

# Business Process as a Service BPaaS Design

Training Material



funded by EC in H2020

CloudSocket

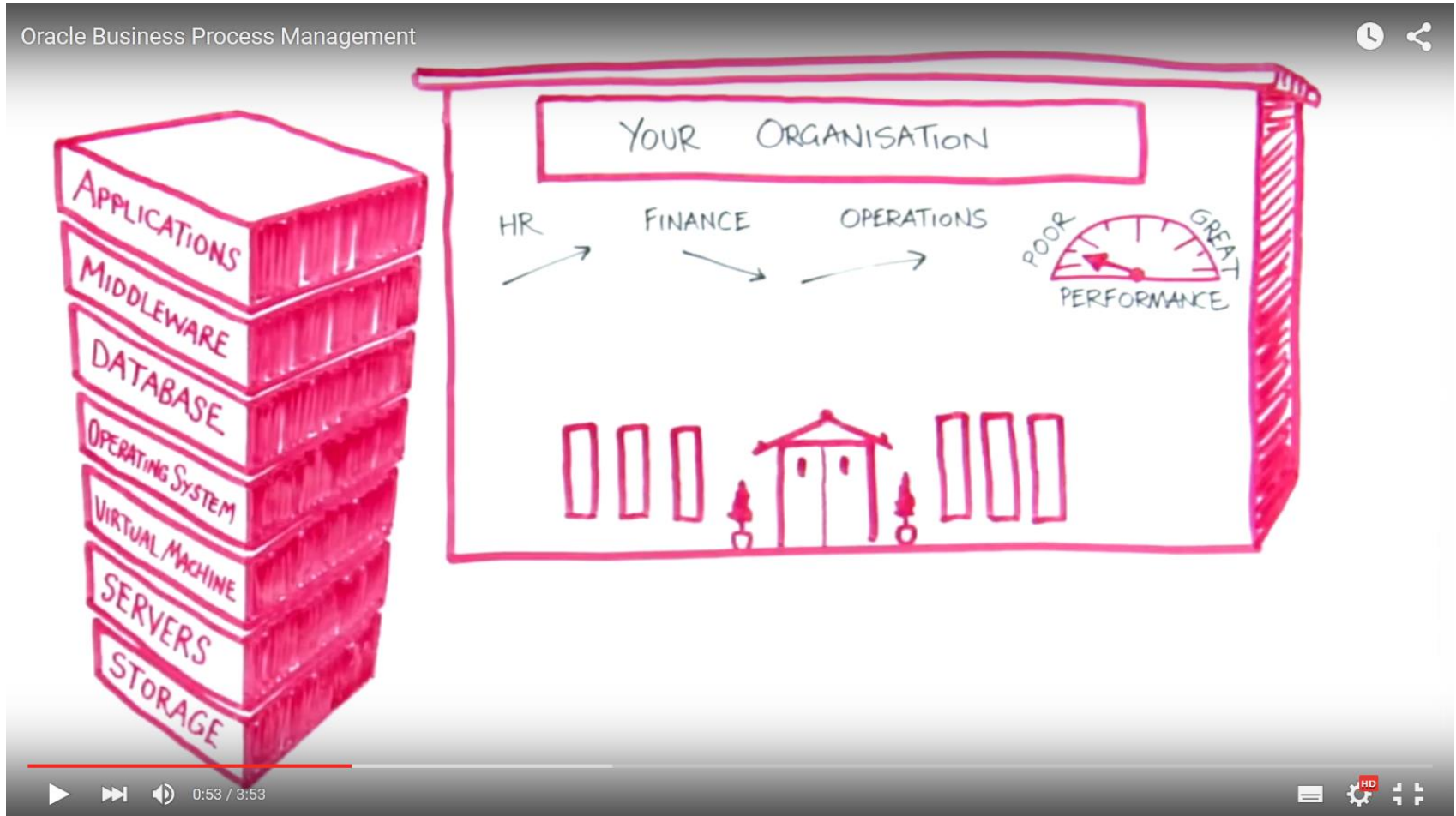
# **INTRODUCTION TO BUSINESS PROCESS MANAGEMENT**

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*“If you can’t explain it simply, you don’t understand it well enough.”*

Albert Einstein

# Introduction on Youtube



<https://www.youtube.com/watch?v=zr3Ph1mbHAU>

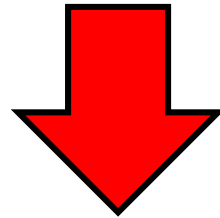
[www.cloudsocket.eu](http://www.cloudsocket.eu), [info@cloudsocket.eu](mailto:info@cloudsocket.eu)

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# Business Process Definition

“One man draws out the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head: to make the head requires two or three distinct operations: to put it on is a particular business, to whiten the pins is another ... and the important business of making a pin is, in this manner, divided into about eighteen distinct operations, which in some manufactories are all performed by distinct hands, though in others the same man will sometime perform two or three of them.”

(Adam Smith, 1776)



“A business process is a set of logically related tasks performed to achieve a defined business outcome” (Davenport, 1993).

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# Why BPM?

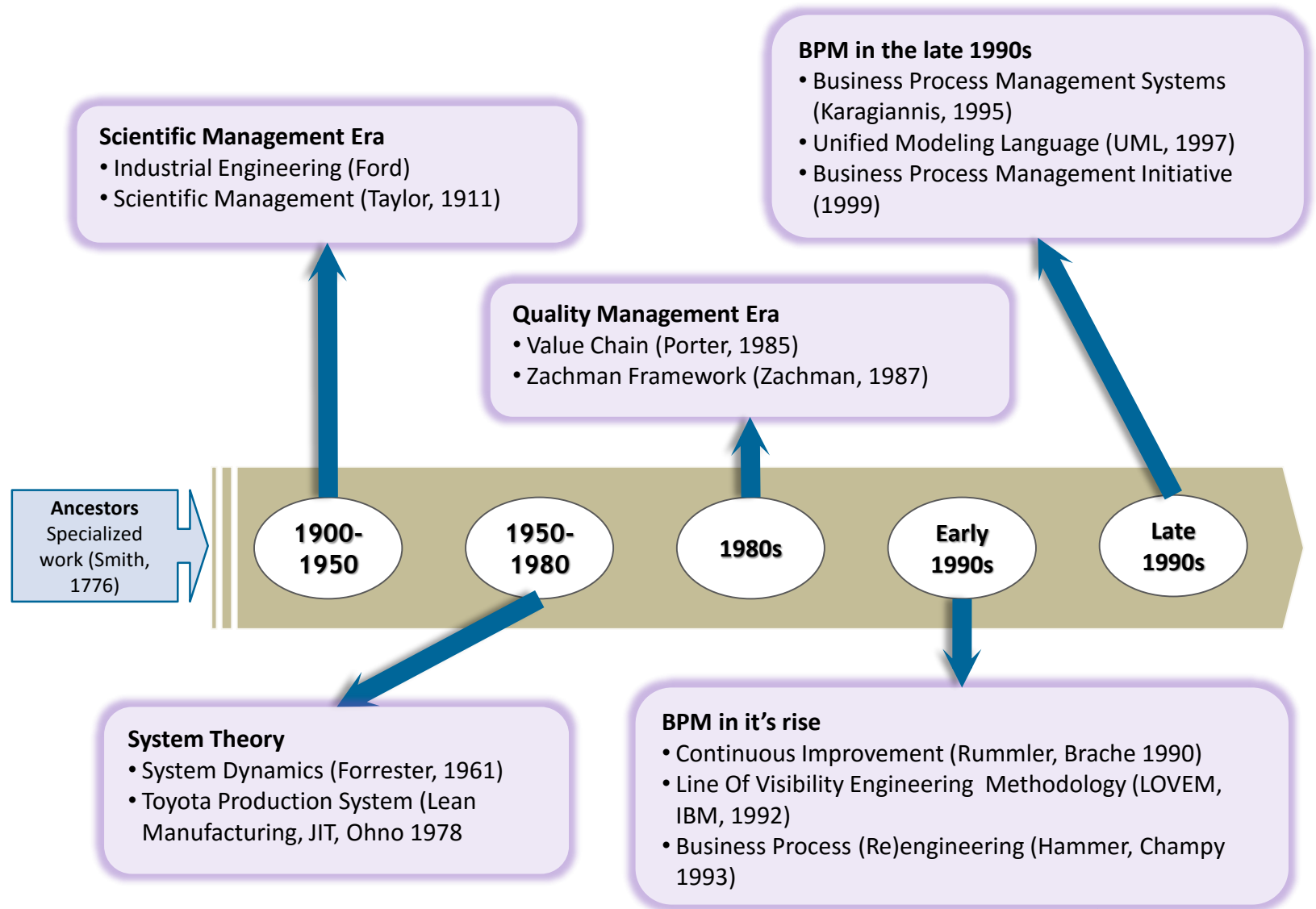
The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency.

The second is that automation applied to an inefficient operation will magnify the inefficiency.

(Bill Gates)

# WHEN DID BUSINESS PROCESS MANAGEMENT START?

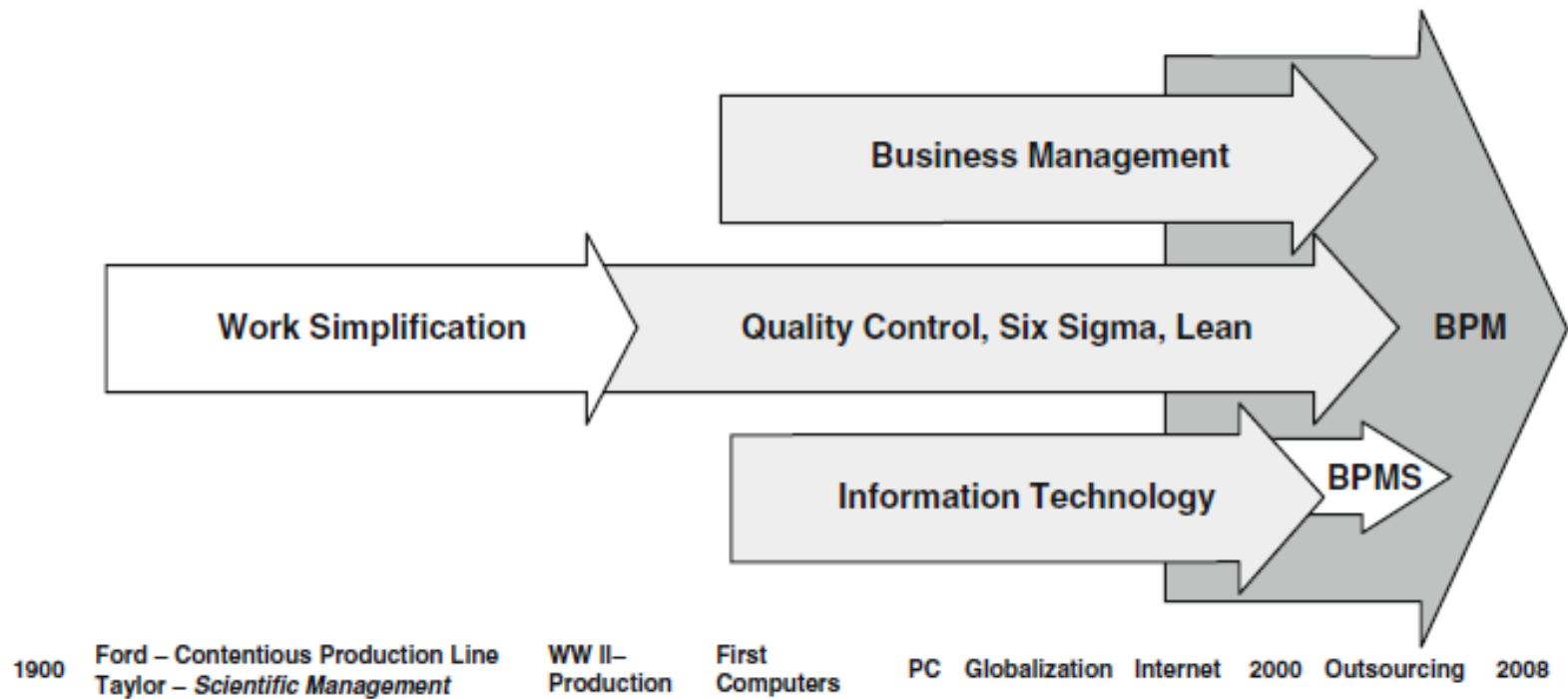
# BPM - how it began...



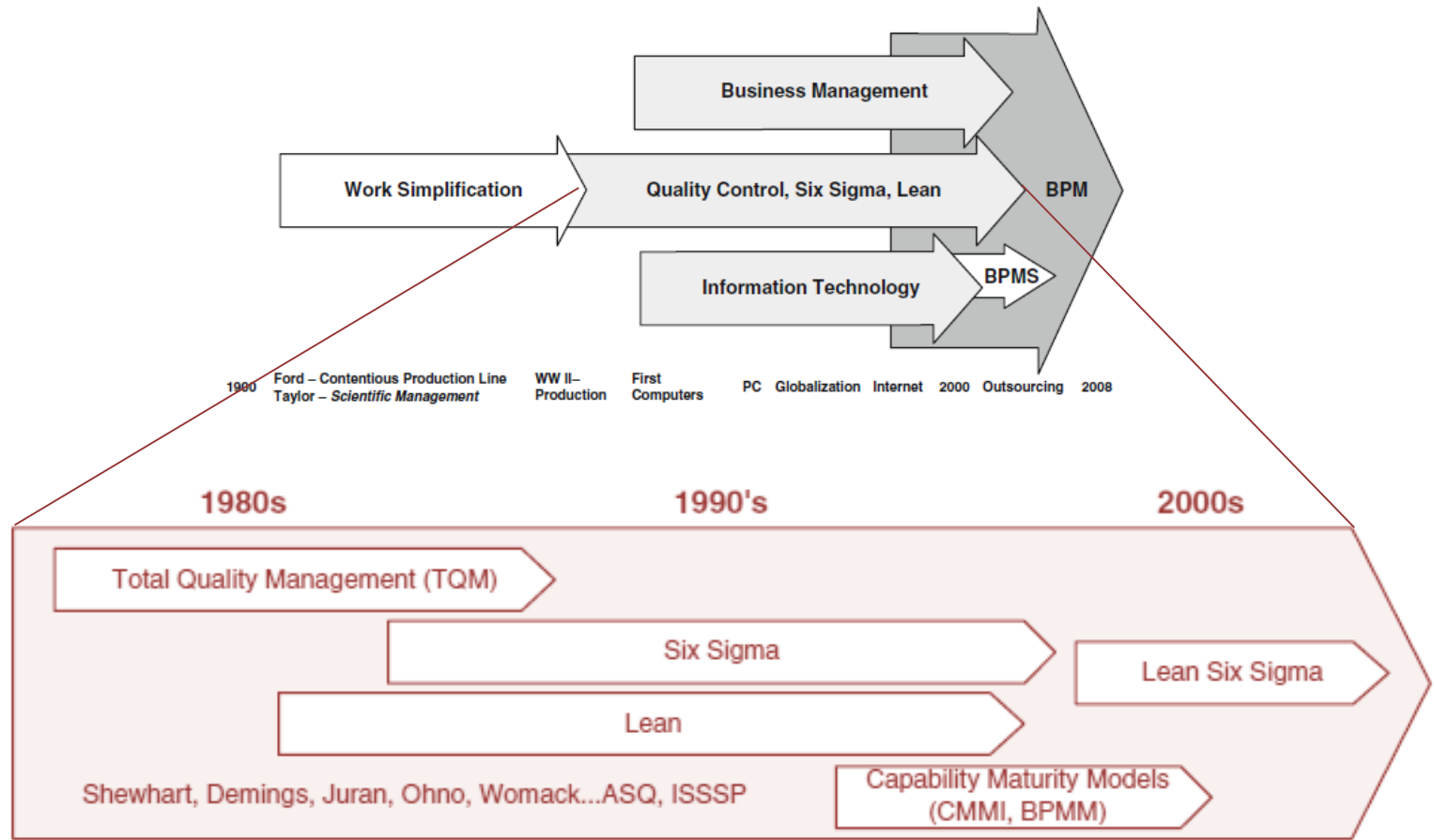
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# The Three BPM Traditions

