



# **T-86.5141** **Enterprise Systems Architecture** **(Fall 2011)**

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## ***BUSINESS PROCESS MANAGEMENT*** ***(BPM)***

## Topics

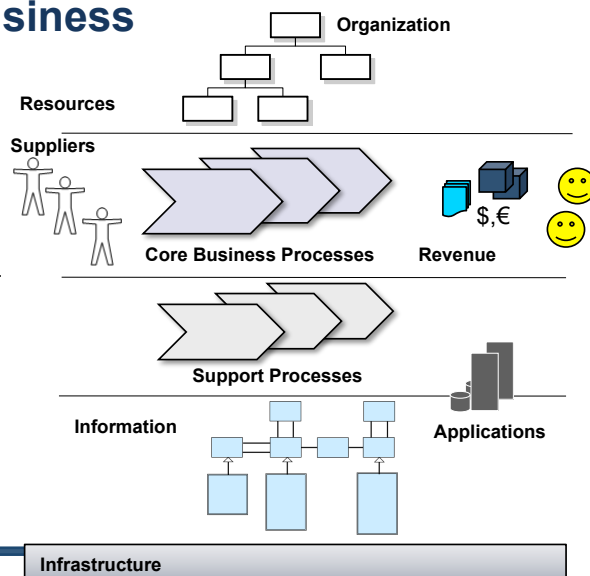
- ☐ Background and concept of Business Process
- ☐ Flows of material, work, money, information
- ☐ Business Process Management
- ☐ Business Process Modeling
- ☐ Service Orientation
- ☐ Behaviour of business processes
  - ☐ Case: Transcription of medical records

## Enterprise Business Processes

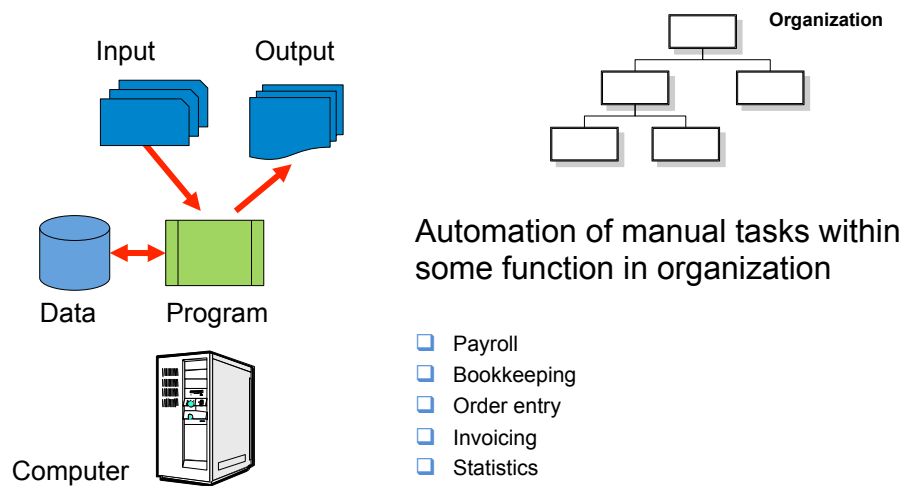
Our **organization** produces **products** and **services** for our **customers**.

The **revenue** covers our **costs** and makes profit to our owners.

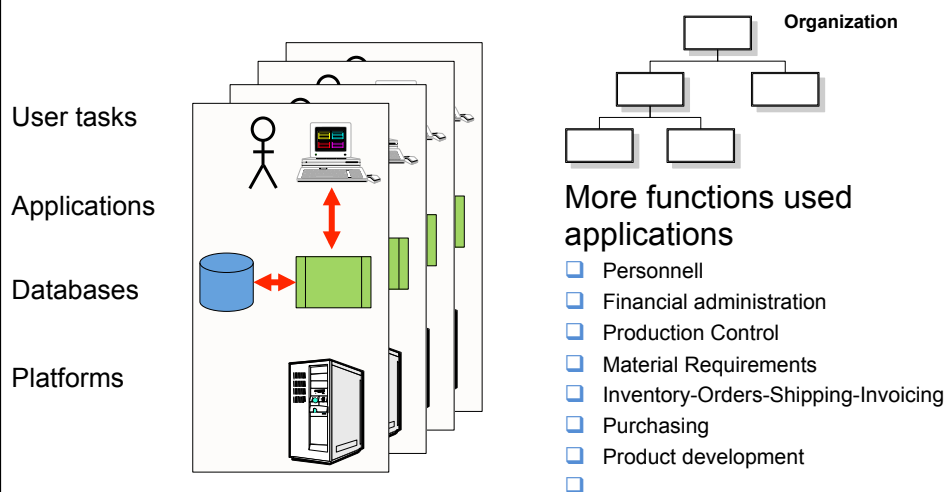
The products and services are results of our **core business processes** which need **information** processed by our **applications** which run on our **infrastructure**.



