MTAT.03.231
Business Process Management (BPM)
(for Masters of IT)

Lecture 5: Process Re-Design

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Re-Design Criteria

A process design is evaluated on the basis of four key issues:

- time
- quality
- costs
- flexibility

Often there is a trade-off!

Design criterion 1: Time

- Throughput time (see earlier), including
  - service time (including set-up)
  - transport time (can often be reduced)
  - waiting time
    - sharing of resources (limited capacity)
    - external communication (trigger time)
- Several ways to improve time properties:
  - Improve average
  - Improve variance
  - Increase ability to meet due dates
  - Increase perception of wait time

Design criterion 2: Quality

- External: satisfaction of the customer
  - Product: product meets specification/expectation.
  - Process: the way the product is delivered (service level)
- Internal: conditions of work
  - challenging
  - varying
  - controlling

There is often a positive correlation between external and internal quality.

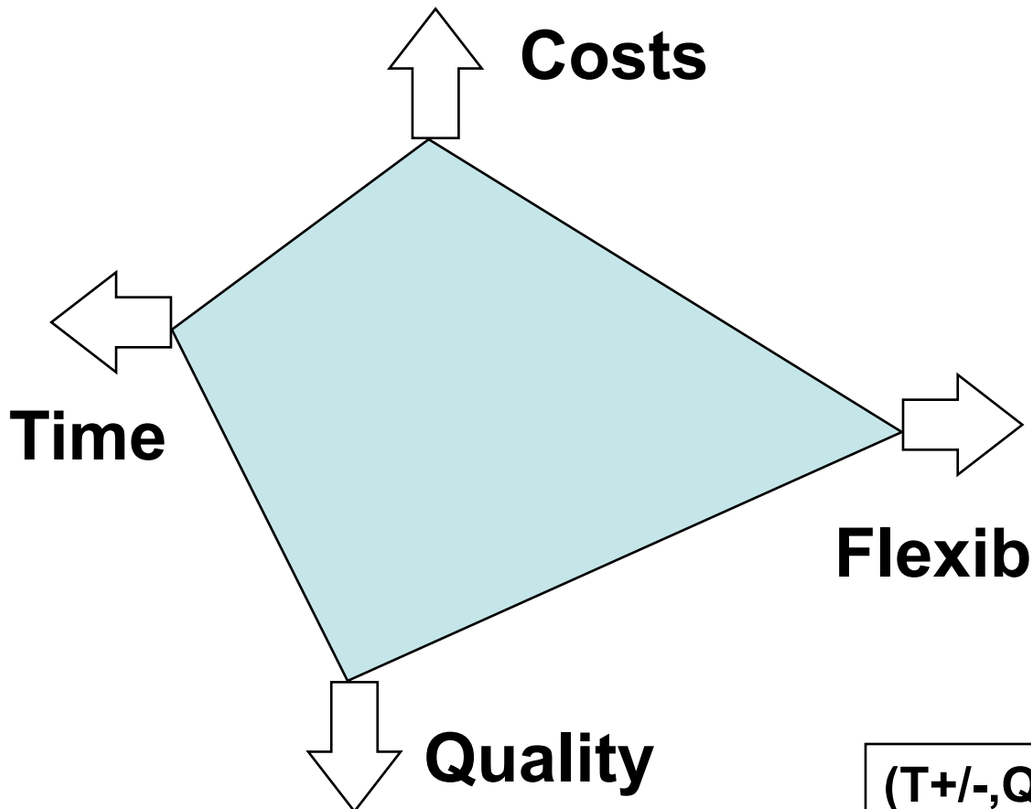
Design criterion 3: Cost

- Type of costs
  - fixed or variable
  - per time unit, per use (consumable resources)
  - processing, management, or support.
  - human, system (hardware/software), or external,