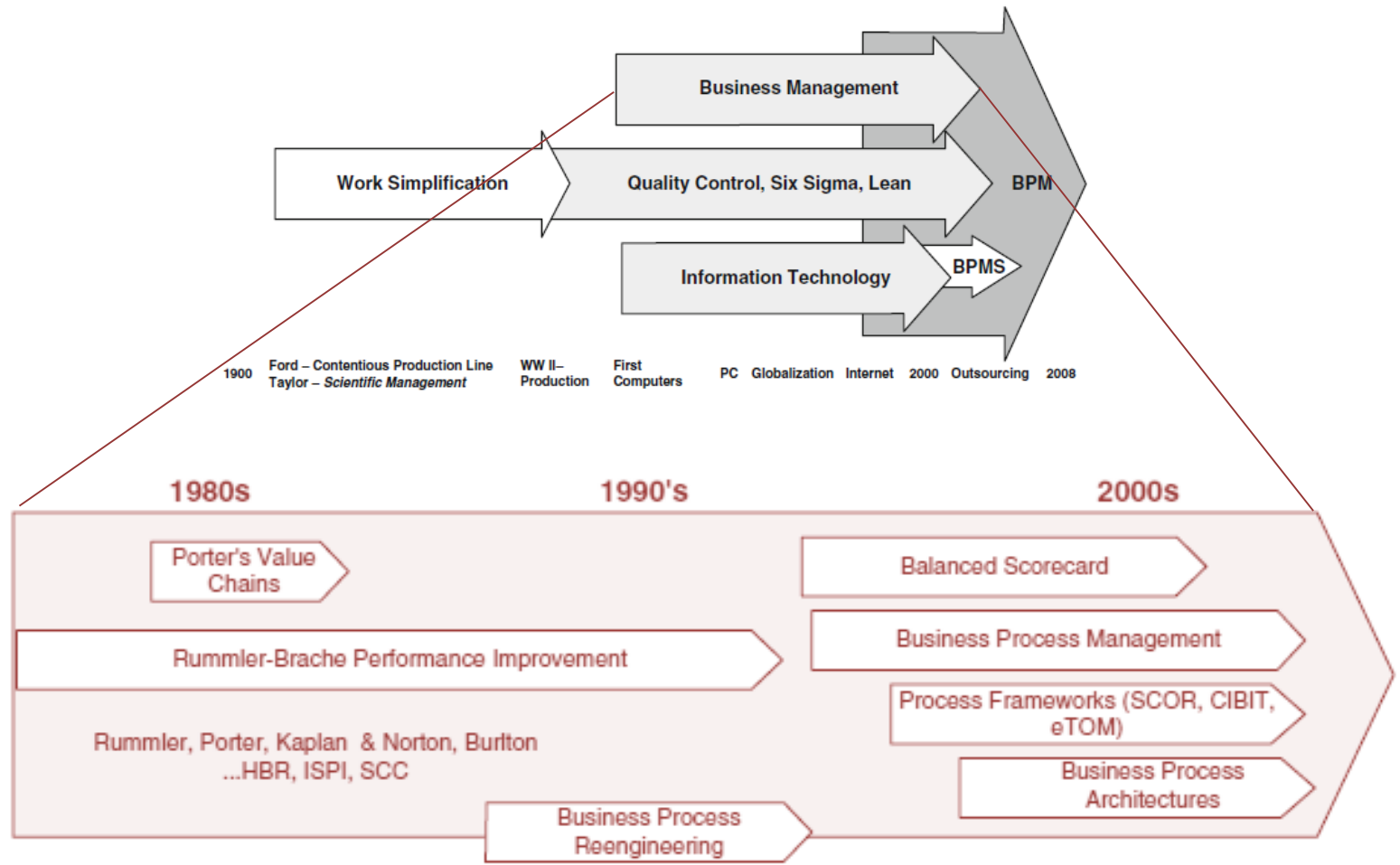


# The Quality Control Tradition



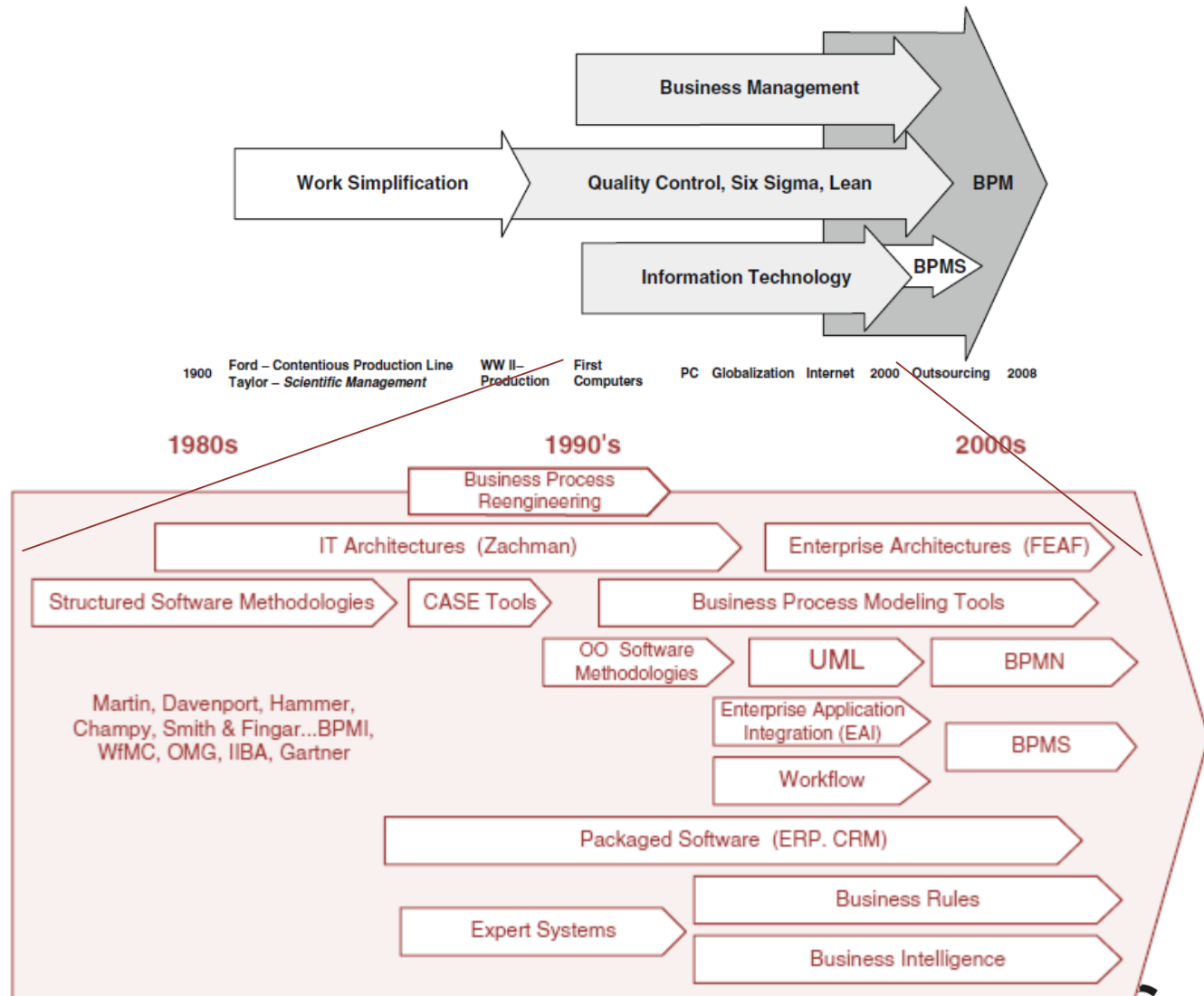
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# The Management Tradition

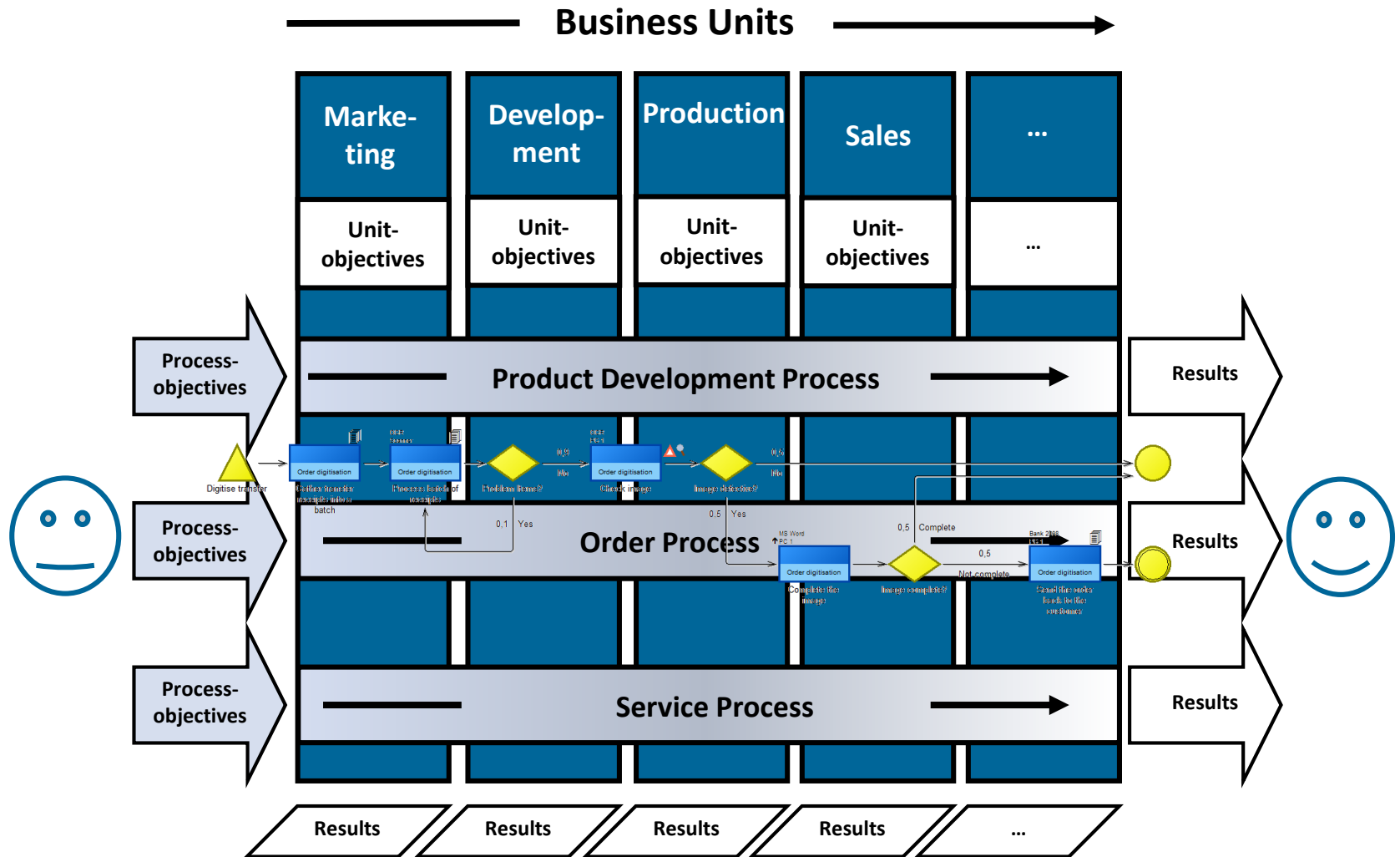


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# The Information Technology Tradition