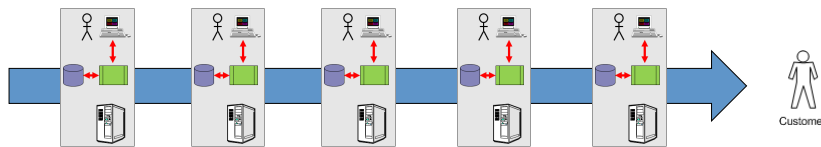
## In the early days...



## The next steps...



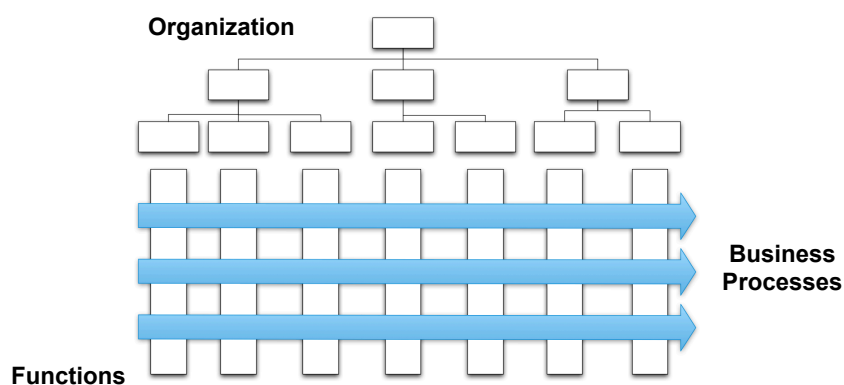
## But: The running business needs applications to be integrated



### Chains of business functions = Business Processes

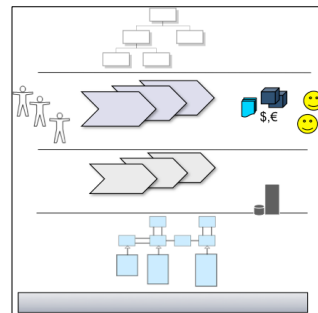
- ☐ Purchasing
- ☐ Raw material inventory control
- ☐ Manufacturing
- ☐ Finished product inventory control
- ☐ Sales, order entry
- ☐ Shipments
- ☐ Invoicing

## Concept of Business Process: Seeing the flows accross silos



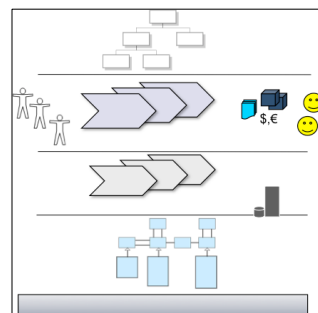
## Business Process (From lecture 1)

- ☐ An ordered collection of related, structured activities or tasks that produce a specific outcome
- ☐ High level business processes
  - ☐ End-to-end set of activities delivering value to the customer
  - ☐ Are performed by humans or machines
  - ☐ Triggered by specific events (inputs)
  - ☐ Clearly defined and measurable
- ☐ In other words: **How work gets done?**
- ☐ Note: Process  $\neq$  Project



## Important Flows

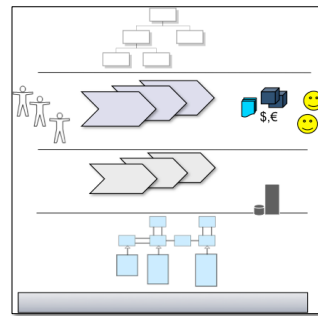
- ☐ Real Flow
  - ☐ Products, finished goods
  - ☐ Raw material
  - ☐ Products, services
- ☐ Work Flow
  - ☐ Tasks, Activities
- ☐ Money Flow
  - ☐ Revenues
  - ☐ Expenditures
  - ☐ Profit/Loss
- ☐ Data Flow, Information Flow



## Exercise: Real Flows

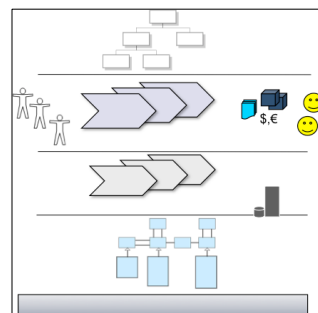
### Flow of products and services

- ☐ Manufacturing
- ☐ Retail
- ☐ Transportation
- ☐ Energy
- ☐ Banking
- ☐ Insurance
- ☐ Newspapers
- ☐ Commercial TV
- ☐ Hospital
- ☐ Education
- ☐ House Cleaning
- ☐ ..



