

Business Process Management

Lecture I

Introduction to Business Process Management

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Seoul National University of Science and Technology



Agenda

- Lecturer and students
- Course logistics
 - Objectives
 - Methodology
 - Contents
 - Resources
- Introduction to BPM
 - Scope of this class

Lecturer presentation



- BSc in Computer Engineering,
 - Universidad de San Carlos de Guatemala



- MSc in Industrial & Management Systems Engineering
 - Business Process Management Laboratory
 - Process mining applied to SNS



- PhD in Industrial & Management Systems Engineering
 - Industrial Artificial Intelligence Laboratory
 - Interpretable Machine Learning for tree ensembles

Prof. Josue Obregon (Assistant Professor)

Tel: 02-970-7291

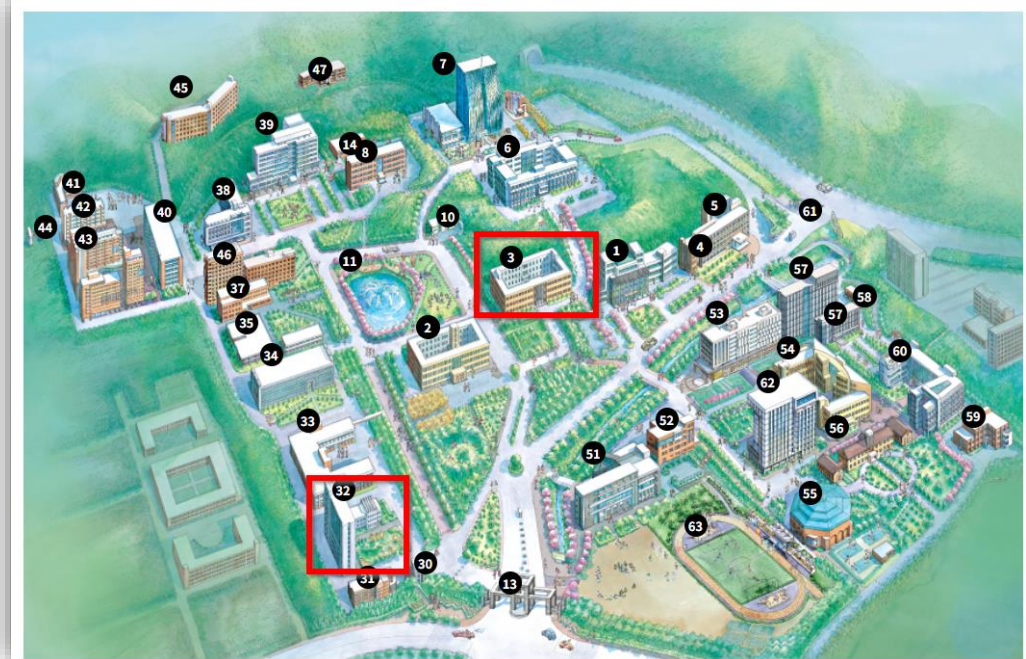
Office: Changhak Hall (3), Room 334-1

Office Hours: Monday 14:00 – 17:00

Home-page: <https://www.josue-obregon.com/>

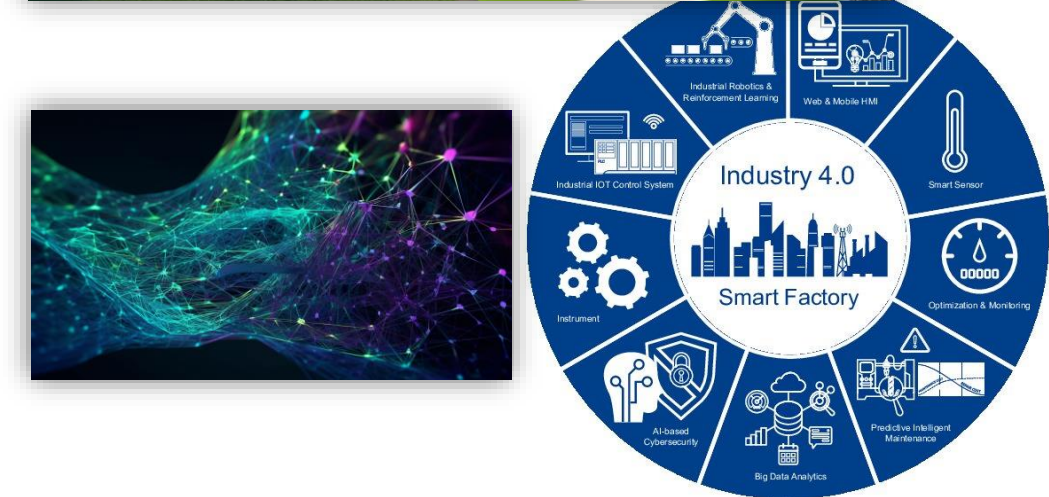
Email: jobregon@seoultech.ac.kr

Publications: [Google Scholar Profile](#)



Lecturer presentation

- EIS Lab (Explainable Intelligent Systems Lab)
- Applied Machine Learning / Deep Learning
 - Smart Energy
 - Solar energy power generation forecasting
 - Batteries SOH estimation
 - Smart Manufacturing
 - Manufacturing quality prediction
- Explainable Artificial Intelligence (XAI)
 - How can we explain the predictions of complex models??
- If you are:
 - Curious about applied AI
 - Want to learn how to read a paper and do basic research
 - Contact me!



https://www.researchgate.net/publication/333531793_Industrial_Internet_of_Things_Big_Data_and_Artificial_Intelligence_in_the_Smart_Factory_a_survey_and_perspective/figures?lo=1&utm_source=google&utm_medium=organic

<https://smartenergysystems.eu/about/>

<https://www.udacity.com/course/deep-learning-pytorch--ud188>

Students

- What comes to your mind when you see this words:
 - Process
 - Business
 - Management
- Are there some international students?
 - Where are you from?
 - What is your major?
 - Why did you come to Korea?

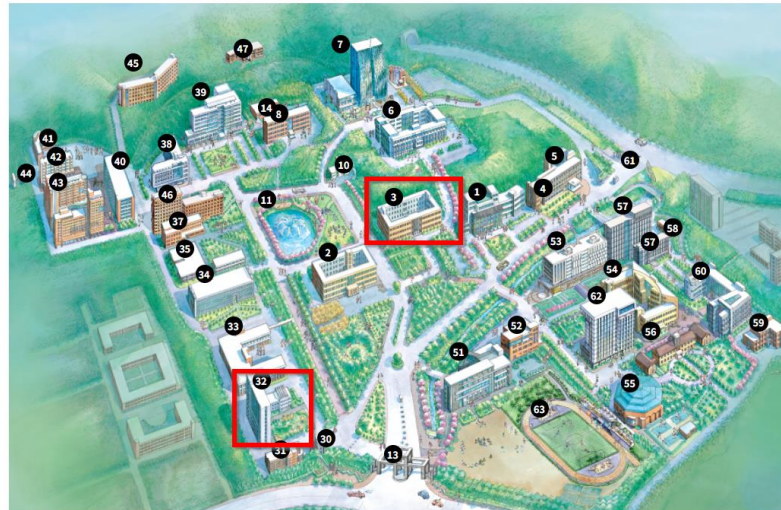


Course objectives

1. Equip students with a thorough understanding of the entire BPM lifecycle, from identification to monitoring, using industry-standard methodologies and tools.
2. Develop students' ability to effectively model and analyze business processes using BPMN to enhance organizational efficiency.
3. Train students to apply qualitative and quantitative techniques for process analysis and improvement, optimizing business operations.
4. Teach students to use process mining tools for monitoring and analyzing business processes to ensure continuous improvement and data-driven decision-making.
5. Prepare students to strategically align BPM initiatives with organizational goals and establish effective governance structures for sustainable success.

Class methodology

- There are two class components: Lectures and discussion of study cases or simplified examples
 - Lectures: Monday 10:00 – 13:00 (Room 408 Frontier Building)
 - Office Hours: Monday 14:00 – 17:00 (Room 334-I, Changhak Hall (3))
- Discussions and practical simple exercises will be provided for reinforcing the concepts learned on each class



Communication

Office Hours: Monday 14:00 – 17:00
Room 334-1, Changhak Hall (3)



During office hours

No appointment is required!

First-come, first-serve

In-person or Zoom

Be effective, more people may be waiting for
their turn

Have your materials ready



Outside office hours

No walk-in

Appointments can be requested by email
preferably

Be aware!

“After class” is not my office hours

- Ask your questions during class time (including attendance issues)
- If your questions are not answered in class, please come to office hours or use asynchronous communication!

Academic Integrity Violation

SeoulTech takes it seriously, so do I

You may get away with it for some time, but not forever

You would be surprised by how easily we can spot it

Both cheaters and facilitators are penalized

In-class participation

1

Talk to me

- Raise your hand and wait your turn to talk
- It is expected and **appreciated**.

2

Ask questions

- It doesn't show a weakness
- It helps everyone to grow!

3

Answer questions

4

Correct some mistakes I will eventually make

- Yeah, this happens

HW start the day they are assigned...

... not the day they are due!

I will not answer questions at night

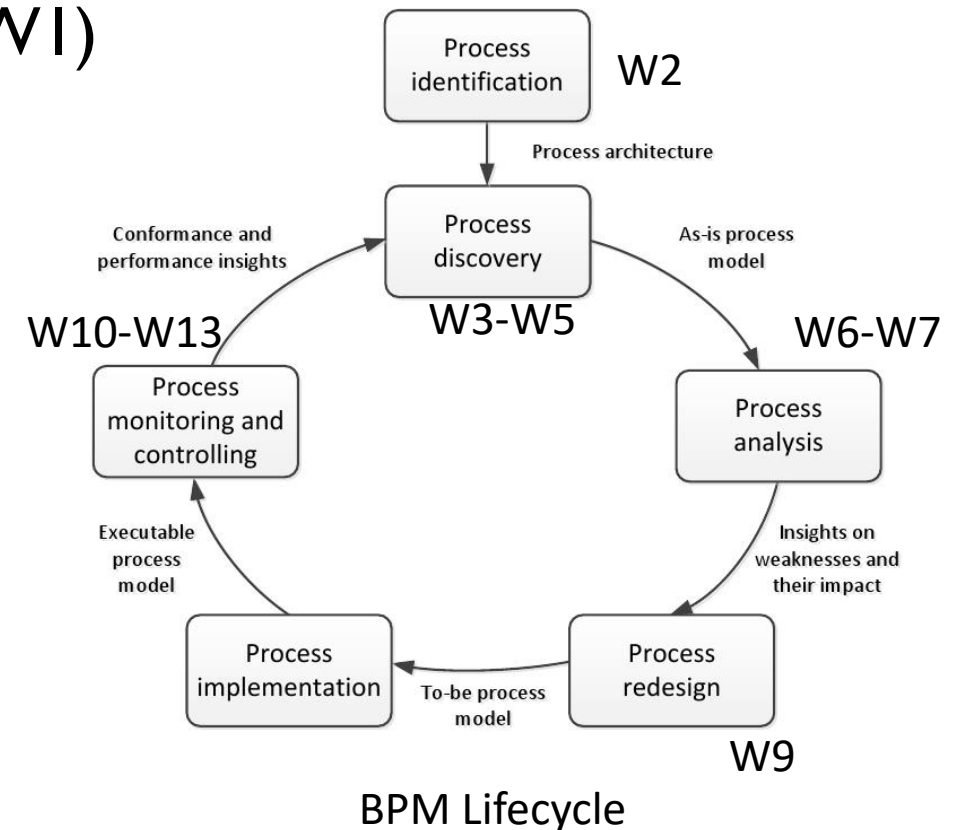
I will not answer questions on weekends

I cannot help you 2 hours before the deadline

I cannot help you after you submitted the wrong file/answer

Contents

- Introduction to BPM (W1)
- Process Identification (W2) (Recorded lecture) (HW1)
- Process Modeling (W3 – W4) (HW2)
- Process Discovery (W5)
- Process Analysis (W6 – W7) (HW3)
- **Midterm Exam (W8)**
- Process Redesign (W9) (TP Released)
- Process Monitoring (W10-W12) (HW4)
 - (W11 Recorded lecture)
- BPM as an Enterprise Capability (W13)
- **Team Project Presentation (W14)**
- **Final Exam (W15)**

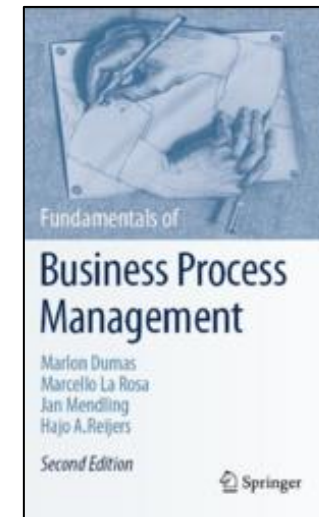


Evaluation

- Evaluation
 - Attendance: 5%
 - Homework: 10% (4)
 - Team Project: 15% (teams of 4 members)
 - Midterm exam: 35%
 - Final exam: 35%

Readings and resources

- Course material posted on e-class system
 - <http://eclass.seoultech.ac.kr>
- Textbook
 - Dumas, La Rosa, Mendling & Reijers:
Fundamentals of Business Process
Management (Second Edition), Springer 2018



What is a Business Process?