# Function versus process (1)



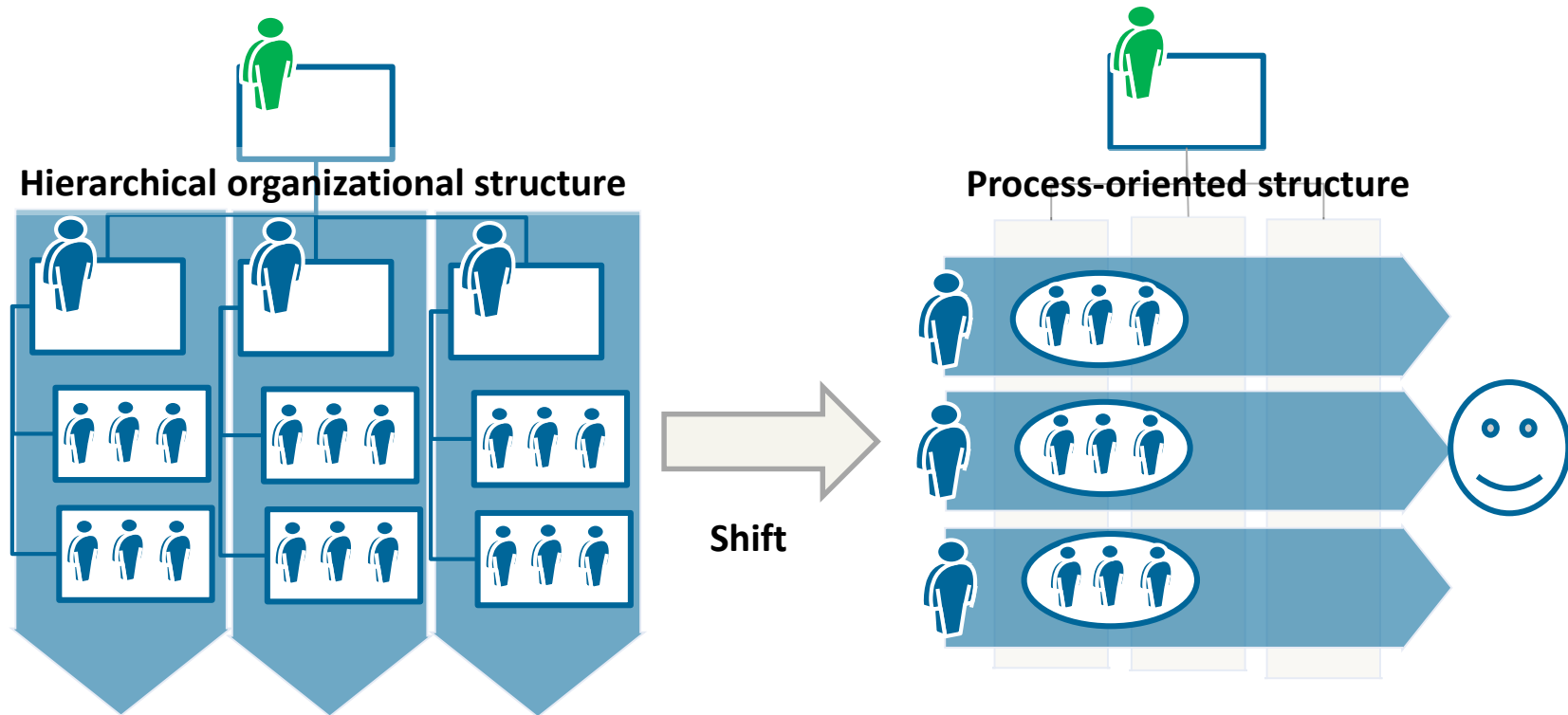
Nach Schmelzer, H.J., Sesselmann, W.; „Geschäftsprozessmanagement in der Praxis, Seite 69ff

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# Function versus process (2) – Typical characteristics

Functional organization	Process-oriented organization
Vertical orientation	Horizontal orientation
Strong division of labor	Integration of labor
Execution oriented	Object oriented
Deep hierarchies	Flat hierarchies
Status-way of thinking	Organizational success thinking
Power-oriented	Customer/Team-oriented
Department goals	Process goals
Goal: Cost efficiency	Goal: Customer satisfaction, productivity
Controlled information	Free and open information
Ratio projects	Continuous improvement
Redundancy	Concentration on value added
Complexity	Transparency

# Hierarchical versus process-oriented organization

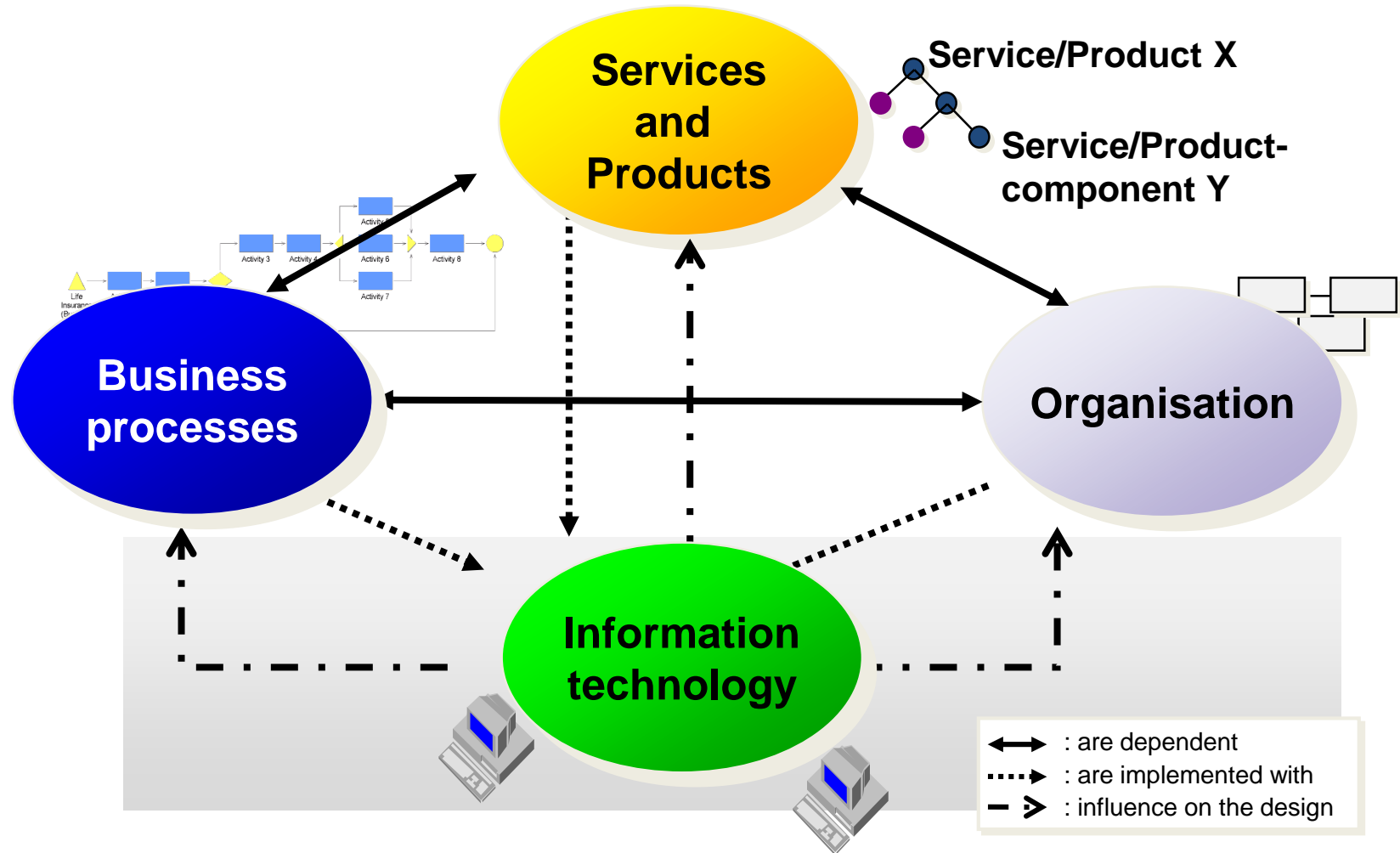


## Goal in the long run: The shift

Change/integrate functional hierarchies to/with process oriented structures with defined process responsibilities.

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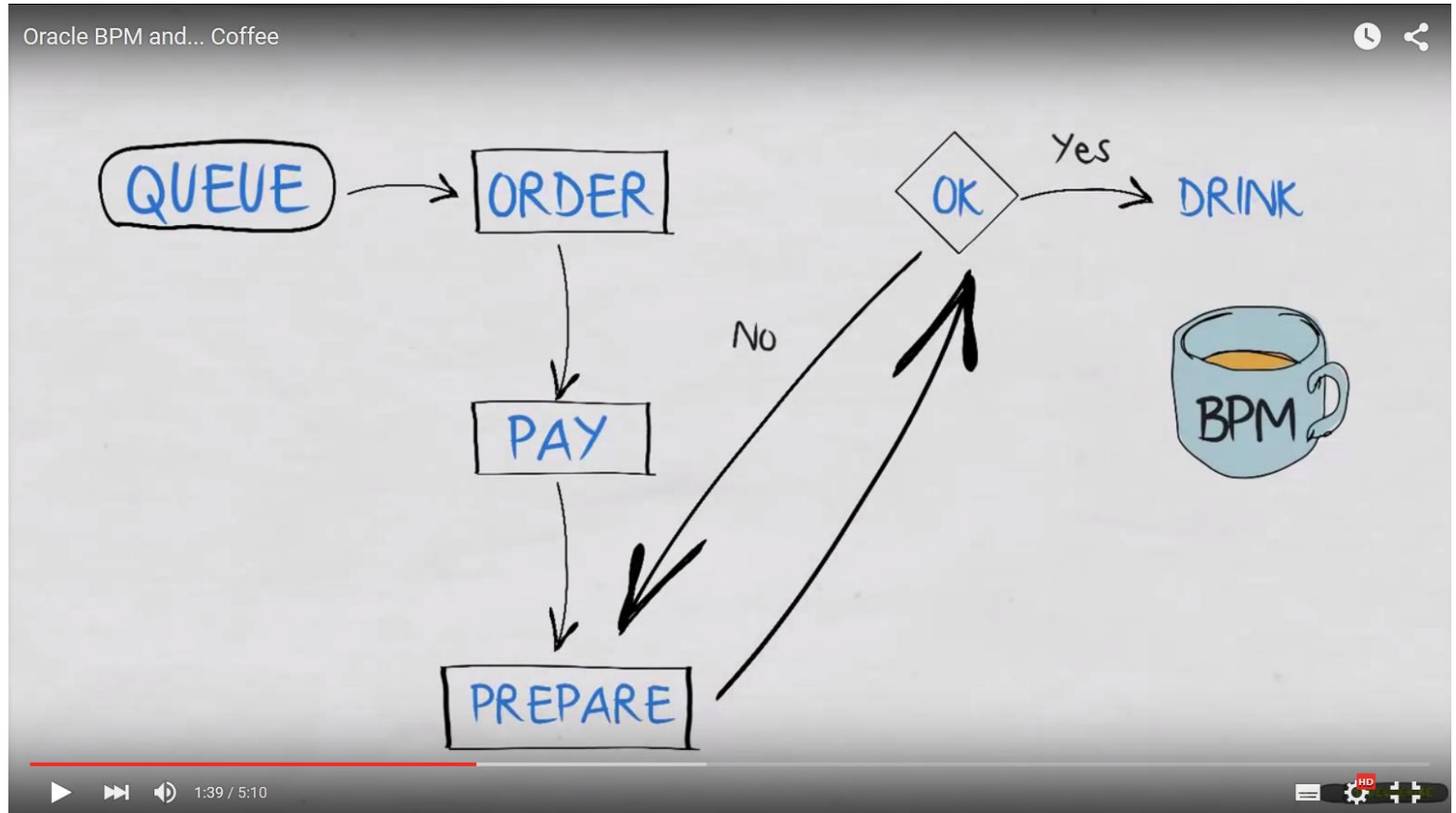
# A holistic Business Process Management approach – generic view



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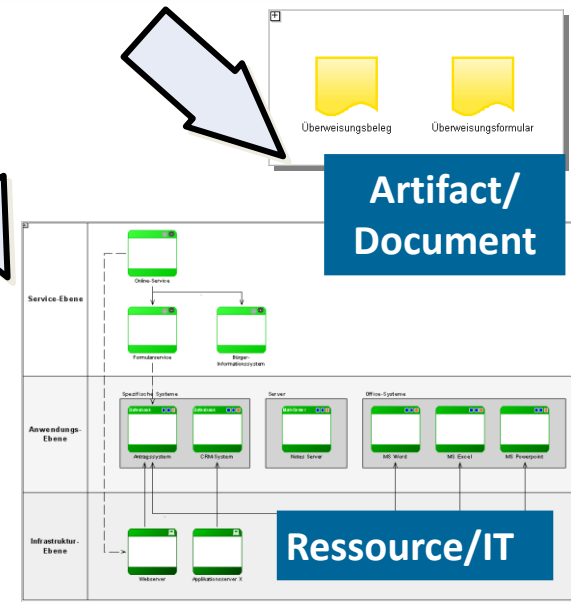
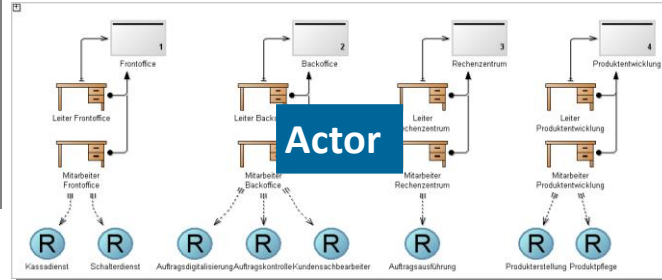
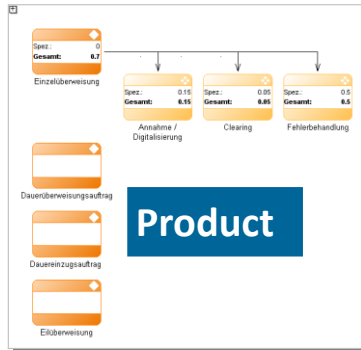
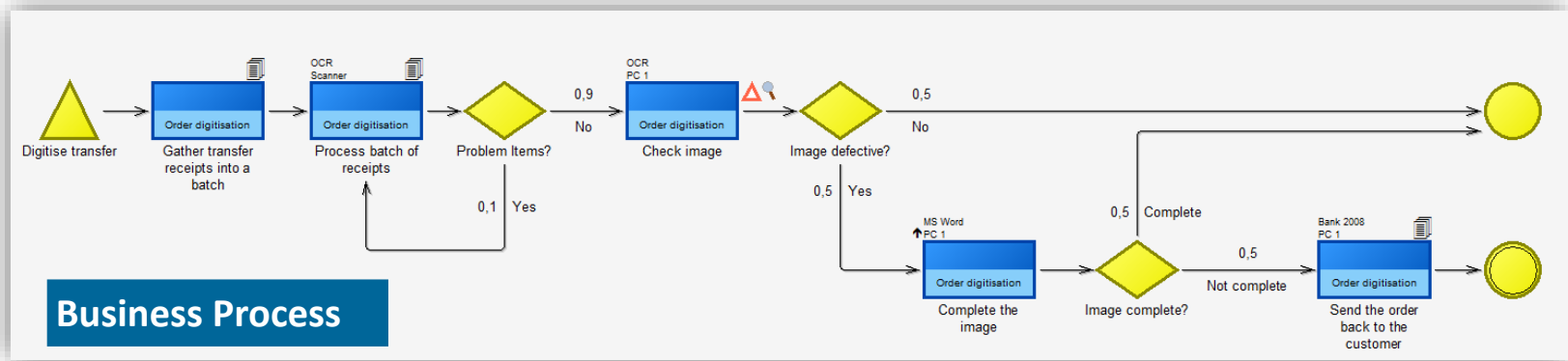