## Business Processes

- ☐ Core Business Processes
  - ☐ Activities that are needed to keep the **real flows** running
  - ☐ Activities that face the customers
- ☐ Support processes
  - ☐ Activities that are needed in order to keep core processes running



## Business Process Management (BPM)

### Improvement

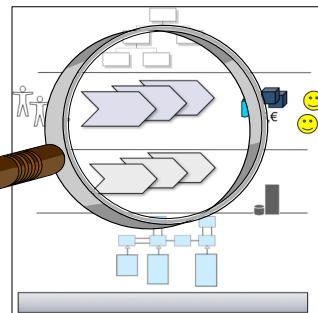
- ☐ Improve: Quality, costs, speed
- ☐ Eliminate waste: Lean production
- ☐ TQM, Six Sigma

### Redesign

- ☐ Example: Invoice handling

### Reengineering

- ☐ Mike Hammer: Reengineering the corporation (1993)
- ☐ Radical rethinking of the process from "clean slate"
- ☐ Example: Homebanking
- ☐ Example: Vendor Managed Inventory

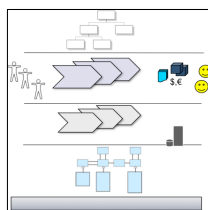


## BPM needs business process models

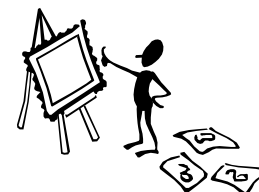
The user of the model



The process to be modeled



Business Process?

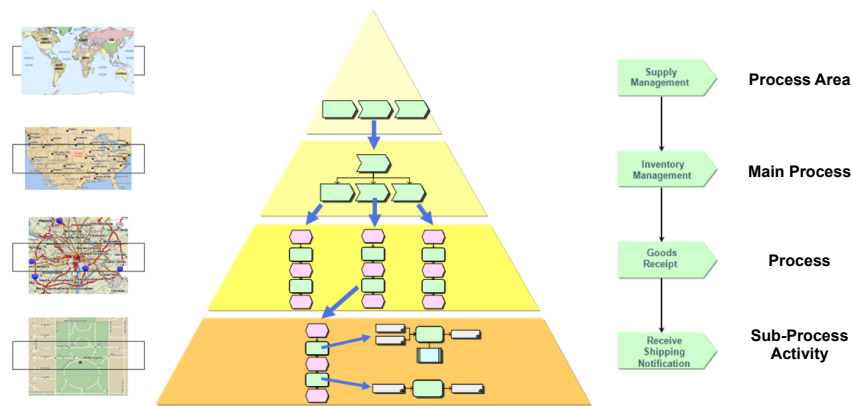


The modeler and the resulting model

The purpose of the models?