Design Criterion 4: Flexibility

- Ability to react to changes.
- Flexibility of
  - resources (ability to execute many tasks/new tasks)
  - process (ability to handle various cases and changing workloads)
  - management (ability to change rules/allocation)
  - organization (ability to change the structure and responsiveness to demands of market or business partners

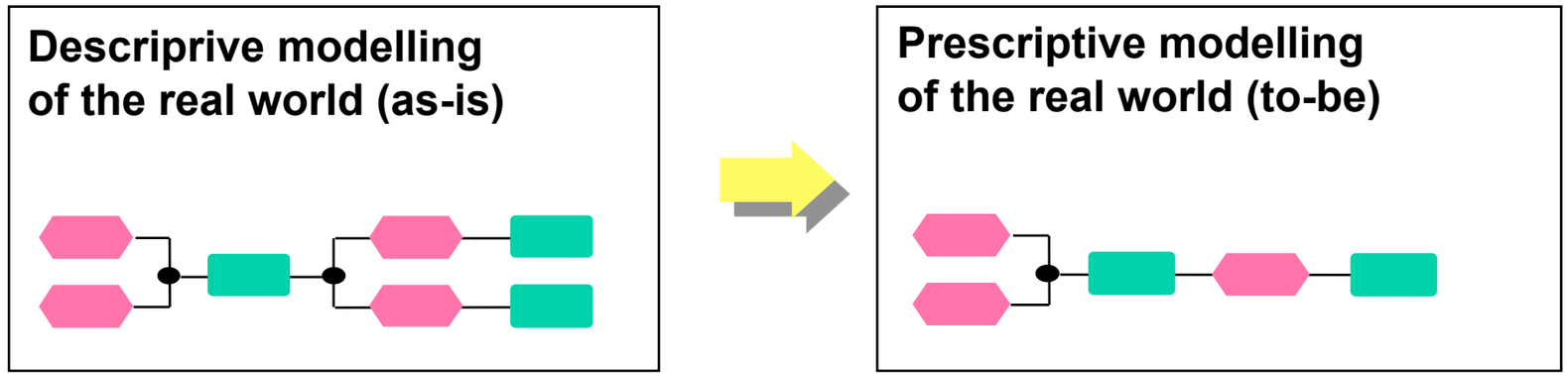
Trade-off



(T+/-,Q+/-,C+/-,F+/-)

Process Re-Design

- Purpose: Identify possibilities for improving the design of a process: “as is” → “to be”