# Oracle BPM Lecture on BP Model in youtube



<https://www.youtube.com/watch?v=3F1qK1UeawE>

# A simple business process



# How to Model Business Processes

## How to create BPMN in ADONIS CE

- <https://www.youtube.com/watch?v=9YppLVcYw2s>

## How to export BPMN in ADONIX CE

- <https://www.youtube.com/watch?v=ZmockrKgf7w>

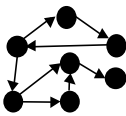
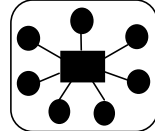
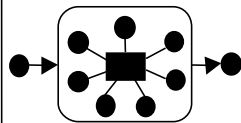
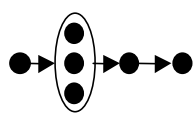
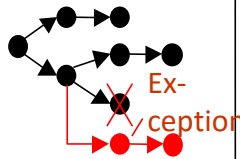
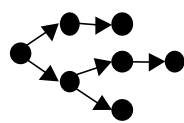
## How to demonstrate value of Business Architecture

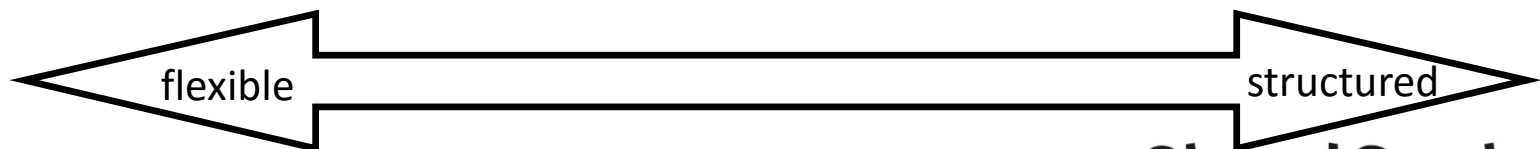
- <https://www.youtube.com/watch?v=BSp6dEjPmVE>

## Why Business Process Management in the Cloud

- <https://www.youtube.com/watch?v=SG77WAX2k3w>

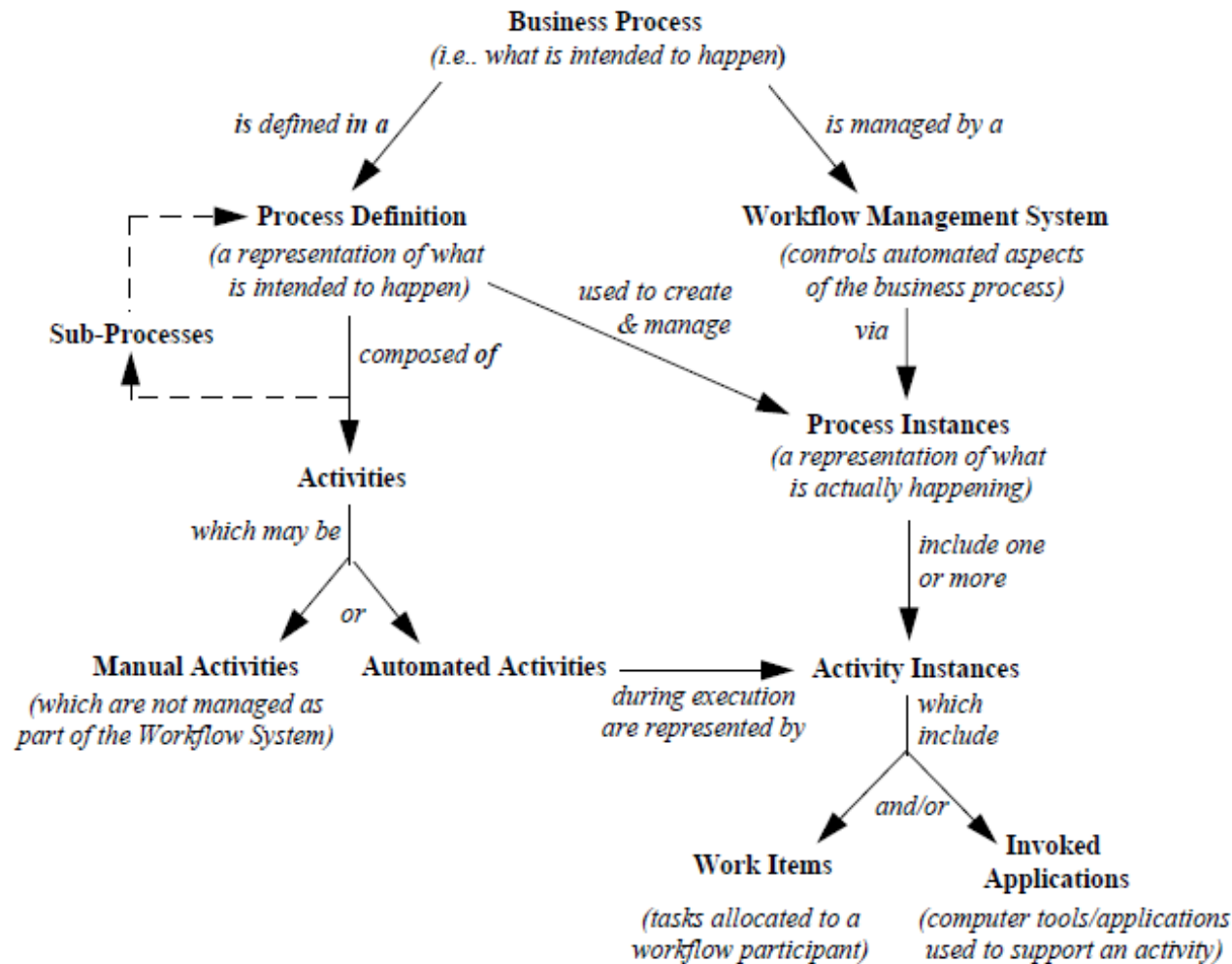
# Types of business processes

Ad-hoc	Weakly Structured			Structured	
Ad-hoc Process	Open Team Process	Integrated Team Proc.	Integrated Coop. Act.	Ad-hoc Exceptions	Well Structured
					
<ul style="list-style-type: none"> <li>- urgent</li> <li>- short-lived</li> <li>- exceptions are handled confidential</li> </ul>	<ul style="list-style-type: none"> <li>- Common job</li> <li>- Common access</li> </ul>	<ul style="list-style-type: none"> <li>- Defined input and output</li> <li>- in between are no flow rules</li> </ul>	<ul style="list-style-type: none"> <li>- Defined activities</li> <li>- number of performers during runtime</li> </ul>	<ul style="list-style-type: none"> <li>- Rules for exceptions defined</li> <li>- reaction for special cond.</li> </ul>	<ul style="list-style-type: none"> <li>- fix predefined</li> <li>- large amount</li> <li>- often transaction oriented</li> </ul>
Example: Completely new Application	Example: Common creation of a book	Example: Common report in project	Example: Multiple signatures necessary	Example: Credit appl. with special conditions	Example: Life Insurance Application



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# Workflow versus business process



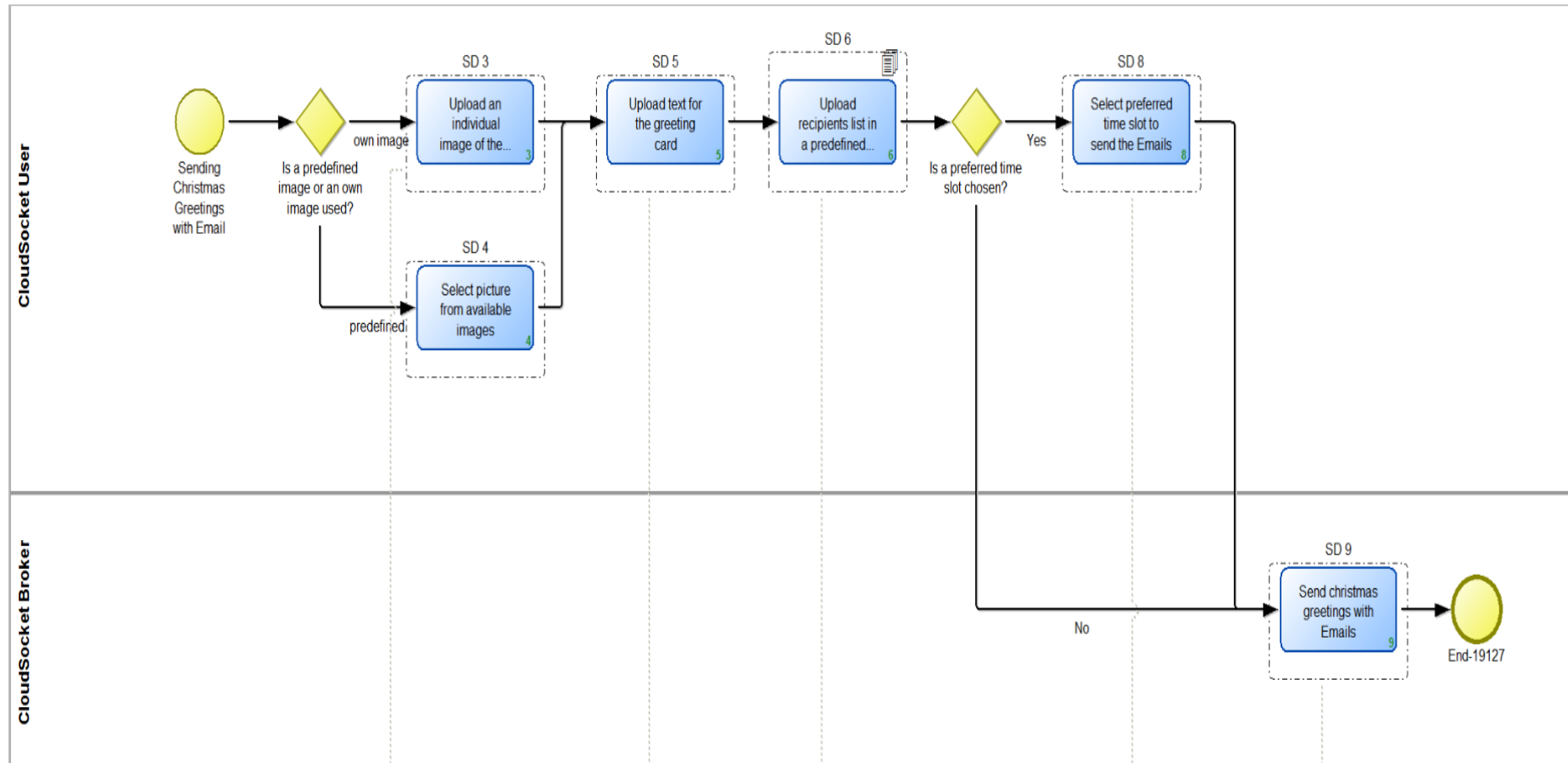
**Source:** Workflow Management Coalition,  
[http://www.wfmc.org/standards/docs/TC-1011\\_term\\_glossary\\_v3.pdf](http://www.wfmc.org/standards/docs/TC-1011_term_glossary_v3.pdf)

# References

- Paul Harmon; The Scope and Evolution of Business Process Management, in J.vom Brocke and M. Roseman (Eds), Handbook on Business Process Management 1, International Handbooks on Information Systems, DOI 10.1007/978-3-642-00416-2\_3, Springer Verlag Berlin Heidelberg.
- T. H. Davenport, *Process innovation: reengineering work through information technology*. Harvard Business Press, 1993.
- BOC Gruppe, <http://www.boc-group.com/at/produkte/adonis/...>; Access: 2010-06-02
- Kühn, H.; Karagiannis, D.: „Modellierung und Simulation von Geschäftsprozessen“. In: Das Wirtschaftsstudium (WISU), 30. Jg., 8-9/01, S. 1161-1170 (siehe Kapitel 6).
- Junginger, S.: „Modellierung von Geschäftsprozessen State-of-the-Art, neuere Entwicklungen und Forschungspotenziale“, BPMS-Bericht, Juni 2000
- Junginger, S., Kühn, H., Strobl, R., Karagiannis, D.: “Ein Geschäftsprozessmanagement-Werkzeug der nächsten Generation – ADONIS: Konzeption und Anwendungen”. In Wirtschaftsinformatik, Heft 5, Jahrgang 42, Oktober 2000, pp392-401
- Architekturen und Plattformen für kooperatives betriebliches Informationsmanagement unter Integration multimedialer Datentypen  
- Die Groupware Herausforderung für hypermediale Dokumente und asynchrone Kommunikationsformen.  
In: Auffahrt zum Information Highway, Hrsgb. U. Glowalla, E. Engelmann, A. de Kemp, G. Rossbach und E. Schoop, Berlin - Heidelberg - New York - London - Paris - Tokyo - Hong Kong - Barcelona - Budapest (Springer - Verlag) 1995, S. 218 - 225.

# **BUSINESS PROCESSES IN THE CLOUD**

# 1.Cloud Computing: Some Challenges



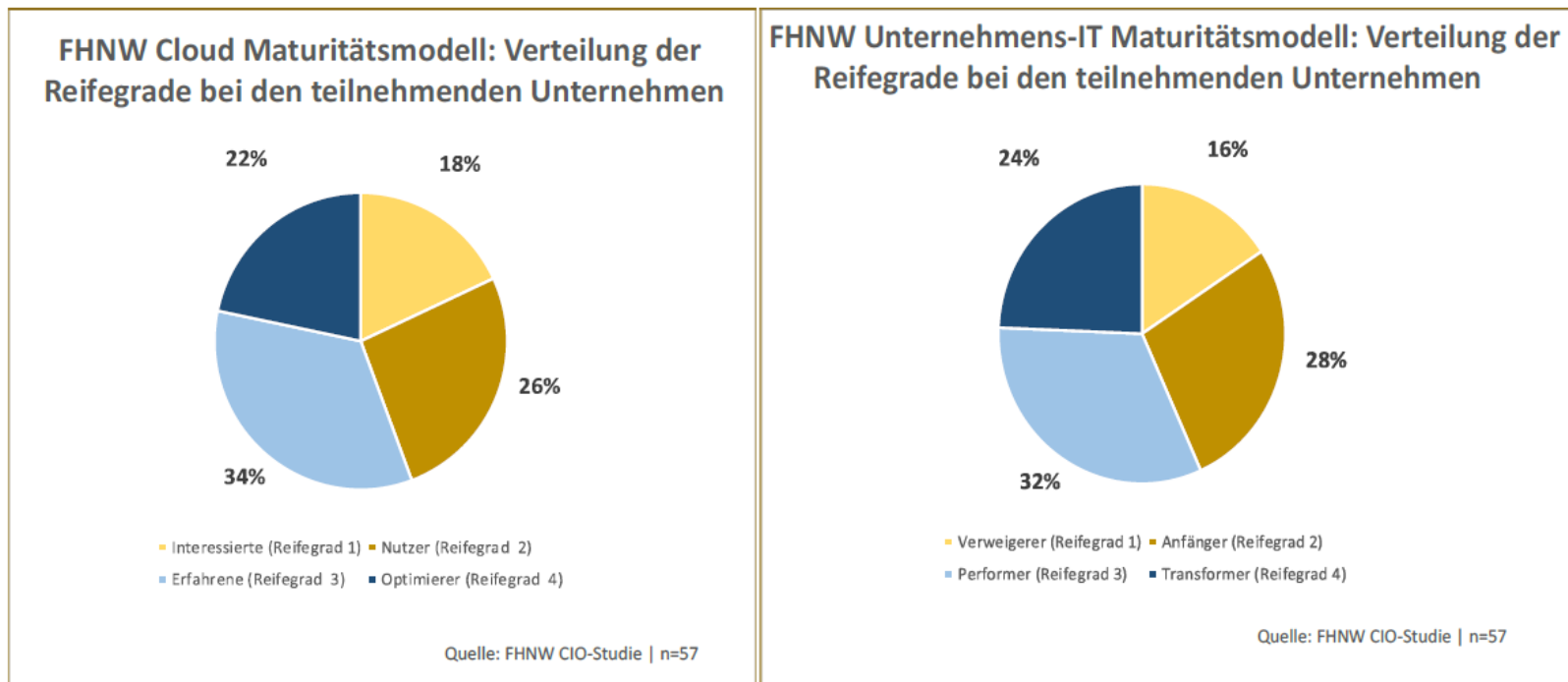
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# 1. Cloud Readiness Level

