





This Module's Scope in the BPM Life Cycle

LOWER COSTS

REDUCED RISKS

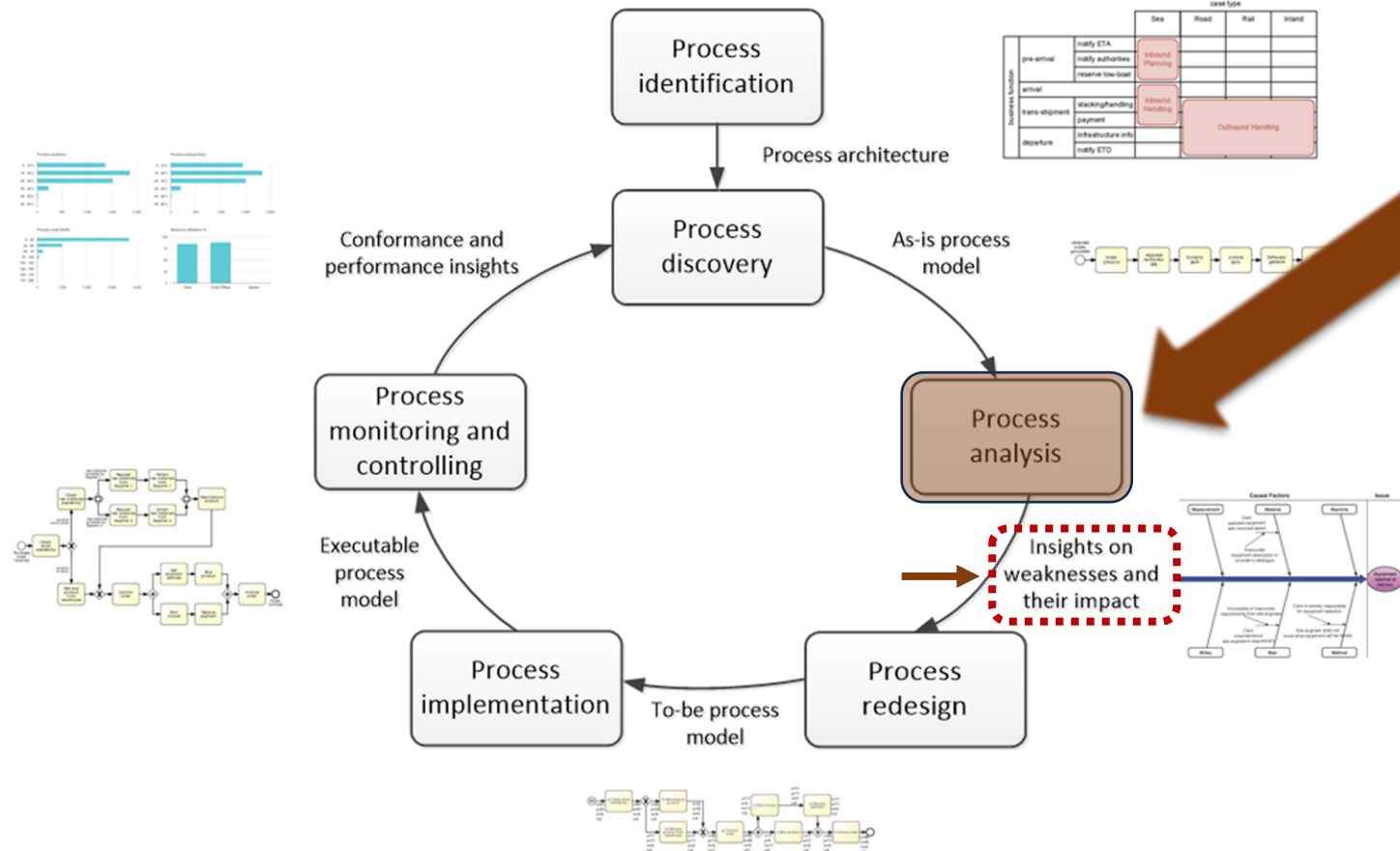
Qualitative and quantitative process analysis

