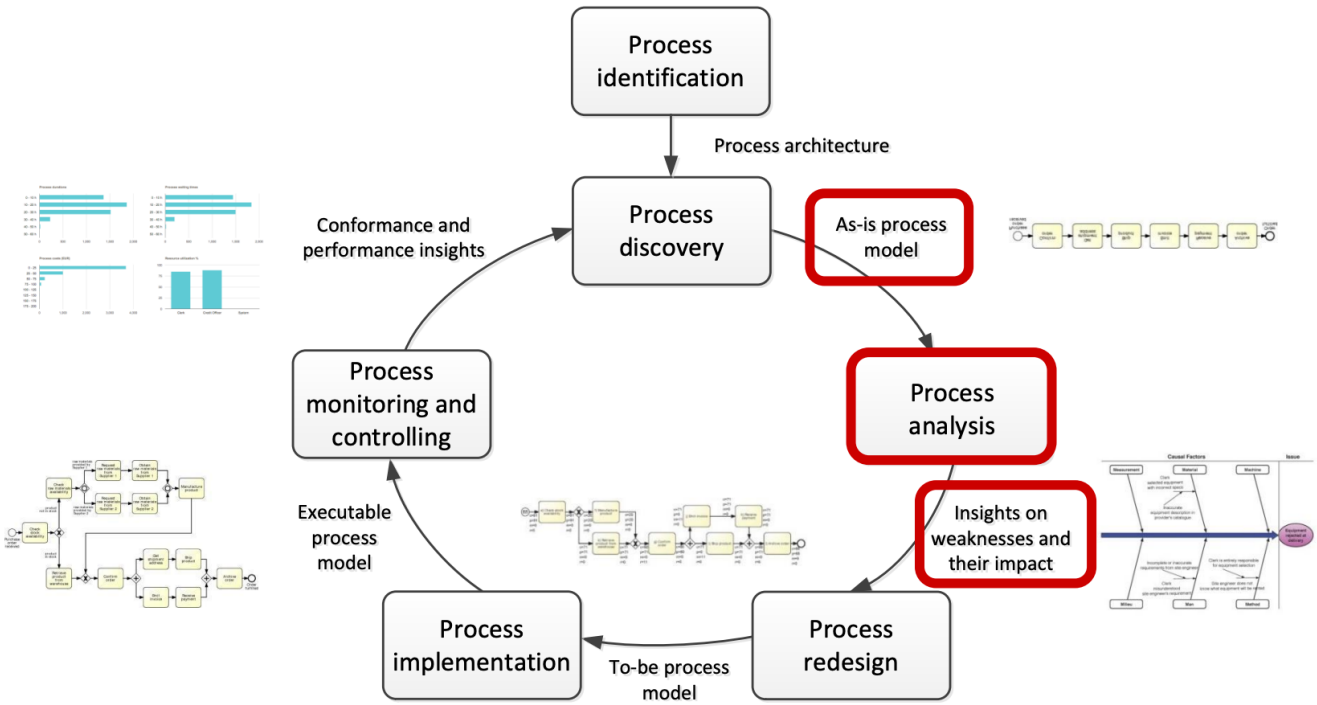
Chapter 6 - Qualitative Process Analysis

Process Analysis



Value-added analysis

1. **Decorticate the process into steps.**
    - Steps performed before a task.
    - The task itself, possible decomposed into smaller steps.
    - Steps performed after a task, in preparation for the next task.
2. **Classify each step.**
    - Value-adding (VA)
    - Business value-adding (BVA)
    - Non-value adding (NVA)

Value-adding (VA) activities

Produce value or satisfaction to the customer.
Criteria

- Is the customer willing to pay for this step?
- Would the customer agree that this step is necessary to achieve their goals?

- If the step is removed, would the customer perceive that the end product or service is less valuable?

Examples

- **Order-to-cash process**: confirm delivery date, deliver products.
- **Univeristy admission process**: assess application, notify admission outcome.

Business value-adding (BVA) activities

Necessary or useful for the business to operate.
Criteria

- Is this step required in order to collect revenue, to improve or grow the business?
- Would the business (potentially) suffer in the long term if this step was removed?
- Does it reduce risk of business losses?
- Is this step required in order to comply with regulatory requirements?

