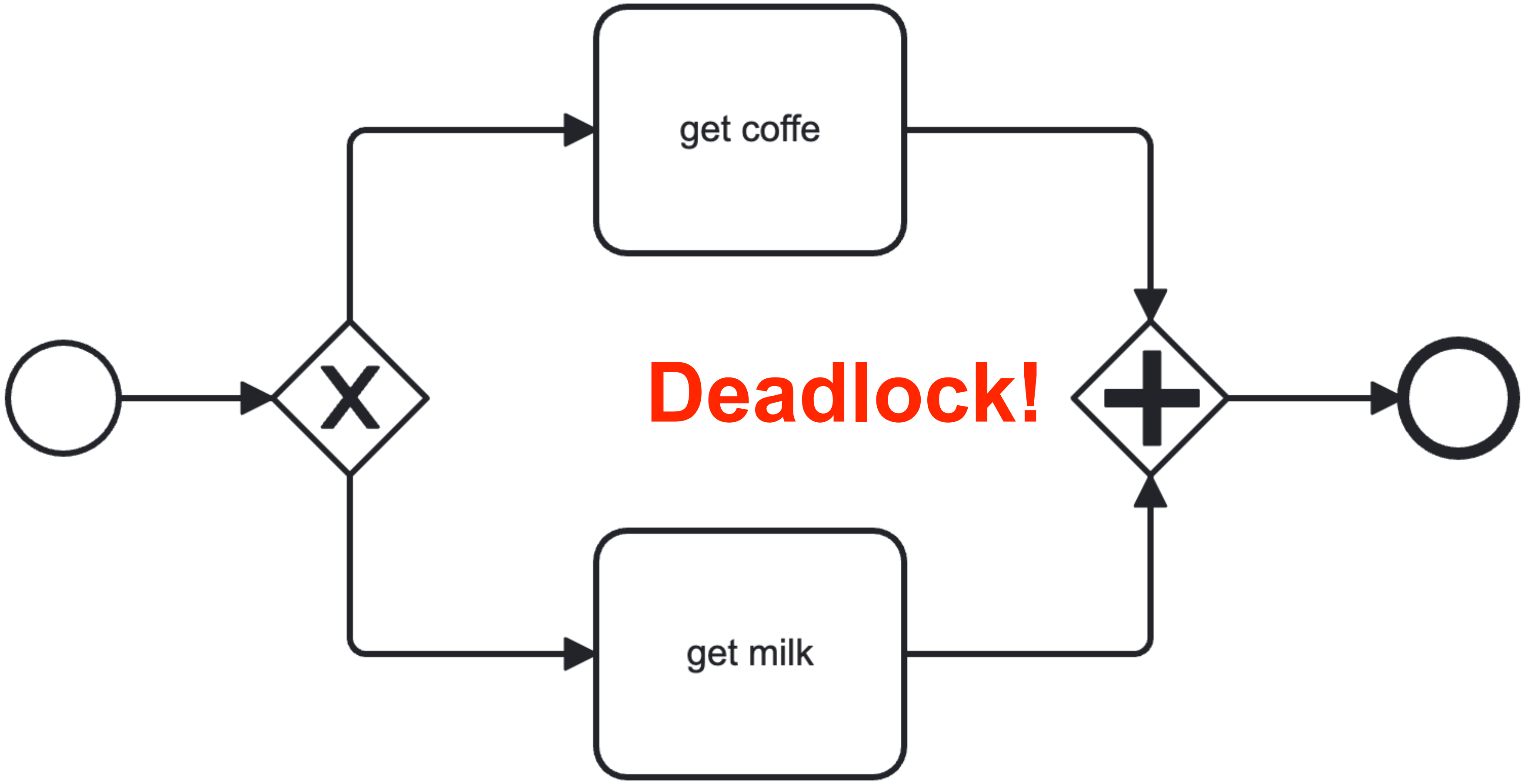


Question time

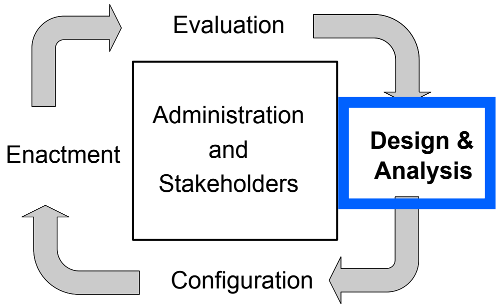
Desired instances:
get coffee
get milk

✖

Undesired instances:
get milk, get coffee



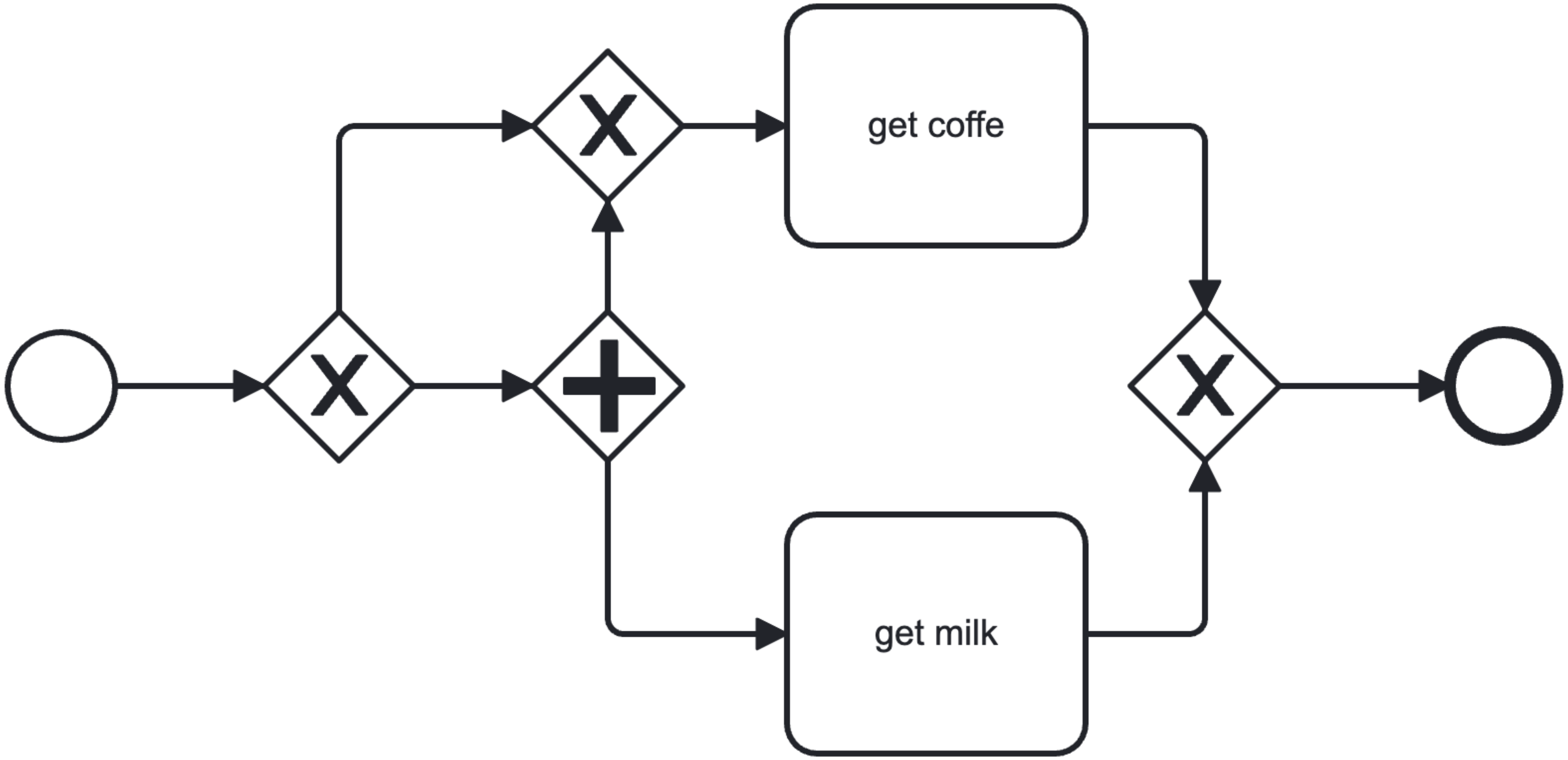
Deadlock!

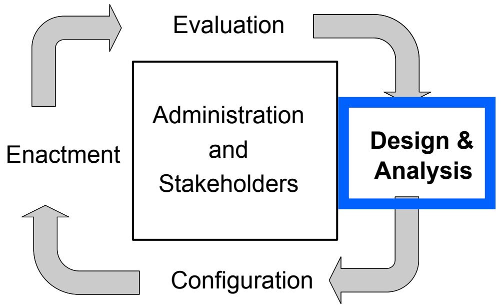


Question time

Desired instances:
get milk, get coffee
get coffee, get milk

Undesired instances:
get milk



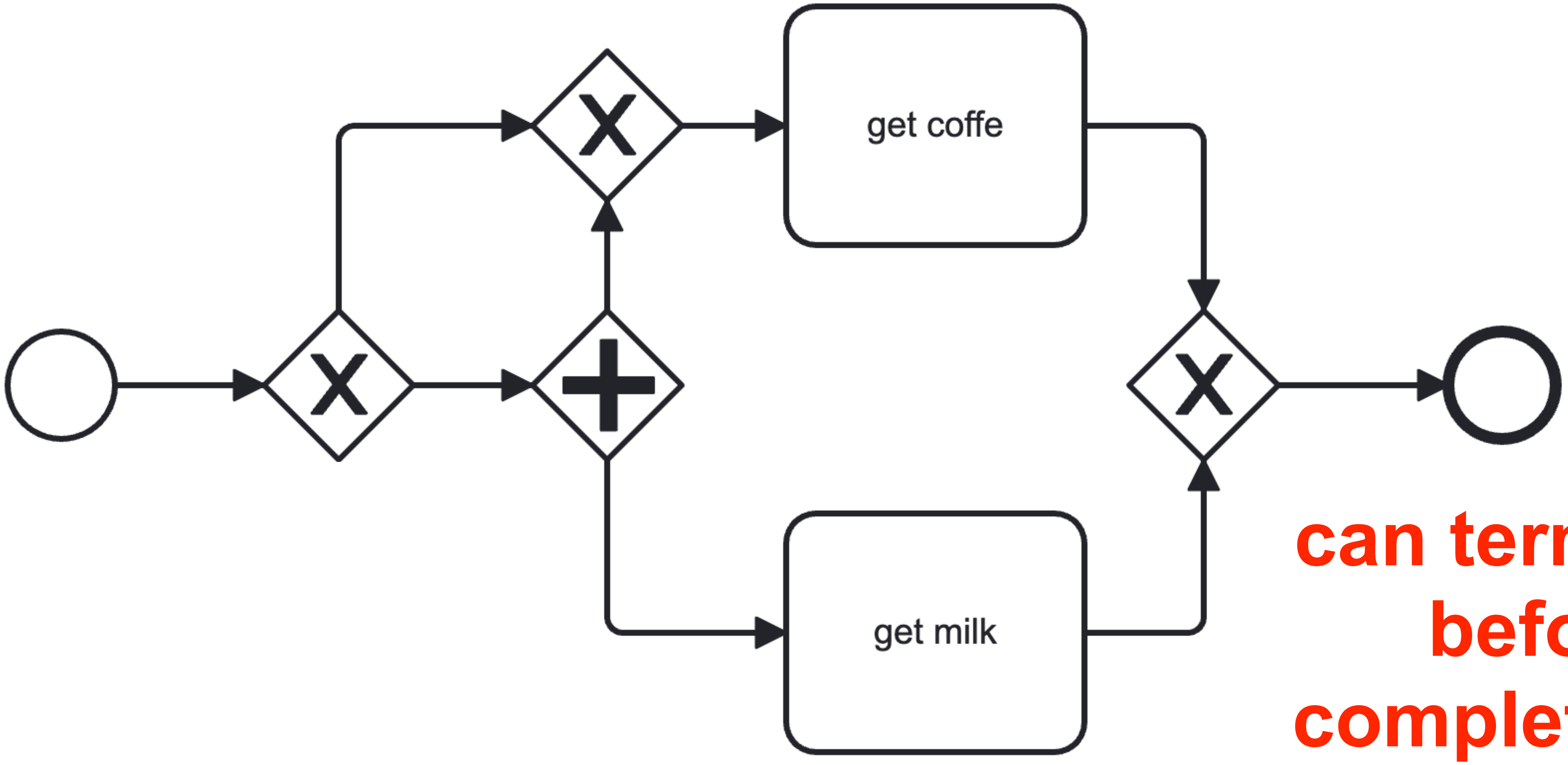


Question time

Desired instances:
get milk, get coffee
get coffee, get milk

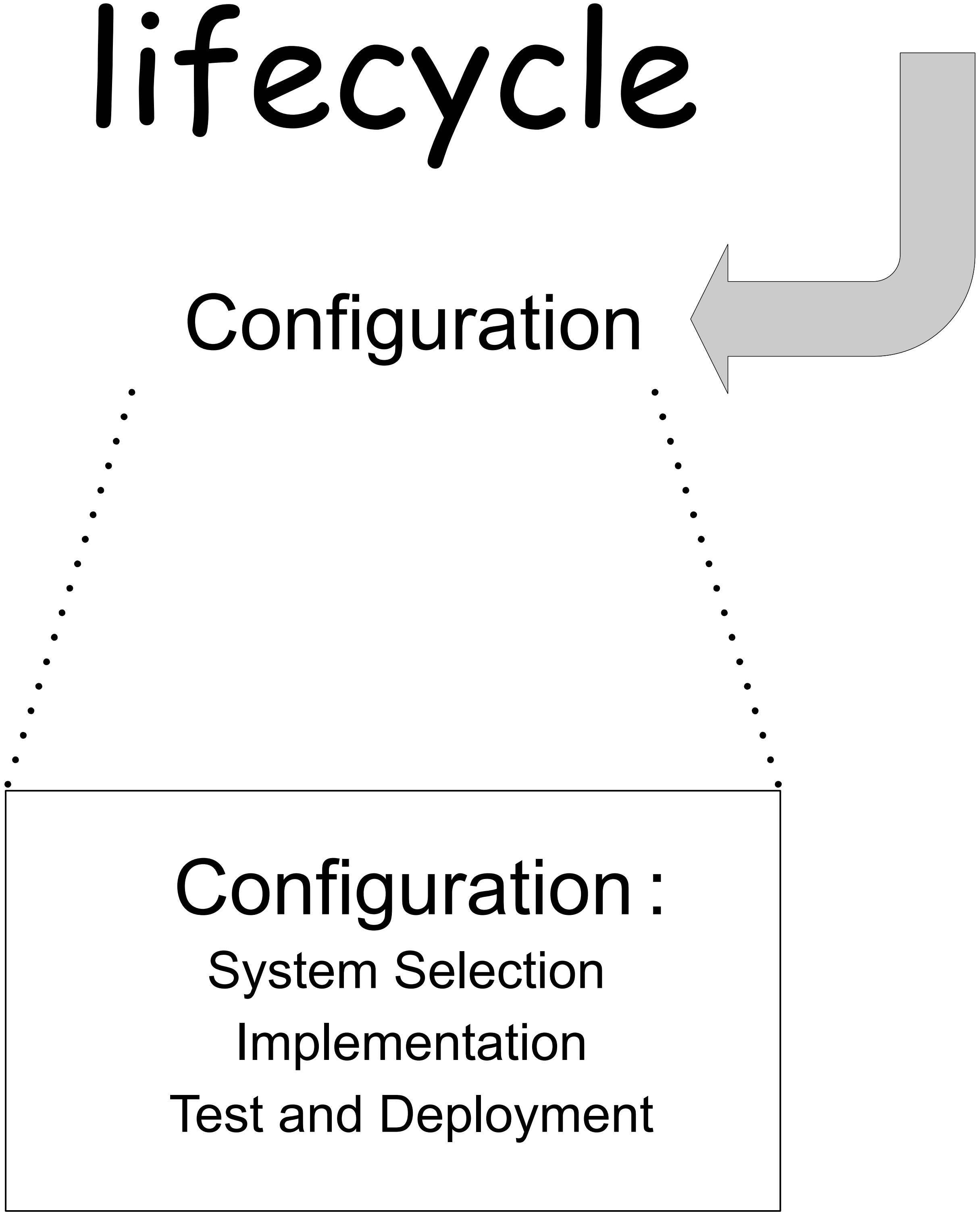
✗

Undesired instances:
get milk



can terminate before completion of all activities!