Issue
delivery
receipt

Load
truck

Package
products

Issue
invoice

Prepare
shipment

Schedule
payment

Schedule
delivery

Check &
confirm
PO

Unload
truck

Notify
shipment

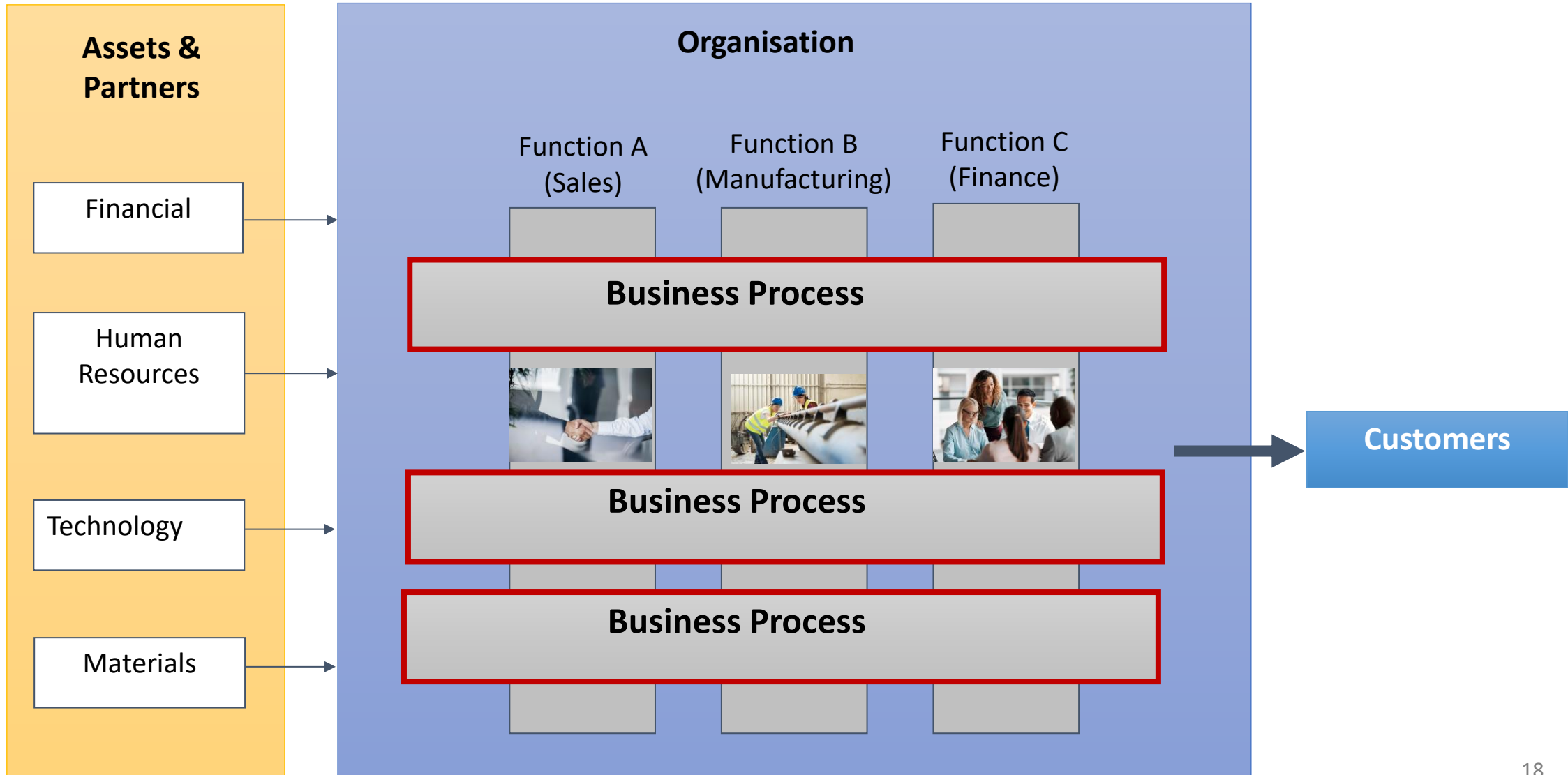
Obtain
PO
confirm.

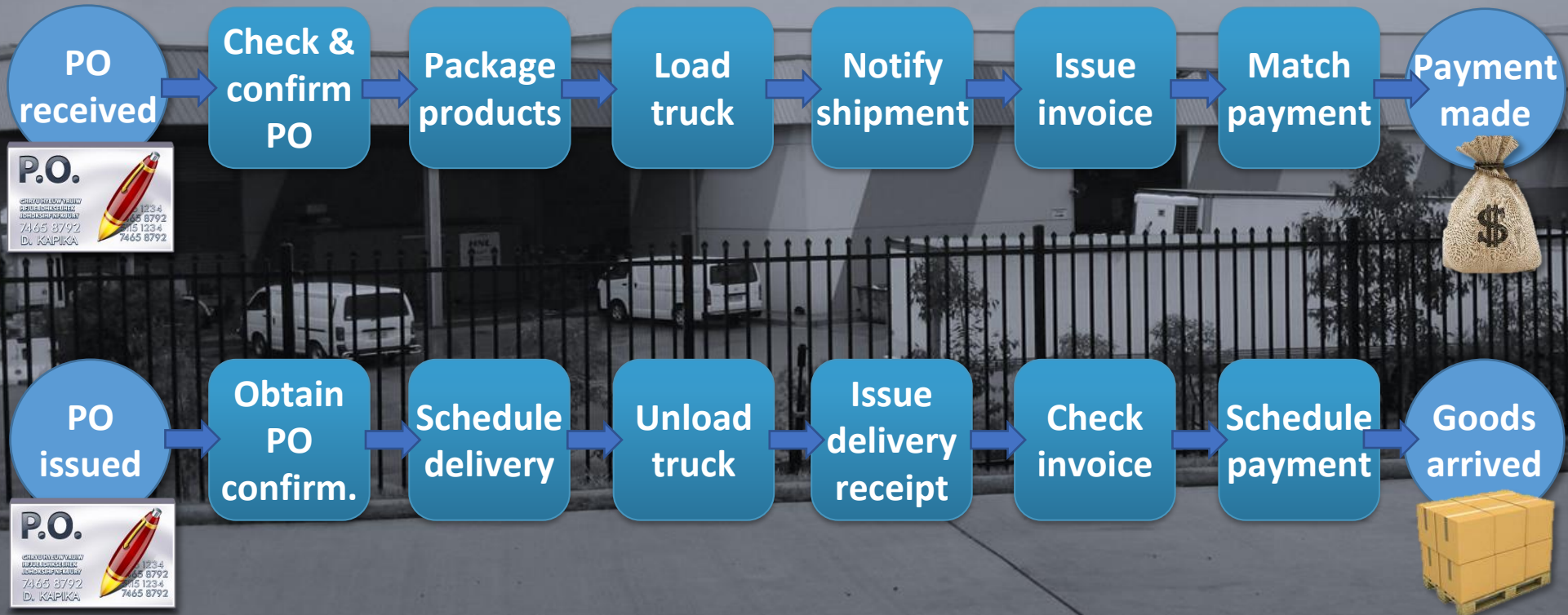
Check
Invoice

Request
PO change

Match
incoming
payment

Business processes





Your turn...

Bring
menu

Load
dish-
washer

Take
order

Serve
meal

Brush
grills

Collect
laundry

Collect
payment

Collect
laundry

Unload
dish-
washer

Present
bill

Sweep
& mop

Clean
kitchen
surfaces

Greet &
seat



Customer arrived

Greet & seat

Bring menu

Take order

Serve meal

Present bill

Collect payment



Customer paid

Kitchen is dirty

Load dish-washer

Clean kitchen surfaces

Brush grills

Collect laundry

Sweep & mop

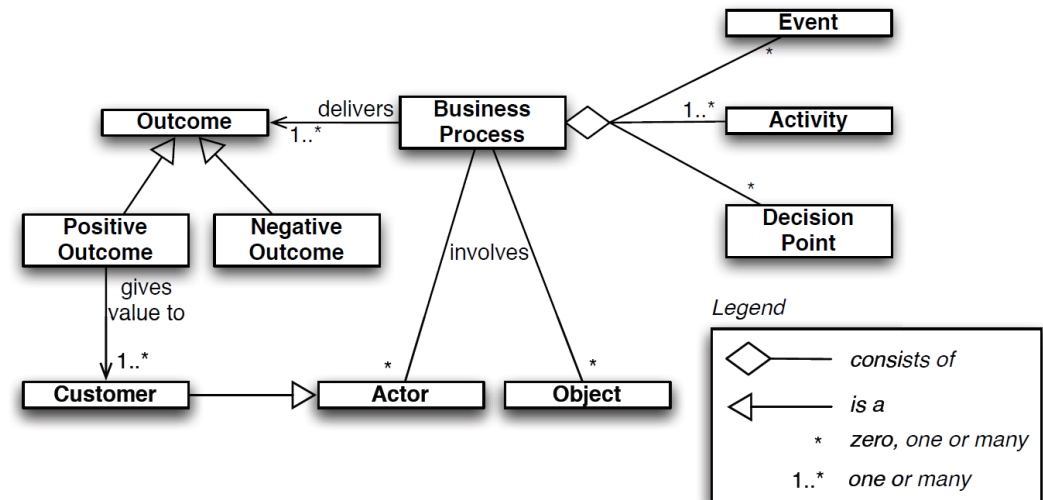
Unload dish-washer

Kitchen is clean



A business process is...

a chain of *events*, *activities* and *decisions*
 ...involving several *actors* and *objects*,
triggered by a *need*
 and collectively leading to an *outcome* that is
 of *value* to a *customer*.