Studie FHNW CIO Studie September 2017, Leitung: Prof. Dr. Stella Gatzu Grivas, Seite 8

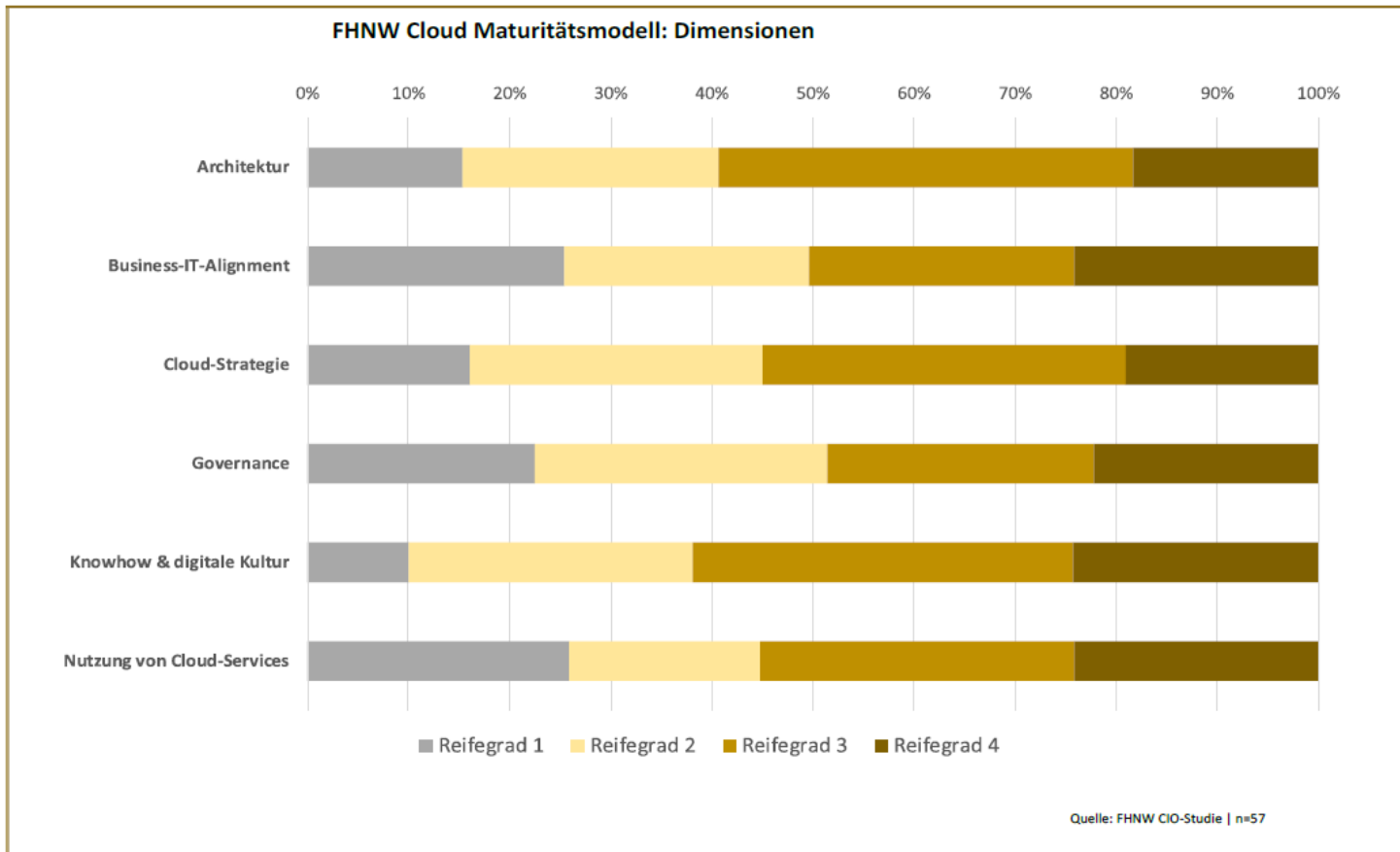
## Auswertung - FHNW Cloud Maturitätsmodell und das FHNW Unternehmens-IT Maturitätsmodell: Dimensionen



Grafik 5: Die FHNW Maturitätsmodelle: Verteilung der Reifegrade bei den teilnehmenden Unternehmen

# 1. Cloud Readiness Level

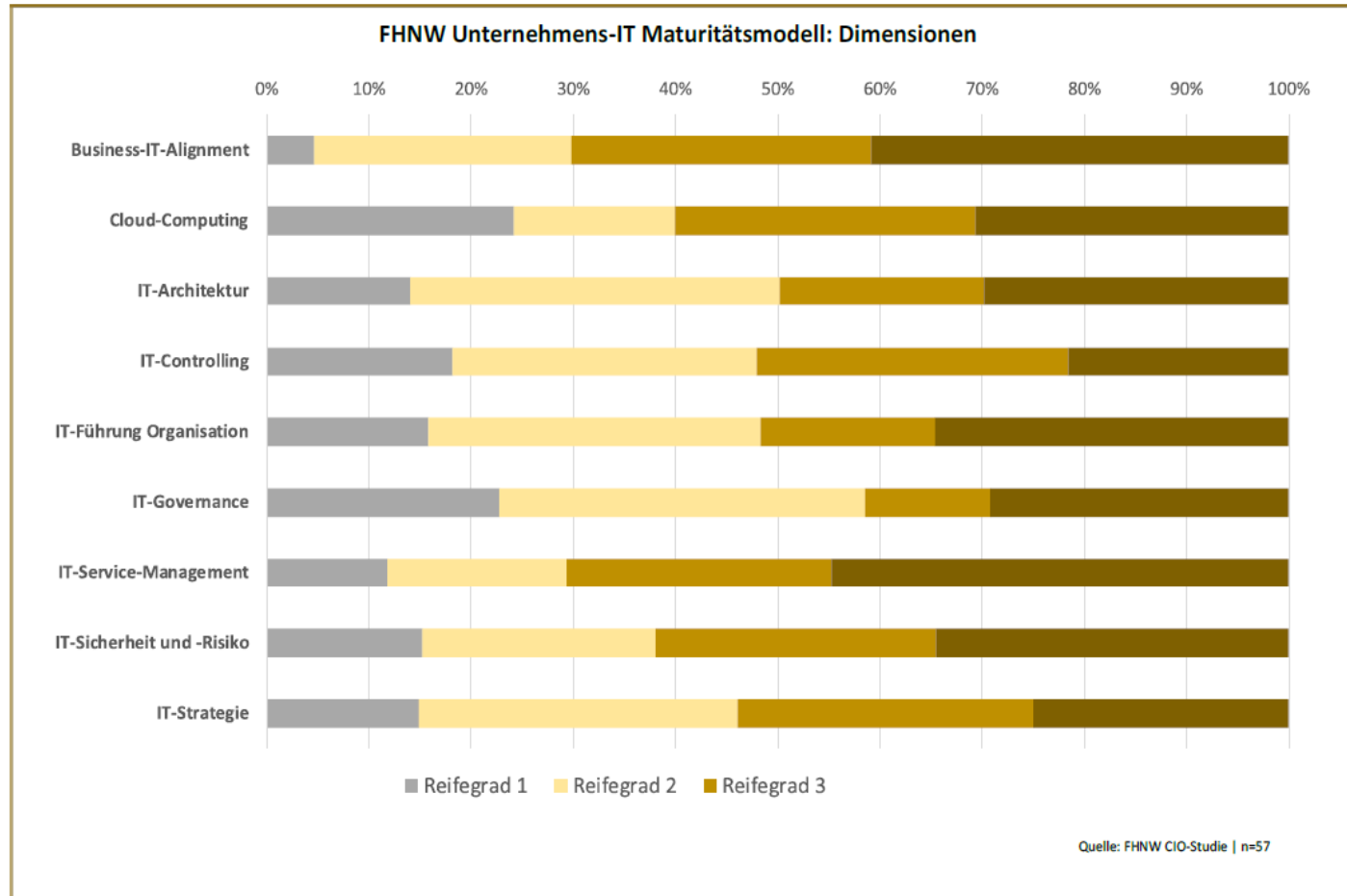
Studie FHNW CIO Studie September 2017, Leitung: Prof. Dr. Stella Gatzju Grivas, Seite 9



Grafik 6: FHNW Cloud Maturitätsmodell: Dimensionen

# 1. Cloud Readiness Level

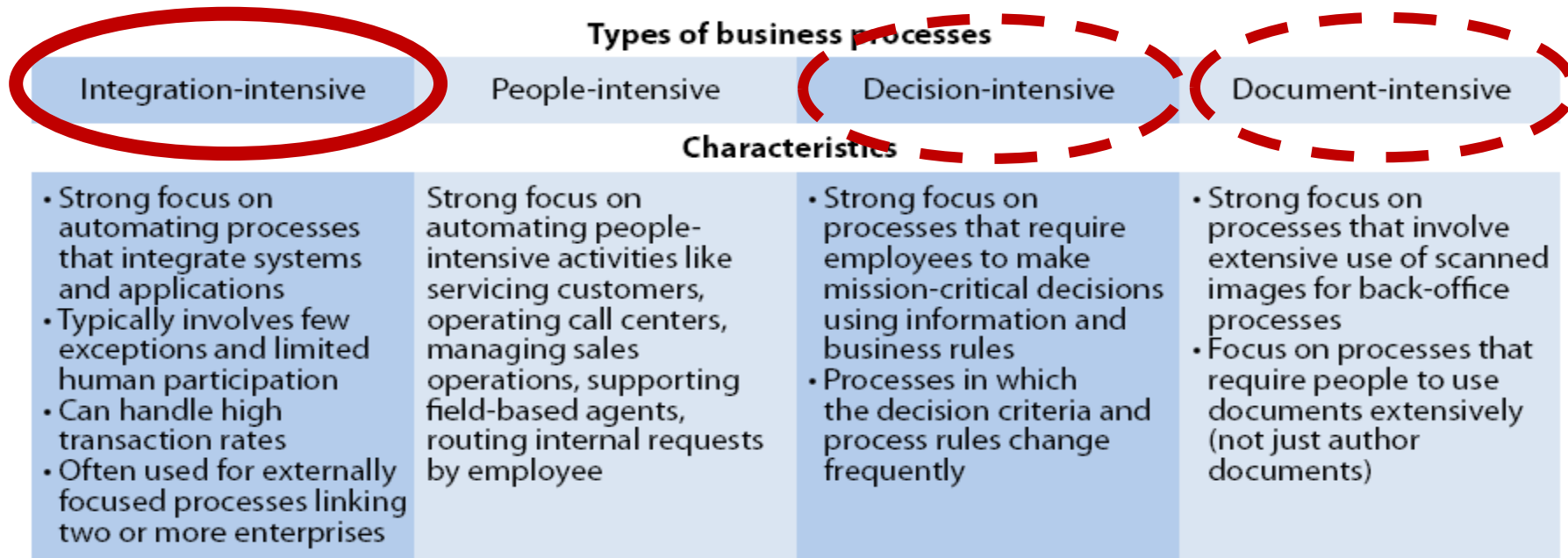
Studie FHNW CIO Studie September 2017, Leitung: Prof. Dr. Stella Gatzju Grivas, Seite 10



Grafik 7: FHNW Unternehmens-IT Maturitätsmodell: Dimensionen

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# Digitization of Business Processes: Process Categories

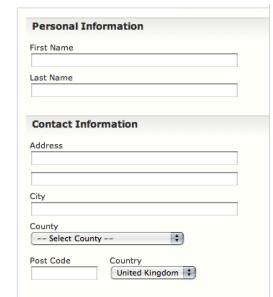


Source: The Forrester Wave™: Human-Centric BPM for Microsoft Platforms, Q4 2007

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# Integration intensive processes

- These business processes involve
  - high volume of transactions
  - need to integrate with other systems
  - high degree of straight-through processing
  - limited human interaction
- Action is driven by machine-interpretable data
  - data extracted from documents
  - electronic forms (web, apps)
  - database systems



First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39
Donald	Duck	555 Quack Street	Mallard	65
Bugs	Bunny	567 Carrot Street	Rascal	58
Wiley	Coyote	999 Acme Way	Canyon	61
Cat	Woman	234 Purrfect Street	Hairball	32
Tweety	Bird	543	Itotitaw	28

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# Decision-intensive processes

- These complex processes involve
  - gathering information
  - automatic and manual scoring
  - mission-critical decision-making.
- Decision-intensive processes can be human-intensive and integration-intensive – depending on the format of data
  - human-intensive: documents
  - integration-intensive: structured data

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# Document-intensive processes

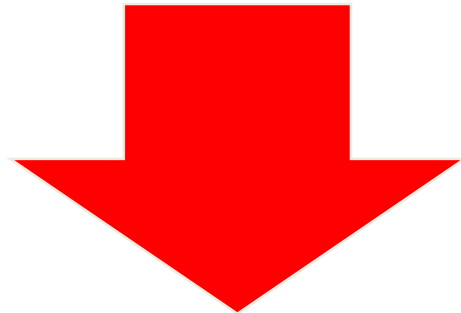
- These processes require users to
  - review documents for approval
  - enter data from documents into a back-office system
  - make decisions.
- Action is driven by information in documents
  - paper
  - scanned documents or forms
  - electronic documents
- Humans are needed to interpret information

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# Consequences of Digital Transformation for Business Processes