Business process lifecycle



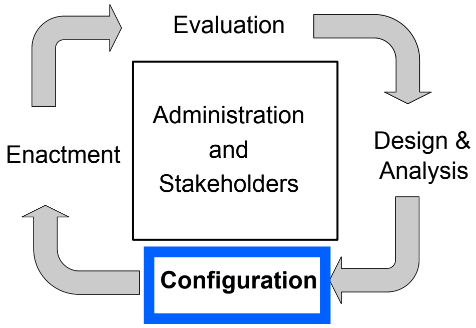
Configuration

Configuration :

System Selection

Implementation

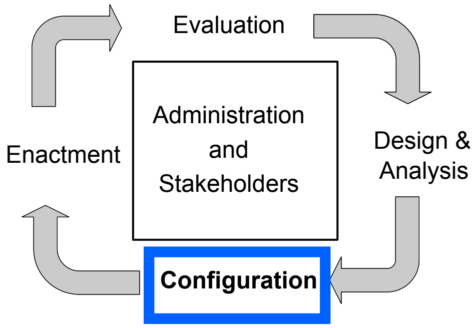
Test and Deployment



Platform selection

Select the platform on which the business process will be enacted and possibly
enhance the process model with additional information to make it executable

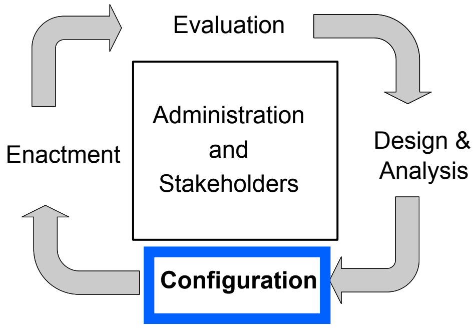
It can be a technological platform (e.g., SOA)
but also a non-technical one
(e.g., written business policies, manual procedures)



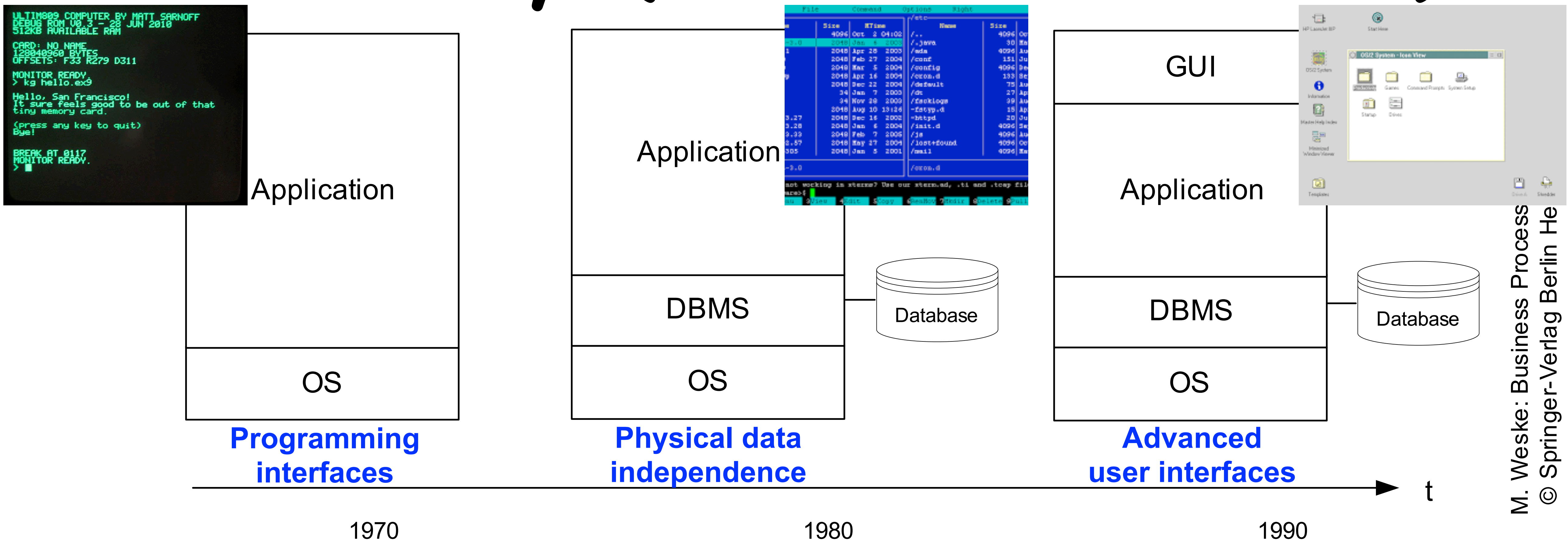
Software Architecture

Definition: A **software architecture** defines a structure that organizes the software elements and the resources of a software system.

Guiding principles:
Modularity and information hiding
(encapsulation, interfaces, reuse, maintainability, response to change)



Early (architectures)



```
ULTIM809 COMPUTER BY MATT SARNOFF
DEBUG ROM V0.3 - 28 JUN 2010
512KB AVAILABLE RAM

CARD: NO NAME
128040960 BYTES
OFFSETS: F33 R279 D311

MONITOR READY.
> kg hello.ex9

Hello, San Francisco!
It sure feels good to be out of that
tiny memory card.

(press any key to quit)
Bye!

BREAK AT 0117
MONITOR READY.
> █
```

```
      File          Command        Options      Right
                                   /etc
        Size    MTime              Name                 Size
        4096  Oct  2 04:02         /..                  4096 Oc
-3.0    2048  Jan  6  2003         /.java                 30 Ma
1       2048  Apr 28  2003         /mdm                 4096 Au
        2048  Feb 27  2004         /conf                 151 Ju
        2048  Mar  5  2004         /config              4096 De
        2048  Apr 16  2004         /cron.d               133 Se
        2048  Dec 22  2004         /default               75 Au
          34  Jan  7  2003         /dt                    27 Ap
          34  Nov 28  2003         /fsckloga              39 Au
        2048  Aug 10 13:26         -fstyp.d               15 Ap
3.27    2048  Dec 16  2002         -httpd                 20 Ju
3.28    2048  Jan  6  2004         /init.d              4096 Se
3.33    2048  Feb  7  2006         /js                  4096 Au
2.57    2048  May 27  2004         /lost+found          4096 Oc
305     2048  Jan  5  2001         /mail                4096 Ma
-3.0                               /cron.d
not working in xterms? Use our xterm.ad, .ti and .tcap fil
are>$
nu  2View  4Edit  5Copy  6RenMov  7Mkdir  8Delete  9Pull
```

Monolithic applications developed from scratch

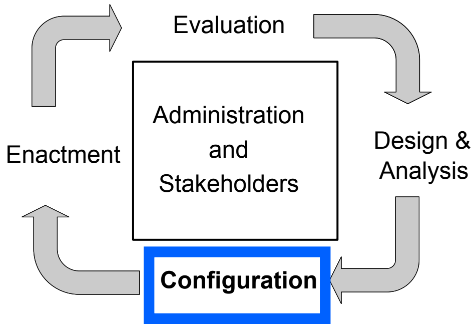
Porting required redevelopment

Data dependency and consistency issues

Application code and (textual) user interfaces still entangled

Data management as a primary concern

Human interaction made easier



Enterprise application

OS + DBMS + GUI **+ Networking capabilities =**
more and more elaborate information systems engineered

Typically hosting enterprise applications (customers, personnel, products, resources)

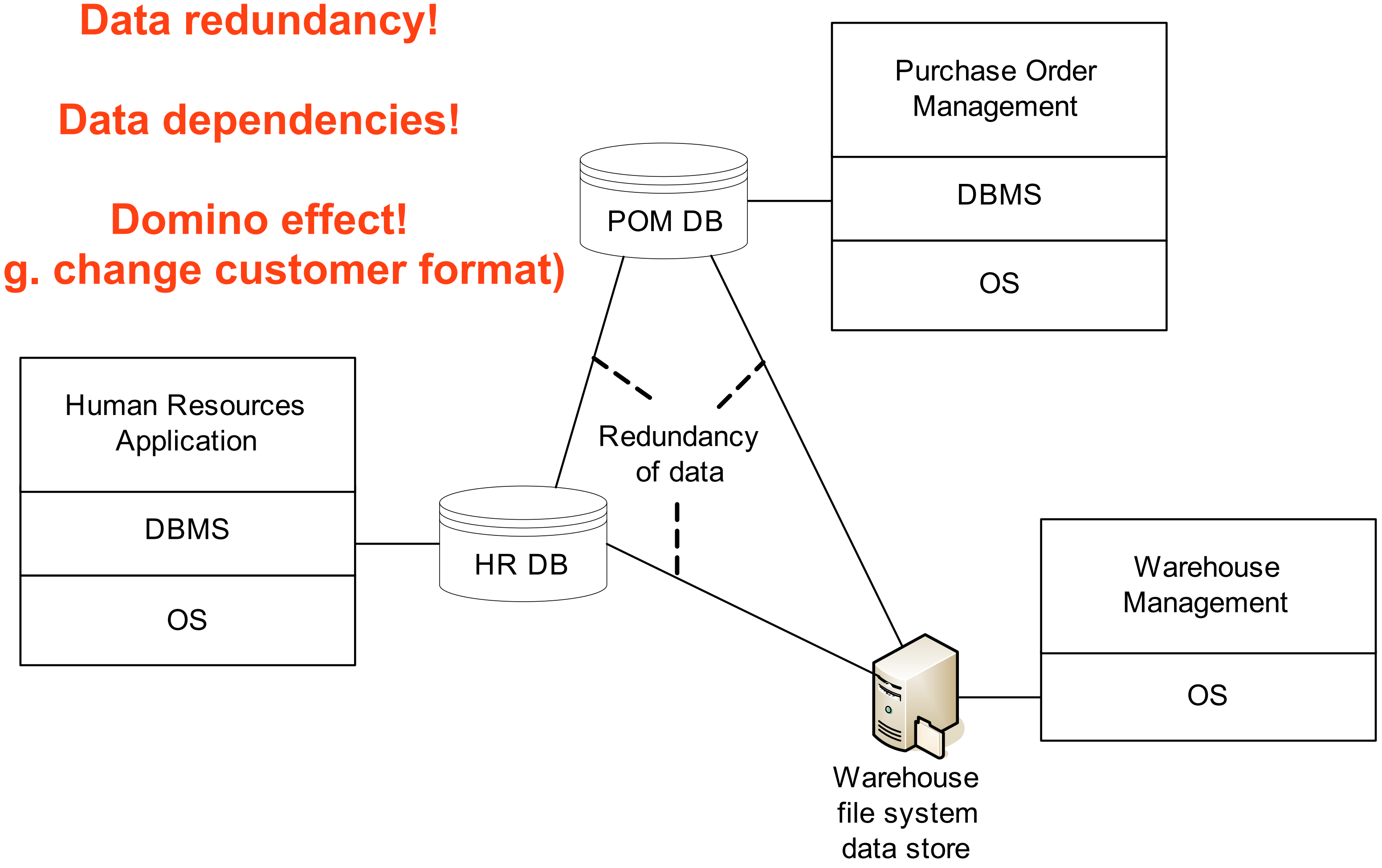
From individual to multiple information systems
(needs integration)

Lack of Integration!

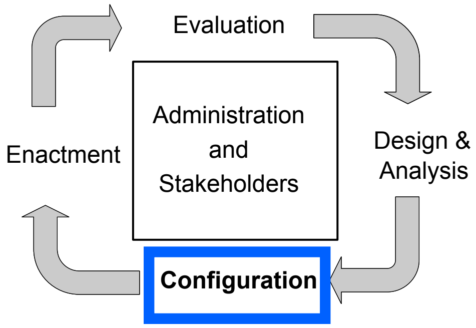
Data redundancy!

Data dependencies!

Domino effect!
(e.g. change customer format)


Purchase Order Management
DBMS
OS
POM DB
Human Resources Application
DBMS
OS
HR DB
Redundancy of data
Warehouse Management
OS
Warehouse file system data store

M. Weske: Business Process Management,
© Springer-Verlag Berlin Heidelberg 2007



Enterprise Resource Planning (ERP) Systems

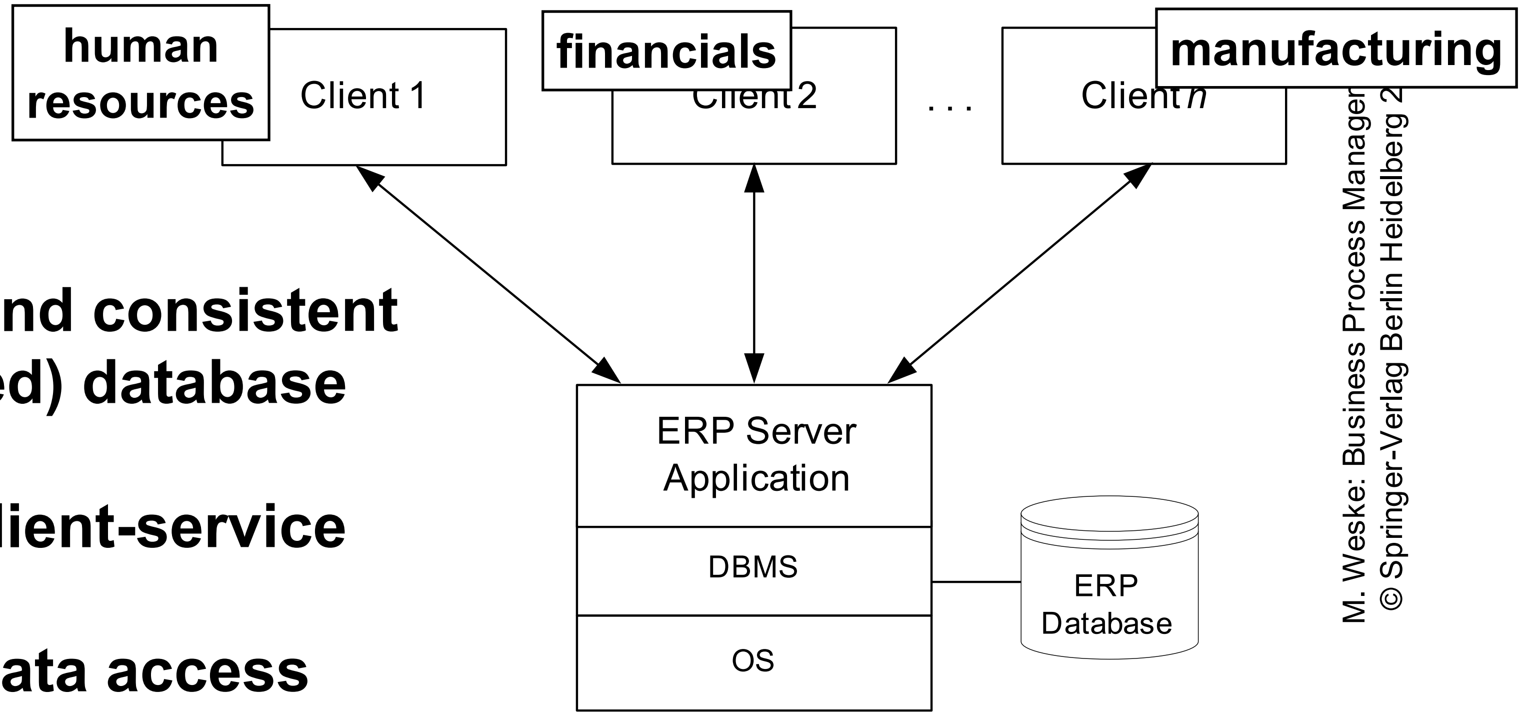
Basic idea

to deal with the increasing complexity of changes, integrated database that spans most applications, separated modules provide desired functionalities, accessed by client applications

Integrated and consistent (centralized) database

Two-tier client-service

remote data access



M. Weske: Business Process Manager
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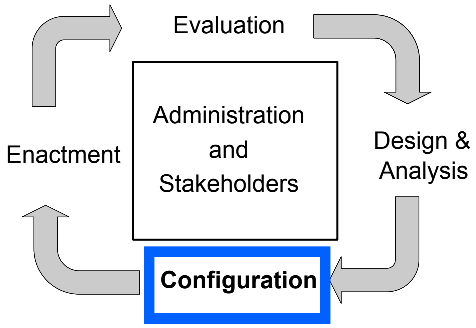