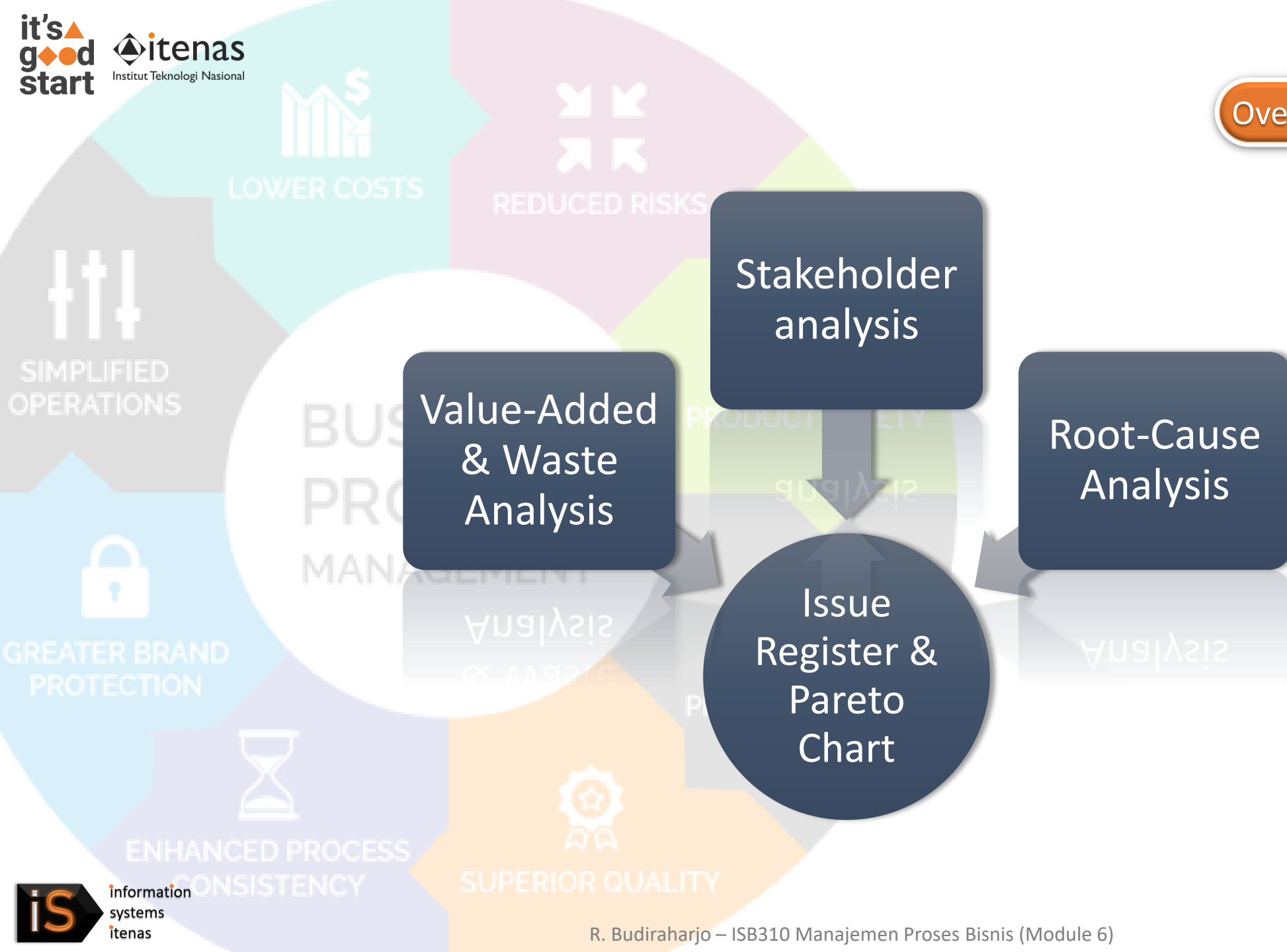
SIMPLIFIED
OPERATIONS

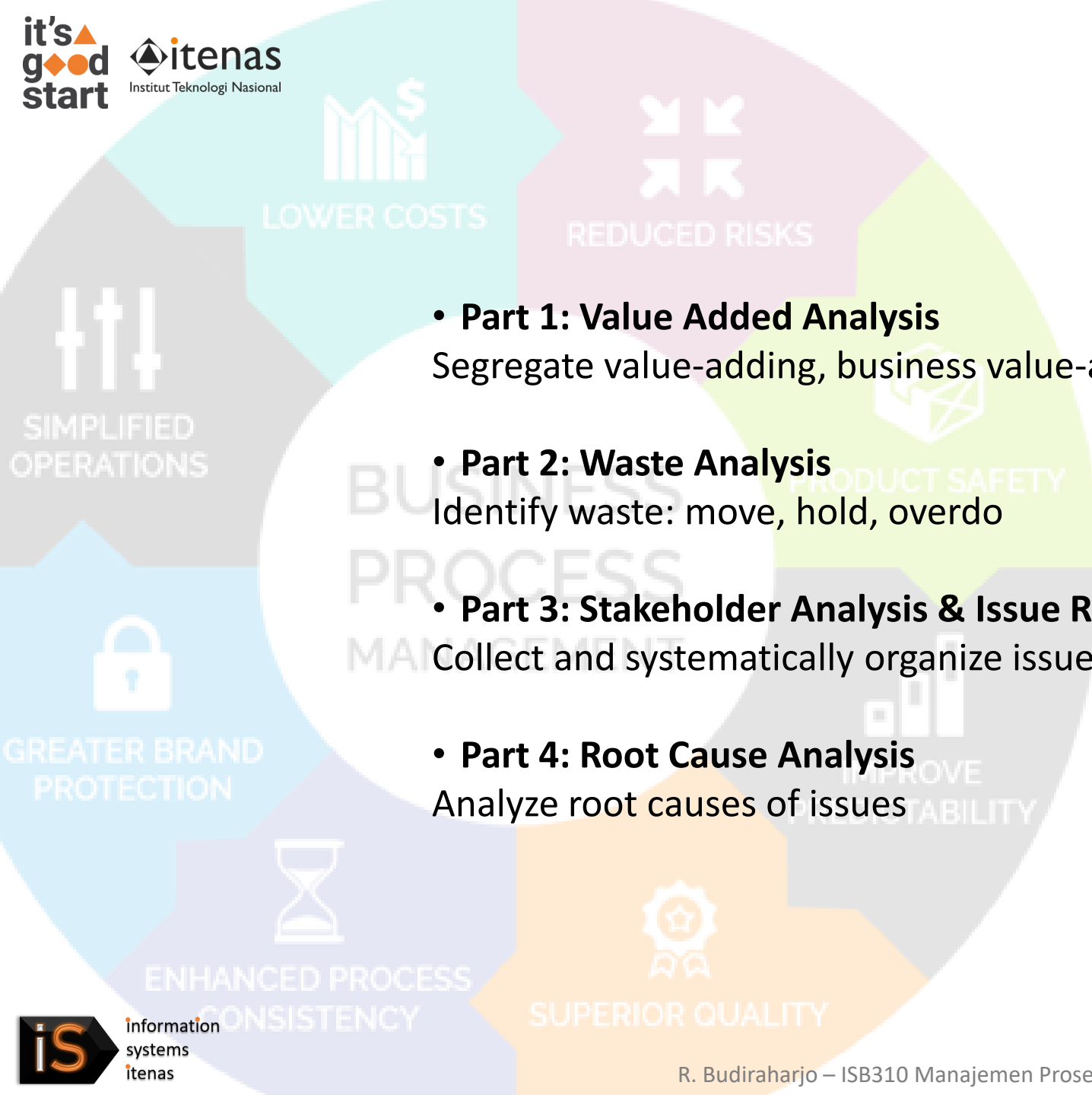
GREATER BRAND
PROTECTION

ENHANCED PR

CONSISTENCY







- **Part 1: Value Added Analysis**

Segregate value-adding, business value-adding and non-value-adding steps