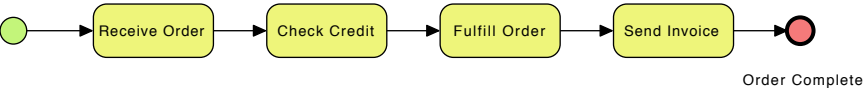


# Processes on different levels of detail



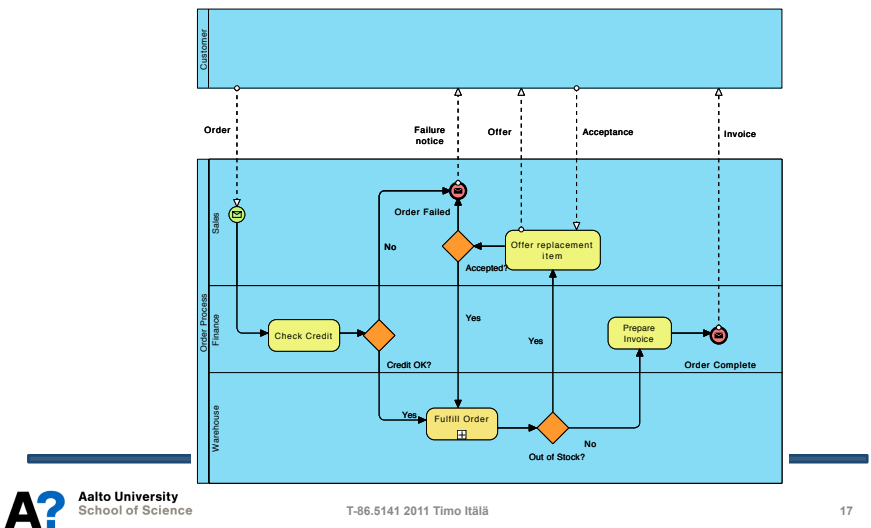
Source: IDS Scheer

# Example of a business process: Basic Order Process

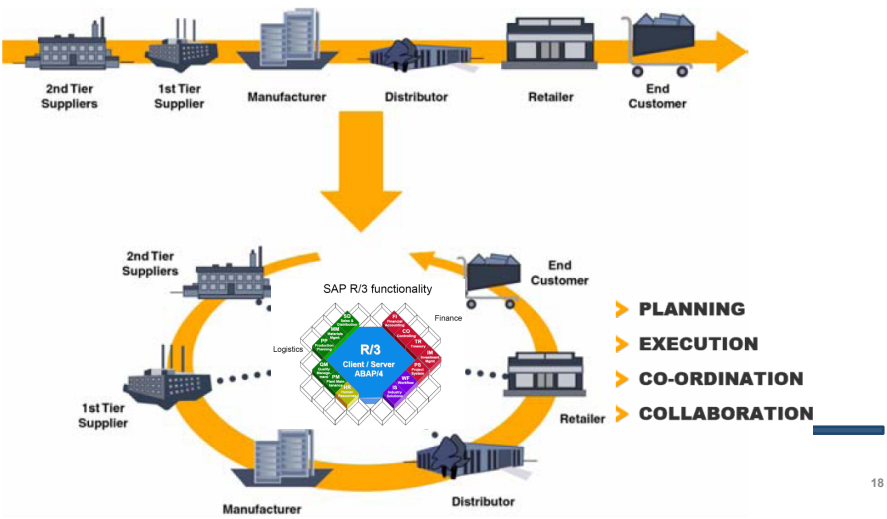




## Example: More details

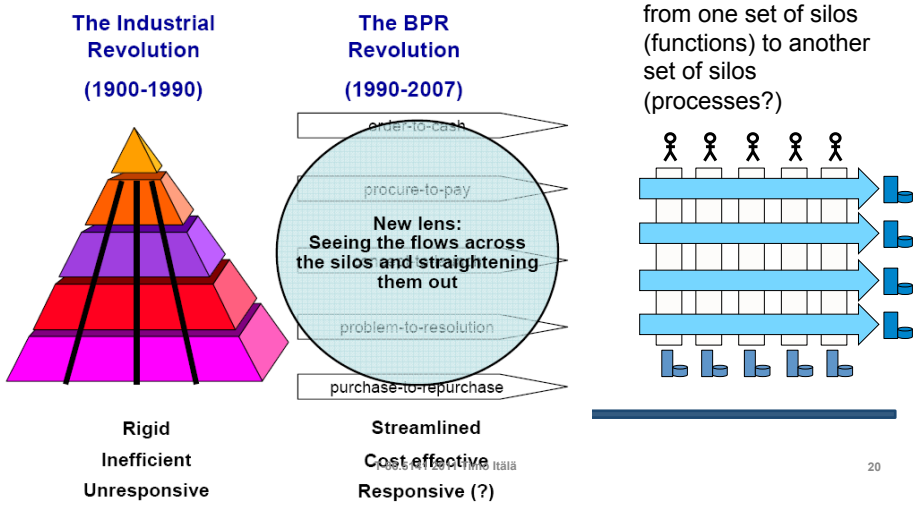


## Extended Business Processes

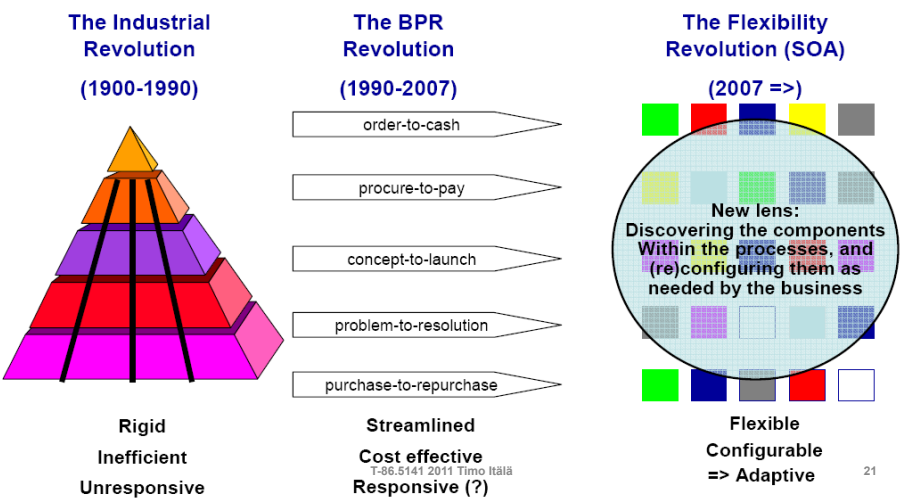


# Service Orientation

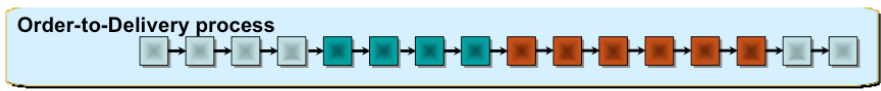
## But what is happening with processes...



