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Business Process Management

Lecture 9 – Process Redesign II

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Process redesign approaches

**Exploitative Redesign (transactional)**
- Doesn’t put into question the current process structure
- Seeks to identify problems and resolve them **incrementally**, one step at a time
- **Example: Heuristic redesign**

**Explorative Redesign (transformational)**
- Puts into question the fundamental assumptions and principles of the existing process structure
- Aims to achieve breakthrough innovation
- **Example: Business Process Reengineering (BPR)**
Heuristic process redesign

• A method to identify changes to an “as is” process based on a collection of heuristics that strike tradeoffs between:
  • Cost
  • Time
  • Quality
  • Flexibility
Performance measures: the Devil’s Quadrangle

- Cost
- Time
- Quality
- Flexibility
Flexibility

• Ability to react to changes in:
  • Workload
  • Customer demands and expectations
  • Resource and business partner availability and performance

• Example: Following natural disasters (e.g. storms), the number of home insurance claims increases by tenfold

• To address this surge, flexibility is required at:
  • Resource level: Staff redeployment, faster performance
  • Process level: Performing tasks differently to speed up the front-end
  • Management: Relaxing business rules and controls where possible
Redesign heuristics

- **Task-level**
  - Task elimination
  - Task composition/decomposition
  - Triage

- **Flow-level**
  - Re-sequencing
  - Parallelism enhancement

- **Process-level**
  - Specialization & standardization
  - Resource optimization
  - Communication optimization
  - Automation
Task-level redesign heuristics

1. Task elimination
2. Task composition/decomposition
3. Triage
H1. Task elimination

Eliminate non-value-adding steps wherever these can be isolated
  • Forward, send, receive, ...

Consider reducing manual control steps (checks & approvals) by:
  • Skipping them where feasible
  • Replacing them with statistical controls
  • Skipping them selectively
H1. Task elimination

Consider trade-off between the cost of the check and the cost of not doing it

Examples:

- **Procure-to-pay process**: some types of employees are empowered to trigger isolated purchases below $500 without supervisor approval.
- **Order-to-cash process**: invoices from trusted suppliers under $1000 are not checked on a one-by-one basis.
- **University admission process**: authenticity check is very expensive, yet it leads to only 1% of applications being rejected.
H2. Task composition/decomposition

- Consider composing two tasks to eliminate transportation and reduce “context switches”, OR
- Consider splitting a task into two and assign to separate, specialized resources
H2. Task composition and decomposition

Composition example:
• **Procure-to-pay process**: Merging two checks: “Check necessity of purchase” and “Check budget”

Decomposition example:
• **Make-to-order process**: Separate a single thick “prepare quote” task into “prepare bill of materials”, “prepare production plan” and “estimate costs and delivery time”

Composition: (T+, C+/-, F+)
Decomposition: (T-, C+, F-)
H3. Triage

• Specialize a task: divide a *general* task into two or more alternative tasks
• Generalize tasks: integrate two or more alternative tasks into one general task
H3. Triage

Specialization example:
- Procure-to-pay process: Separate approvals of *small* purchases, *medium* purchases and *large* purchases

Generalization example:
- Make-to-order process: Integrate quote preparation for two product lines into one single task

| Specialization: (T+, C+-, F-) | Generalization: (T-, C+-, F+) |
Flow-level redesign heuristics

4. Re-sequencing
5. Parallelism enhancement
H4. Re-sequencing

Re-order tasks according to their cost/effect ratio to minimize over-processing

- Postpone expensive tasks that may end up not being necessary until the end
- Put *knock-out* checks first in order to identify problems early
H4. Re-sequencing

Examples:

- **Make-to-order process**: If “Prepare production plan” is time-consuming, postpone it until after the quote price has been tentatively accepted by the customer.

- **Procure-to-pay process**: If “Check necessity of purchase” leads to 20% of knock-outs and “Check budget” leads to 2%, perform “Check necessity of purchase” first.

- **University admission process**: Authenticity check (very slow) leads to 1% of applications being rejected while committee’s check leads to 80% of applications being rejected. Put committee’s check first.
H5. Parallelism enhancement

Parallelize tasks where possible in order to reduce cycle time
H5. Parallelism enhancement

Examples:

- **Procure-to-pay process**: Parallelize “Approve budget” and “Approve necessity of purchase”
- **Make-to-order process**: After “Prepare bill of materials”, perform “Prepare production plan” and “Estimate costs” in parallel
Process-level redesign heuristics

6. Process specialization & standardization
7. Resource optimization
8. Communication optimization
9. Automation
H6. Process specialization/standardization

Process specialization

- One process is split into multiple ones: by customer class, by geographic location, by time period (winter, summer), etc.
- Resources are split accordingly

Process standardization

- Two processes are integrated
- Resources are pooled together
H6. Process specialization & standardization

Specialization example:

- **Procure-to-pay process**: One process for Direct procurement (e.g. raw materials) and one for Indirect procurement (MRO - Maintenance, Repair and Operations)
- **Claims handling process**: One claims handling process for the summer season (stormy season - peak) and one for the winter season (off-peak)

Standardization example:

- **Claims handling process**: Integrate claims handling for motor insurance across different brands of a group

| Specialization: (C+/-, Q+/-, F-) | Standardization: (C+, Q+/-, F+) |
H7. Resource optimization