Examples

- **Order-to-cash process**: *check* purchase order, *check* customer's credit worthiness, issue invoice, collect payment, collect customer feedback.
- **University admission process**: *verify* completeness of application, *check* validity of degrees, *check* validity of language test results.

Non-value adding (NVA) activities

Activities the customer would not be willing to pay for , everything else besides VA and BVA.
Includes

1. Handovers, context switches
2. Waiting times, delays
3. Rework or defect correction

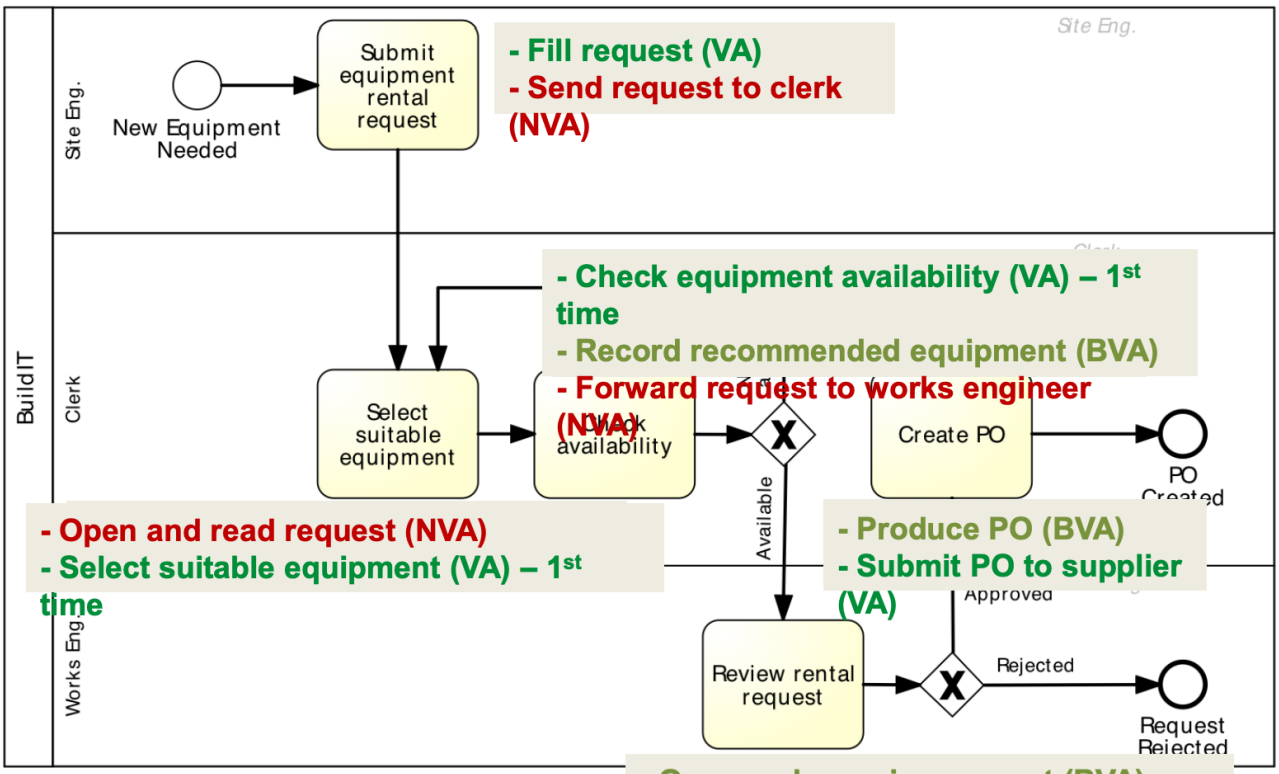
Examples

- **Order-to-cash process**: *forward* PO to warehouse, *re-send* confirmation, *receive* rejected products.
- **University admission process**: *forward* applications to committee, *receive* admission results from committee.