Integration intensive



People intensive

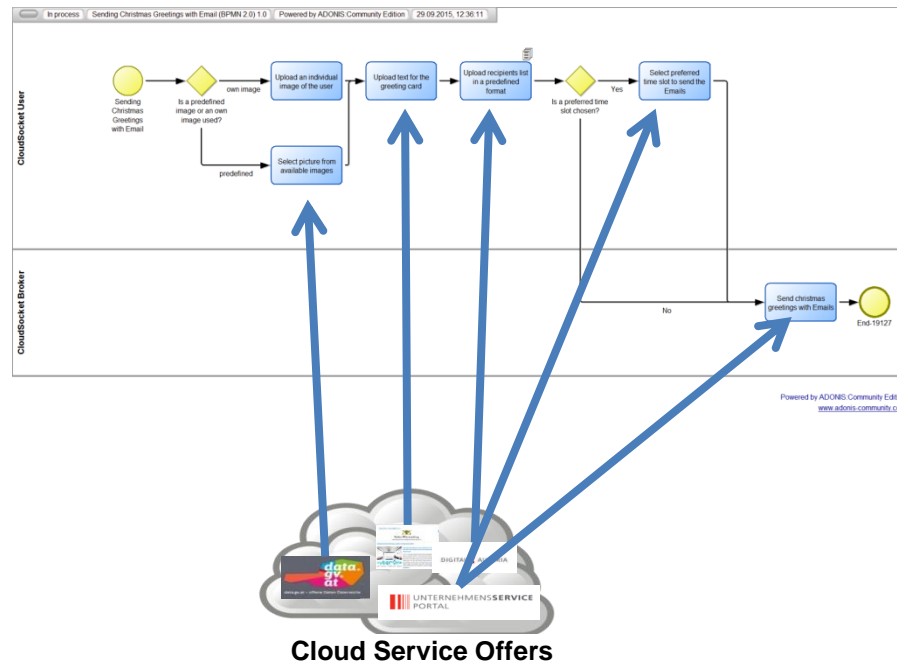
Document intensive

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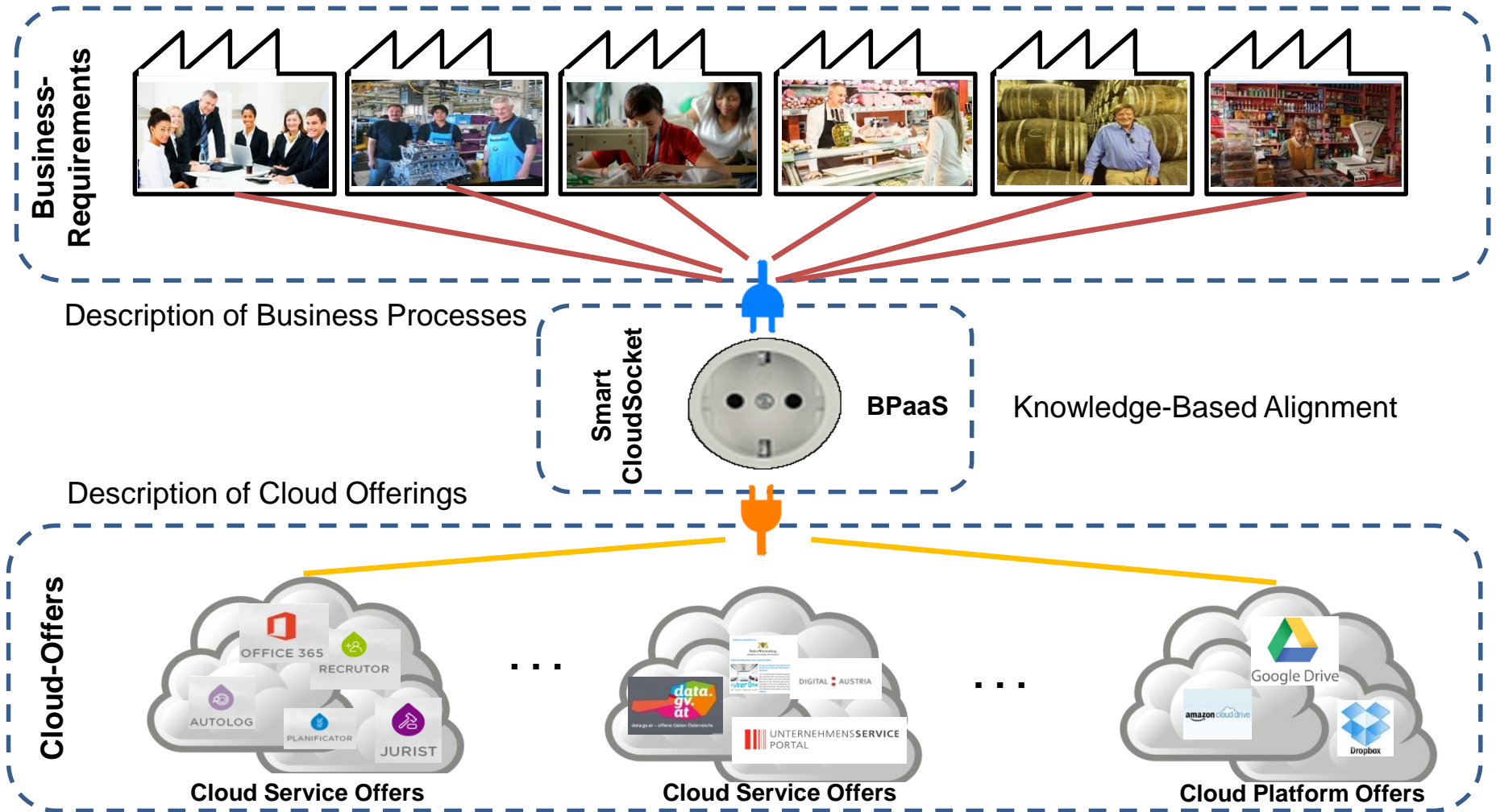
# Business Process as a Service - BPaaS

- Service-oriented business process outsourcing
- Services are sourced from the cloud




# **BUSINESS PROCESS AS A SERVICE APPROACH**

# Use Case Scenario for CloudSocket



# CloudSocket

# BPAAS Marketplace



SHOP

LOGINREQUEST BROKER ACCOUNTEnglish

0 ITEMS

Home / Processes

Status

All

Tease

Active

Tags

Invoice Ninja

Apply FilterClear


Price

10473

Apply FilterClear

Processes

Showing 3 processes




SEND INVOICE SAAS WORLDWIDE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service is hosted in Europe and Invoicing service is hosted in USA, both as SaaS.

€10.50

Add to cart




SEND INVOICE SAAS EUROPE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service and Invoicing Service are hosted in Europe, both as SaaS.

€15.75

Add to cart



SEND INVOICE IAAS EUROPE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service is hosted in Europe as SaaS and Invoicing Service is hosted in Europe as IaaS in a

€21.00

Add to cart

«1»

Showing 1-3 of 3 results

WW

et

36

# The Digitalisation Challenge

- Business Process Models **can be** used for configuring software but **also act** as a basis of organisational knowledge.
- Business Processes are interpreted as the **know-how platform of an organisation** serving both (a) human and (b) machine interpretation.



Human interpretation

*Huge Semantic Distance*



*no simple mapping but  
knowledge-based solution*



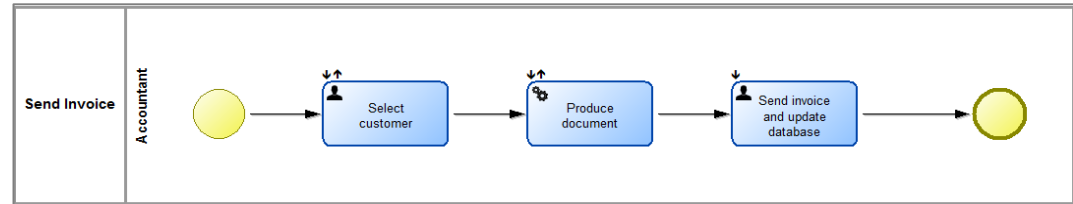
Machine interpretation

# CloudSocket

# Description of Business Process as a Service

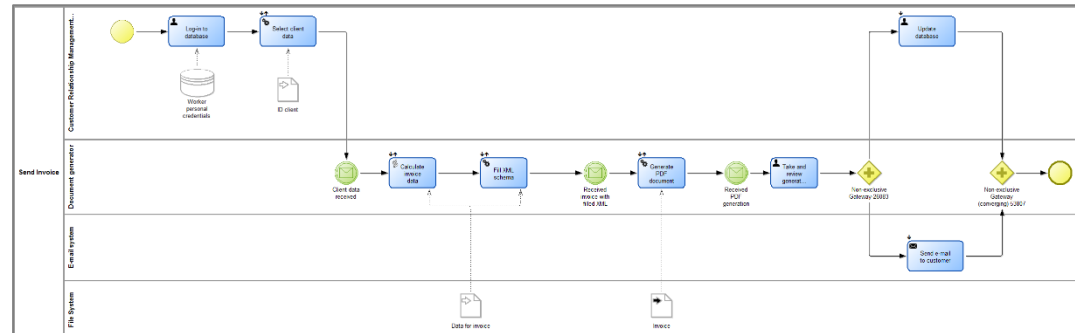
## Business Process Model

Description of Business Case (BPMN)



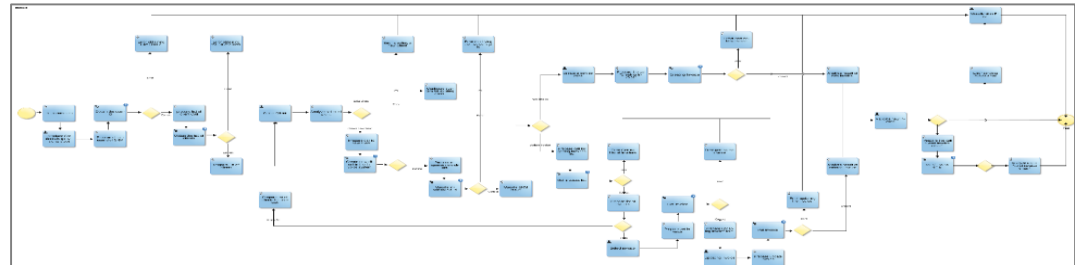
## Abstract Workflow Model

Description of possible realisation (BPMN)



## Concrete (Executable) Workflow

Implementation of executable Workflow (BPMN)



## Cloud Deployment Configuration

Configuration of Cloud Application (CAMEL)

```

<?xml version="1.0" encoding="UTF-8"?>
<camel:CamelModel xmi:version="2.0" name="BundleCamelModel">
  <applications name="ApplicationModel" version="1.0" description="This is the CAMEL file generated by the Allocation Environment" owner="//@organisationModels.0/@users.0"/>
  <organisationModels name="OrganisationModel">
    <organisation name="Mathema" www="" postalAddress="" email="">
      <users name="Owner" email="simone.cacciatore+allocation_mathema@thoster.com" firstName="" lastName="">
        <cloudsocketCredentials password="not necessary for CloudSocket"/>
      </users>
    </organisationModels>
  </camel:CamelModel>
  
```

# Description of Business Process as a Service

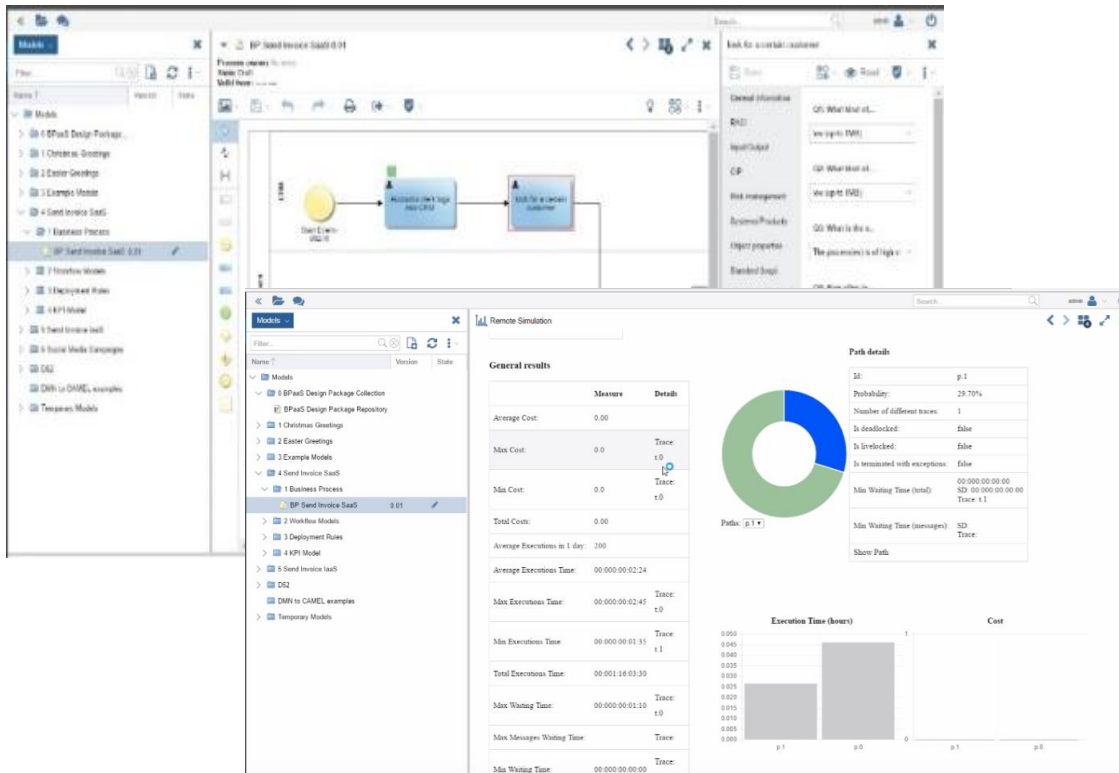


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# Managing Business Processes as a Service

Identify and Check, if Business Process is capable to be digitalised.