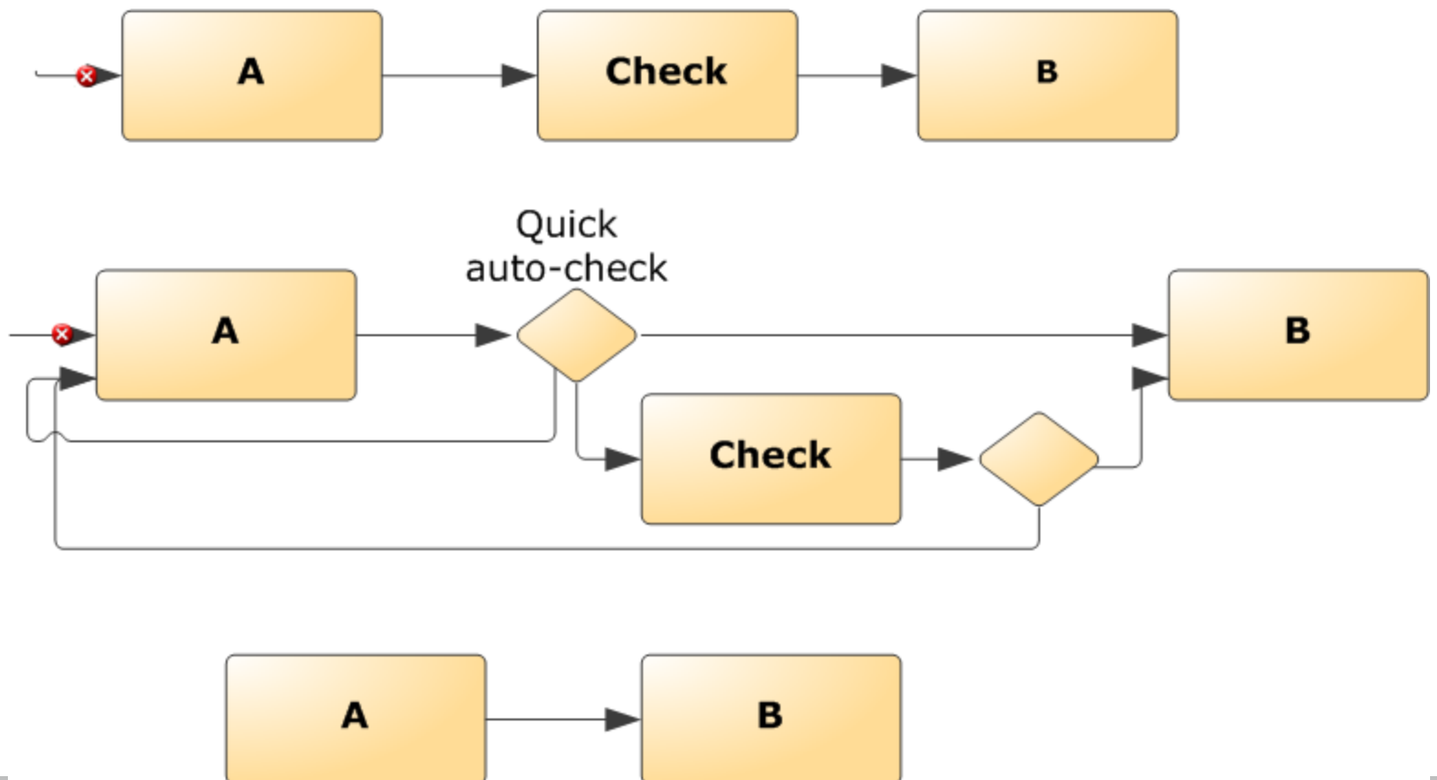
- No silver-bullet: requires creativity
- Re-design patterns can be used to generate ideas

Re-Design Patterns

1. Task elimination
2. Task merge/split
3. Task re-ordering
4. Increase parallelism
5. Triage
6. Specialize/generalize process
7. Improve resource allocation
8. Streamline communication
9. Automate
10. Appoint process/case managers

(1) Check the necessity of each task

- Sometimes "checks" may be skipped: trade-off between the cost of the check and the cost of not doing the check.

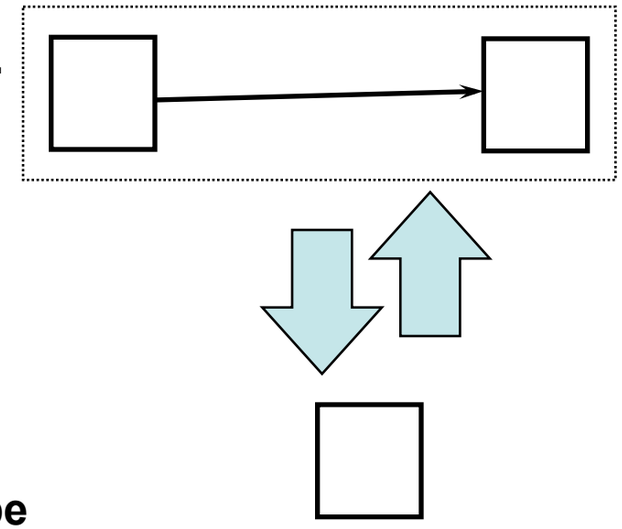


(1) Check the necessity of each task (cont.)

- Other tasks to consider for elimination:
  - Print
  - Copy
  - Archive
  - Store
  - More generally: non-value adding activities
- Task elimination can be achieved by delegating authority, e.g.
  - No need for approval if amount less than Y
  - Employees have budget for small expenses

(2) Re-consider the size of each task: merge or split

Pros: less work to commit, allows for specialization.
Cons: setup time, fragmentation, less commitment.