Siloed applications

New types of sw entered the market around 2000:

Customer Relationship Management (**CRM**) systems

Supply Chain Management (**SCM**) systems

to support the planning, operation, and control of supply chains, including inventory management, warehouse management, management of suppliers and distributors

Problem: different vendors, separately developed

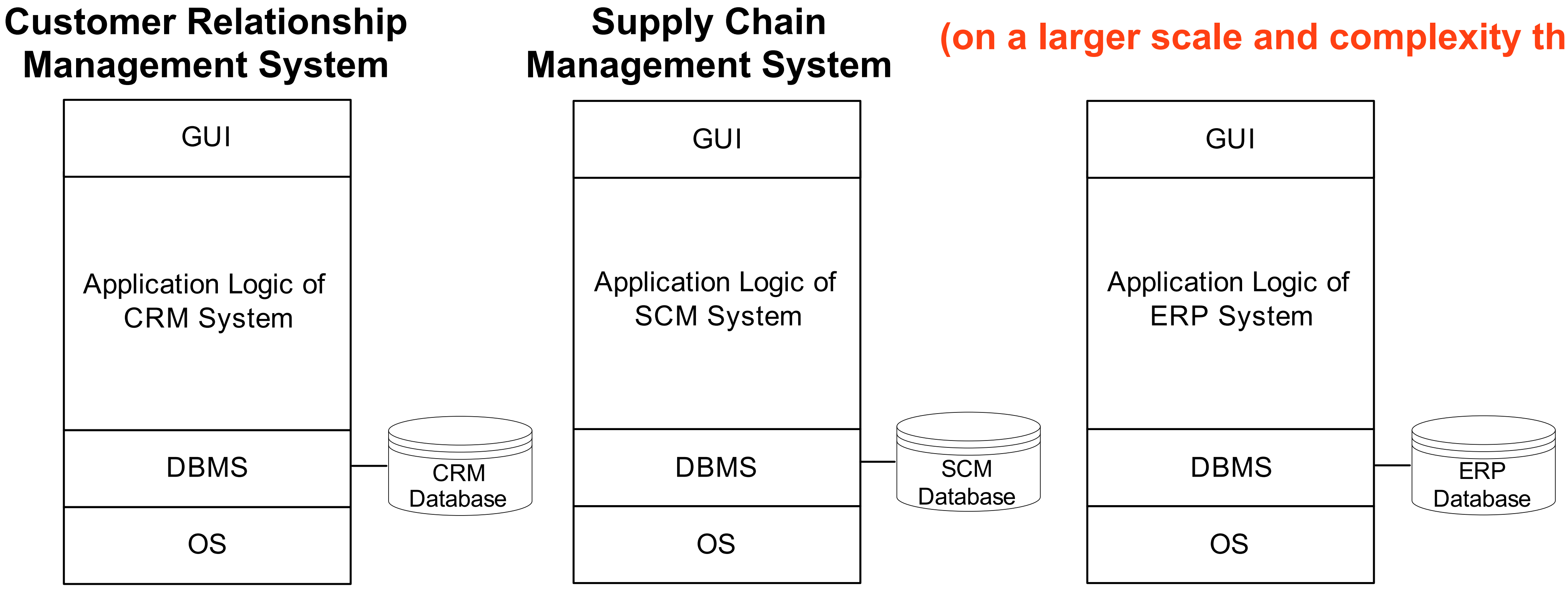
Lack of Integration!

Data redundancy!

Data dependencies!

(on a larger scale and complexity than before)

Data Integration would provide valuable support


Customer Relationship Management System
GUI
Application Logic of CRM System
DBMS
OS
CRM Database
Supply Chain Management System
GUI
Application Logic of SCM System
DBMS
OS
SCM Database
GUI
Application Logic of ERP System
DBMS
OS
ERP Database

Connected on local network, but not logically integrated

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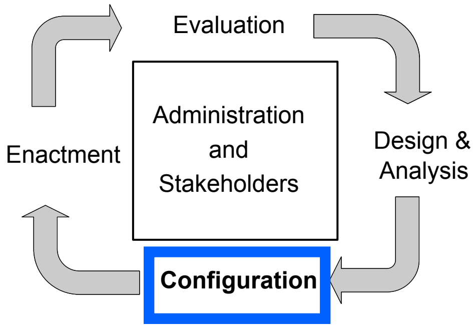
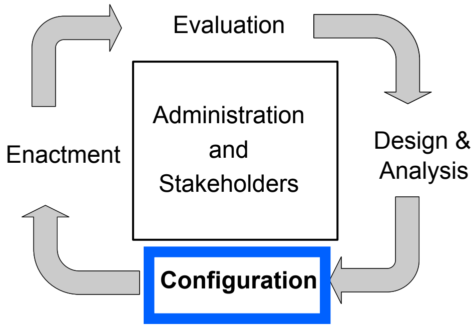


Enterprise Application Integration

Definition: Enterprise Application Integration (**EAI**) is defined as the use of software and computer systems architectural principles to integrate a set of enterprise computer applications.



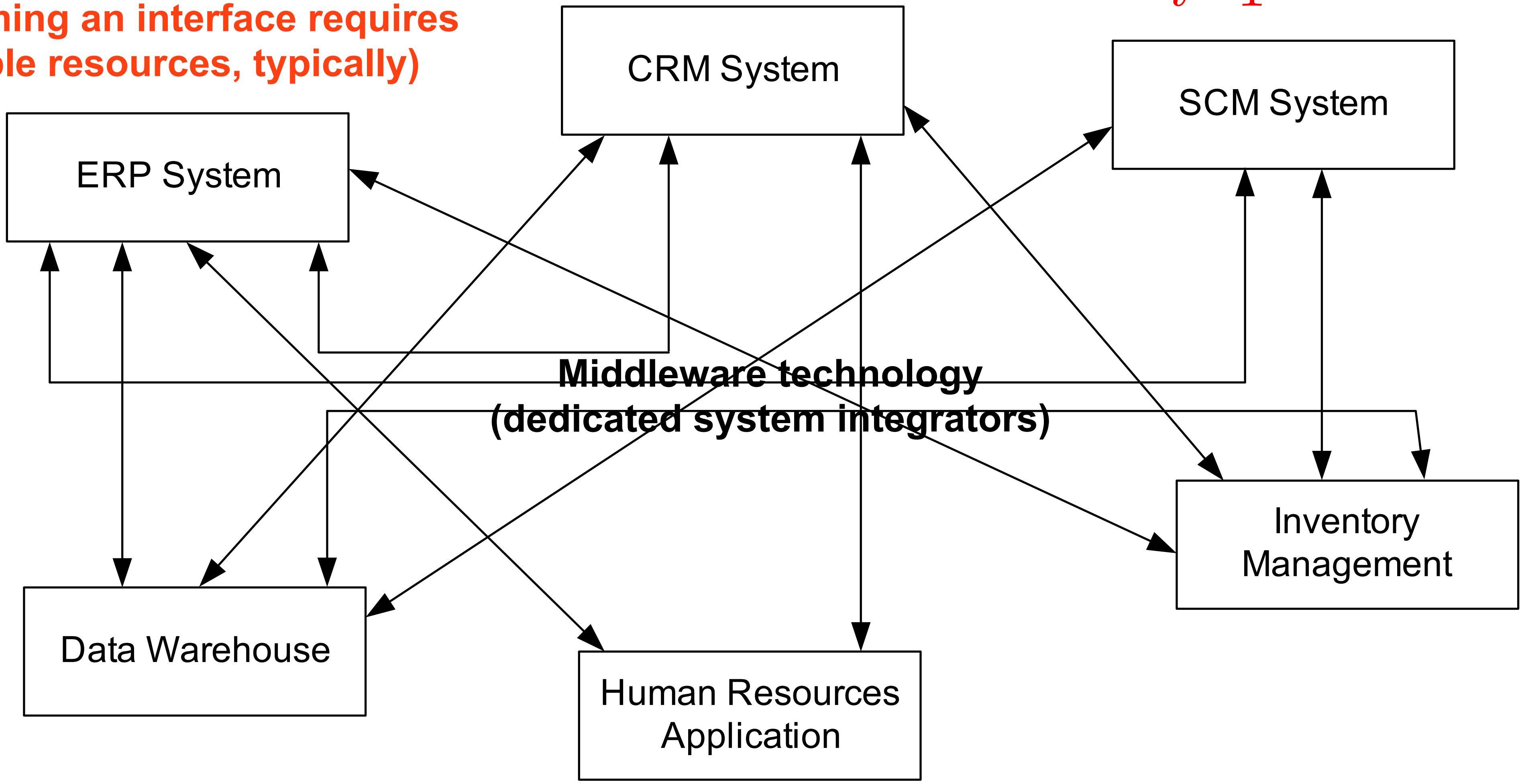
Point-to-point integration

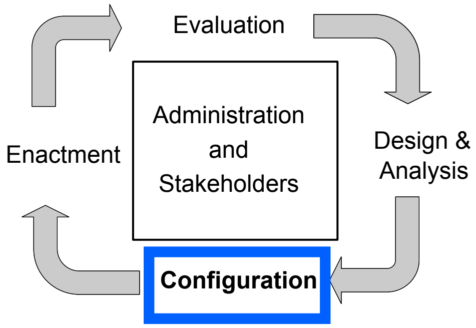
N x N hard-wiring problem!

Too many interfaces to develop!

Does not respond well to changes!
(Reprogramming an interface requires considerable resources, typically)

$$\sum_{i=1}^{N-1} i = \frac{N(N-1)}{2}$$





EAI implementation pitfalls

70% of all EAI projects fail!
Most of these failures are not due to technical difficulties, but due to management issues:

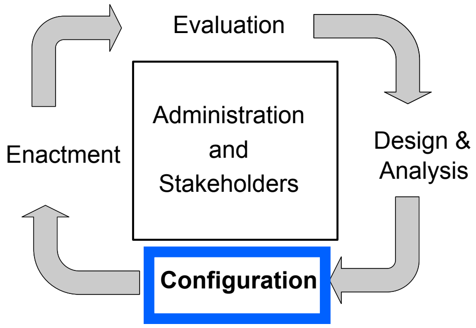
Constant change

Shortage of EAI experts

Competing standards

Loss of detail: Information unimportant at an earlier stage may become crucial later

Data protectionism

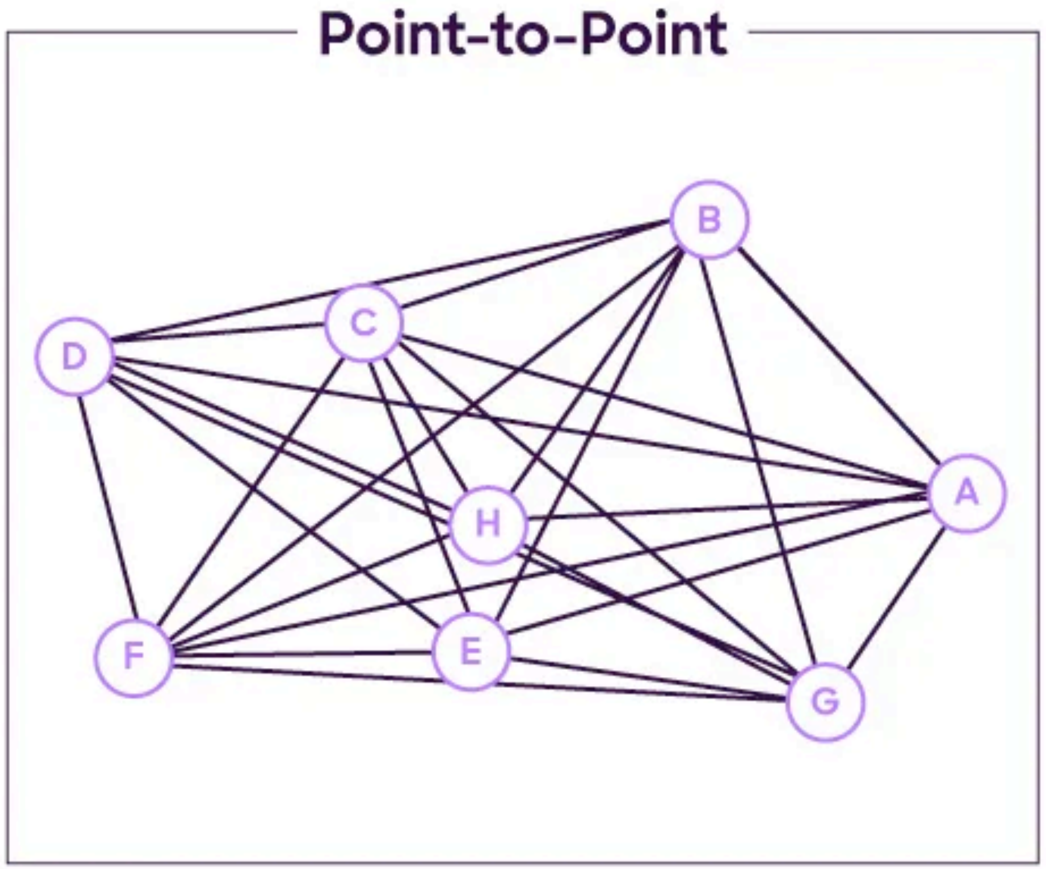


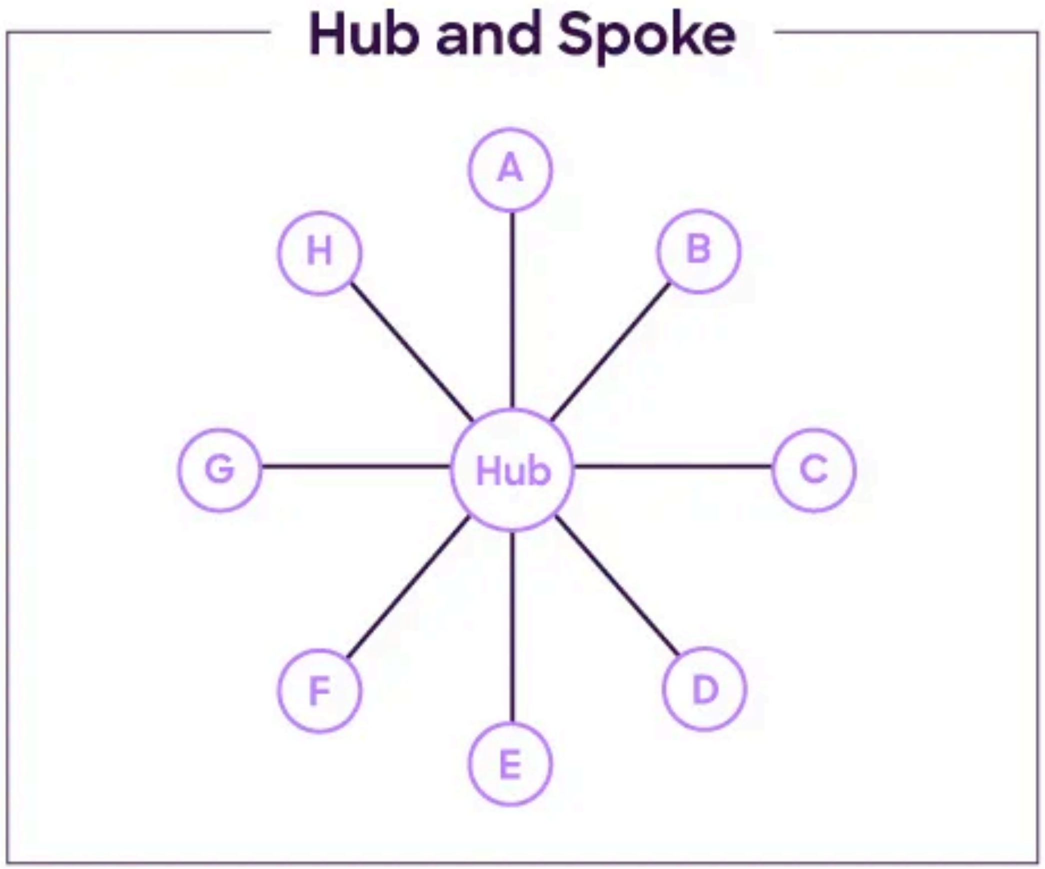
Hub-and-Spoke

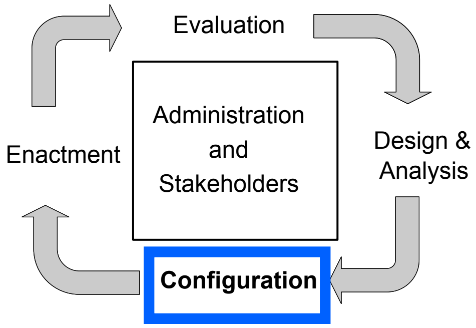
The **Hub-and-Spoke** paradigm is based on a central hub and a number of spokes attached to it