Use resources of a given type as if they were in one room
  • Avoid one group of people overloaded and another (similar) group idle

Let people do work that they are good at
  • However, avoid inflexibility as a result of specialization

When allocating work to resources, consider the flexibility in the near future
  • Allocate work to specialized resources first

Avoid setups as much as possible
  • *Chain* multiple instances of the same task [sequential]
  • *Batch* multiple instances of the same task [parallel]
H7. Resource optimization

Resource integration example:

- **Claims handling process**: Share resources across different types of claims (e.g. motor and personal insurance)

Batching example:

- **Claims handling process**: Batch all claims for a given geographic area and assign them to the same resources
- **University admission process**: Batch all applications and handle them to the assessment committee

(T+, C+, F+/-)
H8. Communication optimization

Automate handling, recording and organization of messages

Monitor customer interactions, record exceptions

Optimize

1. Number of interactions with customers and business partners
2. Type of interaction (synchronous vs. asynchronous)
3. Timing of interactions

(T+,,Q+,,C+/-,,F-)
H8. Communication optimization

1. Optimize number of interactions
   - Gather sufficient information to get to the next milestone (reduce external interactions)

2. Optimize type of interaction
   - *Synchronous* interactions effective to resolve minor defects
   - *Asynchronous* to notify, inform, resolve major defects, request additional information to reach next milestone
H8. Communication optimization

3. Optimize timing of interactions:
   • *Front-loaded process*: bulk of information exchange and processing happens upfront
     • Complete-kit concept
   • *Back-loaded process*: bulk of information exchange and processing happens downstream
     • Example: Ford procurement process in the late 80s (see Lecture 8)
H8. Communication optimization

Complete-Kit Concept: “Work should not begin until all pieces necessary to complete the job are available”

Boaz Ronen

Principles for complete-kit process design:

• 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 vs. roundtrip to revise and resubmit a request.
H9. Automation

Use data sharing (Intranets, packaged enterprise systems) to:
- Increase availability of information to improve visibility and decision-making (subject to security/privacy requirements)
- Avoid duplicate data entry and transportation

Use network technology to:
- Replace physical flow (e.g. paper documents) with information flow
- Enable self-service via e.g. online forms and Web data services
H9. Automation

Use tracking technology to identify and locate materials and resources
  • Identification: Bar code, RFID
  • Location: GPS, indoor positioning

Use business rules technology to automate information processing tasks (including decisions)

Automate end-to-end processes with a dedicated BPM system or system with process automation functionality

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

The Context: Technologies for BP Execution

**Coordination Tech**
- WfMS
- BPMS
- RPA
- "Smart" Contracts

**Decision Tech**
- Expert syst.
- BRMS
- ML/Analytics
- Chatbots

**Data Tech**
- DBMS (data stores)
- Big Data platforms
- Distributed ledgers

**Connectivity Tech**
- Online self-service
- Web portals
- EDI, Web services, Web APIs

**Cyberphysical Tech**
- Digital-physical linking:
  - Bar/QR codes
  - RFID
- Location tracking:
  - GPS
  - Indoor positioning
- Display, Tactile, AR/VR
- Sensing and acting:
  - IoT
  - Auton. Robots
Applying redesign heuristics

Example: Equipment rental process
Applying redesign heuristics

Example: Equipment rental process

**Heuristic 1: Task elimination**

- Eliminate “Request for approval” for small equipment
Applying redesign heuristics

Example: Equipment rental process

Heuristic 1: Task elimination

- Eliminate request for approvals for small equipment
- Replace approval in all cases, with empowerment and statistical controls
Applying redesign heuristics

Example: Equipment rental process

Heuristic 2: Task composition

• Merge equipment selection, availability check and rental request creation
Applying redesign heuristics

Example: Equipment rental process

Heuristic 6: Process specialisation and standardisation

• Separate the process for small versus large equipment and streamline the process for small equipment
Applying redesign heuristics

Example: Equipment rental process

Heuristic 8: Communication optimisation
- Inform the site engineer when the equipment is dispatched
Applying redesign heuristics

Example: Equipment rental process

Heuristic 8: Communication optimisation

• Inform the site engineer when the equipment is dispatched
• Add interaction to handle extensions
Redesign output: to-be process model

Example: Equipment rental process
Applying redesign heuristics

**Example: Equipment rental process**

**Heuristic 9: Process automation**

- Use self-service for the equipment search and availability checking
Applying redesign heuristics

Example: Equipment rental process

**Heuristic 9: Process automation**

- Use self-service for the equipment search and availability checking
- Use process automation to coordinate handovers
Redesign heuristics for Equipment rental process

**Heuristic 1**
- I1. Eliminate request for approvals for small equipment
- I2. Replace approval with empowerment & stat. controls

**Heuristic 2**
- I3. Compose equipment selection, availability check and rental request creation

**Heuristic 6**
- I4. Separate process for small vs. large equipment, streamline “small” process
Redesign heuristics for Equipment rental process

**Heuristic 8**

- I5. Inform site engineer when equipment dispatched
- I6. Ask site engineer if extension required

**Heuristic 9**

- I7. Use self-service for equipment search and availability checking
- I8. Use process automation to coordinate handovers