# Business Process Management (BPM): The Third Wave

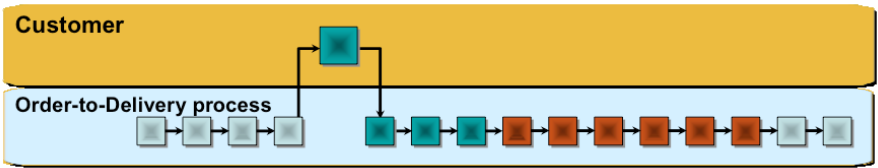


## Our business process



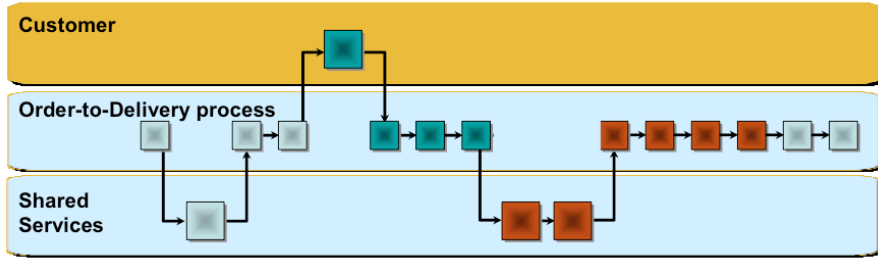
# What if...

We ask the customer to do some of the work



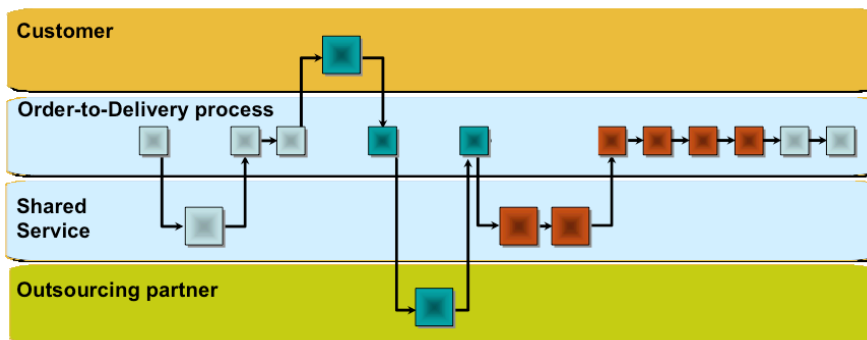
# What if...

We want to share things we have



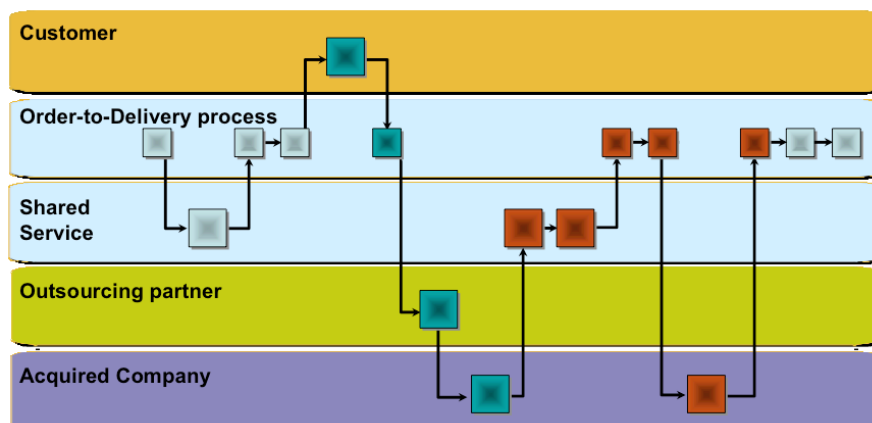
## What if...

Some of our things are outsourced...