The Application Integration middleware represents the hub, and the applications to be integrated represents the spokes

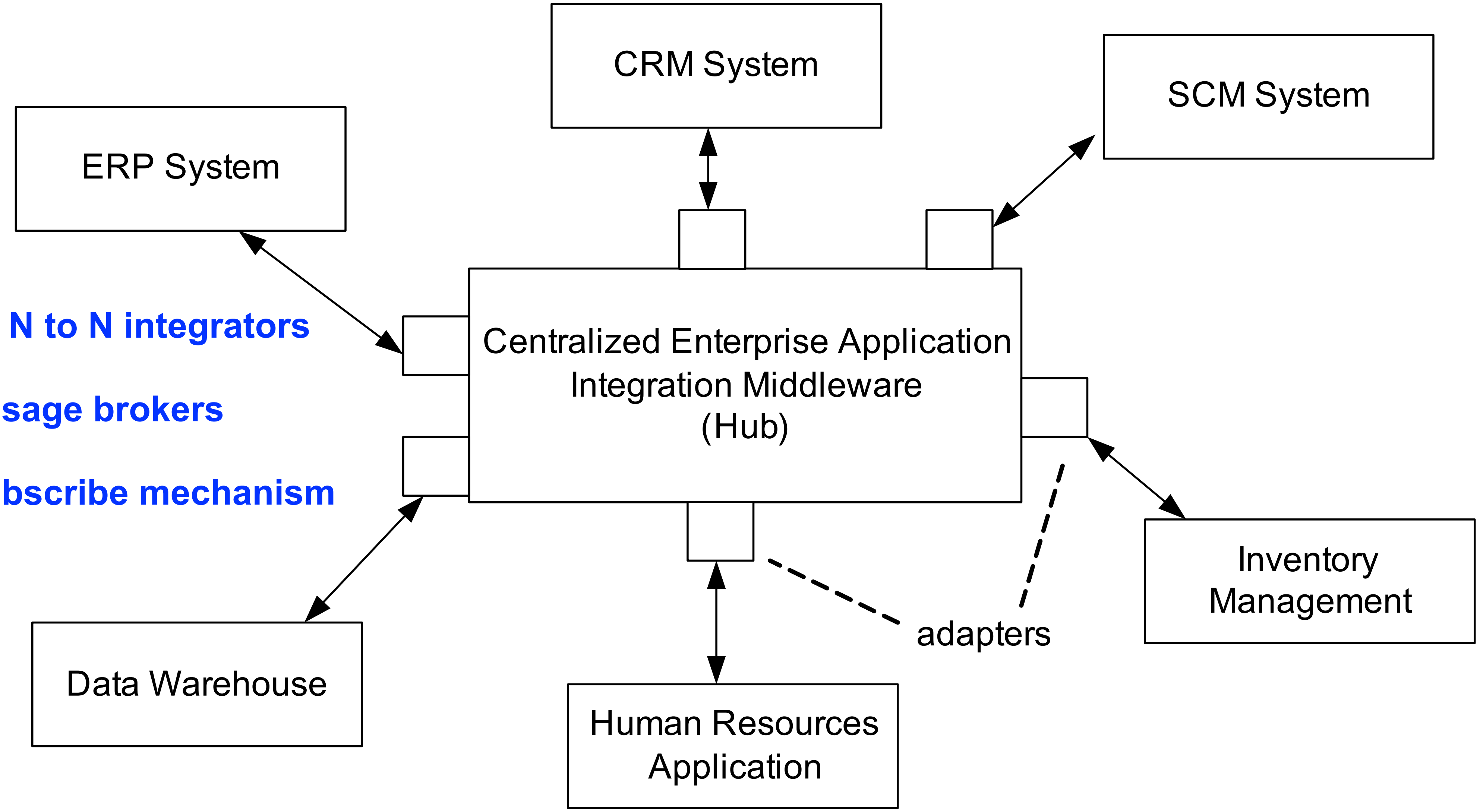
Interactions between any two applications pass through the hub







Hub-and-spoke integration

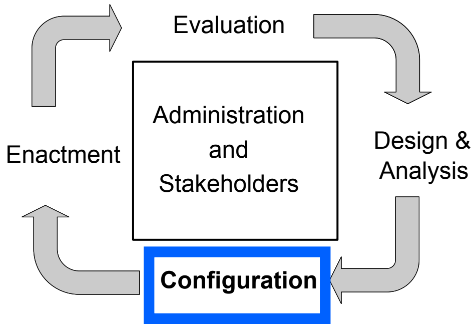

CRM System
SCM System
ERP System
Centralized Enterprise Application Integration Middleware (Hub)
Inventory Management
Data Warehouse
Human Resources Application
adapters

From N x N to N integrators

Message brokers

Publish/subscribe mechanism

M. Weske: Business Process Management,



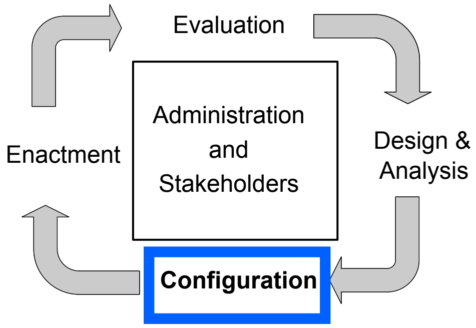
Enterprise service computing

Main ideas:

Business functionalities exposed as **services**
(loosely-coupled computing tasks)

Services are equipped with usage information
(**service descriptions** published in **public registries**)

Customers can find services and use them
(dynamic **discovery** and **invocation** over the network)

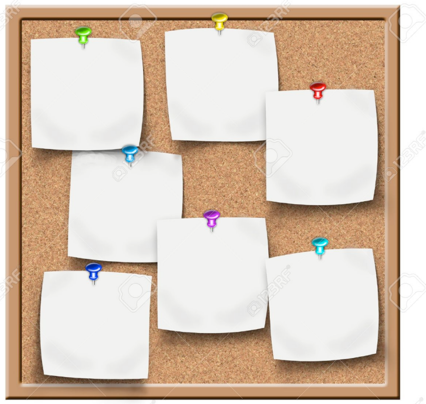


Service-Oriented Architectures (SOA)

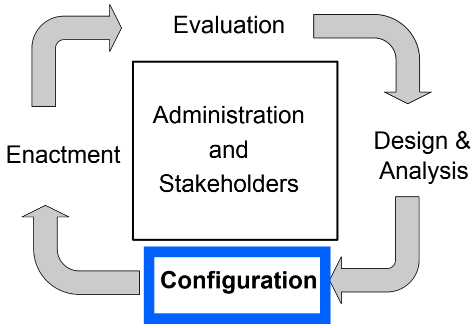
Service Requestor

Service Provider

Service Registry



SOA provides an environment for describing and finding software services, and for binding to services.



Advantages of SOA

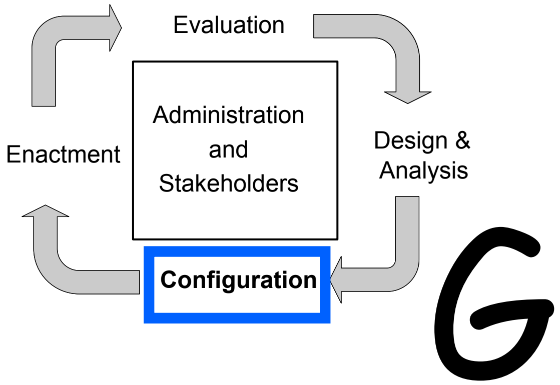
Reuse of functionality at coarse level of granularity

New applications can be built with less effort

Existing applications can respond to changing requirements

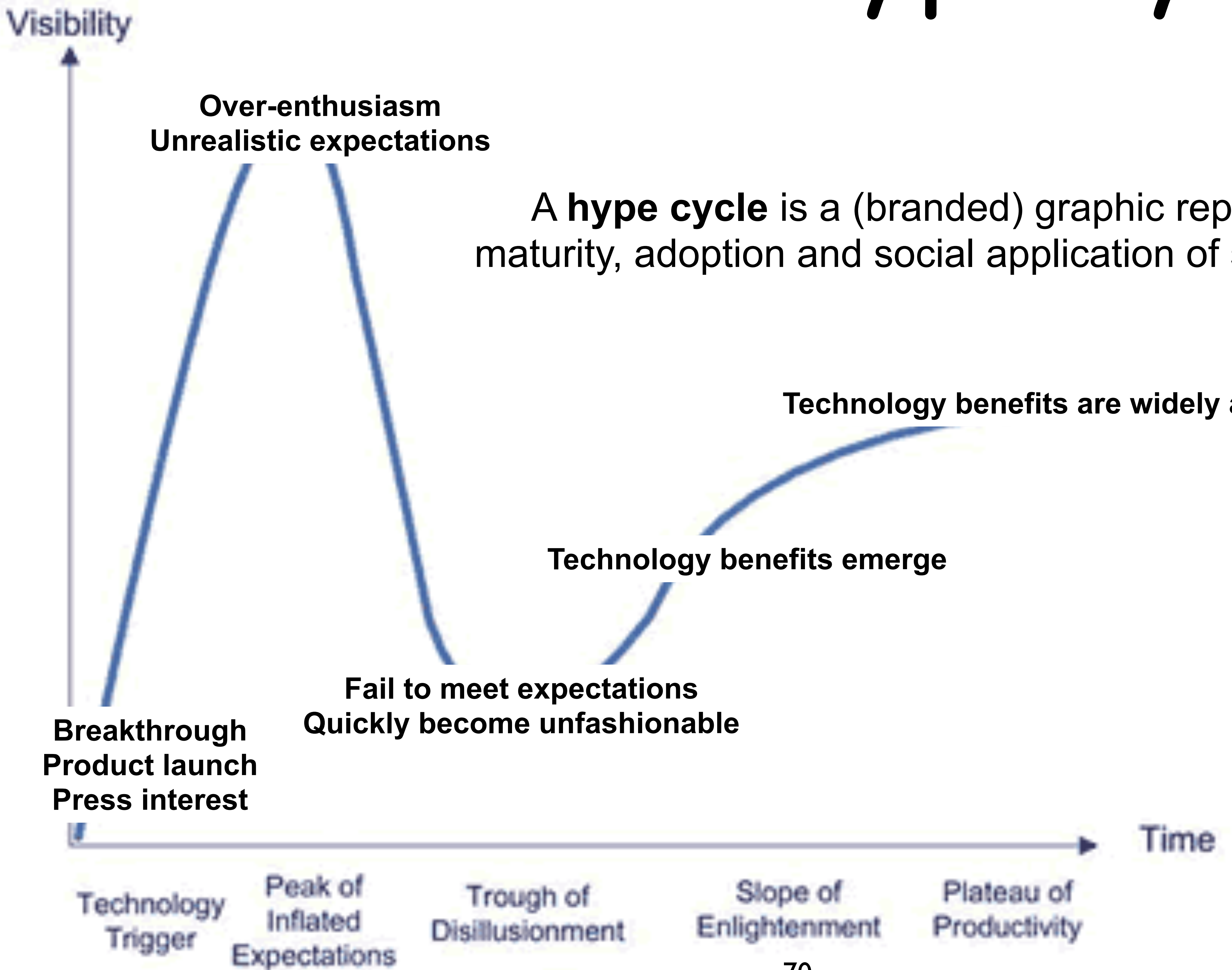
Reduced maintenance and development costs

Corporations are perceived by the services they expose: **enterprise services** (provided by the internal back-end), **third party services** (integrated for better end-user experiences)



Gartner's hype cycle

A **hype cycle** is a (branded) graphic representation of the maturity, adoption and social application of specific technologies



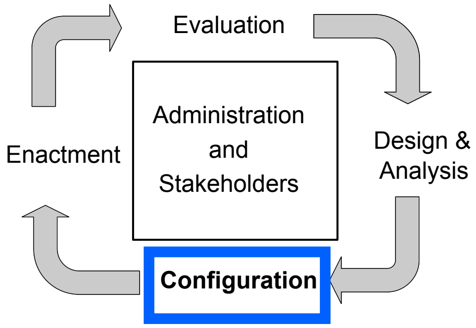
Over-enthusiasm
Unrealistic expectations

Technology benefits are widely accepted

Technology benefits emerge

Fail to meet expectations
Quickly become unfashionable

Breakthrough
Product launch
Press interest

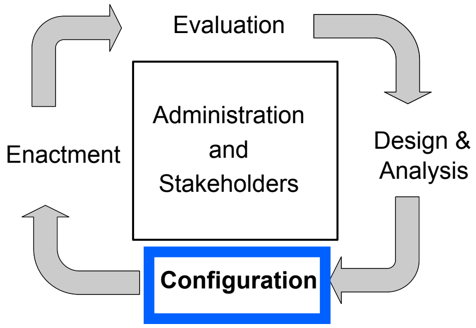


Configuration phase

From (verified) business process models to
implementation as

a set of policies, guidelines and procedures
(to be followed by employees)

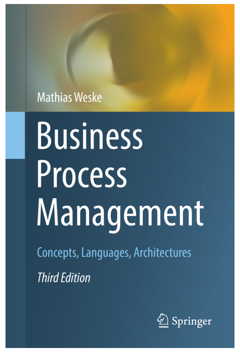
a dedicated software system
(over a chosen implementation platform:
a business process management system)



Business process management system

Business process models are the main artefact for implementing business processes

This implementation can be done by organizational rules and policies, but it can also be done by business process management (software) system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Business Process Management
Concepts, Languages, Architectures
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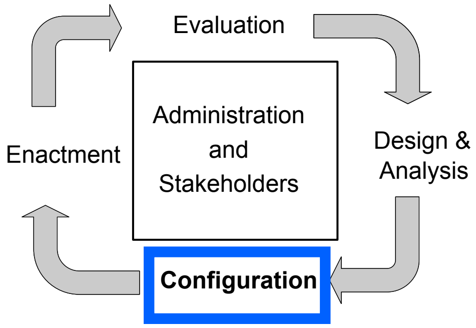
Definition: **business process management system** is a generic software system that is driven by explicit process representations to coordinate the enactment of business processes.