Examples:

- Order-to-Cash
- Quote-to-Order
- Procure-to-Pay (aka Purchase-to-Pay)
- Application-to-Approval
- Issue-to-Resolution

Common Types of Processes

*P/S: product or service

- **Order-to-cash**
 - Start: customer submit order to purchase P/S
 - End: P/S has been delivered and customer make payment
- **Quote-to-order**
 - Start: supplier receives Request For Quote (RFQ)
 - End: Customer places purchase order
- **Procure-to-pay (aka Purchase-to-Pay)**
 - Start: Someone determines that a P/S should be purchased
 - End: P/S has been delivered and paid for
- **Issue-to-resolution**
 - Start: Customer raises a problem or issue
 - End: One or Both of them agree that the issue has been resolved
- **Application-to-approval**
 - Start: Someone applies for a benefit or privilege
 - End: When benefit or privilege is either granted or denied

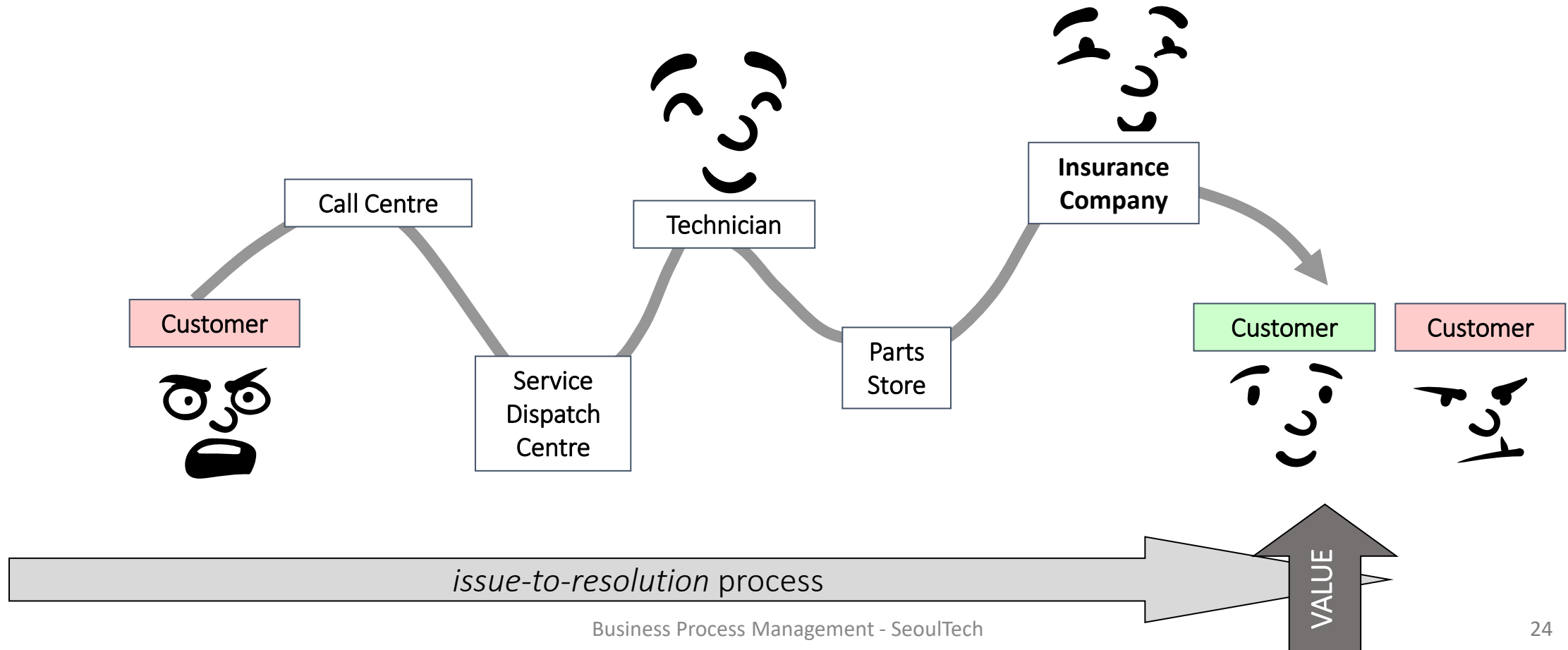
“My washing machine doesn’t work...”

Negative outcomes (value-reducing):

- Fault not repaired in a timely manner
- Fault repaired but customer pays more than expected

Positive outcomes (value-adding):

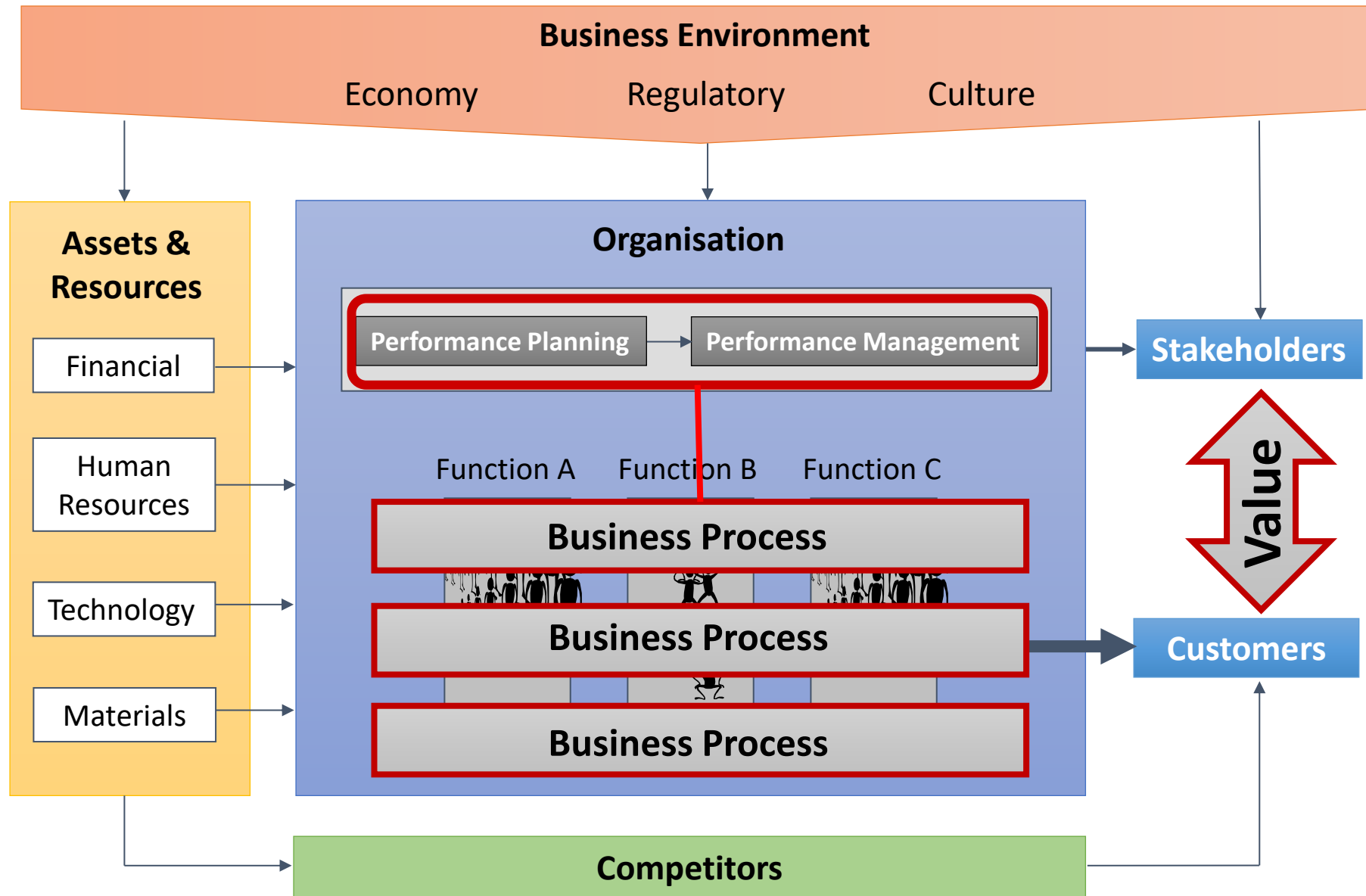
- Fault repaired immediately with minor intervention
- Fault repaired, covered by warranty



What is Business Process Management?

And why should I care about it?

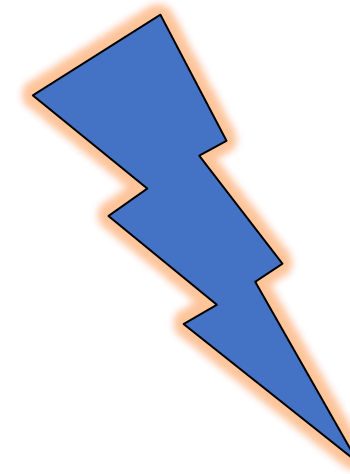
Improving Performance



Process performance

If you had to choose between two services, you would typically choose the one that is:

- F...
- C...
- B...



Process performance

If you had to choose between two services, you would typically choose the one that is:

- Faster
- Cheaper
- Better

Process performance

Three dimensions of process performance

- Time
- Cost
- Quality

Improving process performance



How would you improve this process?



Outsource to Customer



Standardize



Eliminate Cooking



Automate



Invest and Build



Re-sequence

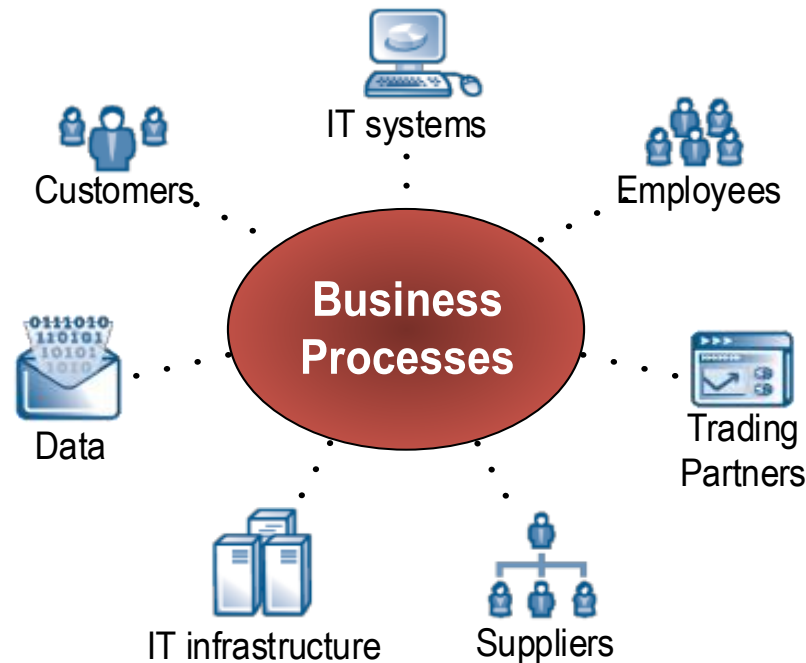


Eliminate Waiters



Business Process Management (BPM)

*Body of principles, methods and tools to design, analyze, execute and monitor **business processes**, with the aim of **improving** their performance.*



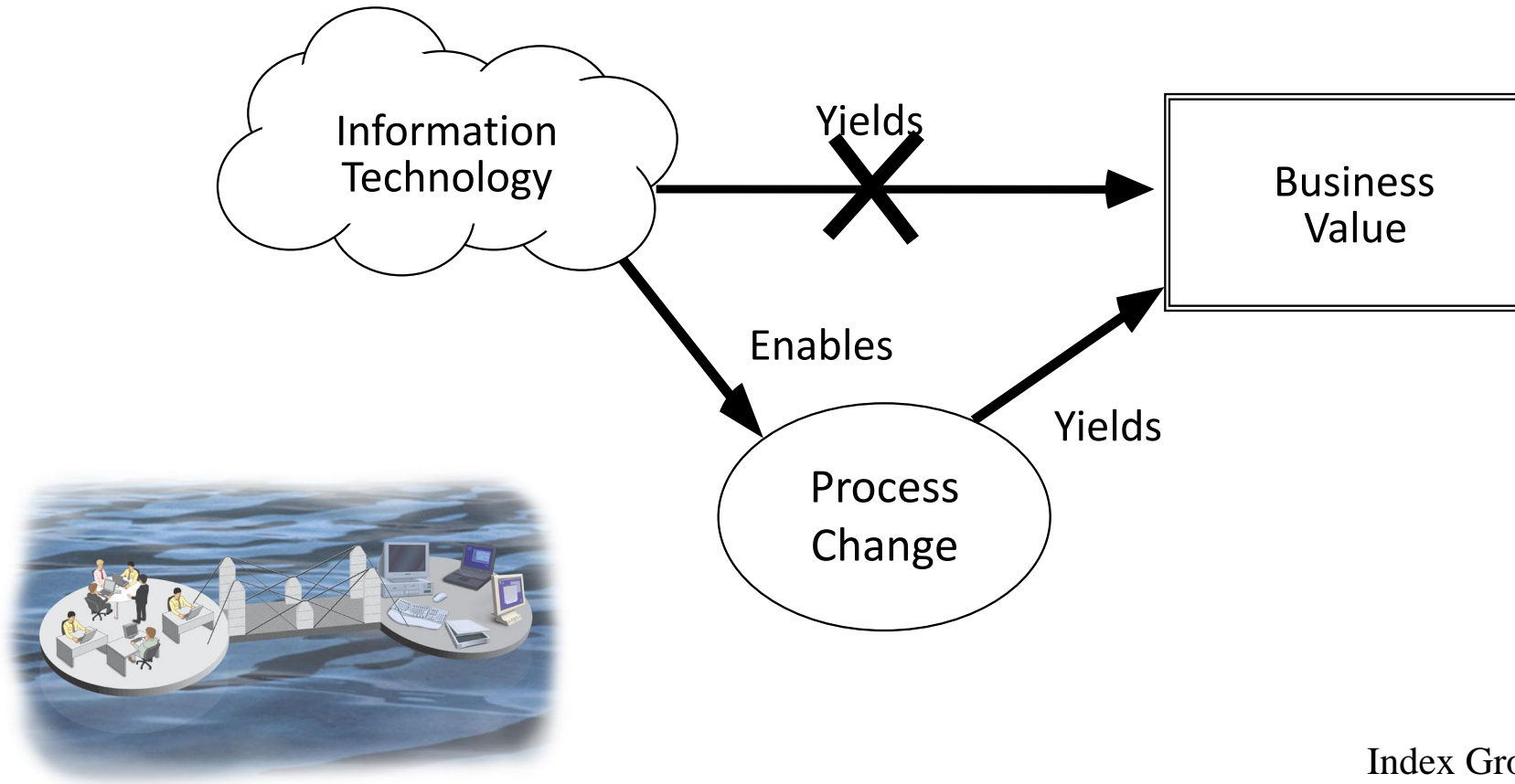
Why BPM?