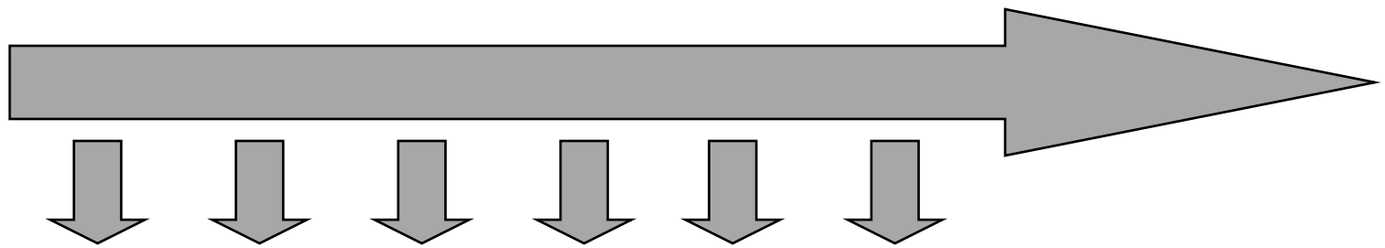


Pros: setup reduction, no fragmentation, less transportation time, more commitment
Cons: more work to commit, one person needs to be qualified for both parts.

Splitting can be an opportunity to enable partial self-service, e.g. decouple scanning and payment in a supermarket

(T+,F-)

