Methods for the specification and verification of business processes
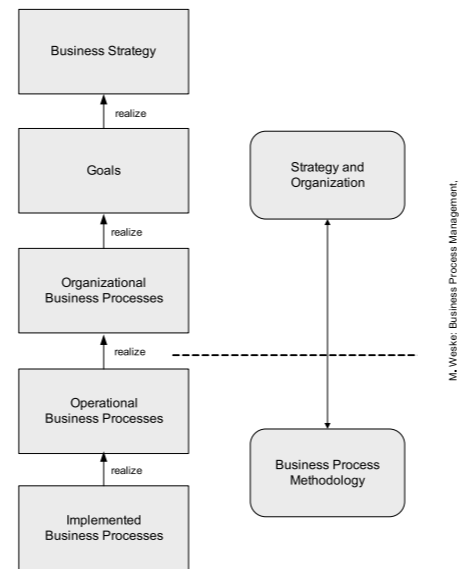## MPB (6 cfu, 295AA)

Roberto Bruni
http://www.di.unipi.it/~bruni
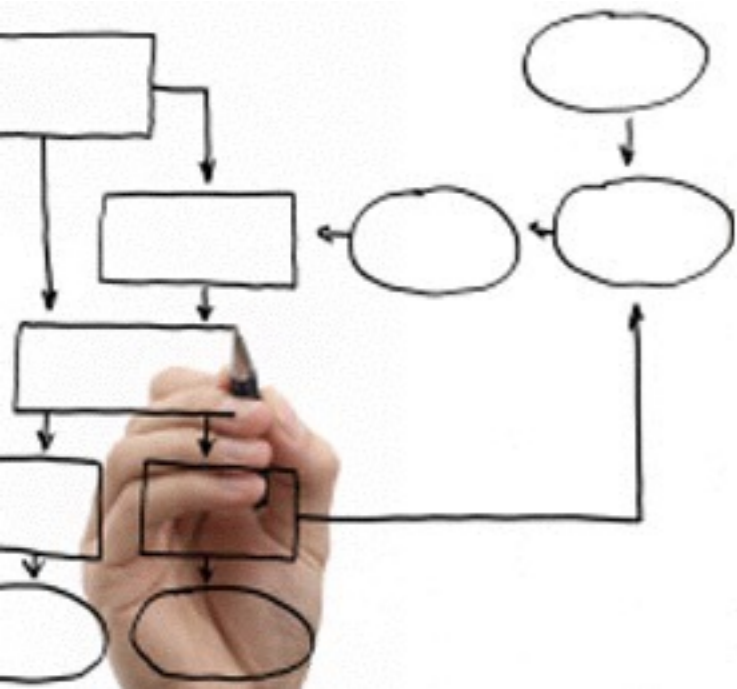
05 - Methodology

Objective

Coarse-grained methodology for developing business process management solutions

Guidelines for process designers to plan and conduct business process management projects

Ch.1.3, 8 of Business Process Management: Concepts, Languages, Architectures

Levels of business processes

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

determines   realize

Business strategies

Competitive Advantage
A competitive advantage is one gained over competitors by offering consumers better value.

You increase value by lowering prices or increasing benefits and services to justify the higher price.

Business strategies

Cost Leadership Strategy
To compete for the largest number of customers through price.

Cost leadership pays off when the goods or services are standardized: generic acceptable goods sold at the lowest prices.

Minimize costs to the company and minimize costs to the customer without decreasing profits.

Business strategies

Differentiation Strategy

Provide a product or service with distinctive qualities valued by customers.

Attract customers because products are set apart from the competition.

Leading scientific research needed:
highly skilled and creative product development team; a strong sales and marketing team.

Business strategies

Focus Strategy

Concentrate on a particular customer, product line, geographical area, to serve a limited group of customers better than any competitor who serve a broader range of customers.

A focus strategy works well for small but aggressive businesses.