“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

In other words...



Index Group (1982)

Why BPM



Process Manager / Business Analyst

Swedbank AS

[Details](#)[Highlights](#)[Company](#)

Are you passionate about working with data related topics and processes supporting that and be part of a team establishing ways of working within Group Business Intelligence and beyond?


In Swedbank you have the opportunity to:

- Lead and facilitate work with stakeholders during process definition work as well as followed by implementation, operations and adherence monitoring;
- Support colleagues in education and information sharing sessions, lead training sessions to establish common ways of working;
- Work in multi-cultural, multi-tasking and challenging environment across Swedbank Group and different teams;
- Be accountable and responsible for measuring process performance.

As Process Manager/Business Analyst within process work area you are the one appointed to operate the process, its improvements and support guild management team in that work. You take lead in proposing and prioritizing improvements and stakeholder engagement.

What is needed in this role:

- Bachelor's or Master's degree in a related field, or a great reason for not having one.
- University degree or acquiring (preferably in finance, mathematics, statistics, economics or IT);
- Previous work experience with process related work, business requirements and data analyses;



PROCESS AUTOMATION EXPERT

Finnair Business Services OÜ

[Details](#)[Highlights](#)[Company](#)

We are now hiring **PROCESS AUTOMATION EXPERT** to be the key person in process automation initiatives. Developing automation solutions in Microsoft PowerPlatform and AWS environment.

We are looking for someone with preliminary understanding of Microsoft PowerPlatform / API technology / scripting concepts or other automation solutions. The ideal candidate has development-minded and proactive personality, self-initiative and great teamwork skills. Relevant education or previous work experience from similar field is considered as advantage.

Main Responsibilities:

- Develop the solution according to the provided documentation and carry out testing phases
- Organize needed production environment changes (user licenses, virtual machine resourcing, production implementation) with IT and external system vendors
- Create documentation for solutions implemented
- Manage recurring activities: change and disruption management, scheduling, environment upgrades & service windows, reporting

We appreciate:

- Familiarity with process way of working

About the job

[Introduction of ZEISS Group & ZEISS Korea]

The German ZEISS group is a Global Leader in Optical Technology with a 175-year history. The ZEISS Group, headquartered in Oberkochen, Germany, provides innovative solutions in semiconductor technology, industrial quality and research, medical technology and consumer optical technology. The history of the ZEISS group, which began with the founder of Carl Zeiss in 1846 based on the entrepreneurial spirit of "combining theory and practice", has established itself as a pioneer in the field of optics through ceaseless exploration of the field of optics.

ZEISS Korea has played a key role in the Korean market for the past 36 years. For ZEISS, the Korean Market is One of the Top 5 Global Sales Markets, providing products and services from five business areas to Korean customers. The Vision Division, which handles advanced optical products for consumers, the Medical Device Division, which is more familiar with Smile LASIK, the Microscope Division, which provides optical and electron microscopes, the Semiconductor Division, which provides semiconductor mask products and services, and the Quality Solutions Division, which measures product quality, is growing by collaborating with Korean customers, companies and research institutes.

Job Title : Business Strategy & Analysis Specialist

In this role, you will have the opportunity to:

A. Developing and owning Fact-base (Market, Customer, Competition)

- Macro-data collection and tracking (GDP, PMI, etc.)
- Customer analysis and update, incl. financial results
- Competitive intelligence update, incl. financial results, in coordination with SBU's
- ZEISS market potential estimation & market share update, in coordination with SBU's

B. Developing and managing Strategy

- ZEISS Korea strategy development support
- ZEISS Korea strategy progress follow-up and communications
- Cross-SBU(Business Division) special project support and management
- Support SBU's Individual Go-To-Market strategy project

C. Business performance analysis

- Create and own business-related dashboard
- Manage KPIs and define improvement initiatives through business outcome analysis
- Other reporting & communications support

ZEISS Group

Business Strategy & Analysis Specialist

Seoul, South Korea · 2 weeks ago · 49 applicants

Thermo Fisher Scientific

IT Business Analyst (ERP Administrator)

Gangnam District, Seoul, South Korea · 2 weeks ago · 11 applicants

About Thermo Fisher Scientific Korea

Thermo Fisher Scientific Korea is a world-class company dedicated to enabling our customers to make the world healthier, cleaner, and safer. As a leading name in the healthcare, pharmaceutical, and biotech industries, we are driven by our mission to accelerate research, solve complex scientific challenges, drive technological innovation, and support patients in need. With our team of over 100,000 colleagues globally, we share a common set of values - Integrity, Intensity, Innovation, and Involvement. We believe in the power of diversity, where diverse experiences, backgrounds, and perspectives are valued.

IT Business Analyst (ERP Administrator) - Seoul, South Korea

Responsibilities:

Business partnership

- Partner with commercial business groups and functions, understand business challenges, and propose, evaluate, and deploy business solutions and system platforms to drive business growth.
- Analyze existing business processes, identify gaps, propose process improvements and system enhancements, and deliver system solutions to improve efficiency and productivity.
- Communicate and present the rationale for expanding operations in Korea to regional and global teams, ensuring that local requirements are considered and global systems are tailored to meet the specific needs of the Korean market.
- Align priorities with business goals and IT roadmap to contribute to business success.
- Build and nurture connections with user groups, customer accounts, and vendors.

Project management

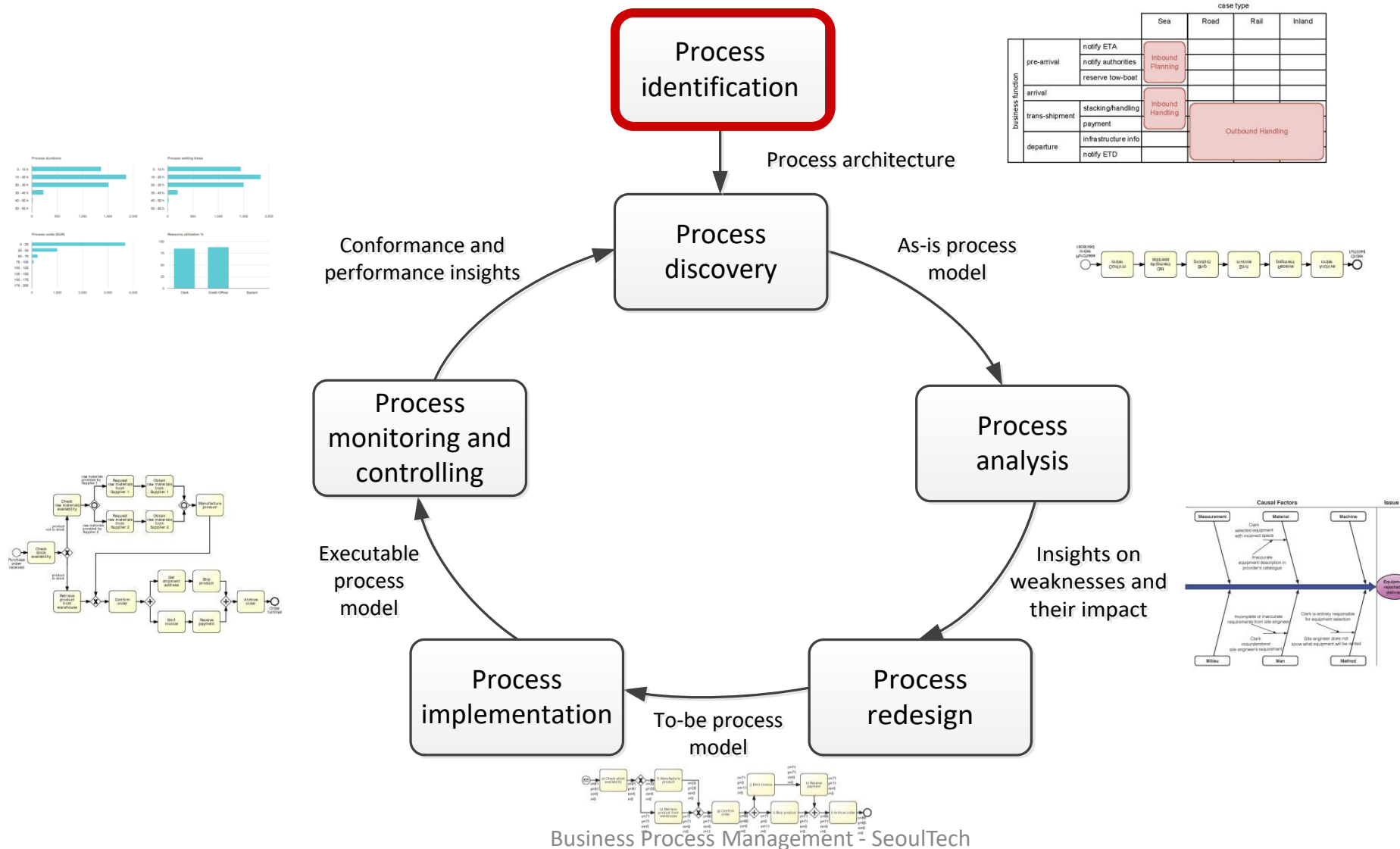
- Plan, lead, and implement projects to enhance business systems, ensuring project completion on time, within scope, and within budget.
- Communicate business processes, system technical specifications, and project requirements to users in an effective and easy-to-understand manner.

Application Operation

- Provide application support for ERP systems.
- Coordinate with global IT teams and regional offshore support to resolve system issues and maintain system availability and reliability.

How to go about BPM?

The BPM lifecycle



Process identification steps

1. Designation step

- Enumerate main processes
- Determine process scope

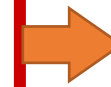


Process
Architecture

2. Prioritization step (aka Process selection)

Prioritize processes based on:

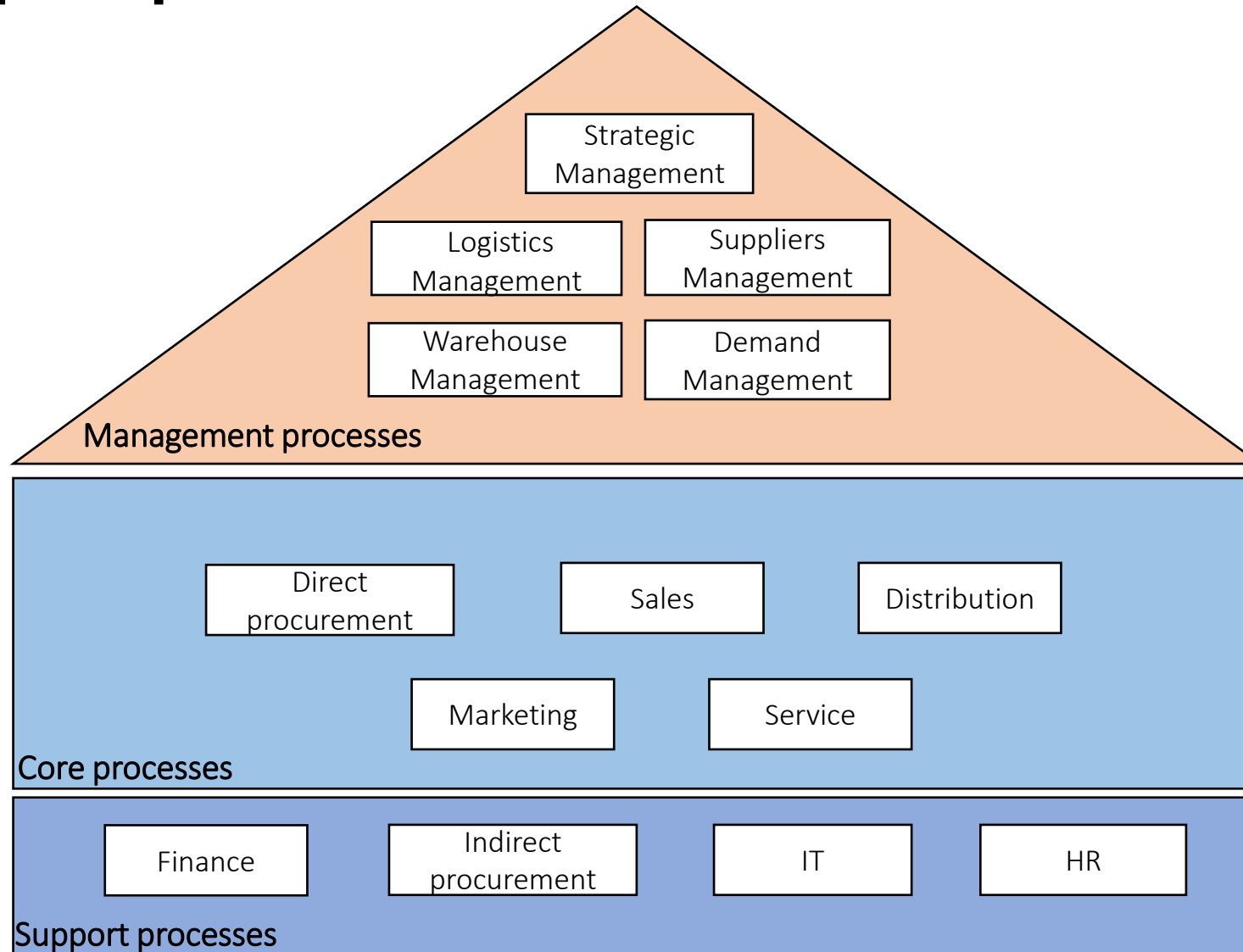
- Strategic Importance
- Health
- Feasibility