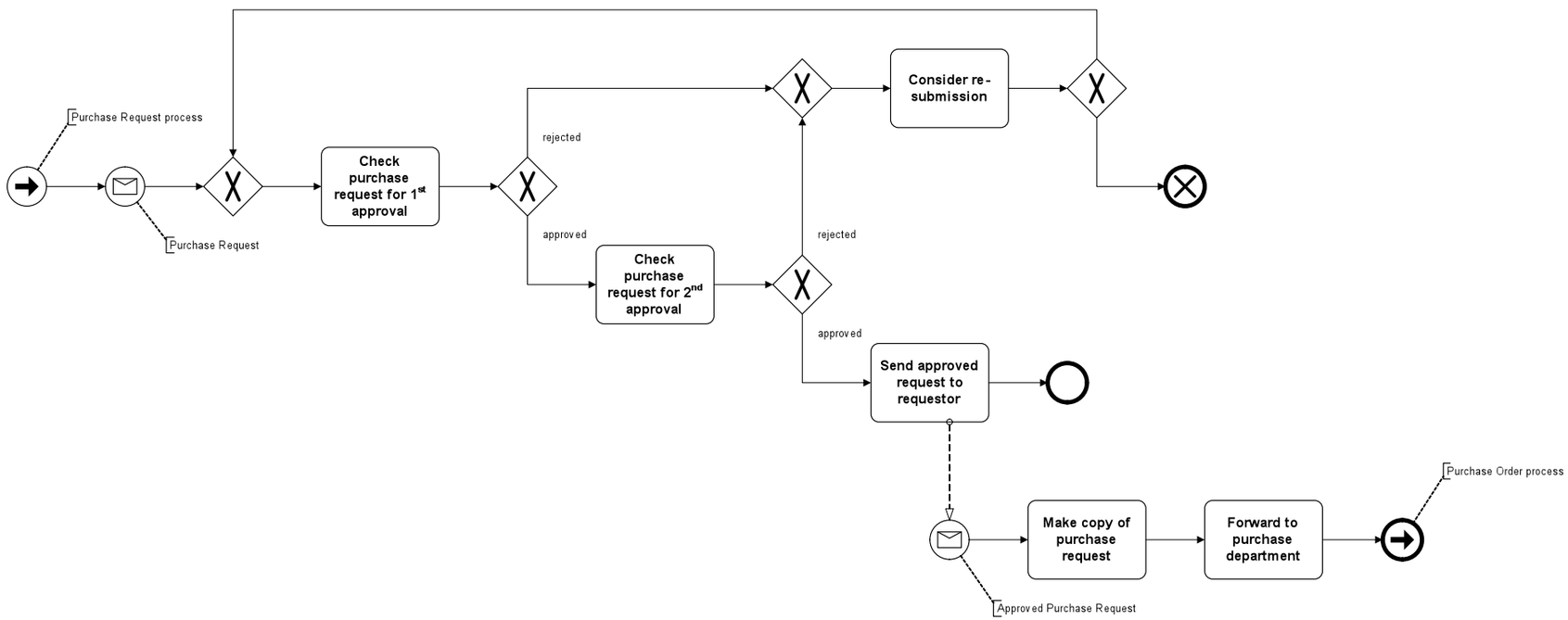
(3) Order tasks based on cost/effect



- Put “knock-out checks” first – identify problems early
- Postpone expensive tasks until the end.
- In other words: order the tasks using the ratio “costs/effect”.

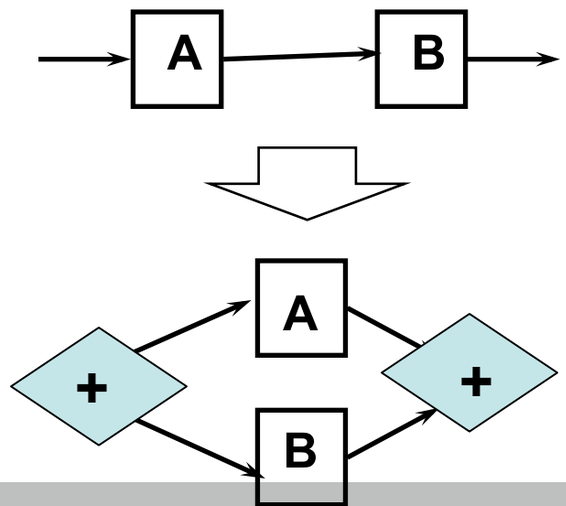
(T+,C-)

Example


Purchase Request process
Purchase Request
Check purchase request for 1st approval
rejected
approved
Consider re-submission
Check purchase request for 2nd approval
rejected
approved
Send approved request to requestor
Make copy of purchase request
Forward to purchase department
Purchase Order process
Approved Purchase Request

(4) Introduce parallelism

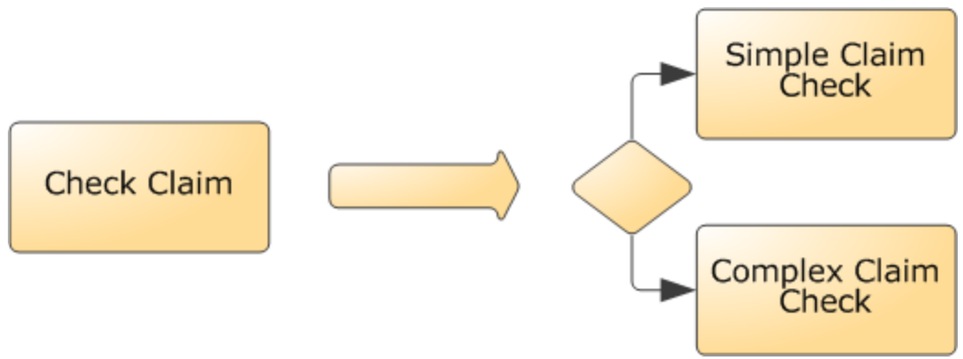
- More parallelism leads to improved performance: reduction of waiting times and better use of capacity.
- Two types of parallelism: semi and real parallelism.
- IT infrastructures which allow for the sharing of data and work enable parallelism.



(T++)

(5) Triage

- Consider dividing a general task into two or more alternative tasks or the integration of two or more alternative tasks into one general task.