- **Part 2: Waste Analysis**

Identify waste: move, hold, overdo

- **Part 3: Stakeholder Analysis & Issue Register**

Collect and systematically organize issues, assess their impact, prioritize

- **Part 4: Root Cause Analysis**

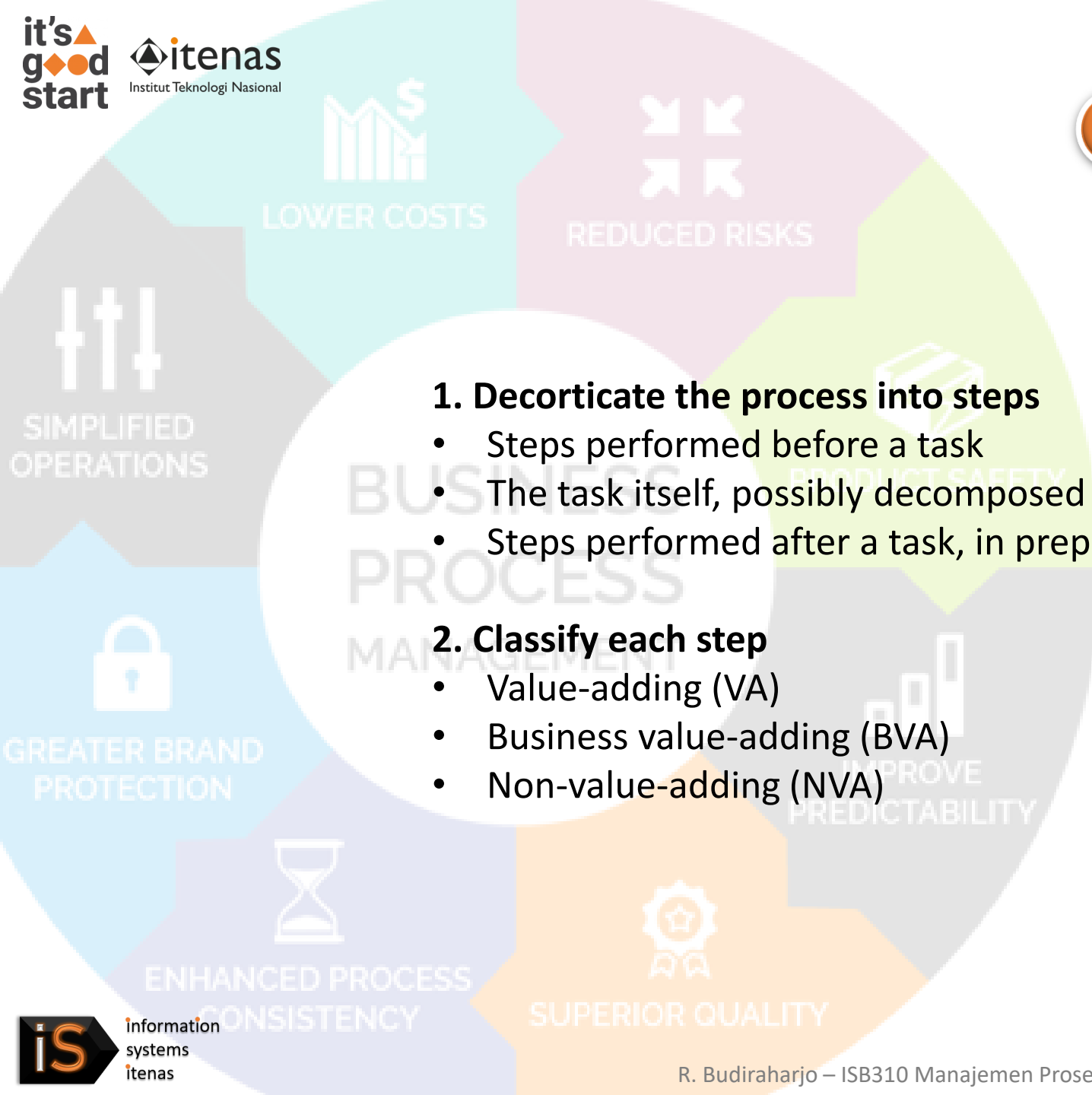
Analyze root causes of issues



Part 1: Value Added Analysis

Part 1: Value Added Analysis

VA analysis



Part 1: Value Added Analysis

Value-adding activities

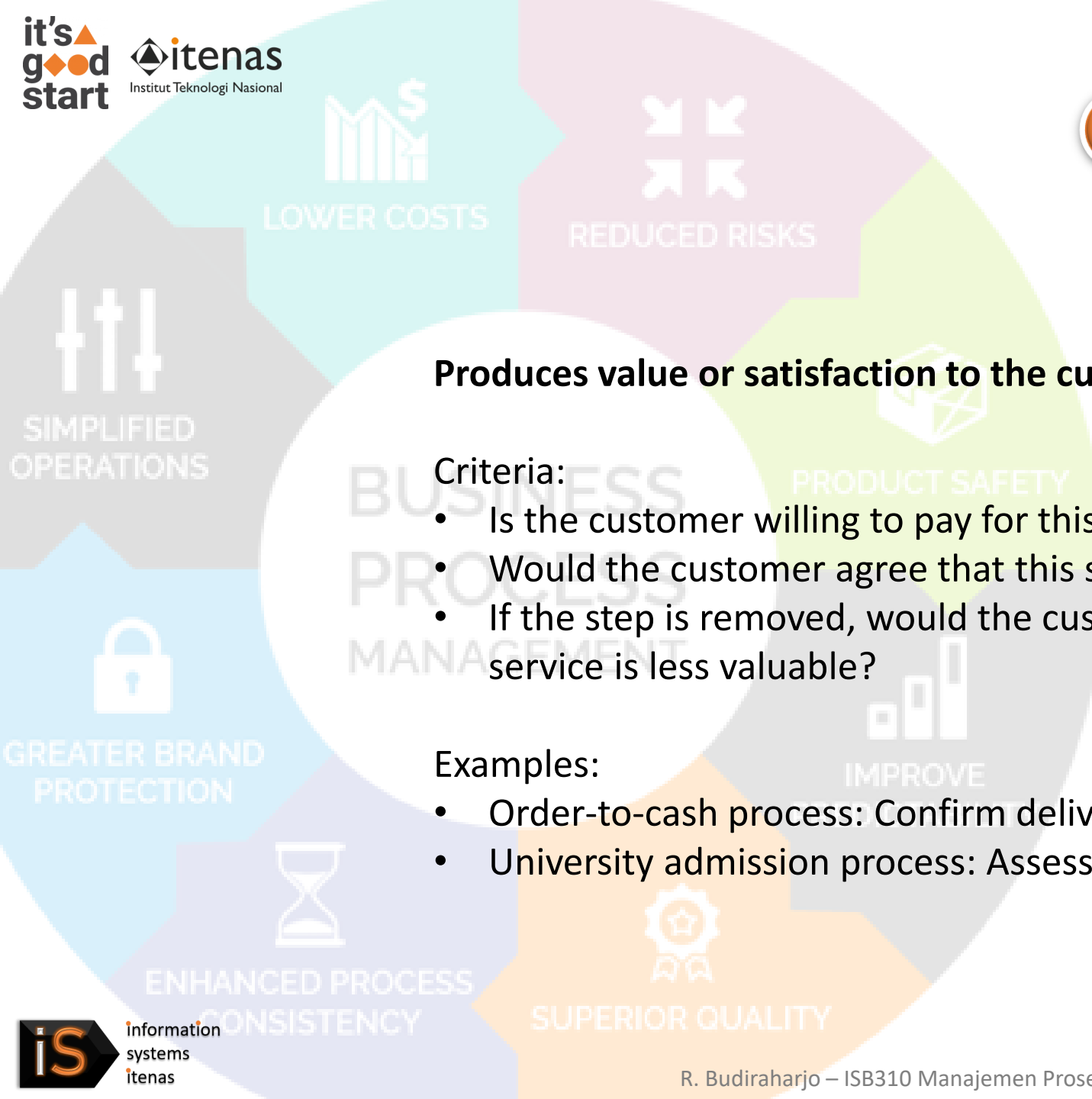
Produces value or satisfaction to the customer.

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
- University admission process: Assess application, Notify admission outcome



Part 1: Value Added Analysis

Business value-adding 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?