Equipment Rental Process

TÉCNICO LISBOA

Extract of Equipment Rental Process



UNIVERSITY OF TARTU Marlon Dumas

VA analysis

Step	Performer	Classification
Fill request	Site engineer	VA
Send request to clerk	Site engineer	NVA
Open and read request	Clerk	NVA
Select suitable equipment	Clerk	VA
Check equipment availability	Clerk	VA
Record recommended equipment & supplier	Clerk	BVA
Forward request to works engineer	Clerk	NVA
Open and examine request	Works engineer	BVA
Communicate issues	Works engineer	BVA
Forward request back to clerk	Works engineer	NVA
Produce PO	Clerk	BVA
Send PO to supplier	Clerk	VA

Waste Analysis

The 7 sources of waste

- Move

    - Transportation
    - Motion
- **Hold**
    - Inventory
    - Waiting
- **Over-do**
    - Defects
    - Over-Processing
    - Over-Production

Move: Transportation

Send or receive materials or documents (including electronic) taken as input or output by the process activities.

Example

- **University admission process**: to apply for admission at a university, students fill in an online form. When a student submits the online form, a PDF document is generated. The student is requested to download it, sign it and send it by post together with the required documents:
    1. Certified copies of degree and academic transcripts
    2. Results of language test
    3. CV

When the documents arrive at the admissions office, an officer checks their completeness. If a document is missing, an e-mail is sent to the student. The student has to send the missing documents by e-mail or post depending on the document type.

Move: Motion

Motion of resources internally within the process.
Common in **manufacturing processes**, less common in service processes.

Examples

- **Vehicle inspection process:** a process worker moves with the inspection forms from one inspection base to another; in some cases inspection equipment also needs to be moved around.
- **Application-to-approval process:** a process worker moves around the organization to collect signatures.

Hold: Inventory

Materials inventory, work-in-process (WIP).

Examples

- **Vehicle inspection process:** when a vehicle does not pass the first inspection, it is sent back for adjustments and left in a pending status. At a given point in time, about 100 vehicles are in the "pending" status across all inspection stations.
- **University admission process:** About 3000 applications are handled concurrently.

Hold: Waiting

- Task waiting for materials or input data.
- Task waiting for a resource.
- Resource waiting for work (resource idleness).

Examples

- **Vehicle inspection process:** A technician at a base of the inspection station waiting for the next vehicle.
- **Application-to-Approval process:** Request waiting for approver.
- **University admission process:** Incomplete application waiting for additional documents; batch of applications waiting for committee to meet.

Over-do: Defects

- Correcting or compensating for a defect or error.
- Rework loops.

Examples

- **Vehicle inspection process:** A vehicle needs to come back to a station due to an omission.
- **Travel approval process:** Request sent back to requestor for revision.
- **University admission process:** Application sent back to applicant for modification; request needs to be re-assessed later due to incomplete information.

Over-do: Over-processing

- Tasks performed unnecessarily given the outcome of the process.
- Unnecessary perfectionism.

Examples

- **Vehicle inspection process:** technicians take time to measure vehicle emissions with higher accuracy than required, only to find that the vehicle clearly does not fulfill the required emission levels.
  ▪ **Travel approval process:** 10% of approvals are trivially rejected at the end of the process due to lack of budget.
  ▪ **University admission process:** Officers spend time verifying the authenticity of degrees, transcripts and language test results. In 1% of cases, these verifications uncover issues. Verified applications are sent to the admissions committee. The admission committee accepts 20% of the applications it receives.