- Weske

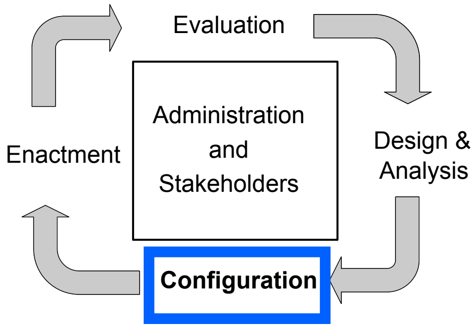


Enhanced models

Software systems usually require additional **technical information**

The model must be decorated with such data, to be exploited for configuring the system

Examples: interactions of the employees with the system, integration of existing systems, wrapping of legacy software



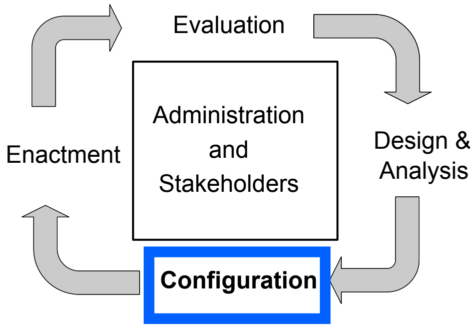
Workflow management coalition (WfMC)

Founded in the ‘90s by vendors, users, academia:
fix standard for Wf representation and execution

http://www.wfmc.org

Workflow Management Coalition

WfMC

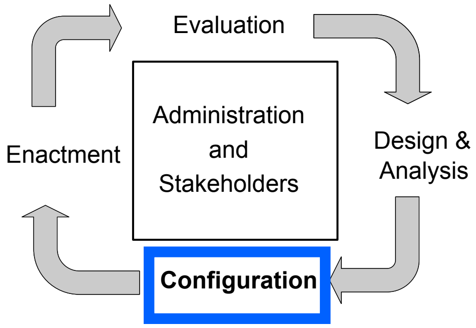


Workflow

Definition: a **workflow** is the automation of a business process, in whole or in part,

during which documents, information, or tasks are passed from one participant to another for action,

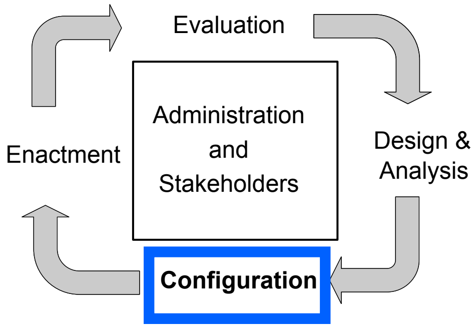
according to a set of procedural rules



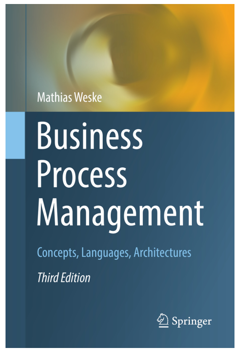
Workflow management system

Definition: a **workflow management system**
is a software system
that defines, creates, and manages Wfs execution,

running on one or more workflow engines,
able to interpret the workflow definition,
able to interact with workflow participants, and
able to invoke the use of IT tools and applications



Workflow component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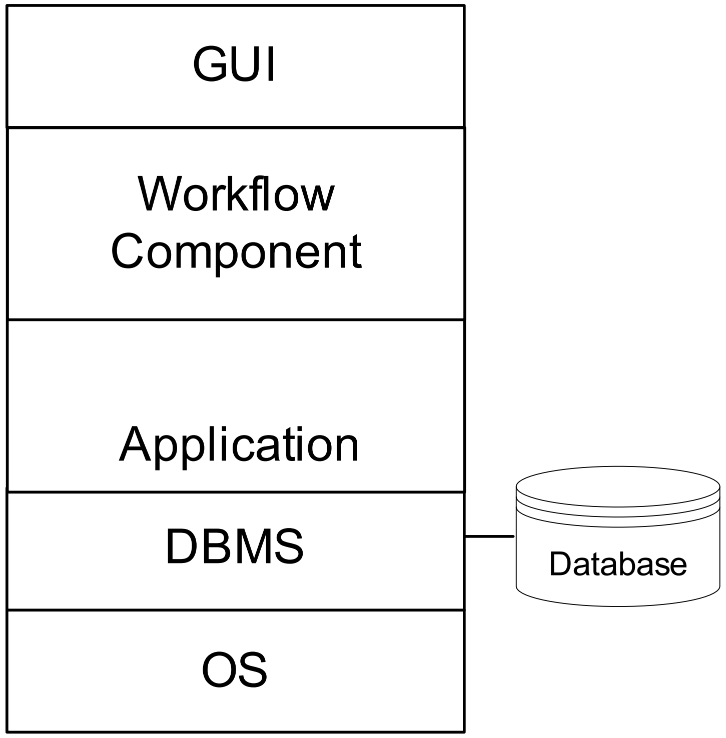
Definition: a **single-application workflow** consists of activities and their causal and temporal ordering that are realized by one common application system.



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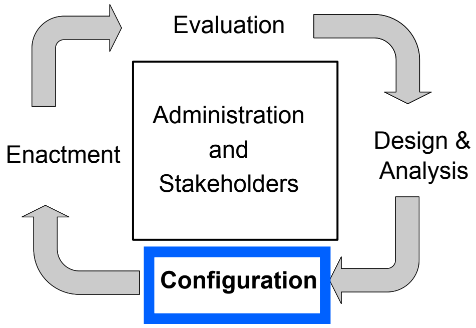
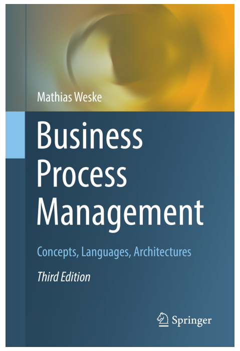


Multiple-application workflow system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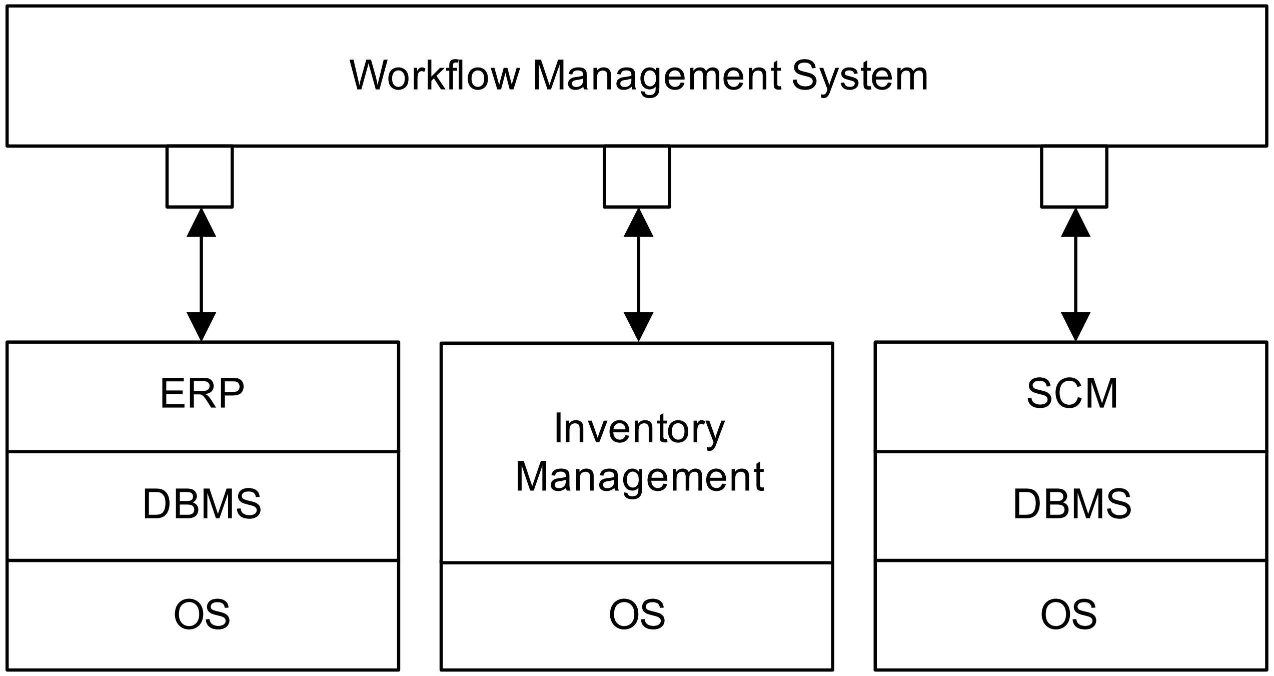
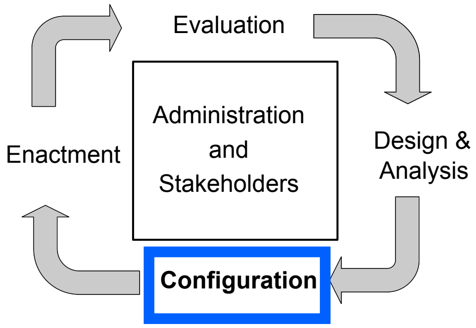
Definition: a **multiple-application workflow** contains activities that are realized by multiple application systems, providing an integration of these systems.





Evaluation

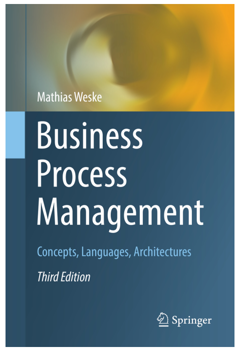
Administration and Stakeholders

Design & Analysis

Configuration

Enactment

System workflow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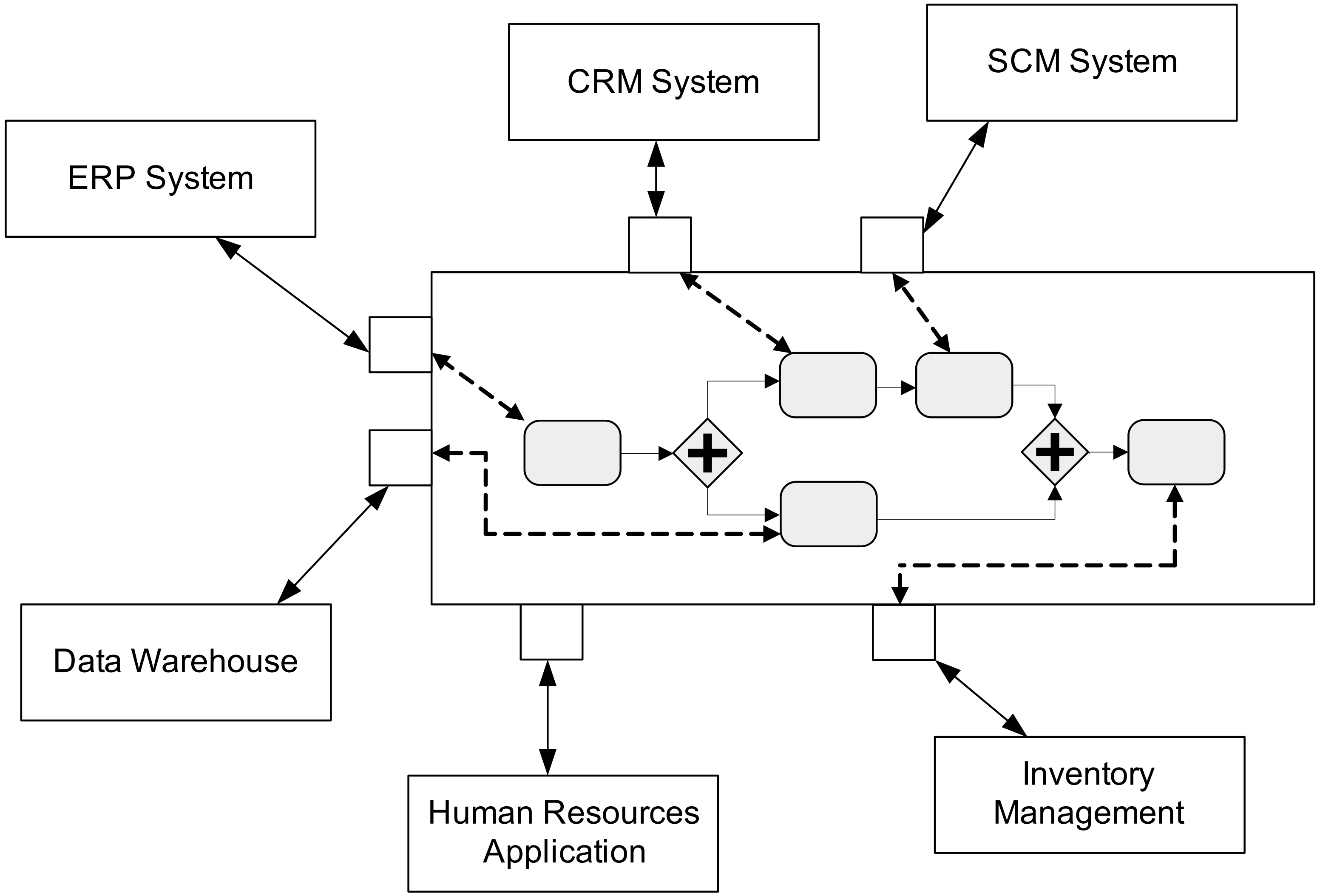
Definition: a **system workflow** consists of activities that are implemented by software systems without any user involvement.



CRM System

SCM System

ERP System

Data Warehouse

Human Resources Application

Inventory Management

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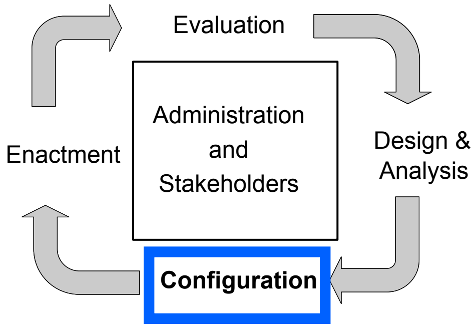
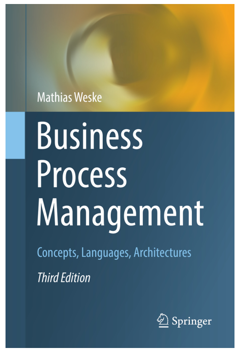


Human interaction workflow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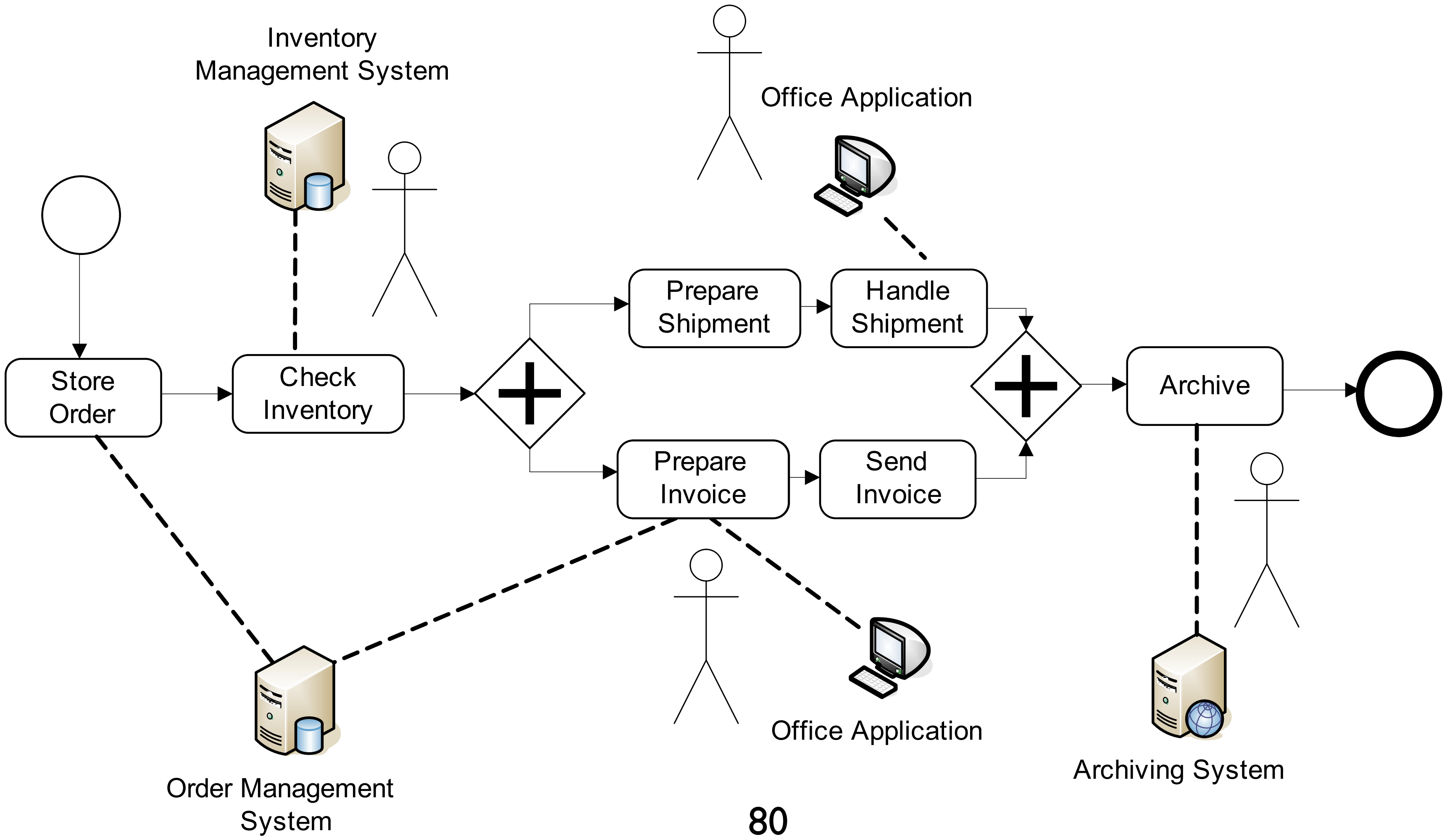
Definition: Workflows in which humans are actively involved and interact with information systems are called **human interaction workflows**.