(T+,F-)

(6) Generic process vs. multiple versions

- Process specialization
  - Differentiate by customer classes, geographical locations, time periods (winter, summer), …
  - Different activities, different resource pools,
- Process standardization
  - All cases treated equally (as much as possible)
  - Resources are pooled together

F+/-, C+/-

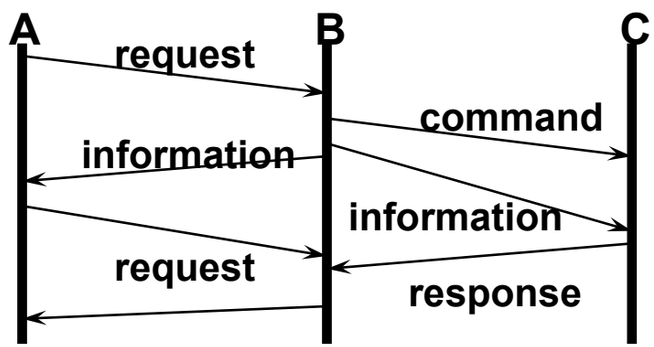
(7) Improve resource allocation

- Use resources as if they are in one room: avoid one group of people overloaded and another (similar) group waiting for work.
- Let people do work that the are good at. However, avoid inflexibility as a result of specialization!
- When allocating work to resources, consider the flexibility in the near future.
- Avoid setups as much as possible:
  1. Case setups
  2. Task setups.

(T+,Q-)

(8) Streamline the communication structure

- Reduce the number of messages to be exchanged between the process and the environment.
- Try to automate the handling of messages (send/receive).
- Avoid communication errors (EDI, XML, Web services)
- If possible, use asynchronous instead of synchronous communication.



(T+,Q+,C+/-,F-)

Interlude: the Complete Kit Concept

- Many processes follow the “complete kit” concept:
  - Work should not begin until all pieces necessary to complete the job are available
- In such cases, consider three principles:
  - *provide complete and easy-to- follow instructions for those who will initiate the process.*
  - *If a process cannot start, the client should be notified of all defects that could be reasonably identified at the onset of the process.*
  - *Consider the tradeoff between “incomplete-kit” process initiation and roundtrip to revise and resubmit a request.*

Michael zur Muehlen: “Service Processes: The Customer at the Center?” http://tinyurl.com/5tunkxy

(9) IT-driven improvements (Automate)

- Data sharing (Intranets, ERPs)
  - Increase availability of (subject to security/privacy) information to improve decisions or visibility
  - Avoid duplicate data entry, paper copies
- Use network technology to:
  - Increase communication speed: e-mail, SMS
  - Enable self-service (e.g. online forms)
  - Replace materials flow with information flow
- Tracking: RFID, GPS tracking
- Automation of tasks and decisions (business rules)
- First re-design, then automate!

(T+,Q+/-,C+/-,F-)

(10) Appoint process and case managers

- A process manager monitors a process to see whether there are bottlenecks, capacity problems and delayed cases. Management instruments: motivating the people involved in the process and control parameters.
- Case managers are assigned to a case. They are responsible and execute as many tasks as possible for the case. Benefits:
  - commitment
  - reduction of setup time
  - one contact person

(Q+)

CVS Case Study

- Consider the CVS case study and the issues identified at the end of the document
  - Which of the previous re-design patterns could be applied to address the identified issues, and how to apply the patterns?

Bonus Task (10 points)

- See the specification in the course Web site – “Lectures” page
- Prepare a simulation of the claims handling process
- Present orally on 5 March

Acknowledgment

- The material in this lecture is adapted from www.workflowcourse.com

  © Wil van der Aalst
- More info about re-design patterns:

  M. Jansen-Vullers, M. Netjes and H Reijers. Business Process Redesign for Effective E-Commerce. In Proceedings of the 6th International Conference on Electronic Commerce (ICEC 2004), pp. 382-391.