Example

- 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



Part 1: Value Added Analysis

Non-value-adding activities

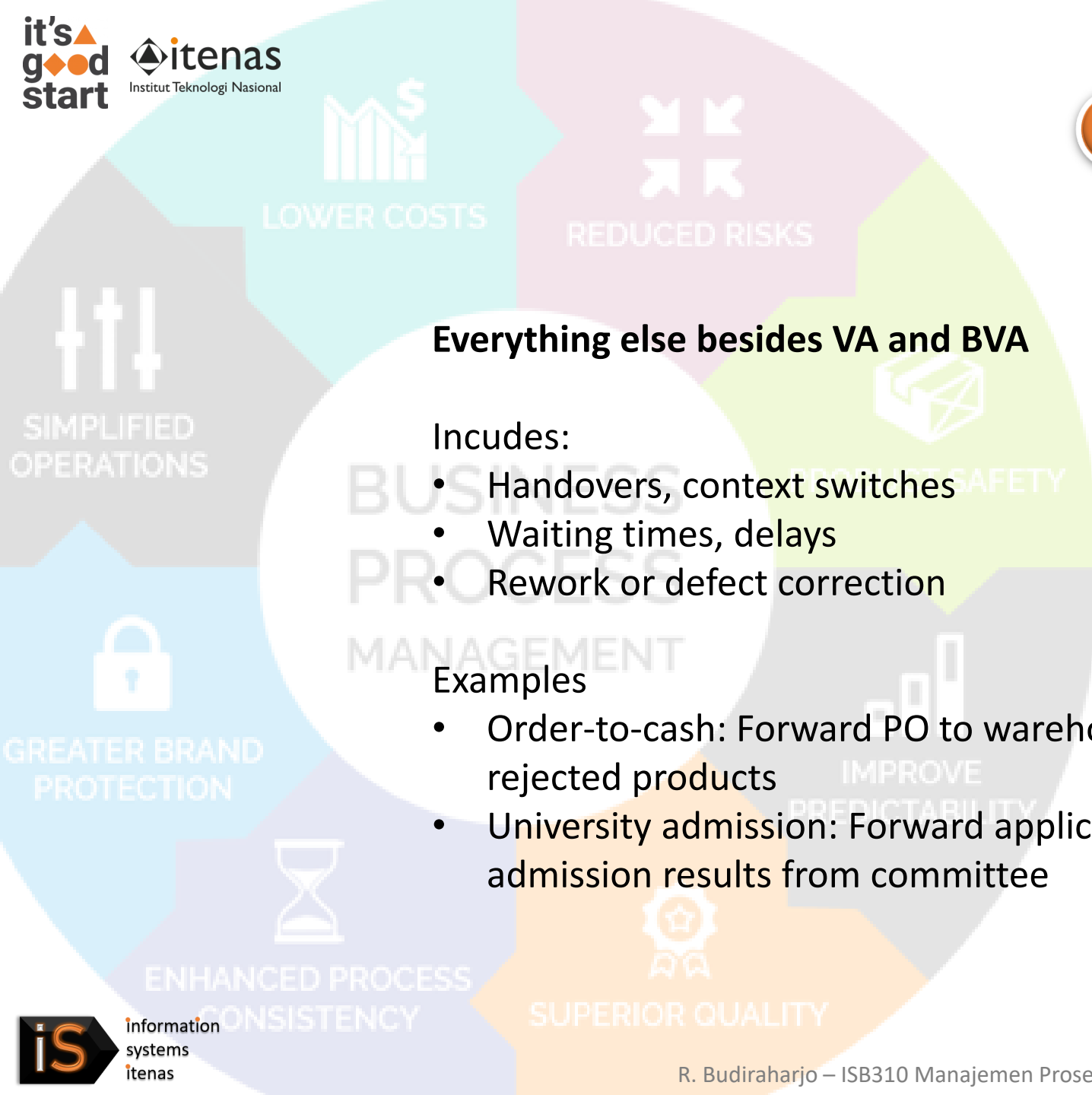
Everything else besides VA and BVA

Includes:

- Handovers, context switches
- Waiting times, delays
- Rework or defect correction