Levels of business processes

Business Strategy

determines | realize

Operational Goals

determine | realize

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

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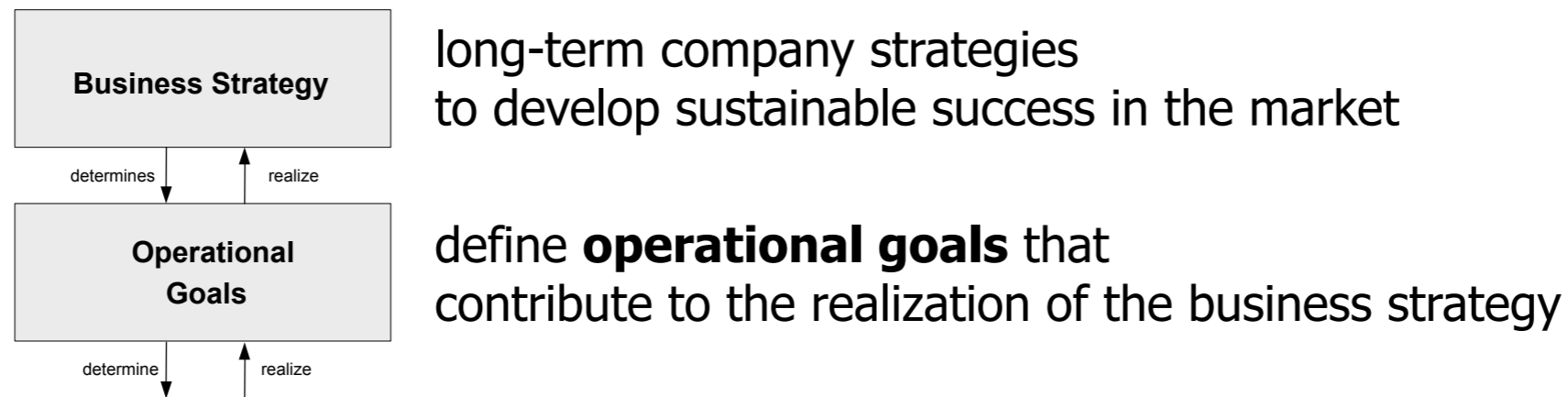
Operational goals

Management implements the business strategy by defining operational goals.

Profitability:

to increase revenue while limiting expenses

Customer Service:

to improve response time to customer complaints

Efficiency:

to implement a new shipping procedure that improves delivery time

Levels of business processes

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

Business Strategy

determines | realize

Operational Goals

determine | realize

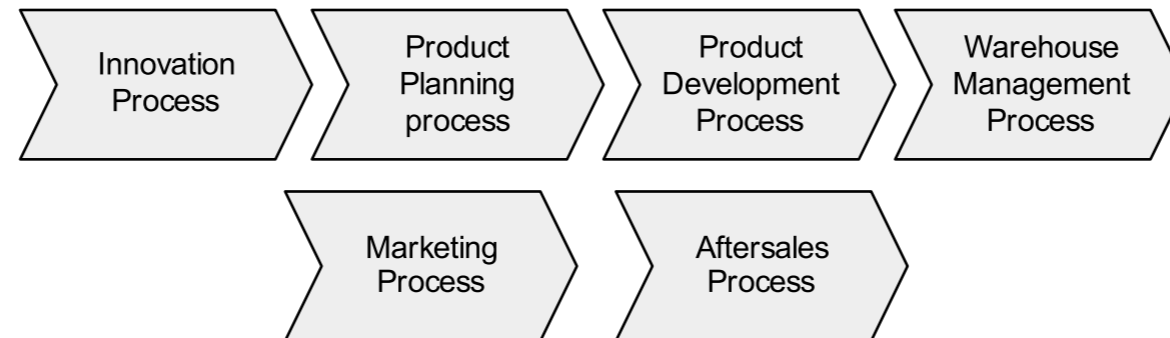**Organizational Business Processes**

determine | realize

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

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

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

Organizational BP (manufactoring company)

```
┌─────────────┐  ┌─────────────┐  ┌─────────────┐  ┌─────────────┐
│  Innovation │  │   Product   │  │   Product   │  │  Warehouse  │
│   Process   │  │   Planning  │  │ Development │  │ Management  │
│             │  │   process   │  │   Process   │  │   Process   │
└─────────────┘  └─────────────┘  └─────────────┘  └─────────────┘

        ┌─────────────┐  ┌─────────────┐
        │  Marketing  │  │  Aftersales │
        │   Process   │  │   Process   │
        └─────────────┘  └─────────────┘
```

Structure of High-Level Organizational BP

Stakeholdes =
partners +
customers +
personnel +
experts +
...