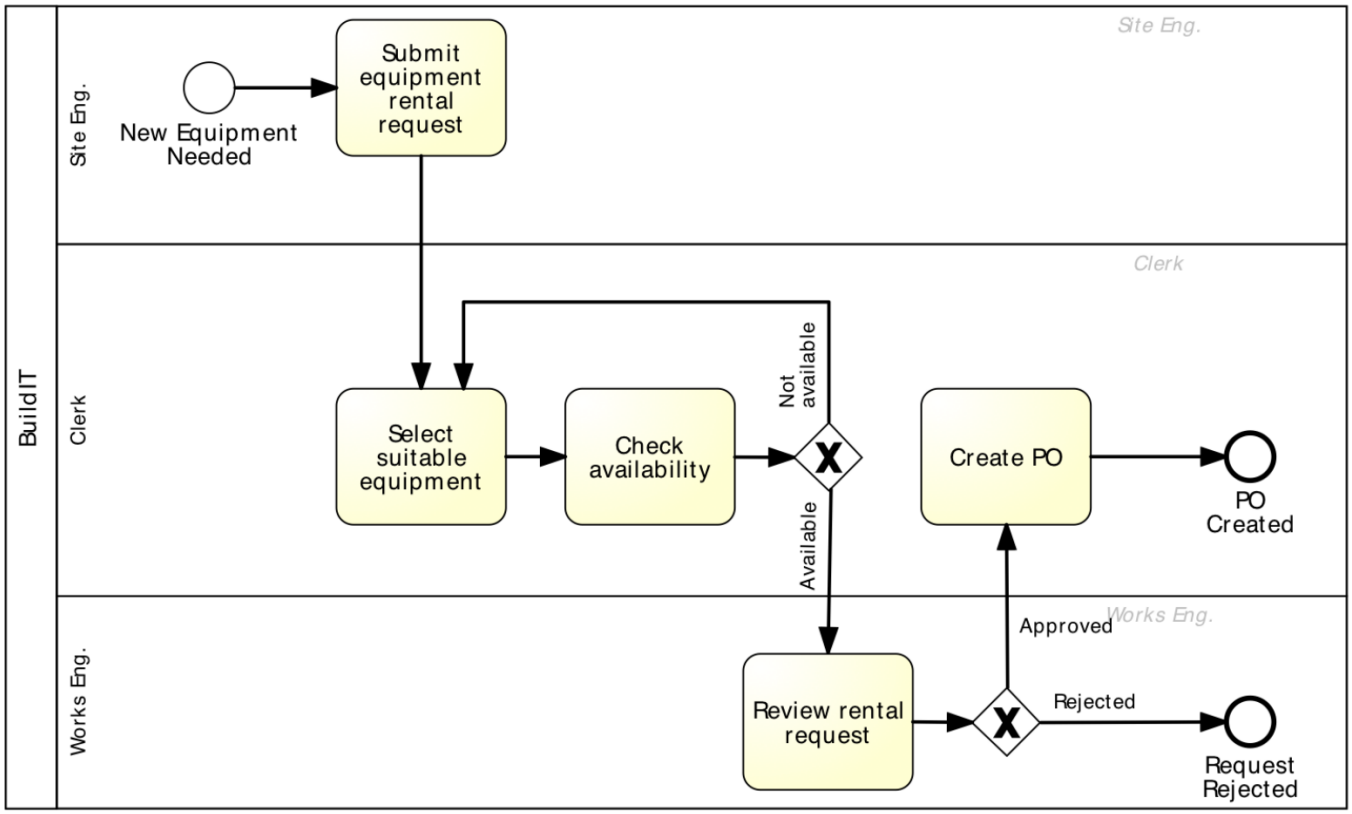
Over-do: Over-production

- Unnecessary process instances are performed, producing outcomes that do not add value upon completion.

Examples

- **Quote-to-cash process:** In 50% of cases, issued quotes do not lead to an order.
- **Travel approval process:** In 5% of cases, travel requests are approved but the travel is cancelled.
- **University admission process:** About 3000 applications are submitted, but only 600 are considered eligible after assessment.