Prioritized
Process
Portfolio

Example: process architecture

Wholesaler



Prioritization (aka Process Selection)

1. Importance

Which processes have greatest impact on the organization's strategic objectives?

2. Health (or Dysfunction)

Which processes are in deepest trouble?

3. Feasibility

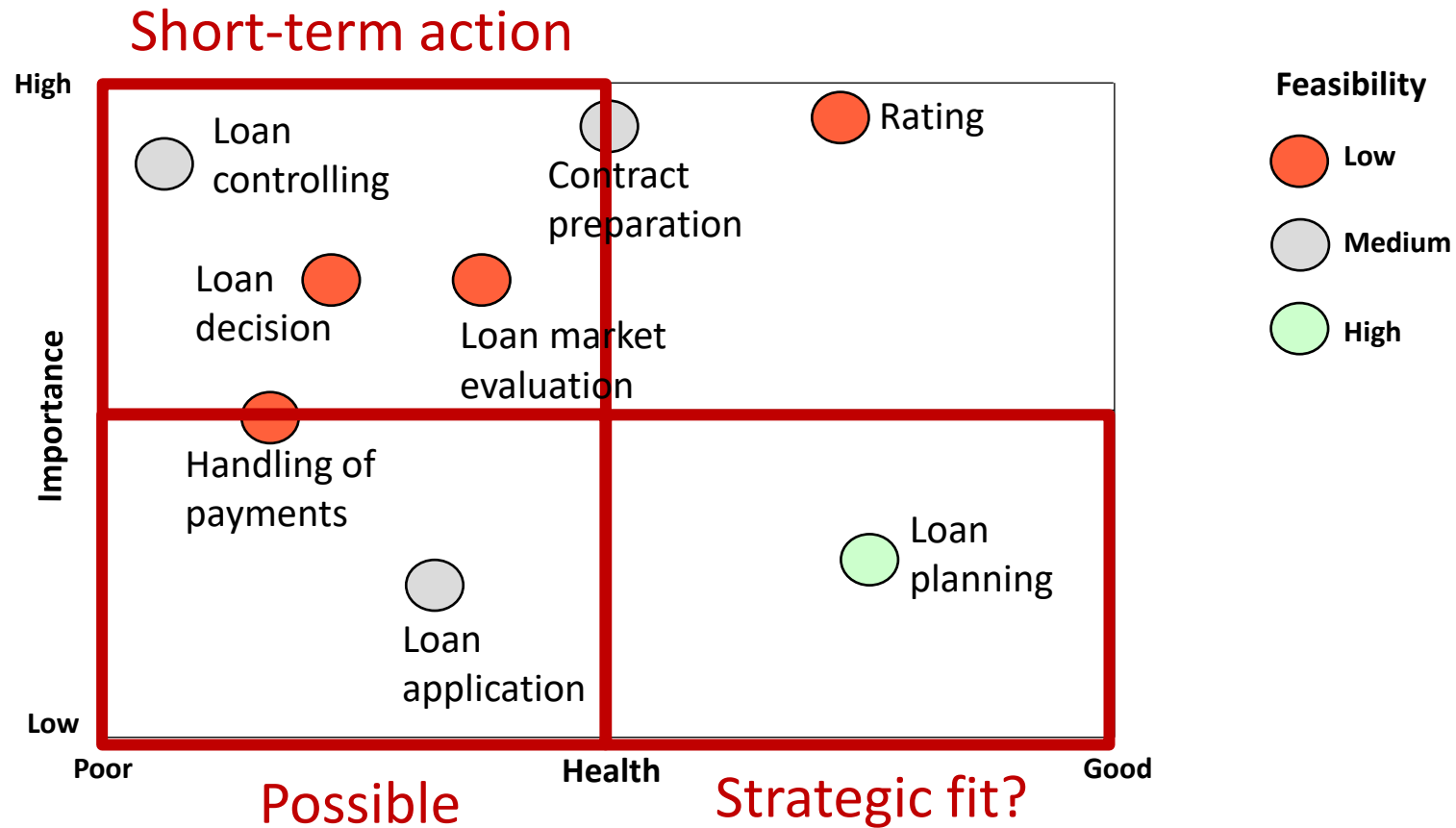
Which processes are most susceptible to successful process management?