Tools:



[en.adonis-community.com/try-out.boc-cloud.com/auth.view](https://en.adonis-community.com/try-out.boc-cloud.com/auth.view)

Contact



Watch Demonstration:

Design: [youtu.be/Ce\\_KX3nC9Y8](https://youtu.be/Ce_KX3nC9Y8)

Check: [youtu.be/OY-lq7orNZU](https://youtu.be/OY-lq7orNZU)

Simulate: [youtu.be/bpWmgsuRCqY](https://youtu.be/bpWmgsuRCqY)

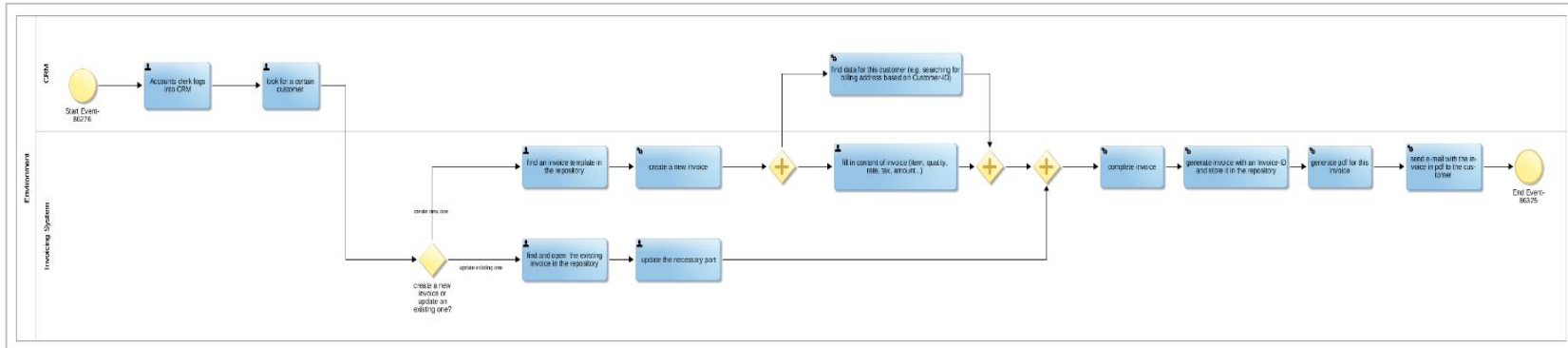
[www.cloudsocket.eu](https://www.cloudsocket.eu), [info@cloudsocket.eu](mailto:info@cloudsocket.eu)

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## 2. Consulting Package for Digital Transformation

### Possible Business Process Management for the Cloud Transformation



**Cloud Readiness Check of the Business Process (Video)**



**Mapping of Cloud Offerings corresponding to the Business Process (Video)**



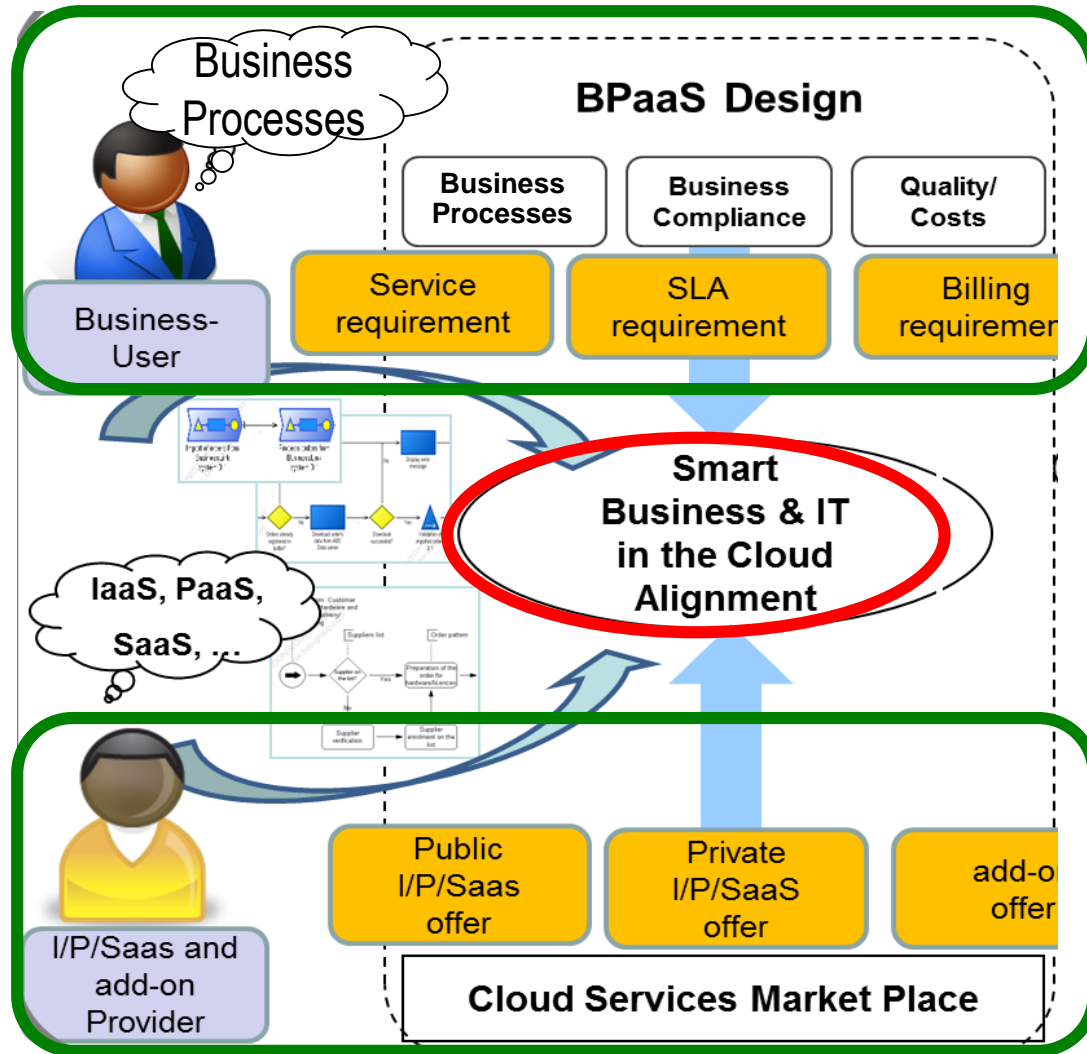
**Simulation of Cloud Costs within the Business Process (Video)**



**Formale Verifikation of the Business Process (Video)**

**CloudSocket**

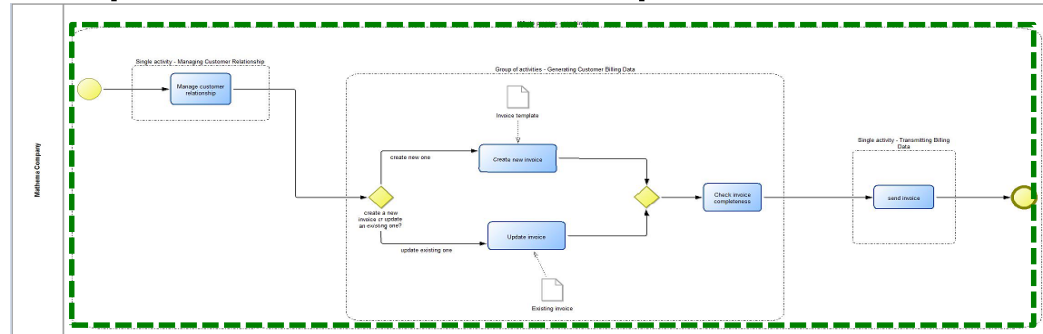
# Alignment of Business and IT in the Cloud



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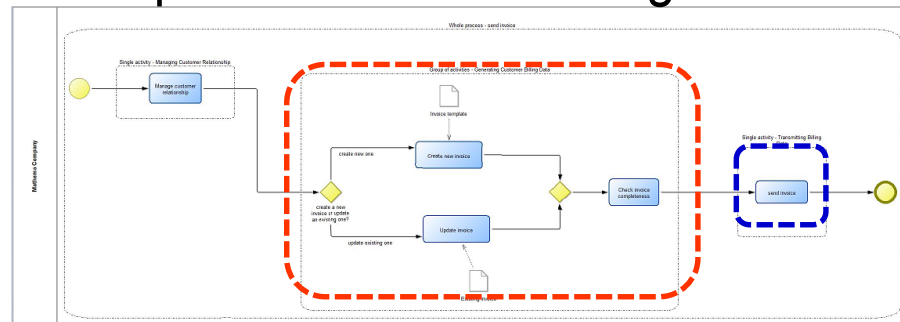
# Hierarchical Service Identification

## 1. Lookup service for whole process



## 2. If not found

- I. Split process into process fragments
- II. Lookup service for each fragment



## 3. If not found for a group, go to 2

CloudSocket

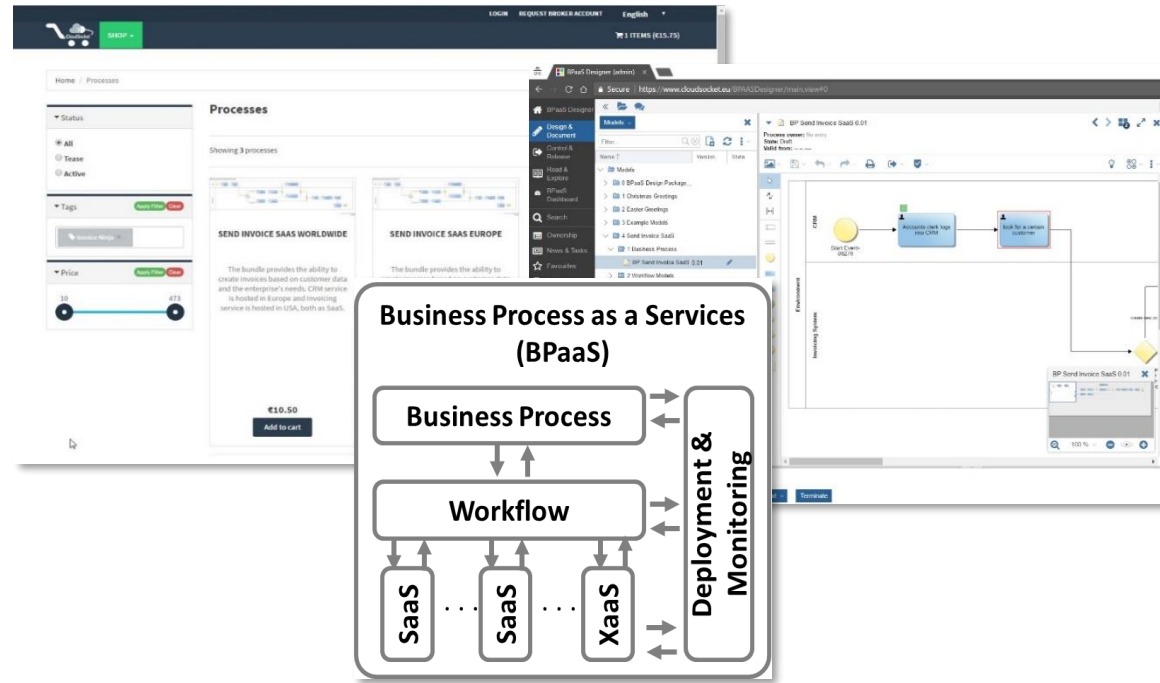
# CloudSocket Results

## Software Tools<sup>1)</sup>:

- BPaaS Design Environment
- BPaaS Allocation Environment
- BPaaS Marketplace
- BPaaS Execution Environment
- BPaaS Evaluation Environment

## Research Items<sup>2)</sup>:

- Semantic Lifting and Matcher
- Context-Adaptive Questionnaire
- DMN-based Ontology Querying Service Discovery
- Smart Service Discovery and Selection
- DMN-to-CAMEL Mapper
- PaaS orchestration and Cross-layer adaptation
- Cross-layer monitoring
- Monitoring Information Harvesting
- KPI drill down



## Sustainability via Communities<sup>3)</sup>:

- FIWARE – Workflow Engine
- GitHub – OpenSrc Projects
- ADOxx.org – Modelling and Semantics

## Download at [cloudsocket.eu](https://cloudsocket.eu):

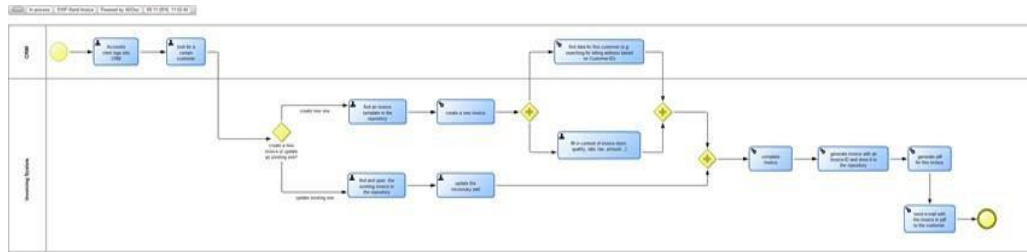
- 1) D4.6\_7\_8 and Tool download section
- 2) Innovation Shop and Zenodo
- 3) Get involved

# CloudSocket

# FIRST REALISATION

# Send invoice

## Company Golden Worm: Early stage



## Customer Management System

Sugar CRM Specifications:

**Storage Location:** Germany

**Storage Type:** Local (File System)

**Availability:** 99%

**N. simultaneous users:** 3

Simple  
Invoices

## Invoice Management System

Simple Invoice Specifications:

**Storage Location:** Germany

**Storage Type:** Local (File System)

**Availability:** 99%

**N. simultaneous users:** 3

CloudSocket

# Send invoice

Company Golden Worm: Business Expansion

BPaaS Requirements for all services



- Storage Type: from **File System** to **Cloud Storage service**
- Storage Location: from **Germany** to **Austria, Italy, Spain, Switzerland, Greece and Romania**
- Downtime: from **8 hours per month (99%)** to **2 min (99,995%)**
- N of daily transactions: from **100** to **2000**
- N of concurrent users: from **3** to **10**

CloudSocket

# Send invoice

## Broker Consultancy and Modeling



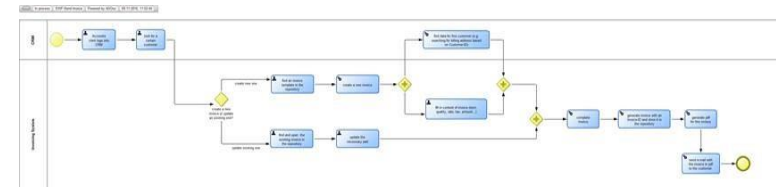
Storage Type: from **File System** to **Cloud Storage service**

Storage Location: from **Germany** to **Austria, Italy, Spain, Switzerland, Greece and Romania**

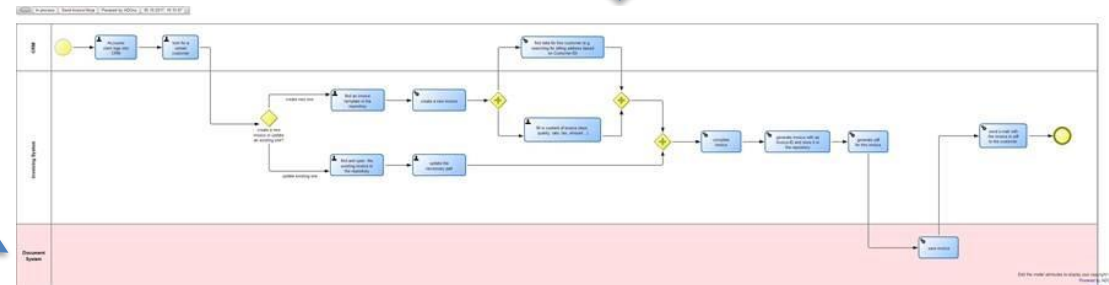
Availability: from **8 hours per month (99%)** to **2 min (99,995%)**