Equipment Rental Process: Wastes



Transportation

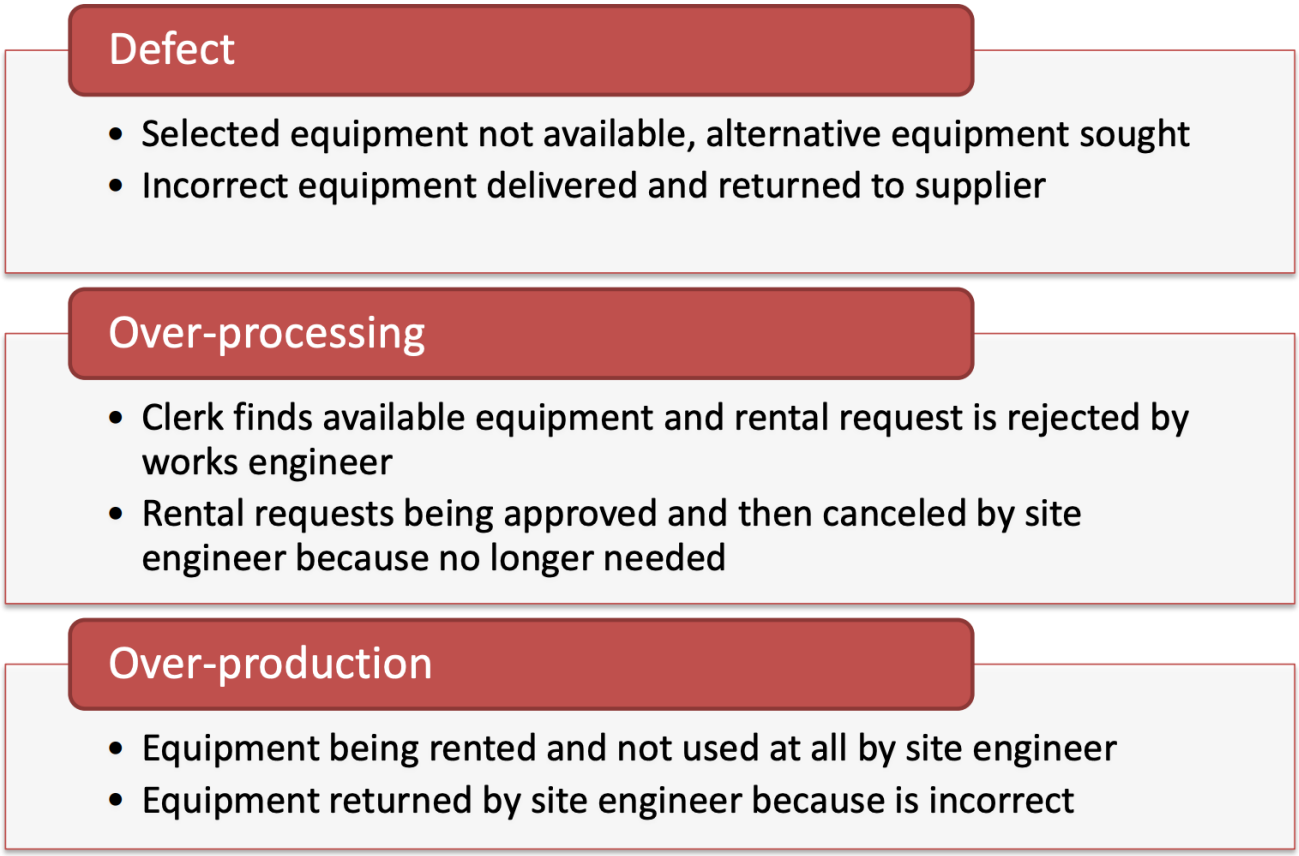
- Site engineer sends request to clerk
- Clerk forwards to works engineer
- Works engineer sends back to clerk

Inventory

- Equipment kept longer than needed

Waiting

- Waiting for availability of works engineer to approve



Stakeholder Analysis

Issue Register

Purpose: to maintain, organize and prioritize perceived weaknesses of the process (issues).

Sources of issues

- Input to a BPM project.
- Collected as part of ongoing process improvement actions.
- Collected during process discovery (modelling).
- Value-added/waste analysis.

Example

Equipment rental process

Name	Explanation	Assumptions	Qualitative Impact	Quantitative Impact
Equipment kept longer than needed	Site engineers keep equipment longer than needed via deadline extensions	3000 pieces of equipment rented p.a. In 10% of cases, equipment kept two days longer than needed. Rental cost is 100 per day		0.1 × 3000 × 2 × EUR 100 = EUR 60000 p.a.
Wrong equipment delivered	Site engineers reject delivered equipment due to non-conformance to their specifications	3000 pieces of equipment rented p.a. 5% of them are rejected due to an internal mistake For each equipment rejected due to an internal mistake, BuildIT is billed EUR 100.	Disrupted schedules. Employees stress and frustration	3000 × 0.05 × EUR 100 = EUR 15000 p.a.
Late payment fees	Late payment fees incurred because invoices are not paid by their due date	3000 pieces of equipment rented p.a. Average rental time is 4 days. Rental cost is EUR 100 per day. Each rental leads to one invoice. About 10% of invoices are paid late. Penalty for late payment is 2%.	Poor reputation with suppliers	0.1 × 3000 × 4 × EUR 100 × 0.02 = EUR 2400 p.a.