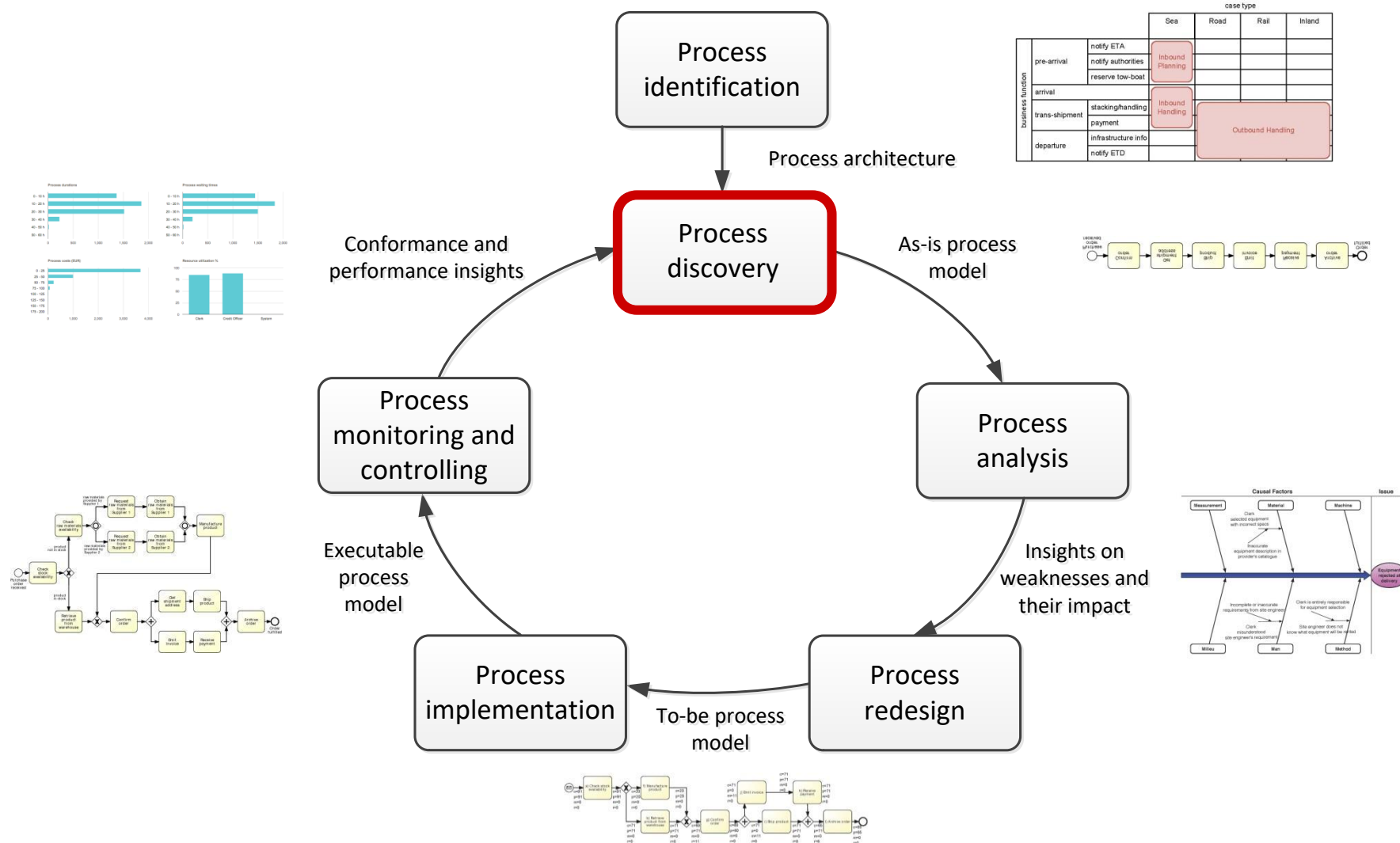
Prioritized process portfolio

Example: prioritized process portfolio

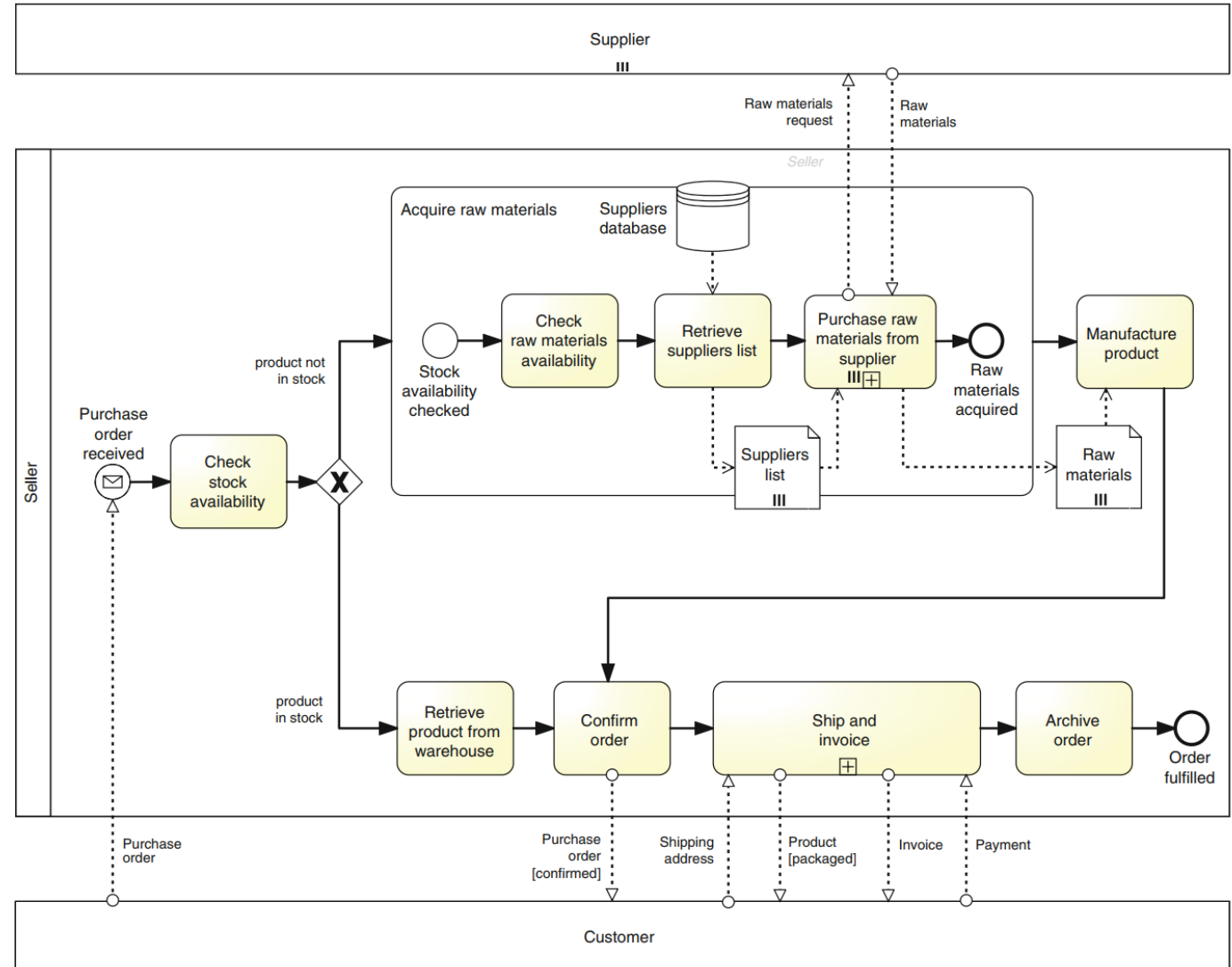
Financial institution



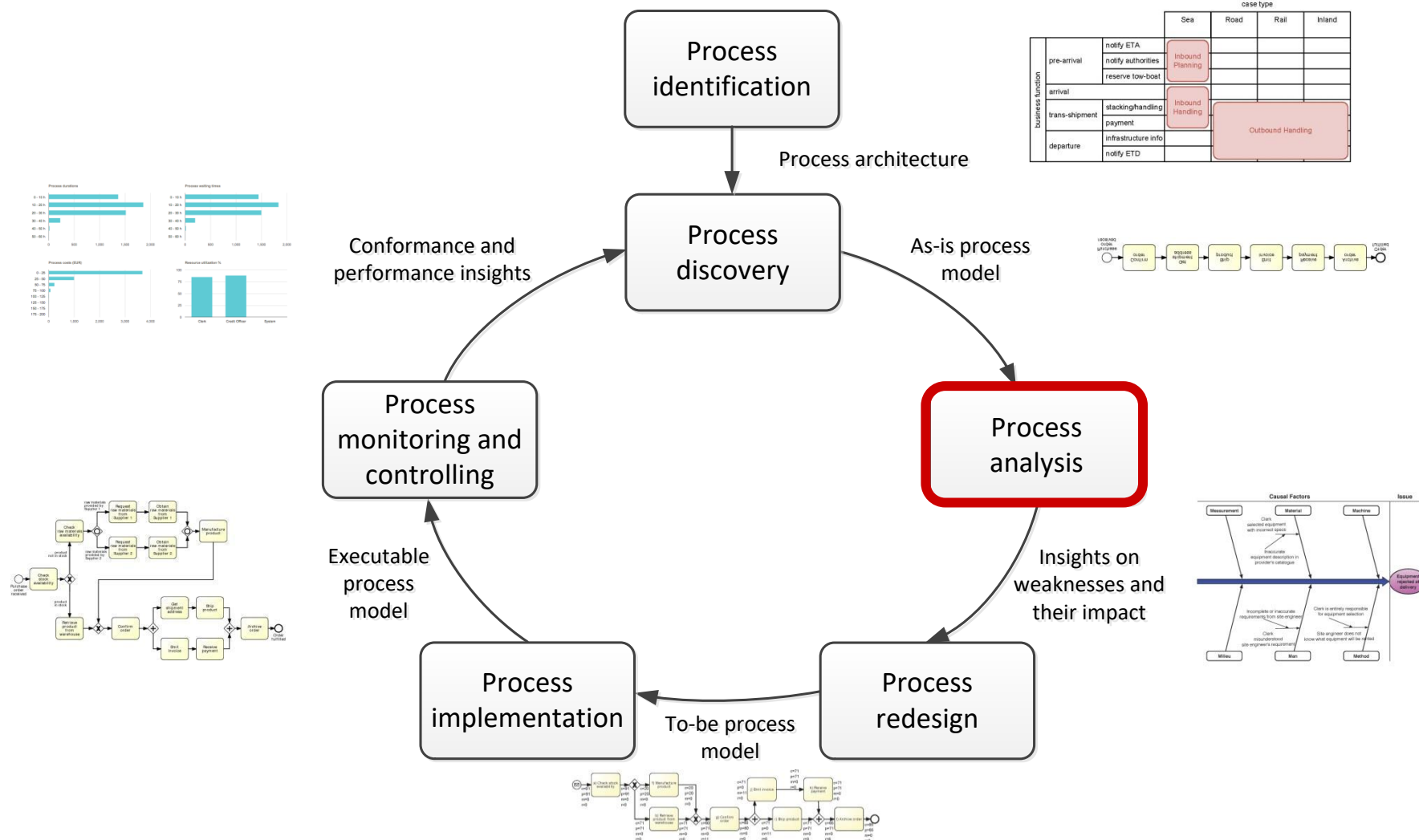
The BPM lifecycle



Business process model

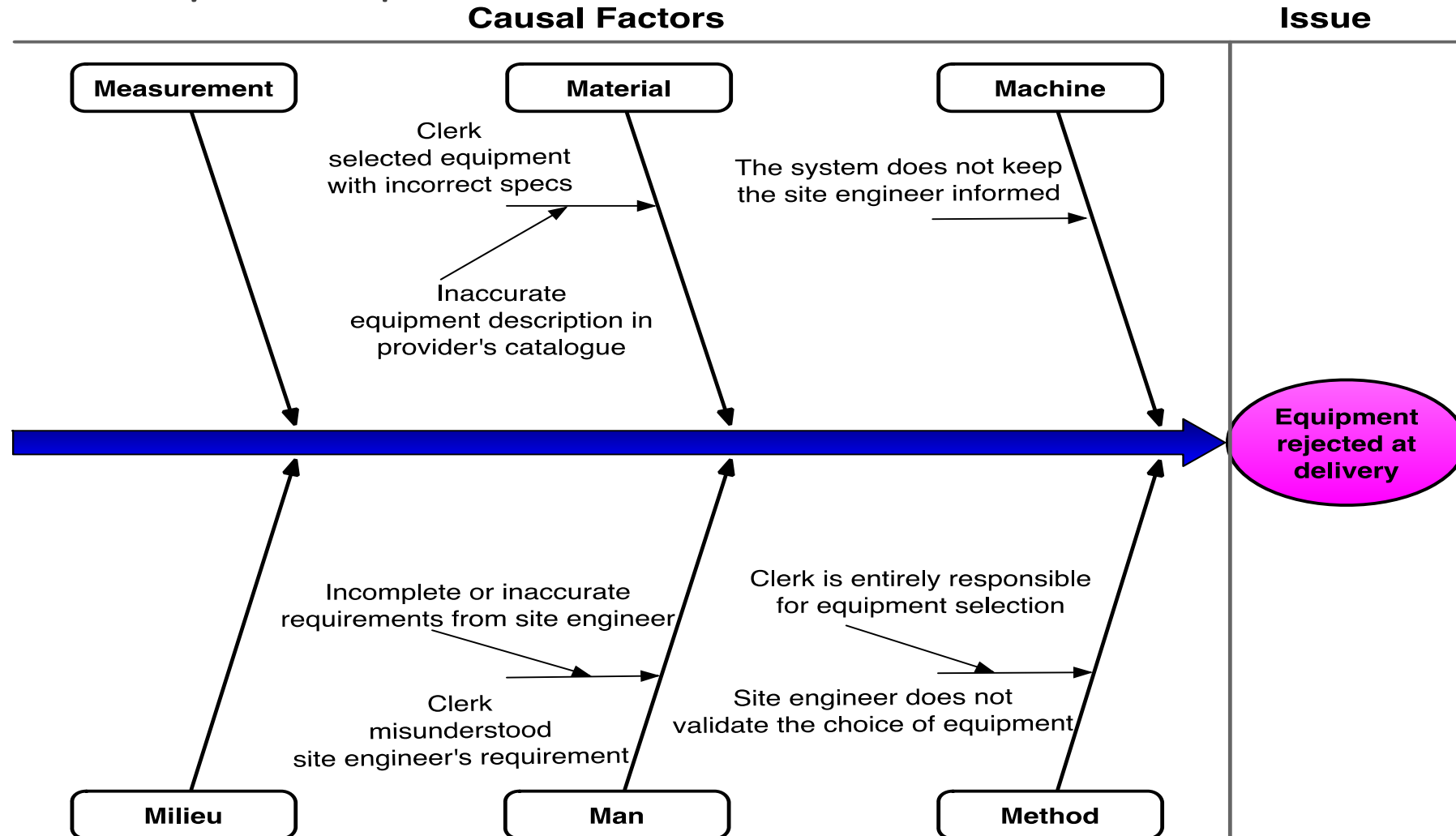


The BPM lifecycle



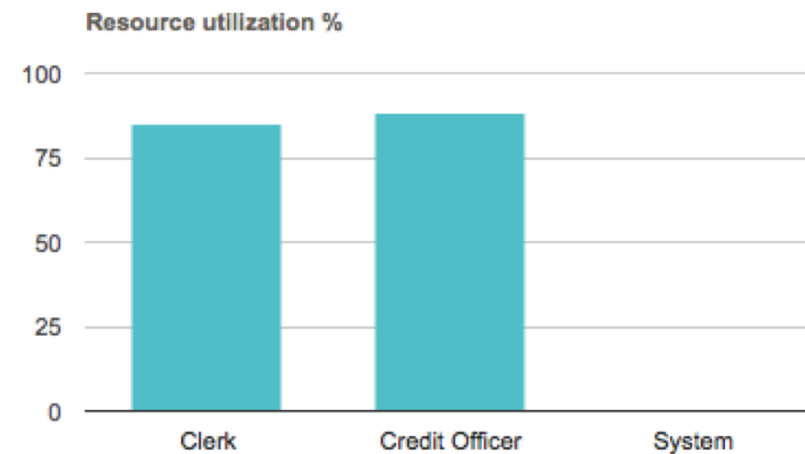
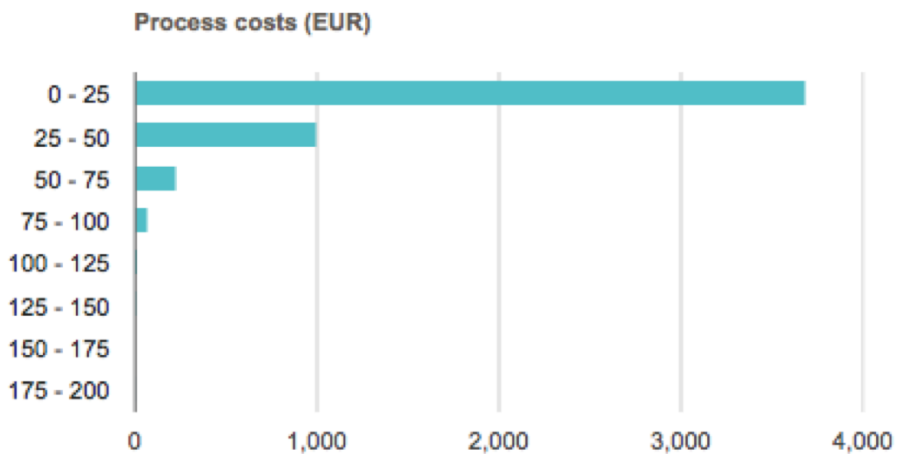
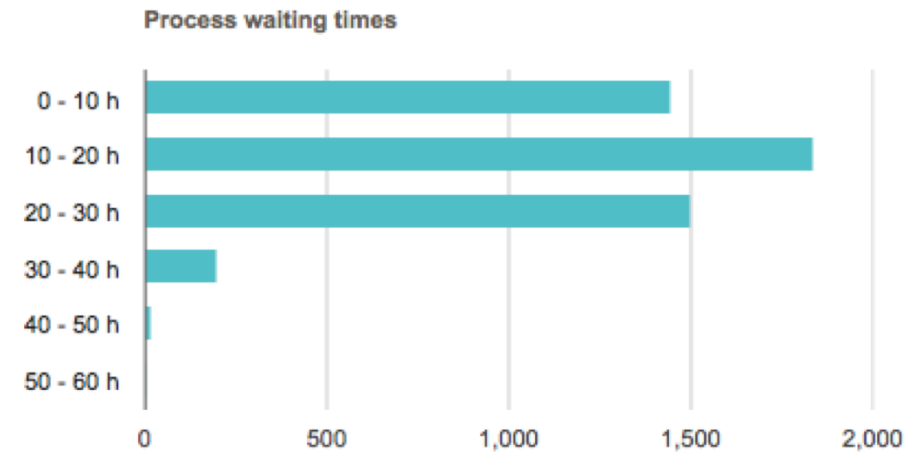
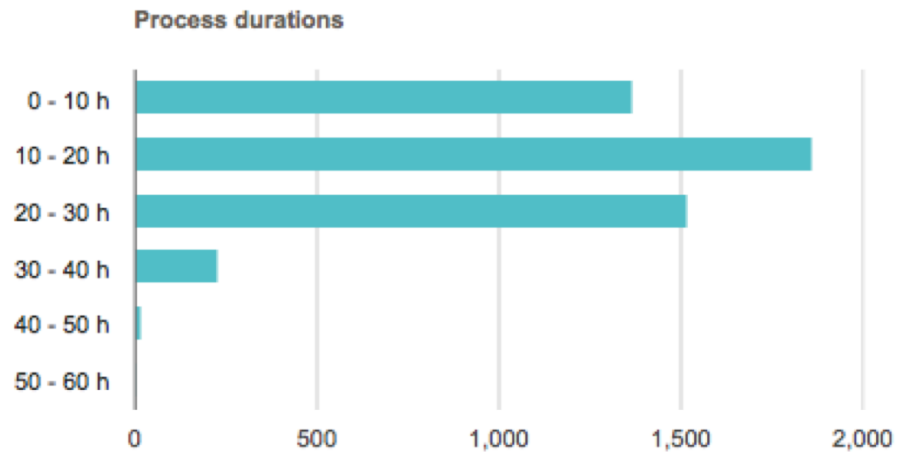
Qualitative process analysis