Business Strategy

influences decisions

Business Process Management– Organizational Level

Stakeholders

influence

| Innovation Process | Product Planning process | Product Development Process | Warehouse Management Process |

| Marketing Process | Aftersales Process |

influence

Stakeholders

enable and support larger units of work

Information Systems

Organizational BP (manufactoring company)

Business Strategy

influences decisions

Business Process Management– Organizational Level

| Management | Organization | Controlling |

influences **influences** **influences**

Innovation Process

Product Planning process

Product Development Process

Warehouse Management Process

Marketing Process

Aftersales Process

Stakeholders **influence**

influence **Stakeholders**

influences

Optimization

enable and support larger units of work

Information Systems

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

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Influences

Management+Organization => BP identification
Management+Organization => CPO selection
Management+Organization => resp. selection
Management+Organization => roles selection

Controlling => is the BP efficient?
Controlling => are business goals met?
Controlling => KPI selection and measurement
(e.g. response time, error-rate, cost saving)

Controlling+Optimization => BP improvements

Organizational process

Innovation Process

Innovation process
Conception + Implementation + Marketing

Conception input: Requirement analysis
Conception output: Project planning

Implementation input: Plan
Implementation output: Pilot application

Marketing input: Prototype
Marketing output: Market launch

Organizational process

Product
Development
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

Intra-organizational process

No interaction with business processes performed by other parties (single organization processes)

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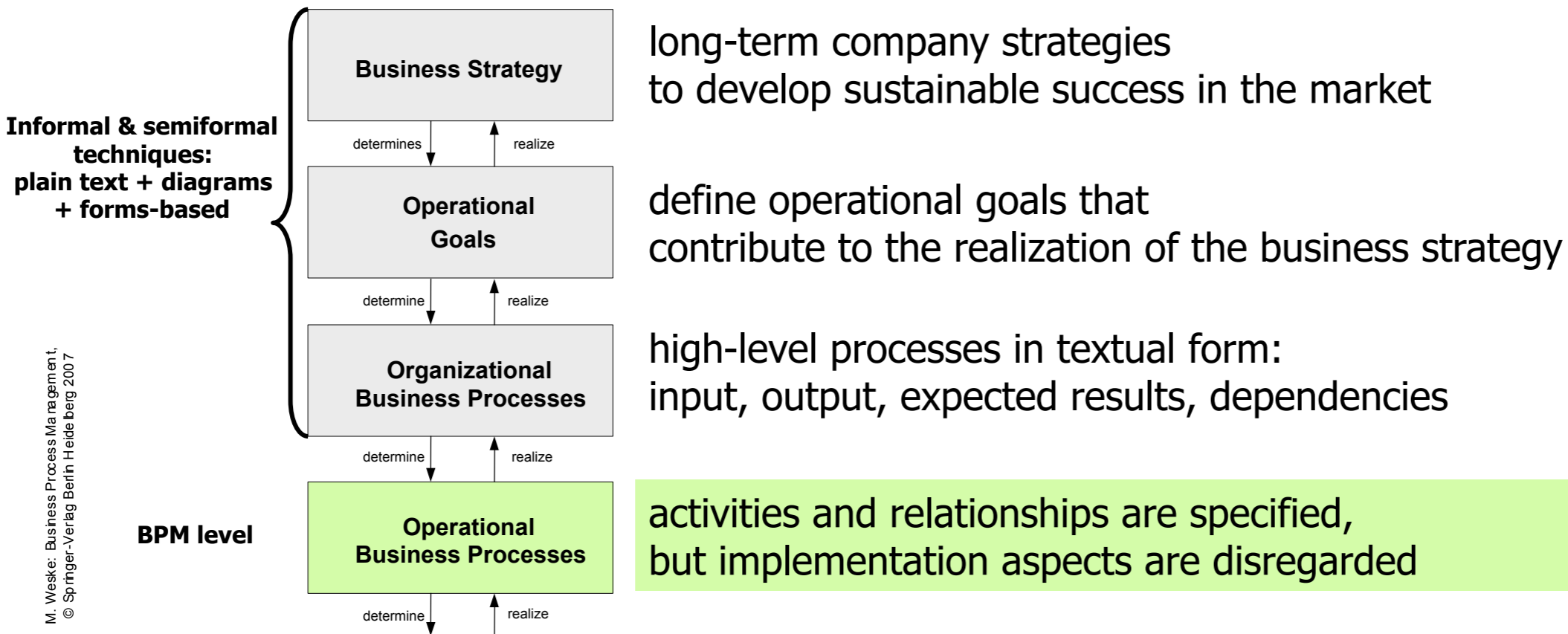
Orchestration!