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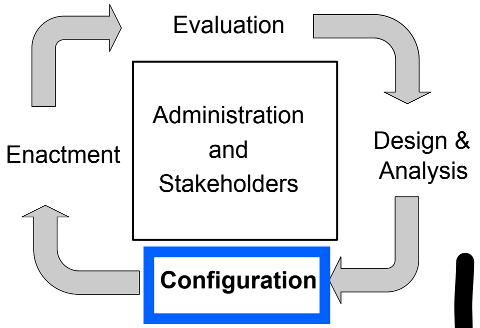


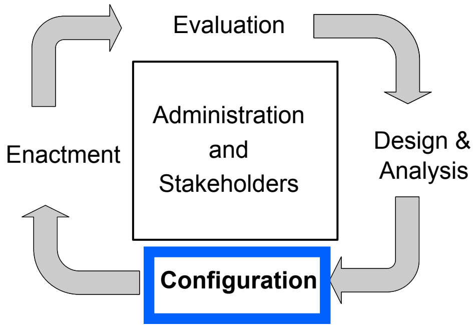
Human collaboration

When tasks performed by humans are present, it is not sufficient to equip workers with adequate software:

their collaboration must be supported:
shared data repositories and work handover can speed-up office procedure considerably

Goal: support automation by driving the human activities according to the process model

Benefits: reduce idle periods
avoid redundant work
improve human/machine work integration



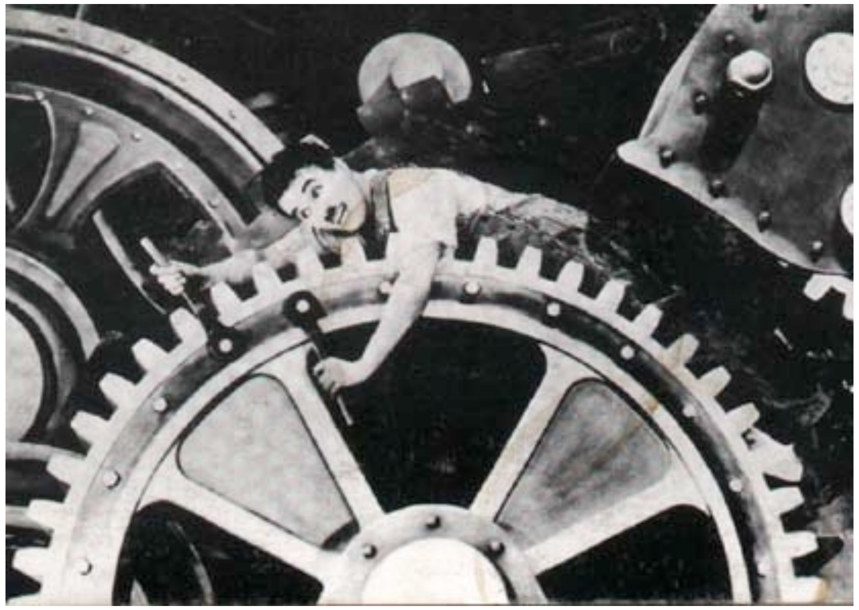
Some limitations

Problems with knowledge workers:

User acceptance issues

(Metropolis, 1927)

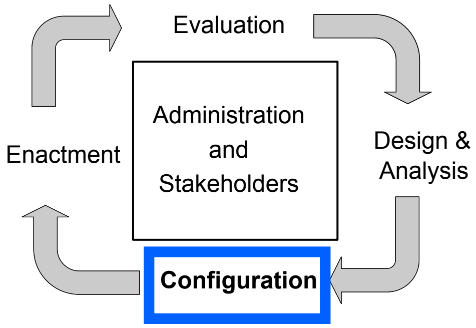
Machine burdening of workers



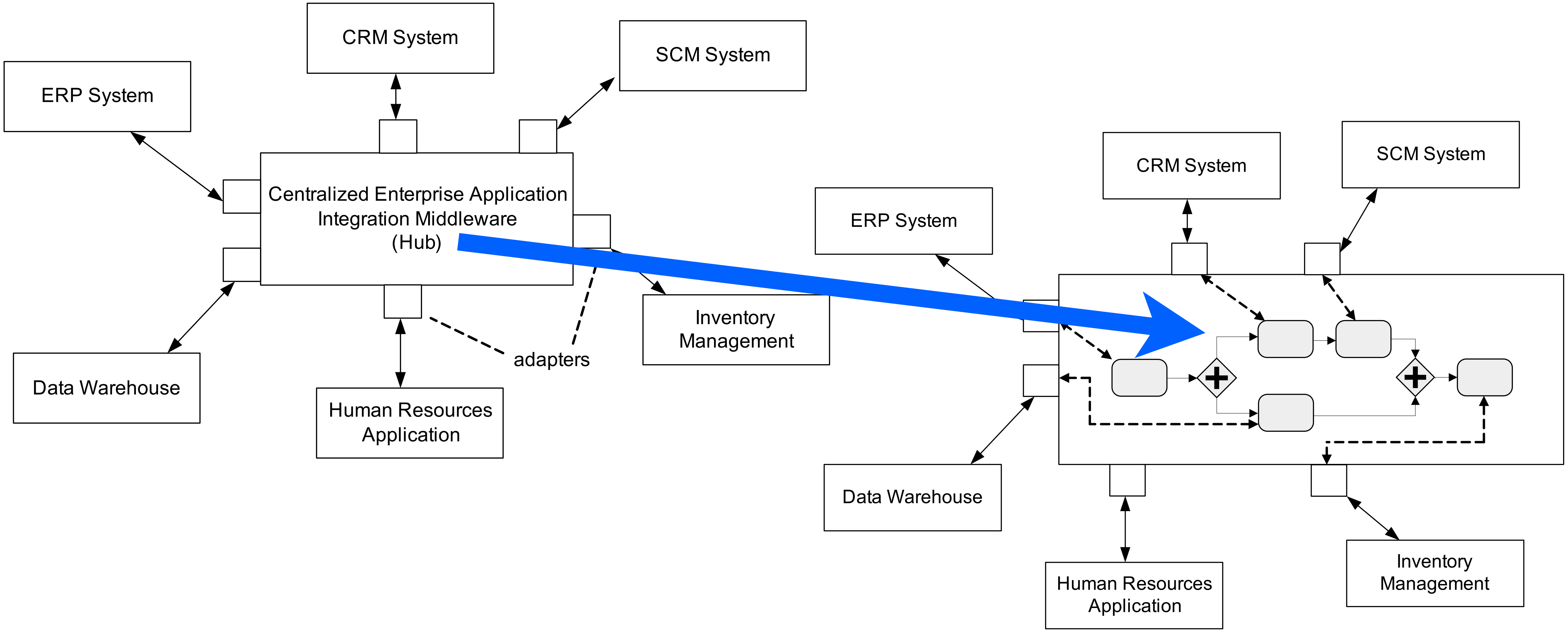
(Modern Times, 1936)

Little room for creativity and flexibility

(Metropolis, 1927)



Workflows fit well with hub-and-spokes EAI



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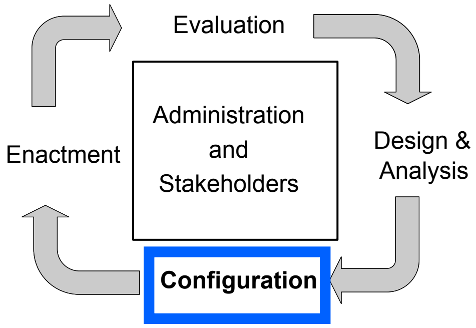
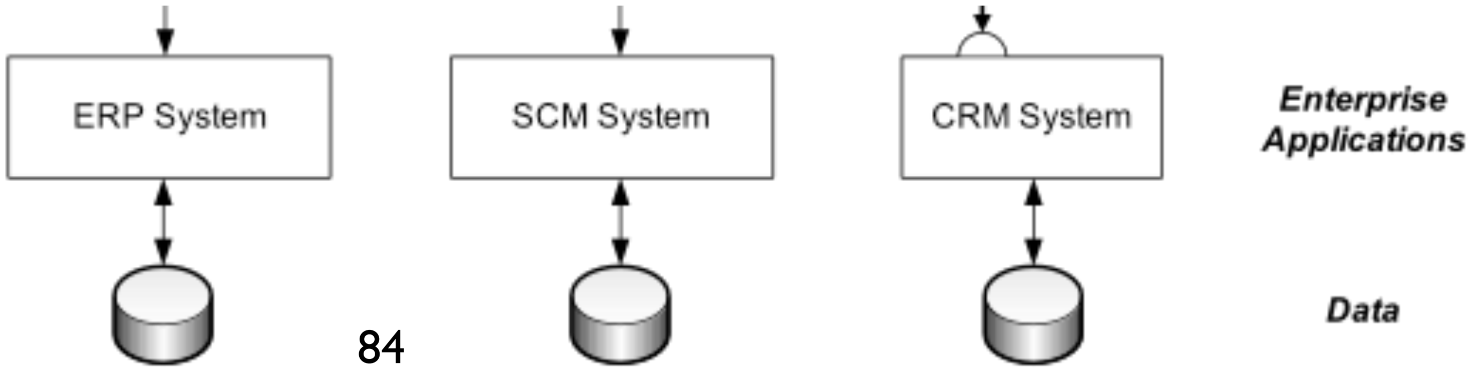
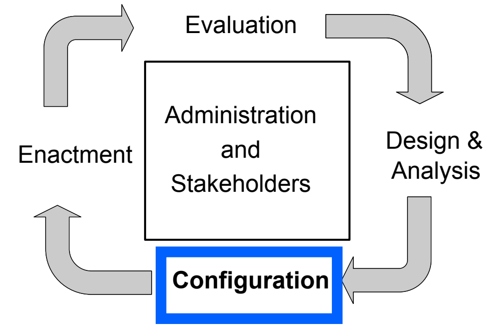
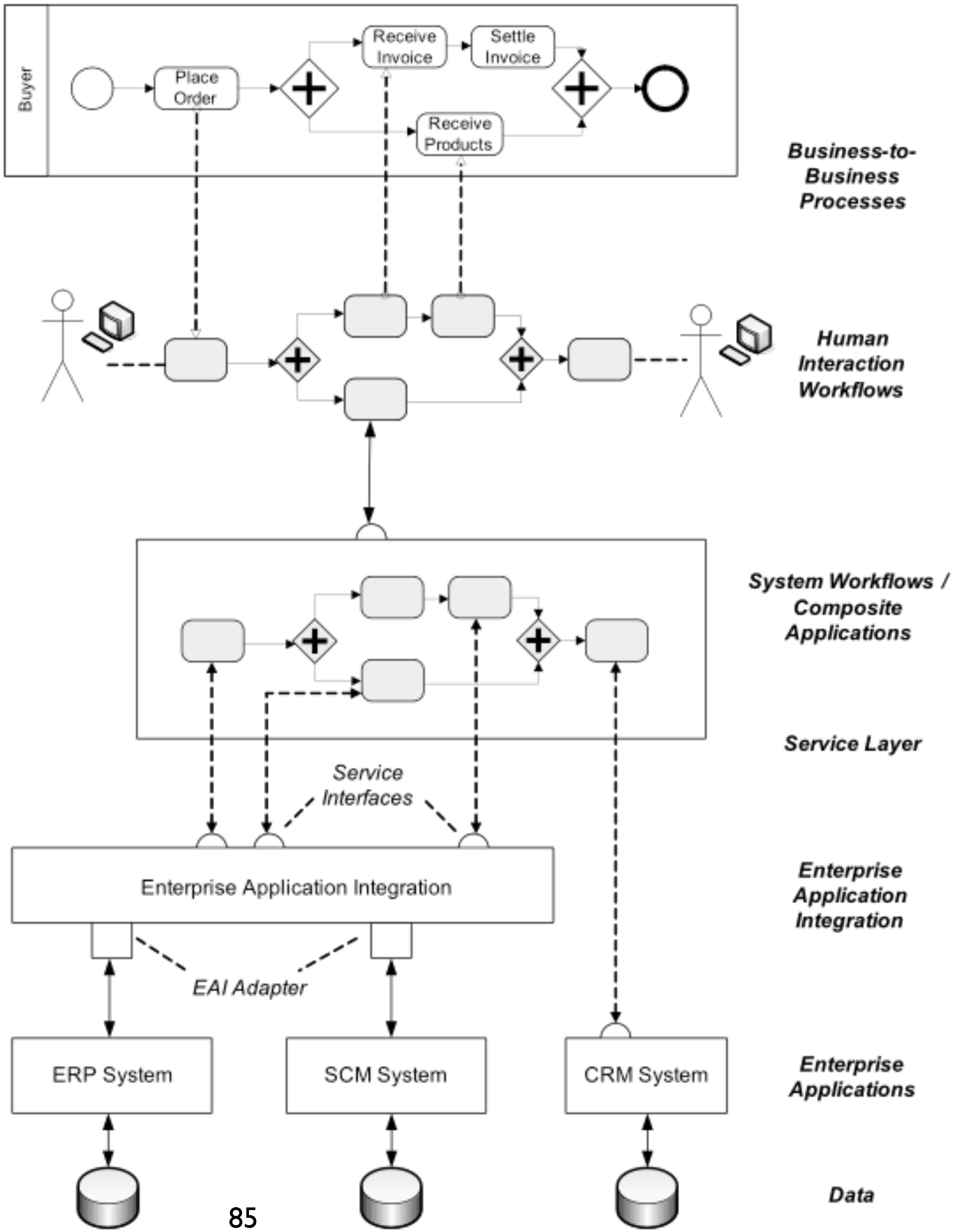

Evaluation
Administration and Stakeholders
Design & Analysis
Enactment
Configuration


ERP System
SCM System
CRM System
Enterprise Applications
Data




Buyer
Place Order
Receive Invoice
Settle Invoice
Receive Products
Business-to-Business Processes
Human Interaction Workflows
System Workflows / Composite Applications
Service Layer
Service Interfaces
Enterprise Application Integration
Enterprise Application Integration
EAI Adapter
ERP System
SCM System
CRM System
Enterprise Applications
Data

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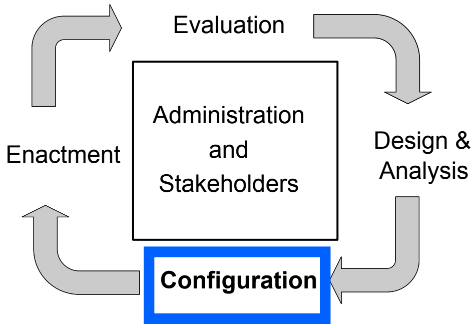