N of daily transactions: from **100** to **2000**

N of concurrent users: from **3** to **10**



Lane: **“Document System”**  
Activity: **“Manage Document”**

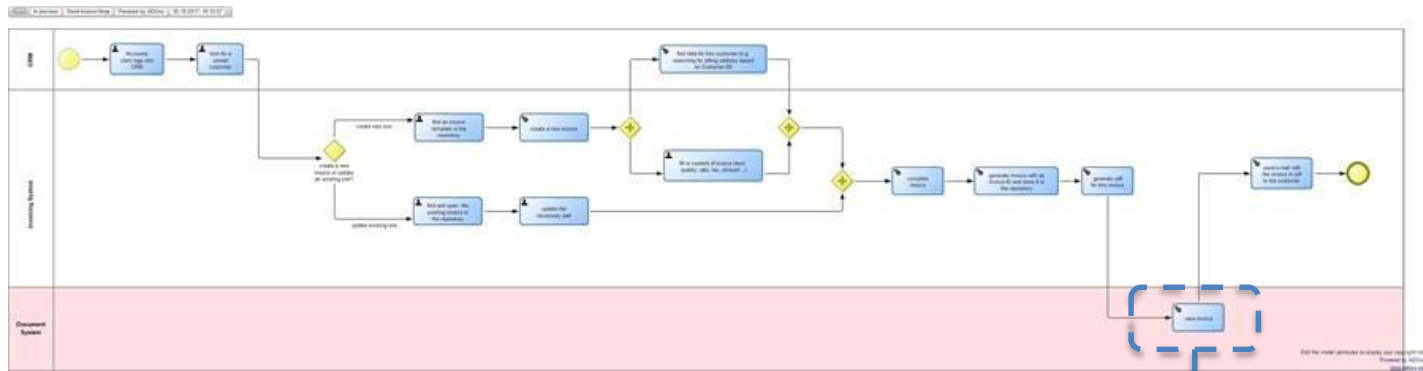


# CloudSocket

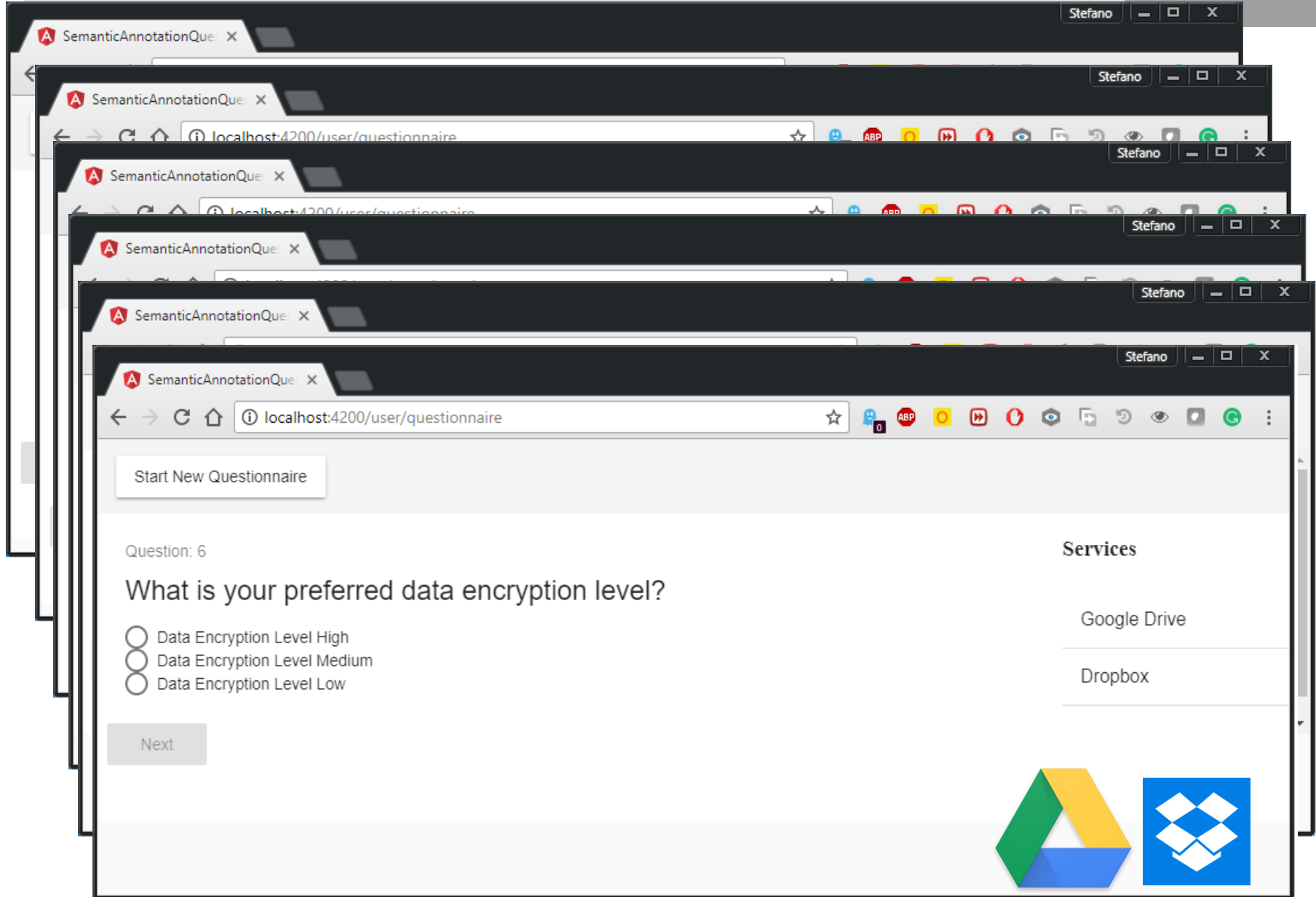


# Send Invoice

## Identification of Services satisfying the requirements



Activity "Manage Document"



# CloudSocket

# Send Invoice: Identified Services



## Invoice Management System

### Specifications

**Action:** Generate

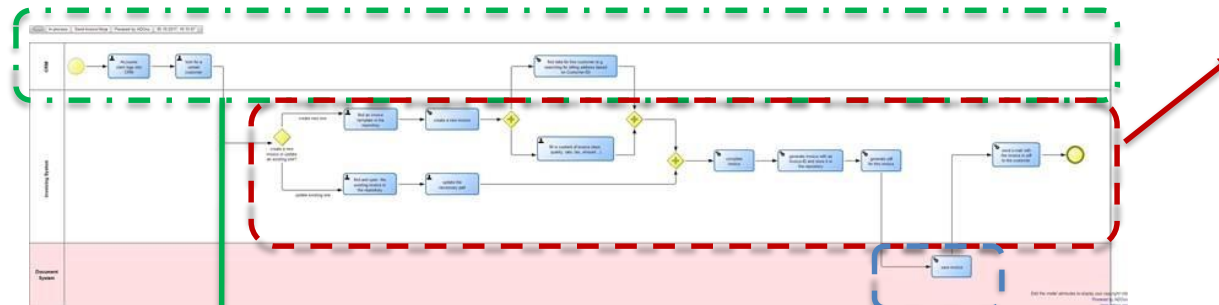
**Object:** Invoice

**APQC:** 9.2.2.2 Generate Customer Billing Data

**Storage Location:** Europe

**Availability:** 99.999%

**N. simultaneous users:** 100



## Customer Management System

### Specifications

**Action:** Manage

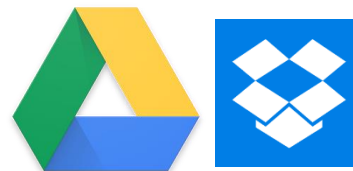
**Object:** Customer

**APQC:** 3.5.2.4 Manage Customer Relationship

**Storage Location:** Europe

**Availability:** 99.999%

**N. simultaneous users:** 100



**Action:** Manage

**Object:** Document

**APQC:** 9.2.2.2 Generate Customer Billing Data

**Storage Type:** Storage Service

**Storage Location:** Europa

**Availability:** 99.999%

**N. simultaneous users:** 100

# CloudSocket

# The Winner Is ...

## Identified Cloud Services satisfying the requirements



Zoho CRM



OpenSourceBilling



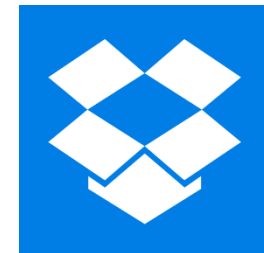
Google Drive



Solutia Ymens CRM



InvoiceNinja



DropBox

FINAL SELECTION IS BASED ON TECHNICAL ASPECTS AND COST NEGOTIATIONS

# CloudSocket

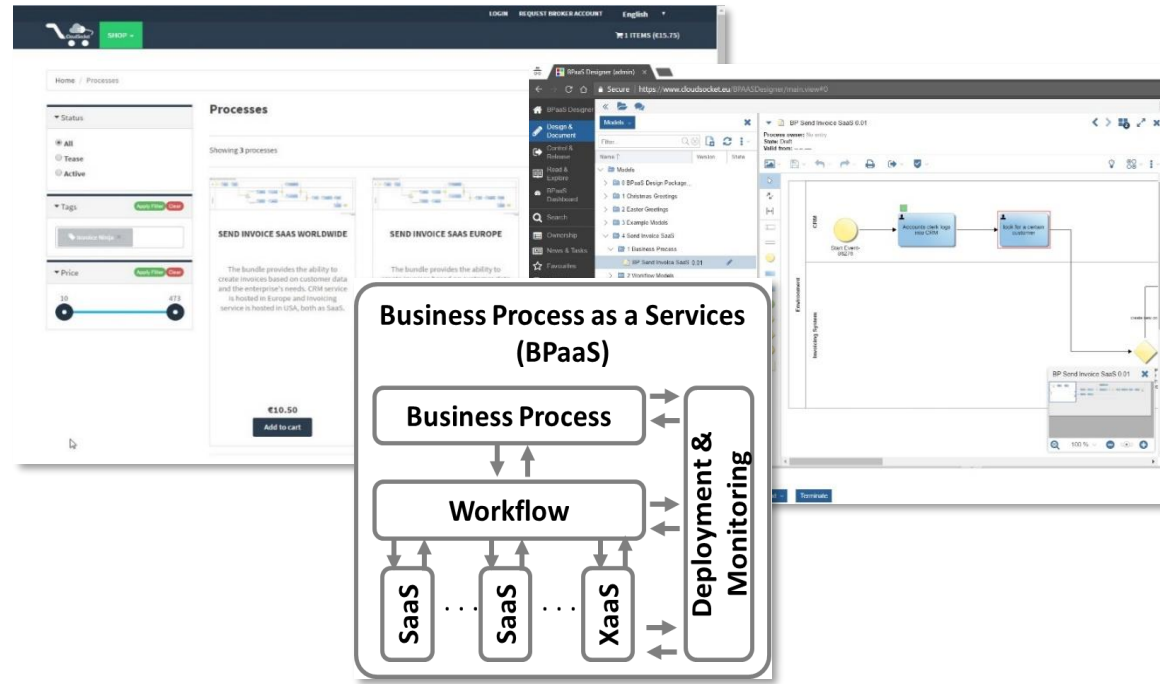
# Project Results

## Software Tools<sup>1)</sup>:

- BPaaS Design Environment
- BPaaS Allocation Environment
- BPaaS Marketplace
- BPaaS Execution Environment
- BPaaS Evaluation Environment

## Research Items<sup>2)</sup>:

- Semantic Lifting and Matcher
- Context-Adaptive Questionnaire
- DMN-based Ontology Querying Service Discovery
- Smart Service Discovery and Selection
- DMN-to-CAMEL Mapper
- PaaS orchestration and Cross-layer adaptation
- Cross-layer monitoring
- Monitoring Information Harvesting
- KPI drill down



## Sustainability via Communities<sup>3)</sup>:

- FIWARE – Workflow Engine
- GitHub – OpenSrc Projects
- ADOxx.org – Modelling and Semantics

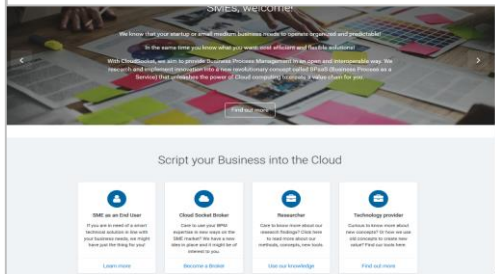
## Download at [cloudsocket.eu](https://cloudsocket.eu):

- 1) D4.6\_7\_8 and Tool download section
- 2) Innovation Shop and Zenodo
- 3) Get involved

# CloudSocket

# Stay in Touch

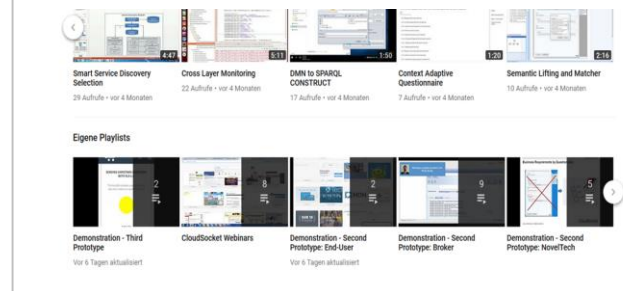
[WEB: cloudsocket.eu](http://WEB: cloudsocket.eu)



[TWITTER: @cloudsocketeu](https://TWITTER: @cloudsocketeu)



[YouTube: UC8qbCYS49FfG7S8j5AABpaA](https://YouTube: UC8qbCYS49FfG7S8j5AABpaA)



Coordinator

[robert.woitsch@boc-eu.com](mailto:robert.woitsch@boc-eu.com)

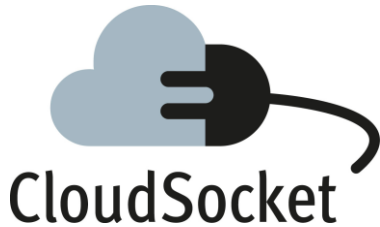
++43-1-905 10 56 – 0

BOC Asset Management GmbH  
Operngasse 20b  
1040 Wien, Österreich



CloudSocket

# Stay in Touch



[www.cloudsocket.eu](http://www.cloudsocket.eu)

[@CloudSocketProject](https://twitter.com/CloudSocketProject)

<https://www.youtube.com/channel/UC8qbCYS49FfG7S8j5AABpaA>

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