Inter-organizational process

Business-to-business process, value system
(multiple organizations)

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

Choreographies!

Levels of business processes

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

BPM level

Box	Description
Business Strategy	long-term company strategies to develop sustainable success in the market
Operational Goals	define operational goals that contribute to the realization of the business strategy
Organizational Business Processes	high-level processes in textual form: input, output, expected results, dependencies
Operational Business Processes	activities and relationships are specified, but implementation aspects are disregarded

determines / realize

determine / realize

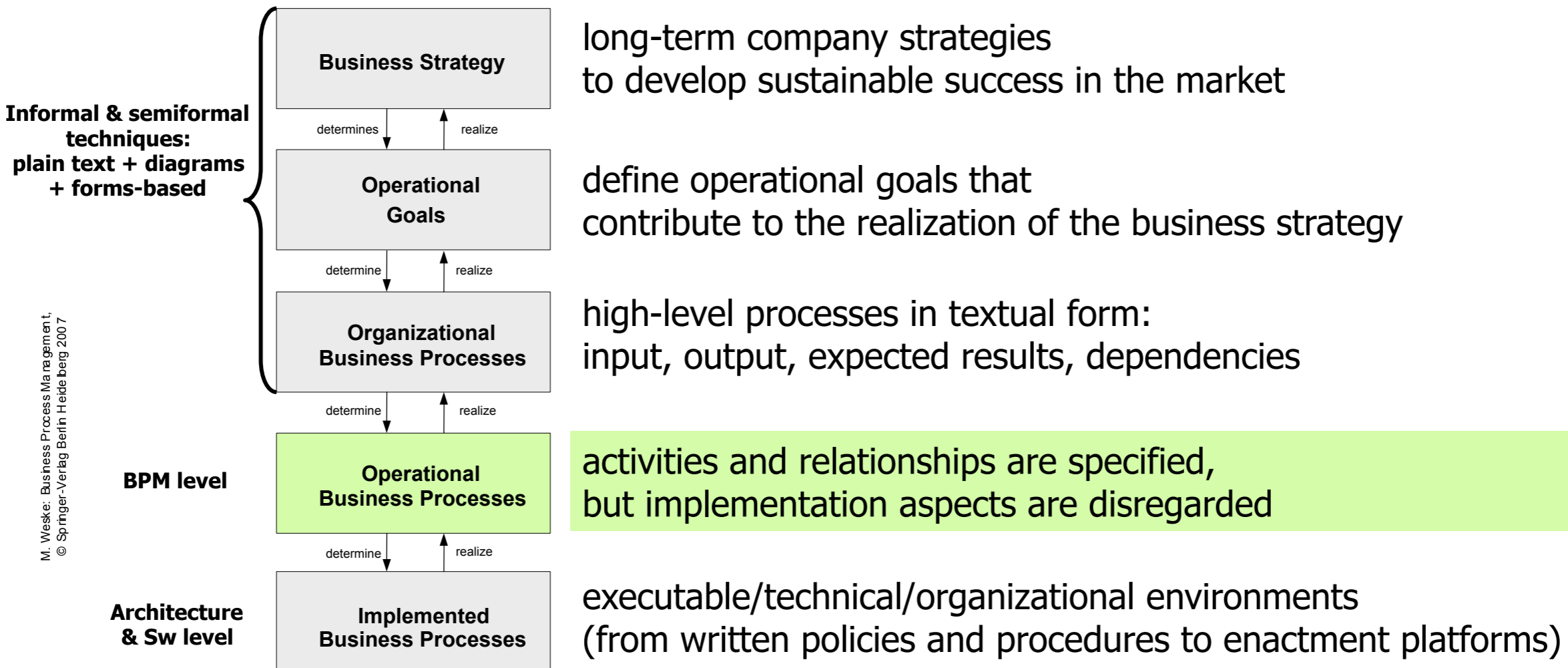determine / realize

determine / realize

Repetitive vs collaborative

Highly **repetitive processes**,
fully automated, no human involvement:
process automation can pay off
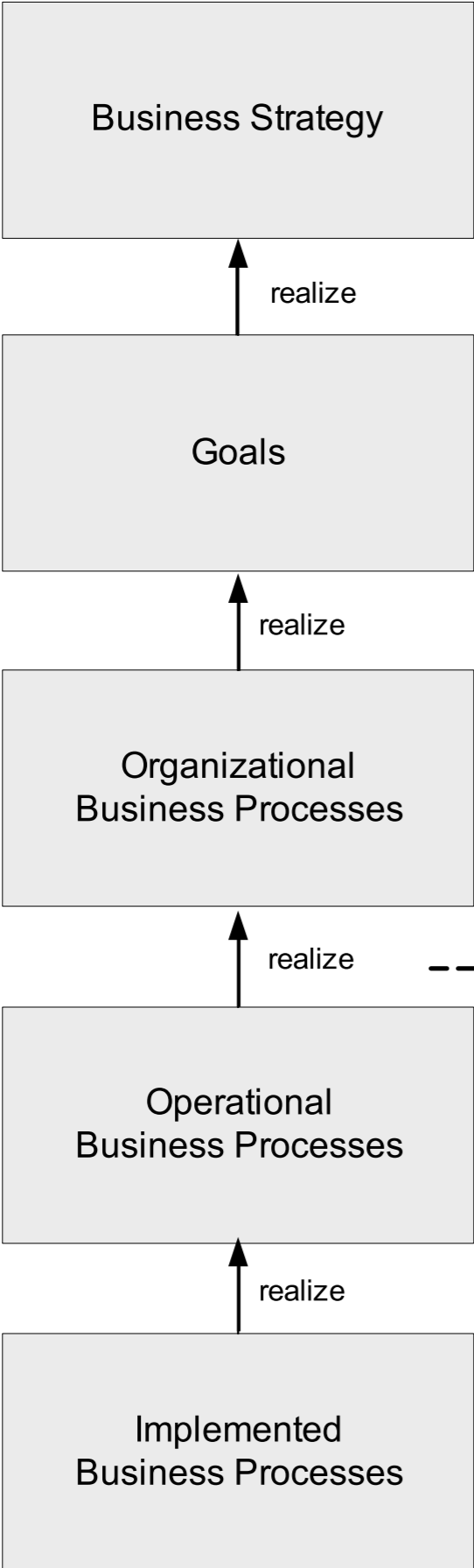(e.g. online airline ticketing)

On the opposite, **for rarely enacted processes it is questionable if the effort of modeling can pay off**
(e.g. vessel design: cost per instance too high)

Collaborative business processes,
low degree of repetition, involved persons are at the centre of attention: allow to track relationships
(human activities, no cost for automation)

Levels of business processes

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

BPM level

Architecture & Sw level

Business Strategy
determines / *realize*

Operational Goals
determine / *realize*

Organizational Business Processes
determine / *realize*

Operational Business Processes
determine / *realize*

Implemented 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

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)

Levels of Business Processes

Business Strategy

↑ realize

Goals

↑ realize

Organizational Business Processes

↑ realize

Operational Business Processes

↑ realize

Implemented Business Processes

Strategy and Organization

Focus on overall operations of the company

Determine the operational goals, such as focus on customers, cost efficiency, leadership in innovation or quality or price

Business Process Methodology

Focus on individual business processes

Operational business processes design: Guidelines

Guideline #1

Recursively:
Collect observations
Classify information
Validate findings with stakeholders
Refine artefacts

Guideline #2

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

Prepare a domain ontology to fix a common understanding of terms and concepts in the application domain

Guideline #3

Represent the (textual) gathered information as
business process model(s)

Exploit the model as a **communication basis**
to consolidate findings and
improve the organizational/technical environments
(e.g., acquire new skills, move to service-orientation)

Rules for identifying business processes

1 - 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

(remind that a customer can be internal to the organization, e.g. a department)

Rules for identifying business processes

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

(individual in charge of making sure that process instances are conducted correctly and that business goals are met)

Rules for identifying business processes

3 - which tasks?

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

Rules for identifying business processes

4 - which dependencies?
Execution constraints are used to order activities in the business process in a way that enterprise resources are used efficiently and at the same time the business goals are met

(process orchestration language are used to express process execution constraints)

Guideline #4

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
but also a non-technical one
(e.g., written business policies, manual procedures, service-oriented architecture)