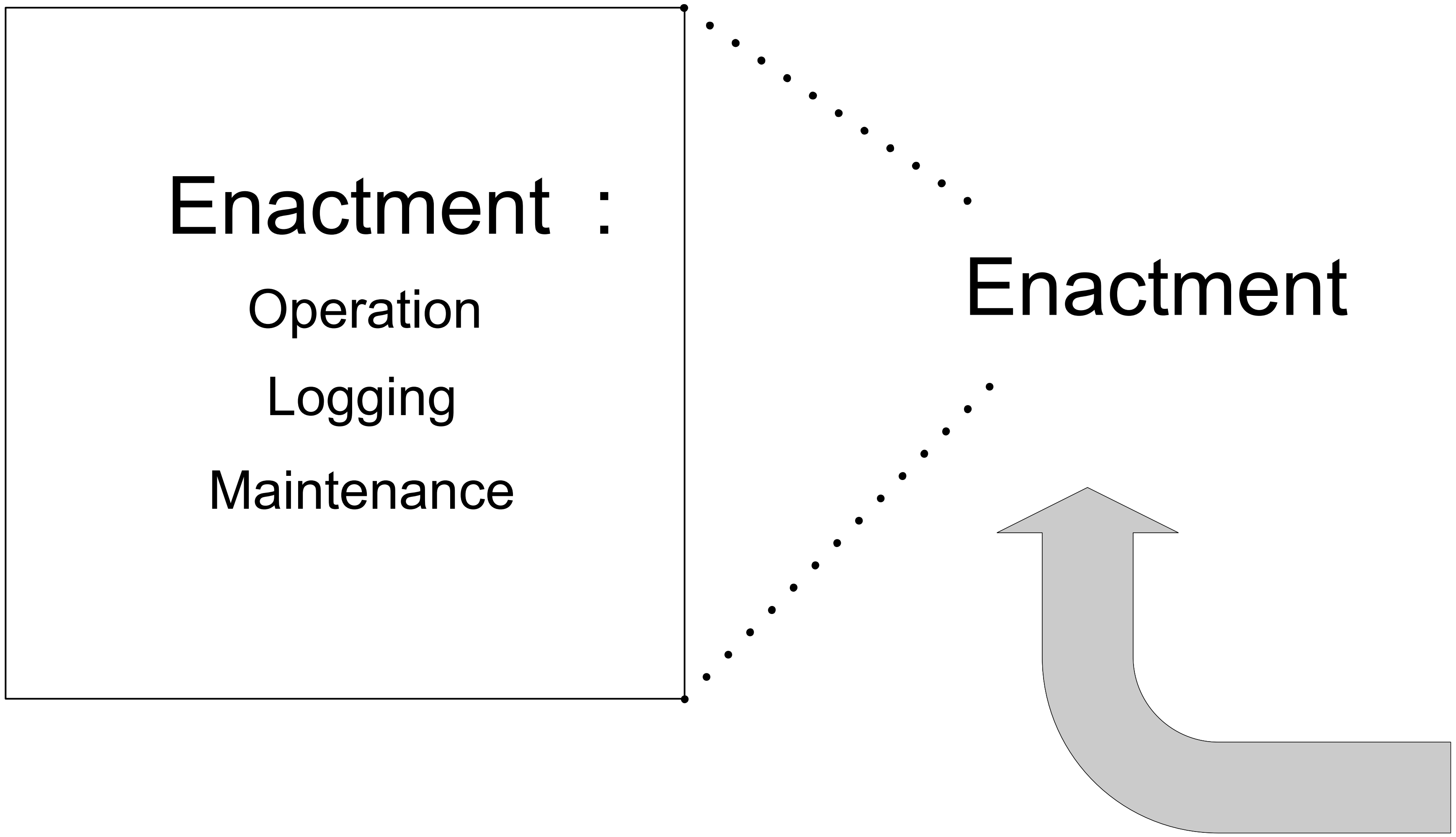
Testing

When the system is configured,
it must be tested before deployment

Usual testing techniques from SW engineering
Integration tests
Performance tests

Other possible activities:
training of personnel,
migration of application data

Business process lifecycle



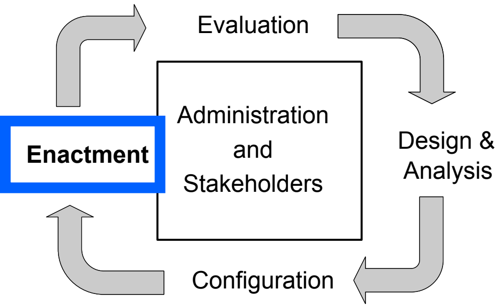
Enactment :

Operation

Logging

Maintenance

Enactment

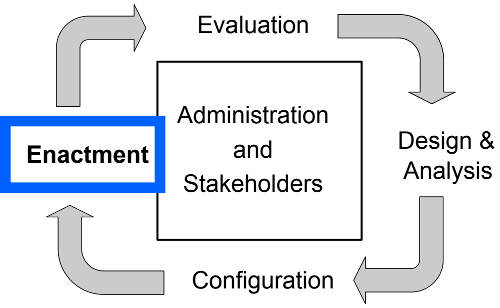


Enactment phase

When the system is deployed,
business process instances can be **enacted**

Typically, each process instance is initiated after an **event** occurs
(e.g., the receipt of an order)

The system must control and monitor the execution of all instances according to the model to guarantee a correct process **orchestration**
(e.g., respecting dependencies)

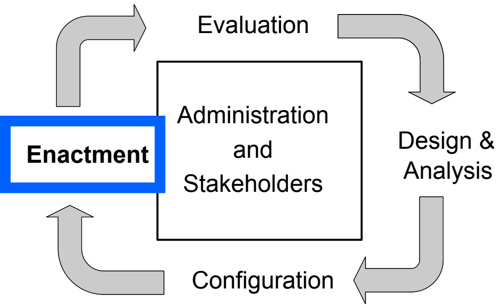


Enactment

Activities can be performed by employees **manually** or by the help of information systems

Other activities can be enacted **automatically** by information systems

Some activities can **trigger** or **inhibit** other activities



Evaluation

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Enactment

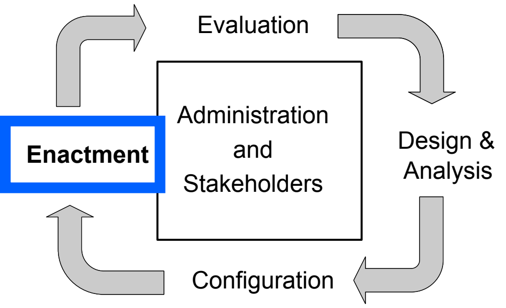
Logging

At each moment in time, the current **status** of any instance must be **known** (and **logged**) by the system as accurately as possible

Both for process instances and activity instances

Helpful visualization techniques can be provided by business process management systems (e.g., coloured activities)

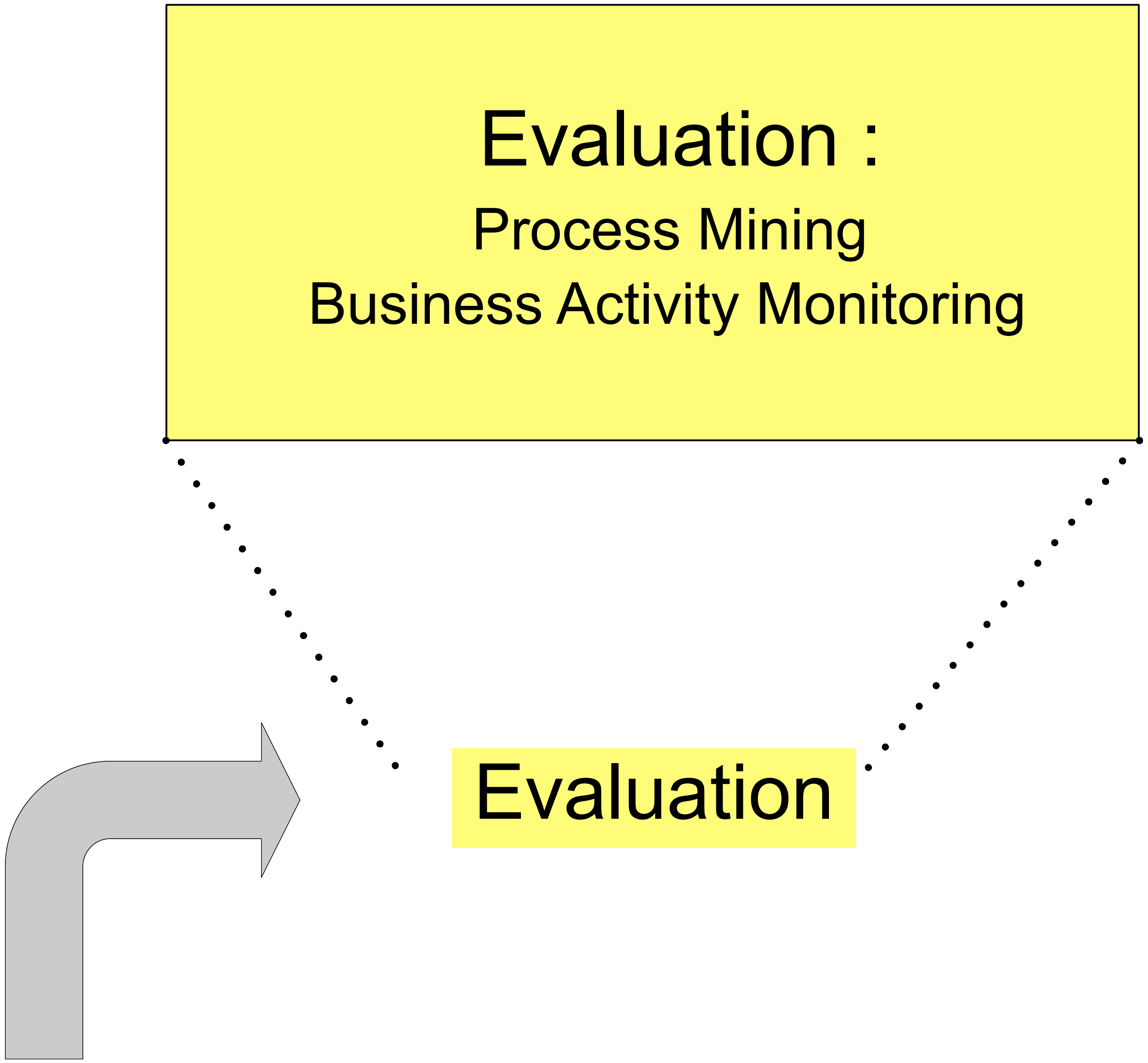
Such information is highly valuable for customers (e.g., tracking of orders)



Event Log Example

Case id	Event id	Properties				
		Timestamp	Activity	Resource	Cost	. . .
1	35654423	30-12-2010:11.02	Register request	Pete	50	. . .
	35654424	31-12-2010:10.06	Examine thoroughly	Sue	400	. . .
	35654425	05-01-2011:15.12	Check ticket	Mike	100	. . .
	35654426	06-01-2011:11.18	Decide	Sara	200	. . .
	35654427	07-01-2011:14.24	Reject request	Pete	200	. . .
2	35654483	30-12-2010:11.32	Register request	Mike	50	. . .
	35654485	30-12-2010:12.12	Check ticket	Mike	100	. . .
	35654487	30-12-2010:14.16	Examine casually	Pete	400	. . .
	35654488	05-01-2011:11.22	Decide	Sara	200	. . .
	35654489	08-01-2011:12.05	Pay compensation	Ellen	200	. . .

Business process lifecycle

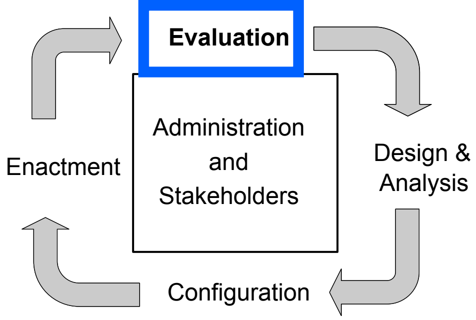


Evaluation :

Process Mining

Business Activity Monitoring

Evaluation

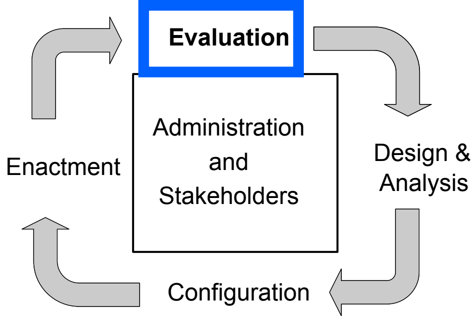


Evaluation phase

Execution **logs** are of fundamental importance

The information collected during instances enactment can be used to evaluate and improve business process models

Business **activity monitoring** and **process mining** techniques aim at identifying the quality of the model and the adequacy of the environment

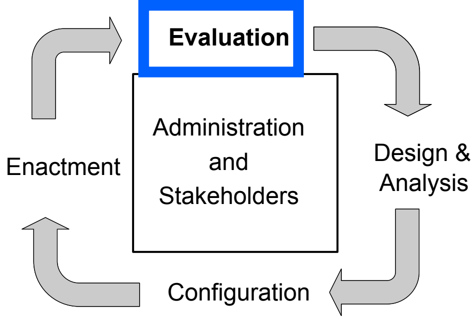


Monitoring

Log files typically include information such as the start / end timestamps of activity instances

Activity monitoring serve to identify that certain activities take too long or need more resources

The same information can be also exploited in the simulation sub-phase of the design and analysis phase

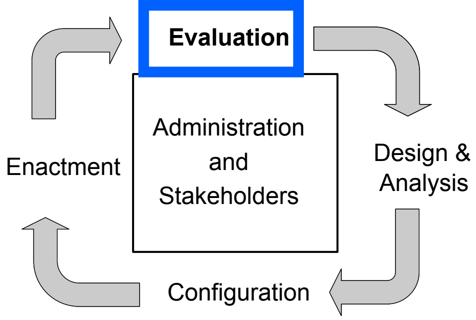


Mining

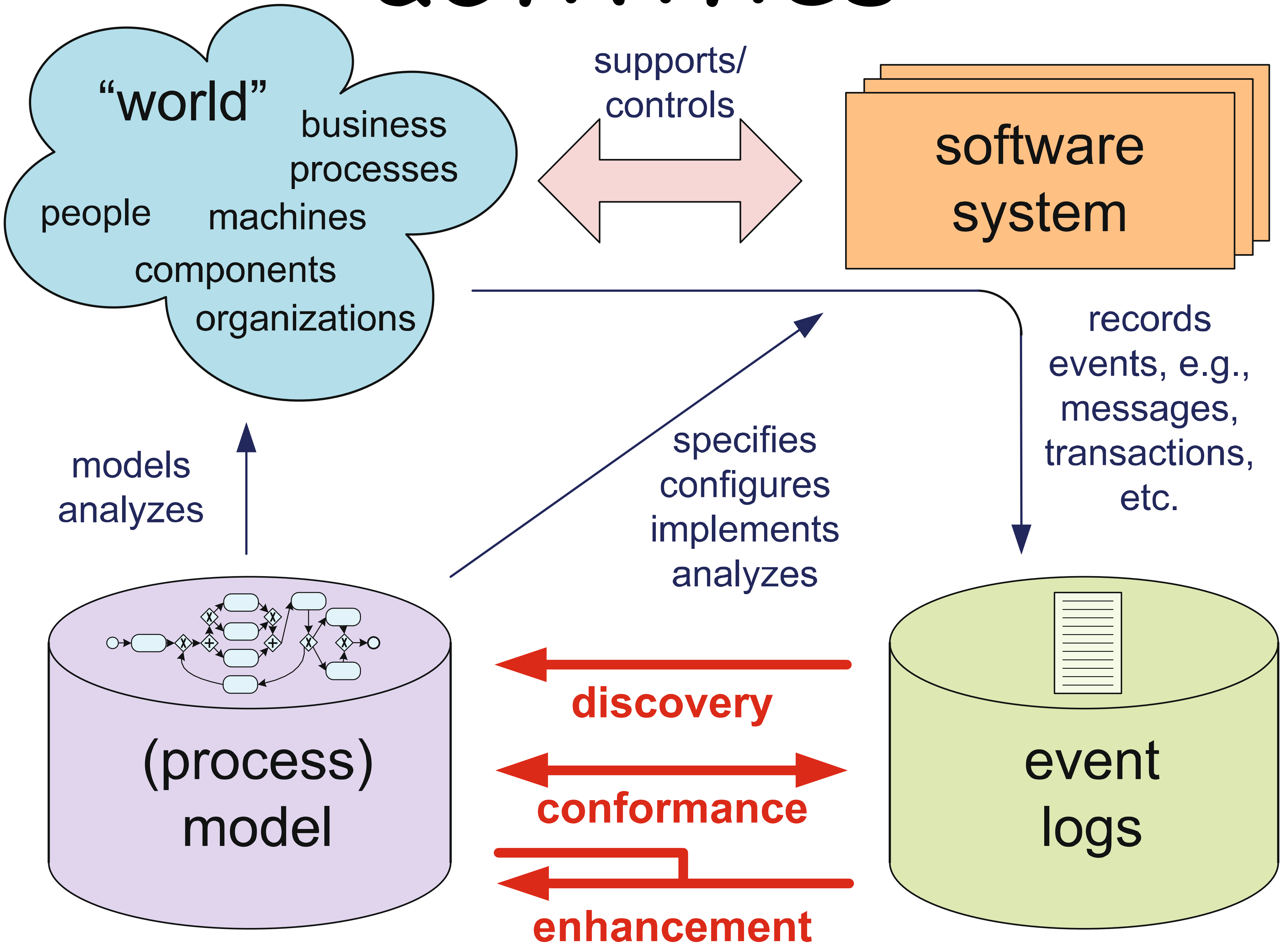
Process mining is an active field of research