Root-cause analysis example



Quantitative process analysis

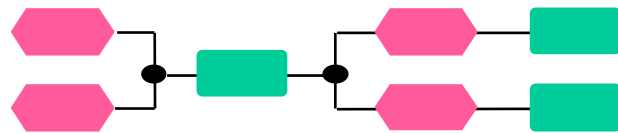
Process simulation



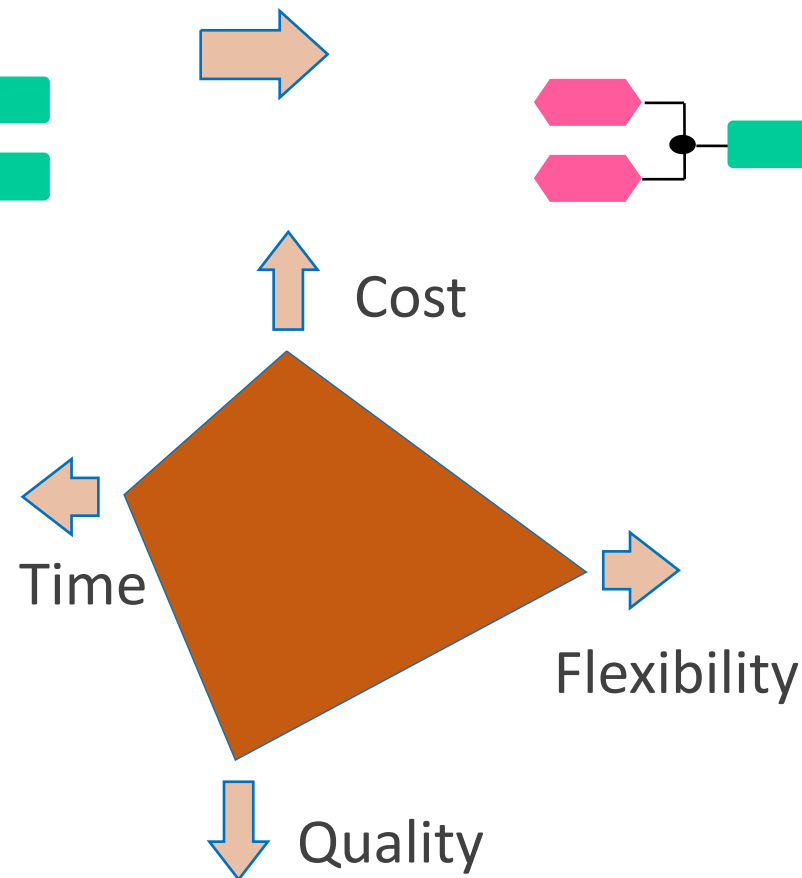
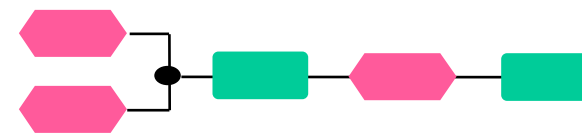