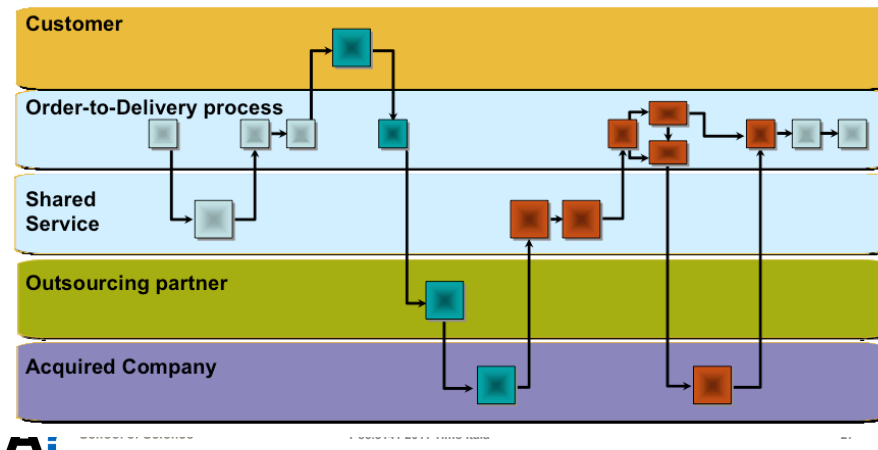
## What if...

We then acquire a competitor who does certain things better than we do!



## What if...

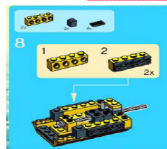
We then make changes to our brilliant process design on 18 months...



## What if: Service Orientation



**Service:**  
A reusable business task – e.g., check customer credit, create new account

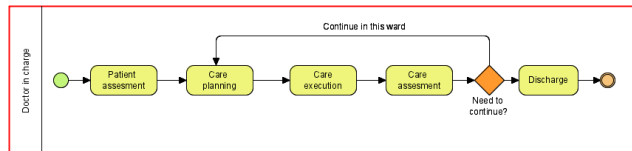


**Business Processes:**  
A way of integrating your business as linked services and the outcomes that they bring



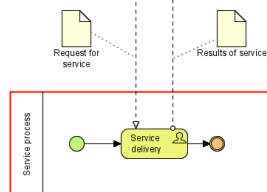
**Service oriented architecture (SOA):**  
An IT architectural style that supports service orientation

## Example: Healthcare Business Process and Business Services



### Flexibility:

Each patient has a unique care process model, in details....



**Business Process:** Care Process of a patient

### Business Services:

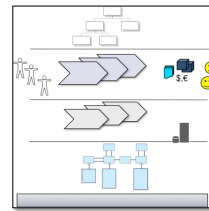
- ☐ Lab tests, radiology tests, endoscopy tests etc...
- ☐ Procedures, Medication, Therapies
- ☐ A care process consists of multiple services
- ☐ A service can be requested in any task of the process

## Behaviour of Business Process

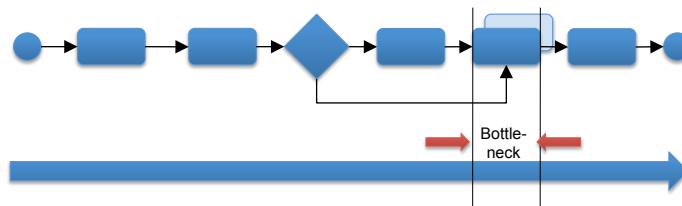
## Process improvement steps

- ☐ Clarify the drivers for improvement
  - ☐ Problems
  - ☐ Business Opportunities
- ☐ Model the **As-Is** process
  - ☐ Show areas of problems or opportunities
- ☐ Analyse problems or opportunities
  - ☐ What are related to the process?
- ☐ Model the **To-Be** process
  - ☐ Solutions to problems or opportunities
  - ☐ Basis for implementation

Business Process?



## Goldratt: Theory of Constraints (TOC)



Local or global optimization?

- ☐ Total throughput (units/hour) = Throughput of the bottleneck
- ☐ Optimize the whole process so that the bottleneck runs on its full capacity
- ☐ Elevate the bottleneck before anything else
- ☐ Then locate the next bottleneck and repeat



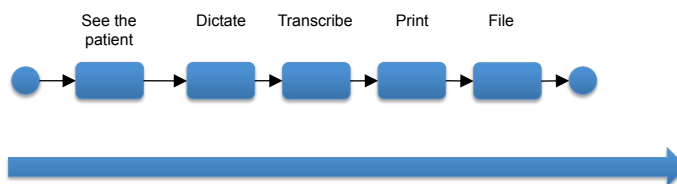
## Example: Medical transcriptionists' workflow in hospital

- ☐ Medical transcriptionists listen to dictated recordings made by physicians and other healthcare professionals and transcribe them into medical reports, correspondence, and other administrative material.
- ☐ They generally listen to recordings on a headset, using a foot pedal to pause the recording when necessary, and key the text into a personal computer or word processor, editing as necessary for grammar and clarity.
- ☐ The documents they produce include discharge summaries, medical history and physical examination reports, operative reports, consultation reports, autopsy reports, diagnostic-imaging studies, progress notes, and referral letters.
- ☐ Medical transcriptionists return transcribed documents to the physicians or other healthcare professionals who dictated them for review and signature or correction. These documents eventually become part of patients' permanent files.