Thanks to mining techniques, execution logs can be used for the automatic generation of business process models in the design and analysis phase (discovery)

They can also be used to assess and compare different models to see which fits best the enacted instances (conformance, enhancement)



Process Mining activities

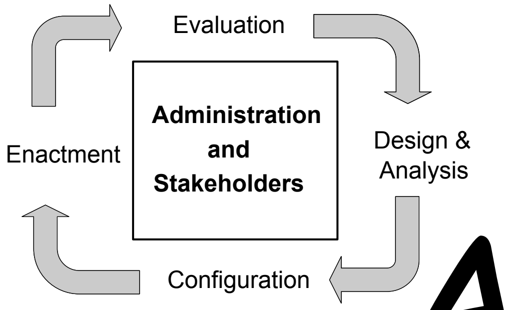


Business process lifecycle

Administration

and

Stakeholders

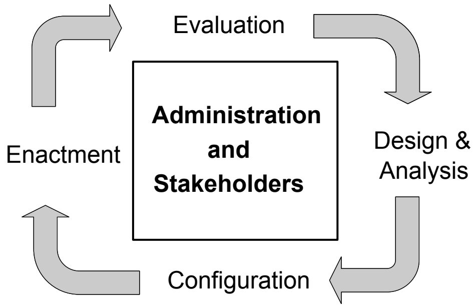


Administration phase

Business process management involves numerous artefacts at different levels of abstraction

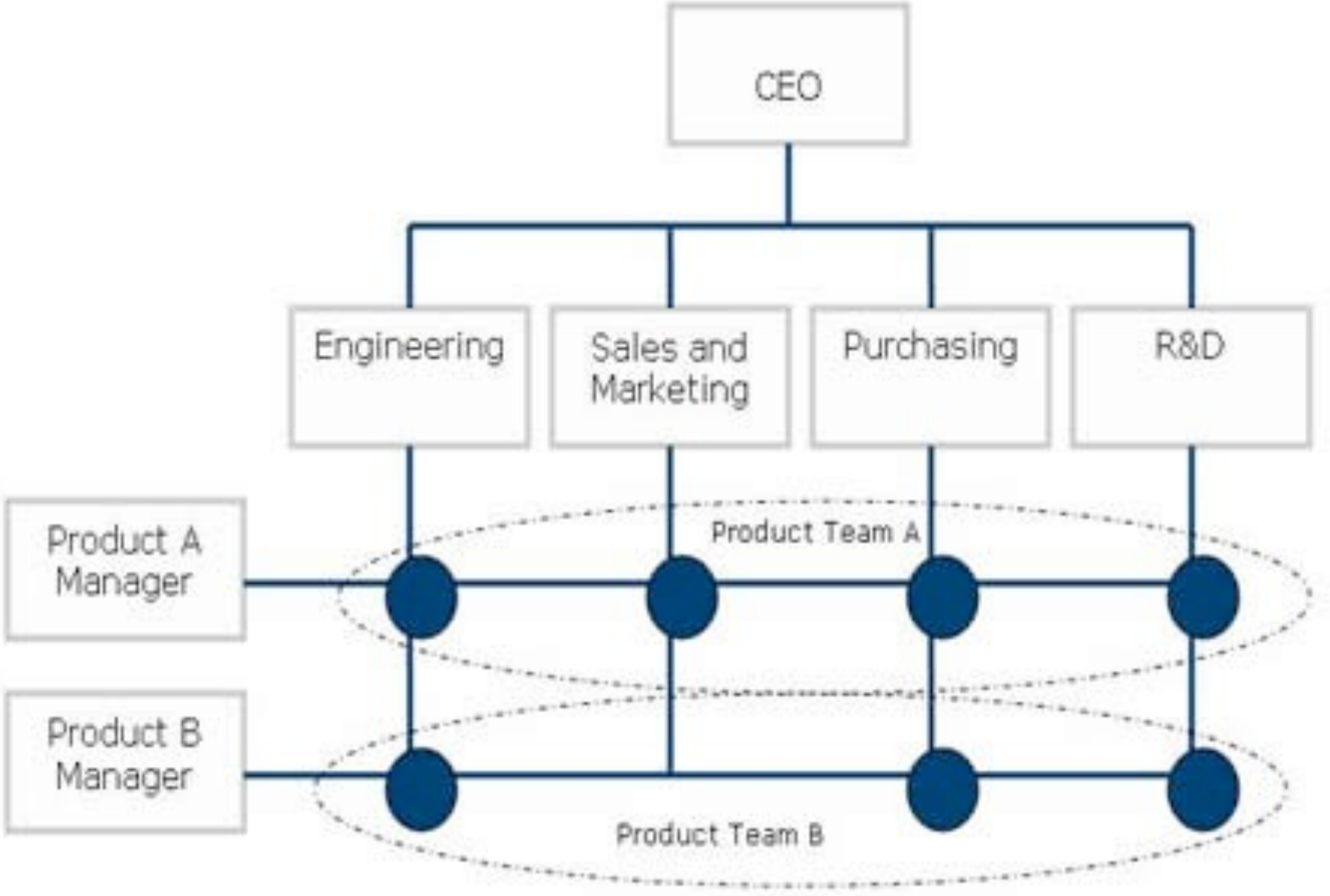
Such artefacts need to be organized and managed (storage, retrieval, disposal)

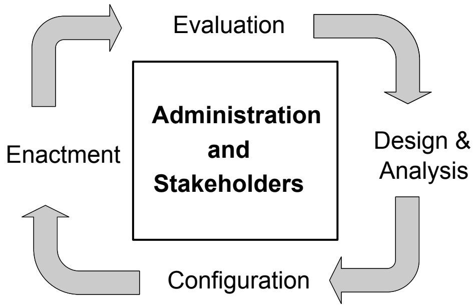
A well-structured repository is needed, with powerful query mechanisms



Context

Matrix organizational structure





Evaluation

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Enactment

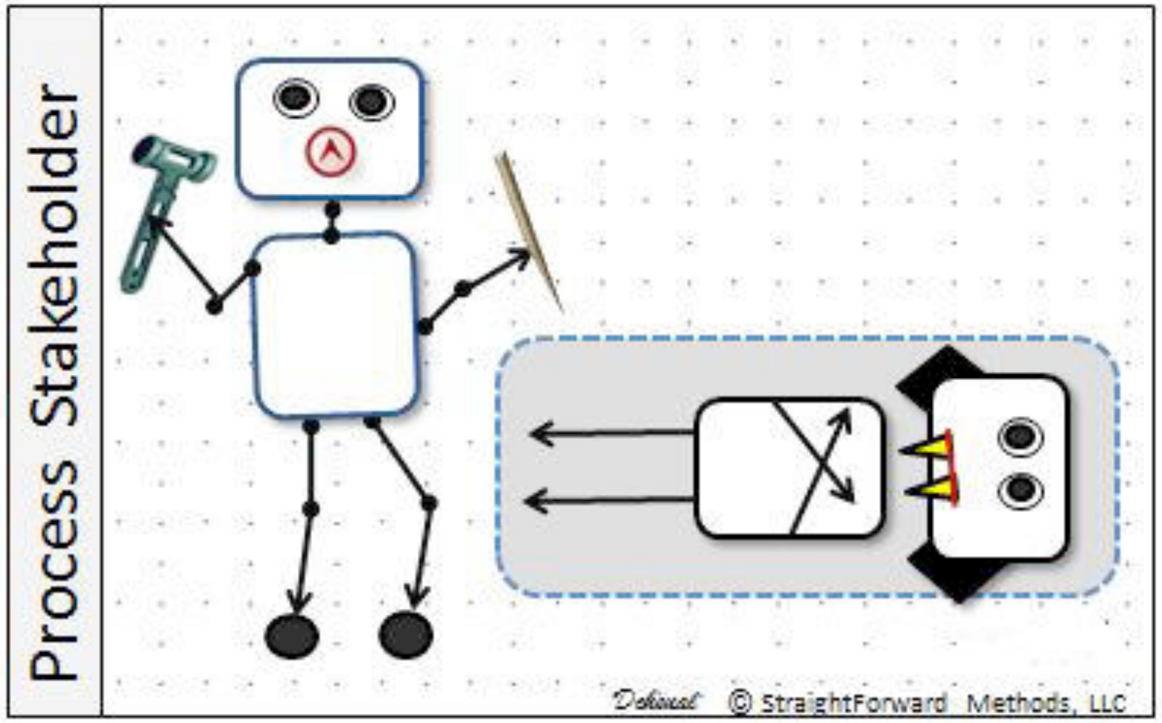
Administration and Stakeholders

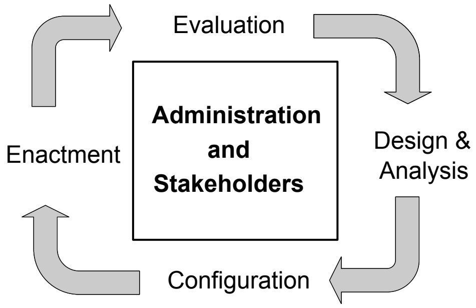
Stakeholders

Several types of stakeholders co-exist in the process domain

They have different kind of educational background, knowledge, expertise, experience

Roughly, they can be classified into a few roles

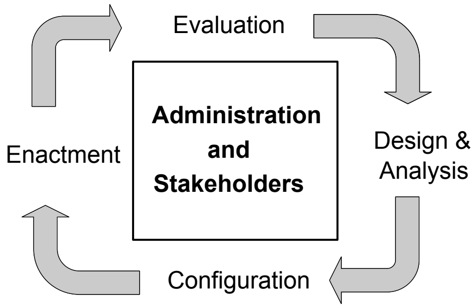




Chief process officer

Top level management
(CPO reports directly to CEO / board of directors)

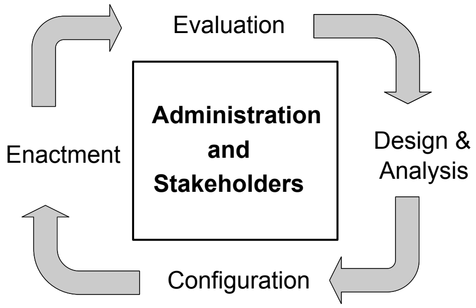
Responsible for defining **rules, policies and guidelines** and for standardizing and harmonizing business processes in the enterprise



Business engineer

Business domain expert
responsible for defining **strategic goals** of the company and **organizational business processes**

Often equipped with non-technical educational background (mostly economics)
simple-to-use process modeling notation are the perfect communication mean



Evaluation

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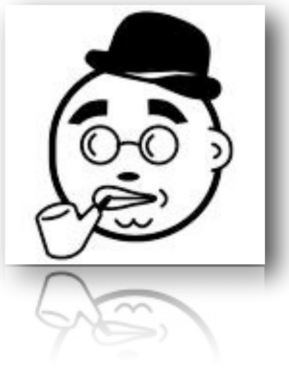
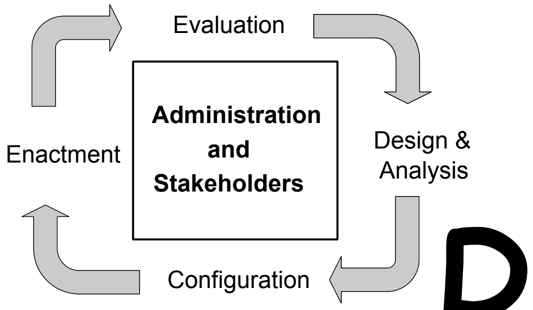
Process designer

Responsible for **modeling business processes** by communicating with business domain experts and other stakeholders

Must be equipped with good analytical capabilities and **excellent communication skills**



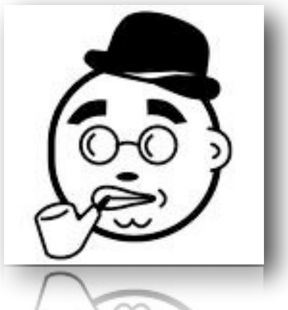


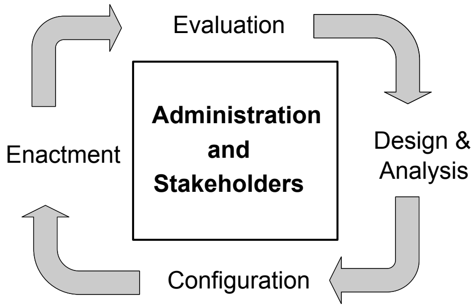
Process participants

Conduct the actual **operational work** during the enactment of processes

They are knowledgeable about the activities conducted, fundamental information for the modeling phase

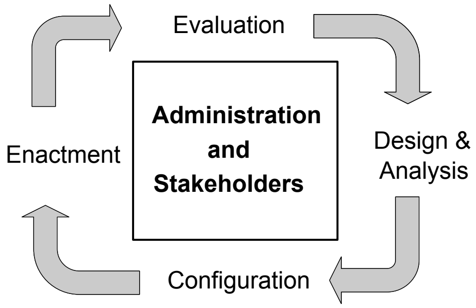
Their information must be assembled by the designer to compose an overall picture in the process model





Knowledge worker

Process participants who use software systems to **perform activities** in a business process, often autonomously



Evaluation

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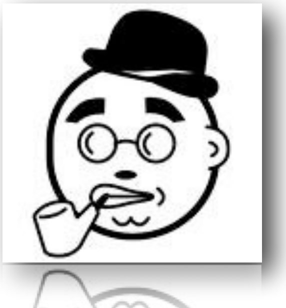
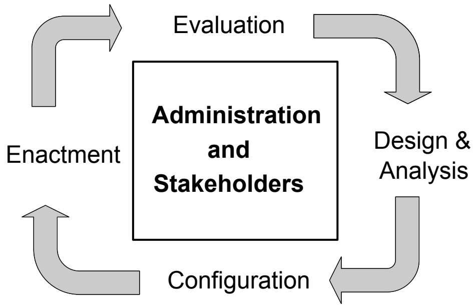
Process responsible

An individual who is held responsible for the correct and efficient execution of all instances of a business process model

Responsible for **detecting inefficiencies** and **improving** the process model

Close collaboration with process participants and the process designer is needed





Evaluation

Administration and Stakeholders

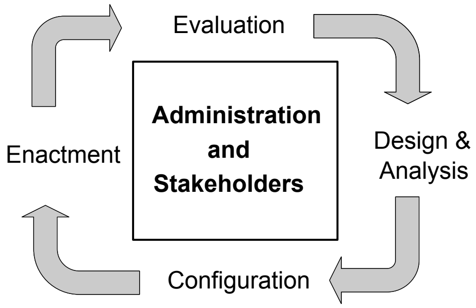
Enactment

Design & Analysis

Configuration

System architect

Responsible for developing and **configuring** business process management systems on the information system infrastructure at hand

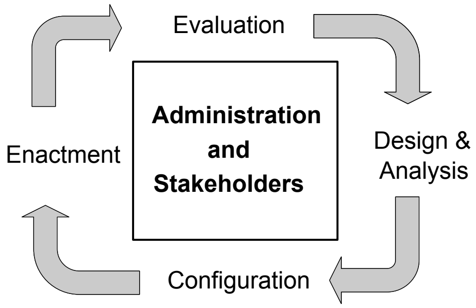


Developers

Information technology professionals

Responsible for creating the **software artifacts** required to implement business processes

Implementation of interfaces is a relevant part of the work done by developers



Evaluation

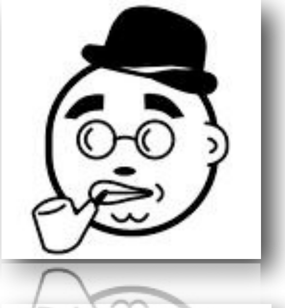
Design & Analysis

Configuration

Enactment

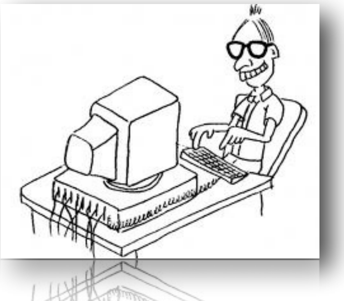
Administration and Stakeholders

Chief Process Officer: policies and guidelines



Business Engineer: organizational business processes

Process Designer: business processes modeling



Process Participants / Knowledge Workers: operational work

Process Responsible: monitoring and improvement

System Architect / Developers:
IT infrastructure and SW artefacts configuration

Requirements gone bad

How the customer explained it