Process redesign

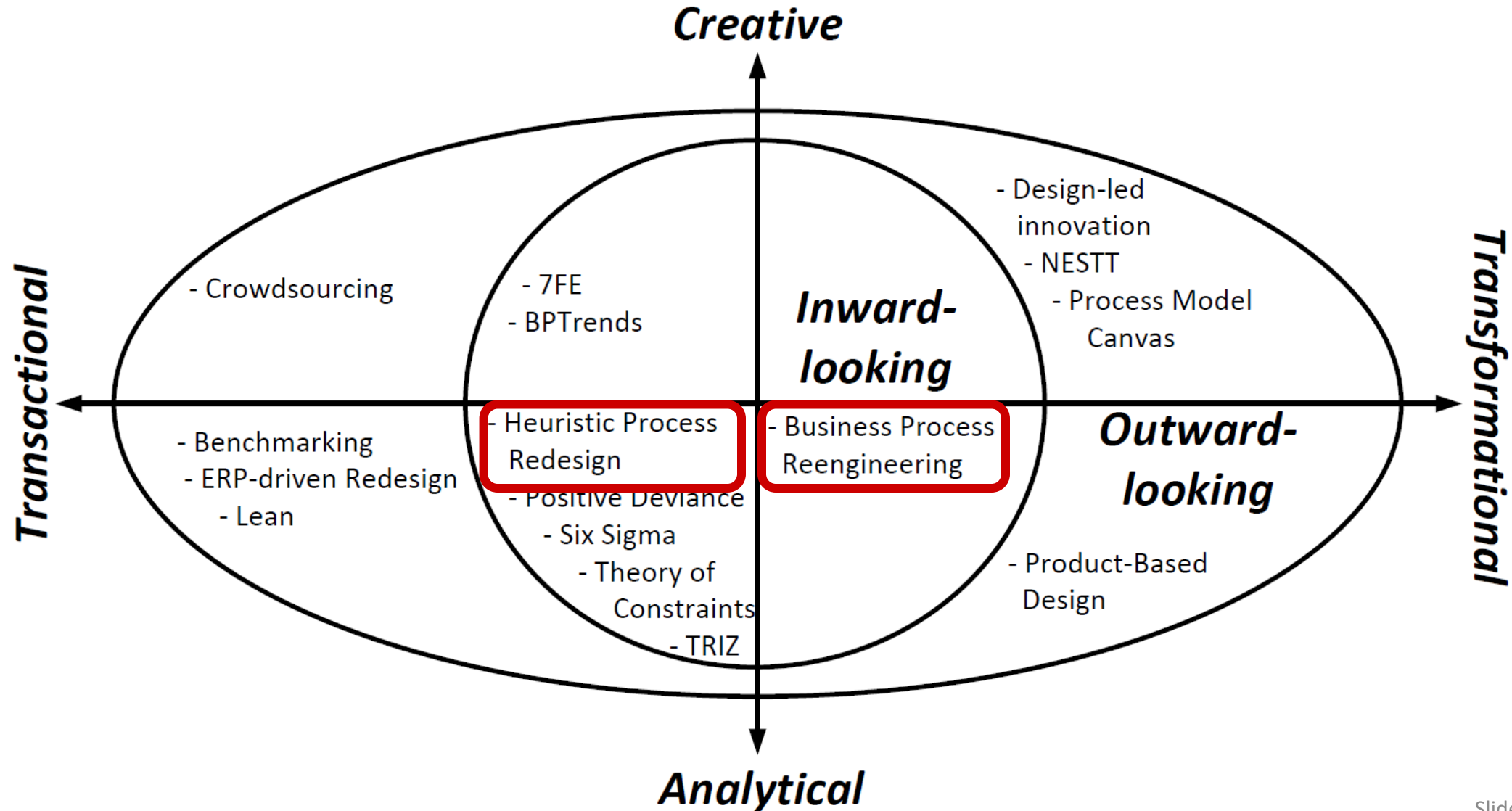
AS-IS process model



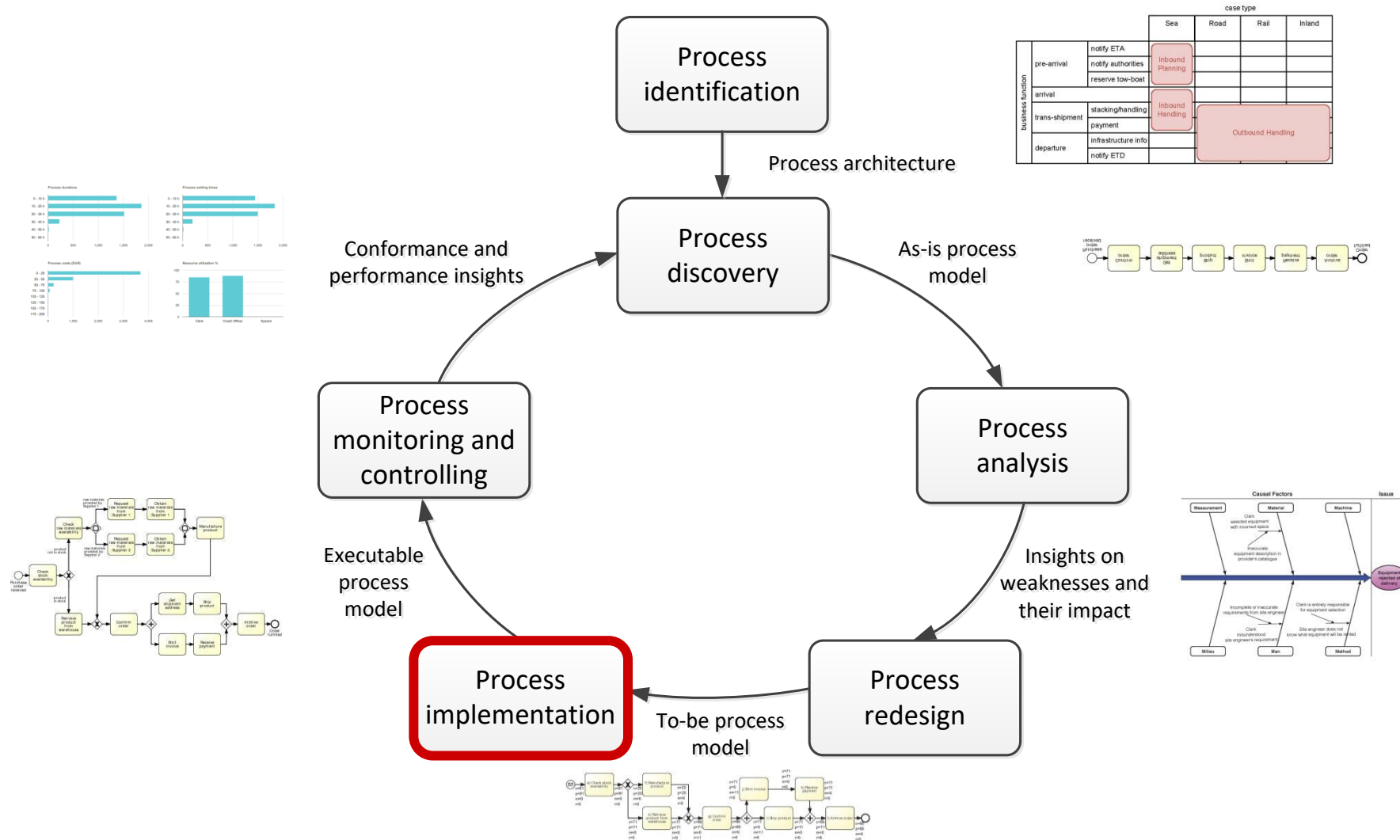
TO-BE process model



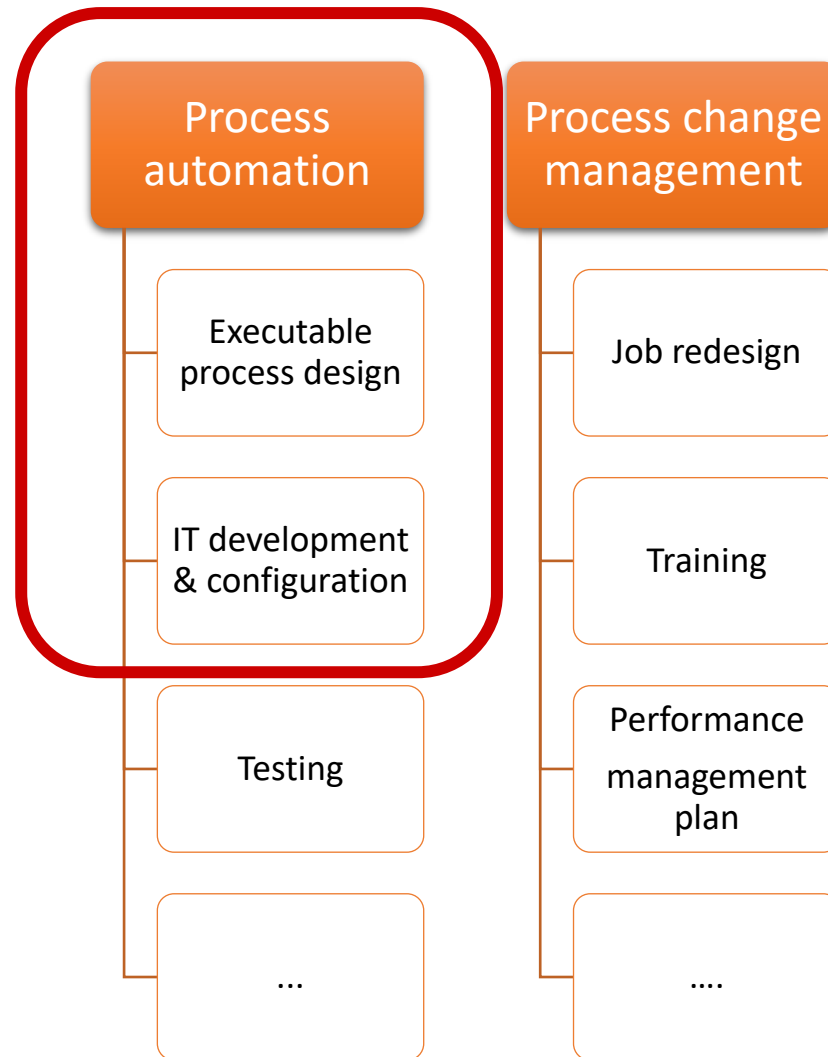
The Process Redesign Orbit



The BPM lifecycle



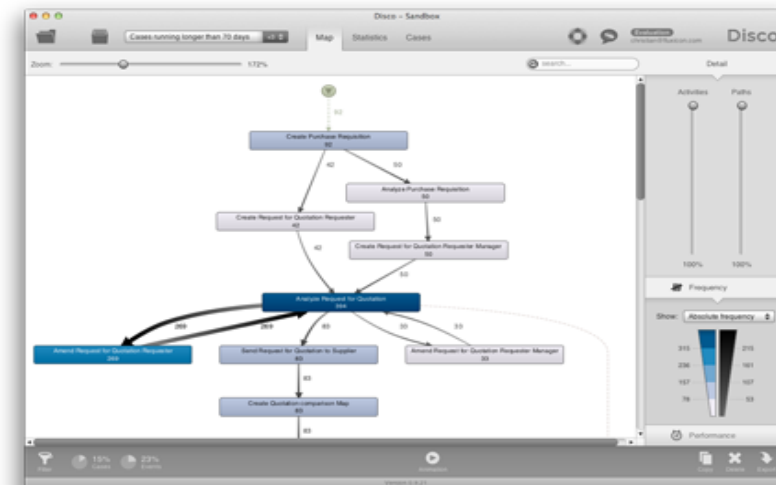
Process implementation



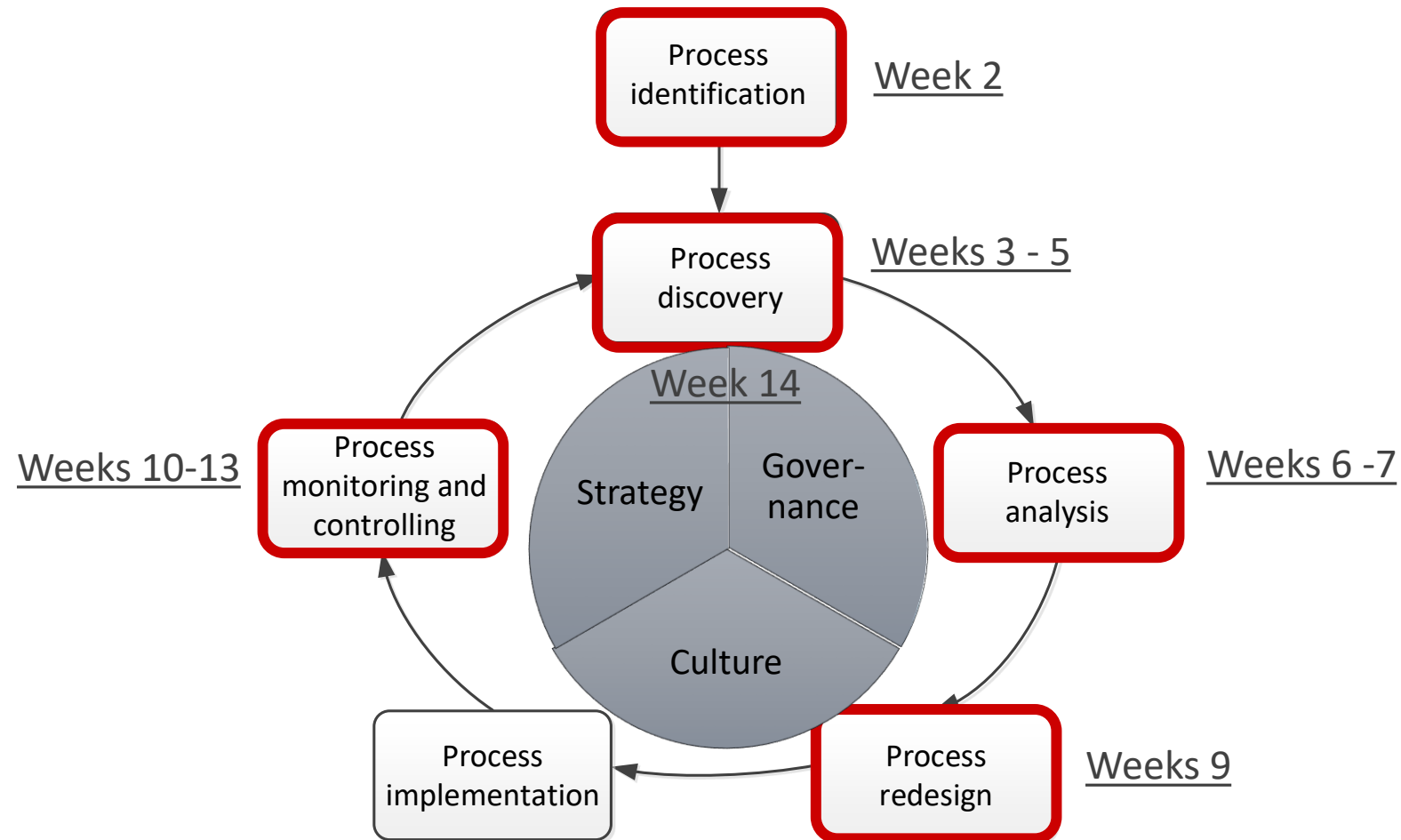


Event stream

DB logs



Course structure



Further Readings & Resources

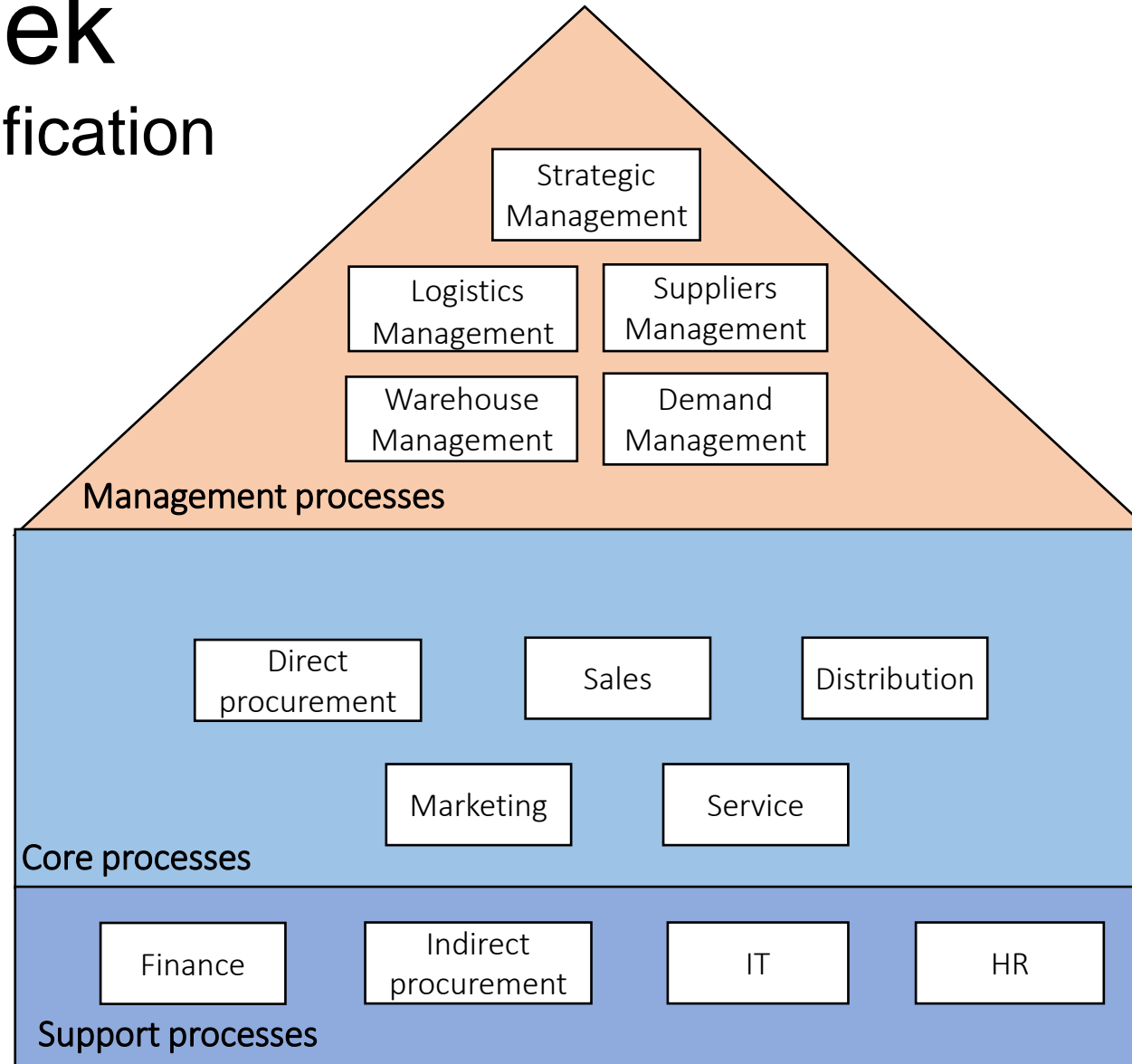
- Fundamentals of Business Process Management
 - Chapter I – Introduction

Recap

- A business process is a collection of events, activities, and decisions that collectively lead to an outcome that brings value to an organization's customers.
- Every organization is a collection of interrelated processes.
- Managing processes ensures that they produce value.
- BPM is a body of principles, methods, and tools to design, analyze, execute, and monitor business processes.
- Process models and performance measures are pillars for managing processes.

Next Week

Process Identification



Acknowledgements

- Most of the lectures notes for this class feature content borrowed with or without modification from the following sources:
 - “Source: M. Dumas, M. La Rosa, J. Mendling and H. Reijers, *Fundamentals of Business Process Management*, 2nd edition, Springer, 2018”.