## As-Is

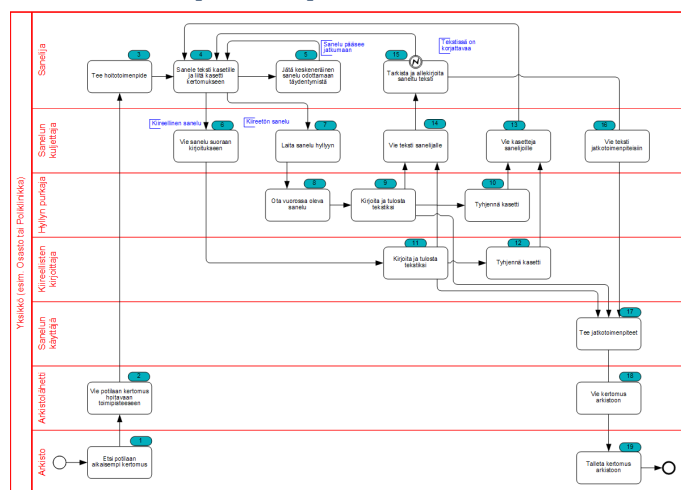
- ☐ Introduction of digital dictation technology
- ☐ Problem with throughput at some departments
- ☐ Long backlogs of dictations waiting for transcription
- ☐ A requirement to deliver the transcription in five days
- ☐ What is causing the problem?

## A simple process model



Why backlogs?

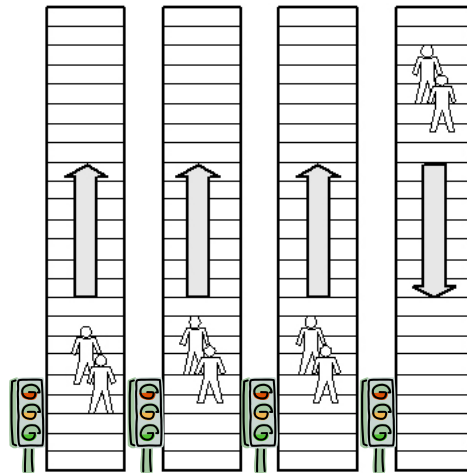
## More complete process model



Why  
backlogs?

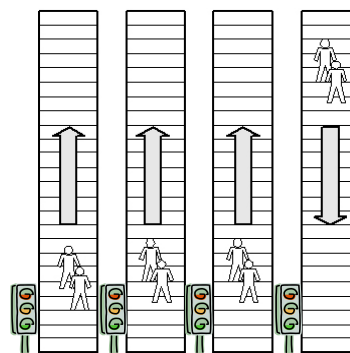
## Idea: Escalators at Helsinki metrostation

- ☐ When do the traffic lights change?
- ☐ Why?



## Look at the flow!

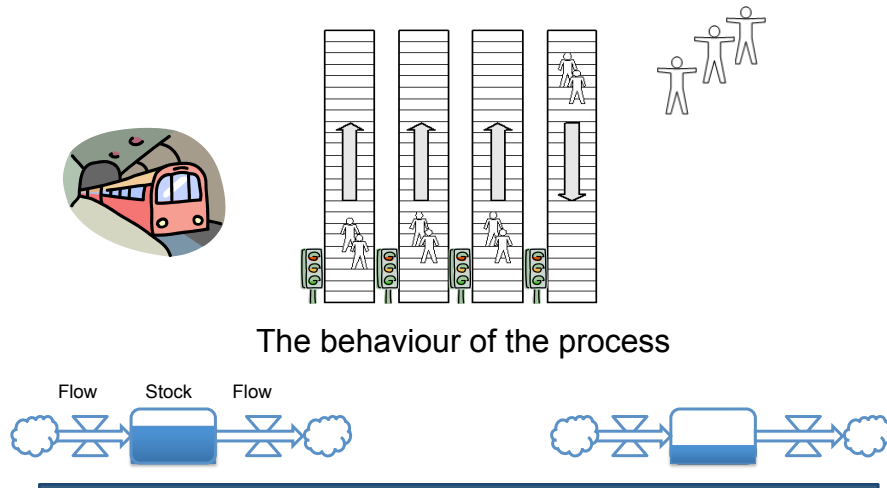
Bursts of people



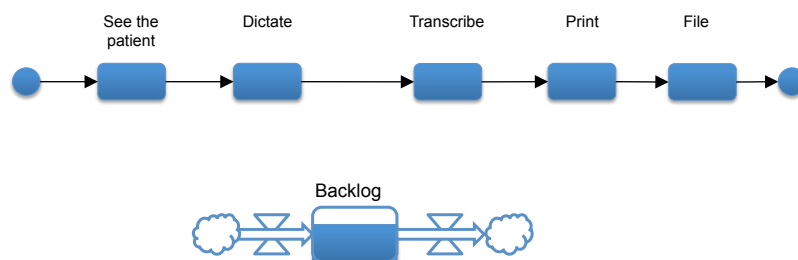
Steady flow of people

The lights do not change!

## Let us use Stock and Flow models



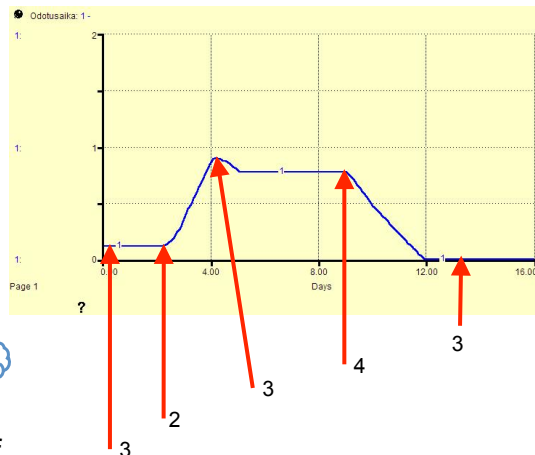
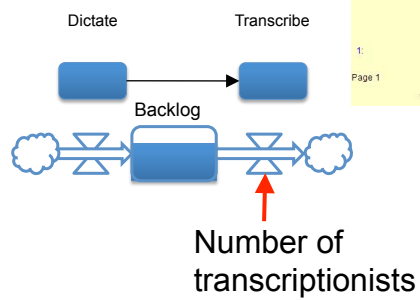
## Back to hospital



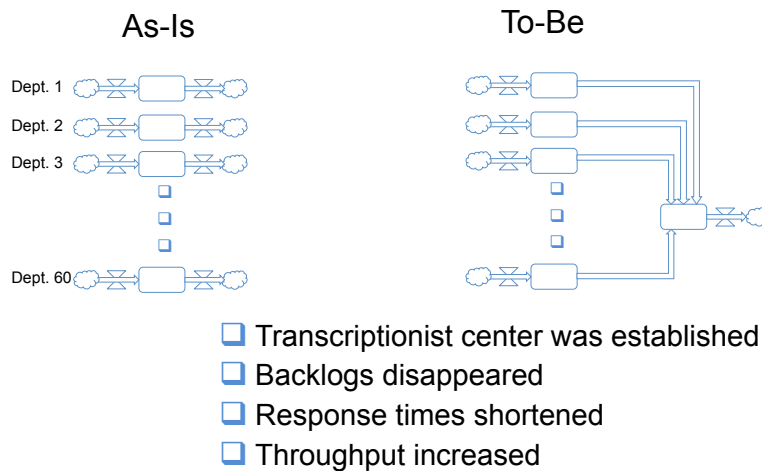
Why backlogs?



## Simulation: Wait time behaviour



## Solution to backlogs?



## Business Process Management (BPM)

### ☐ Improvement

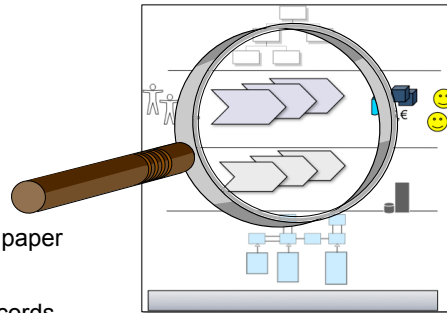
- ☐ Digital dictation, no change in process

### ☐ Redesign

- ☐ From distributed to centralized transcription
- ☐ Medical journals still printed on paper

### ☐ Reengineering

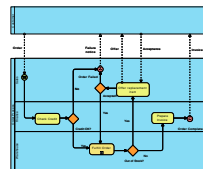
- ☐ Speech recognition, medical records created when doctors dictate
- ☐ Paperless hospital



## BPM Summary

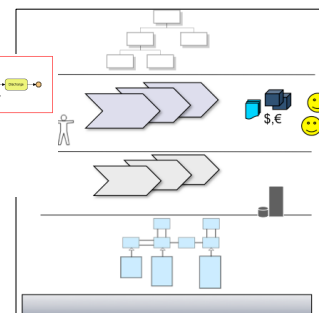
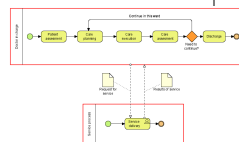
### ☐ Task centric:

- ☐ What to automate
- ☐ What to integrate
- ☐ What to implement as services



### ☐ Flow centric:

- ☐ Behaviour of the process
- ☐ Locate bottlenecks
- ☐ Improve throughput



### ☐ Improve, Redesign, Reengineer

## Questions?