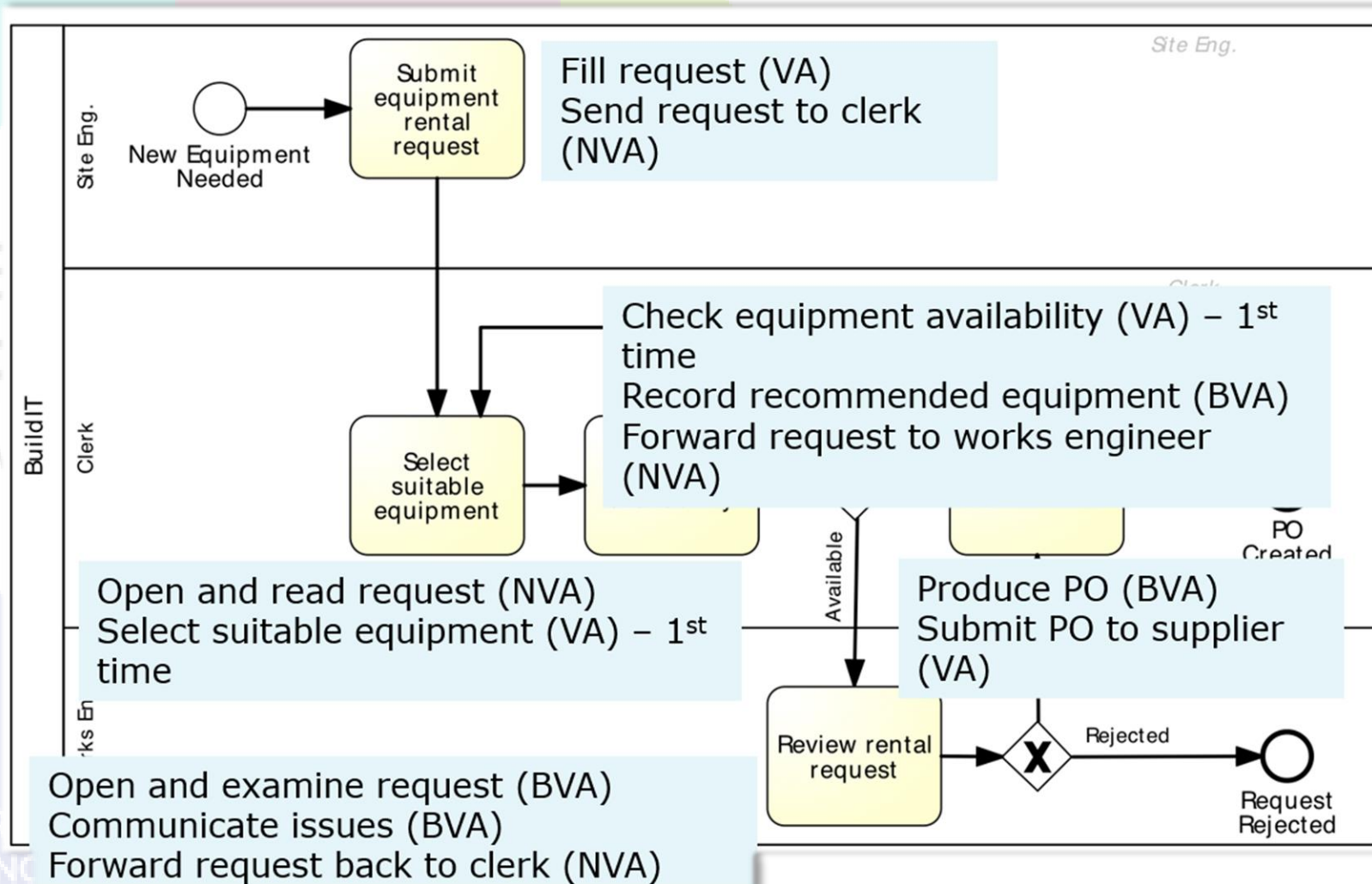
Examples

- Order-to-cash: Forward PO to warehouse, Re-send confirmation, Receive rejected products
- University admission: Forward applications to committee, Receive admission results from committee



Part 1: Value Added Analysis

Extract of equipment rental process



Part 1: Value Added Analysis

Equipment rental process: 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



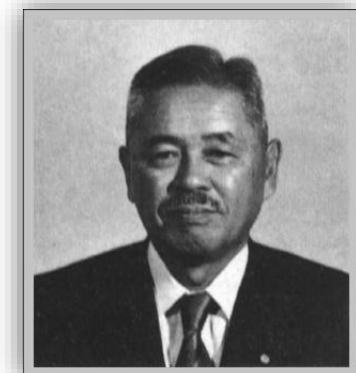
Part 2: Waste Analysis

Part 2: Waste Analysis

Waste analysis

"All we are doing is looking at the time line, from the moment the customer gives us an order to the point when we collect the cash. And we are reducing the time line by reducing the non-value-adding wastes"

Taiichi Ohno



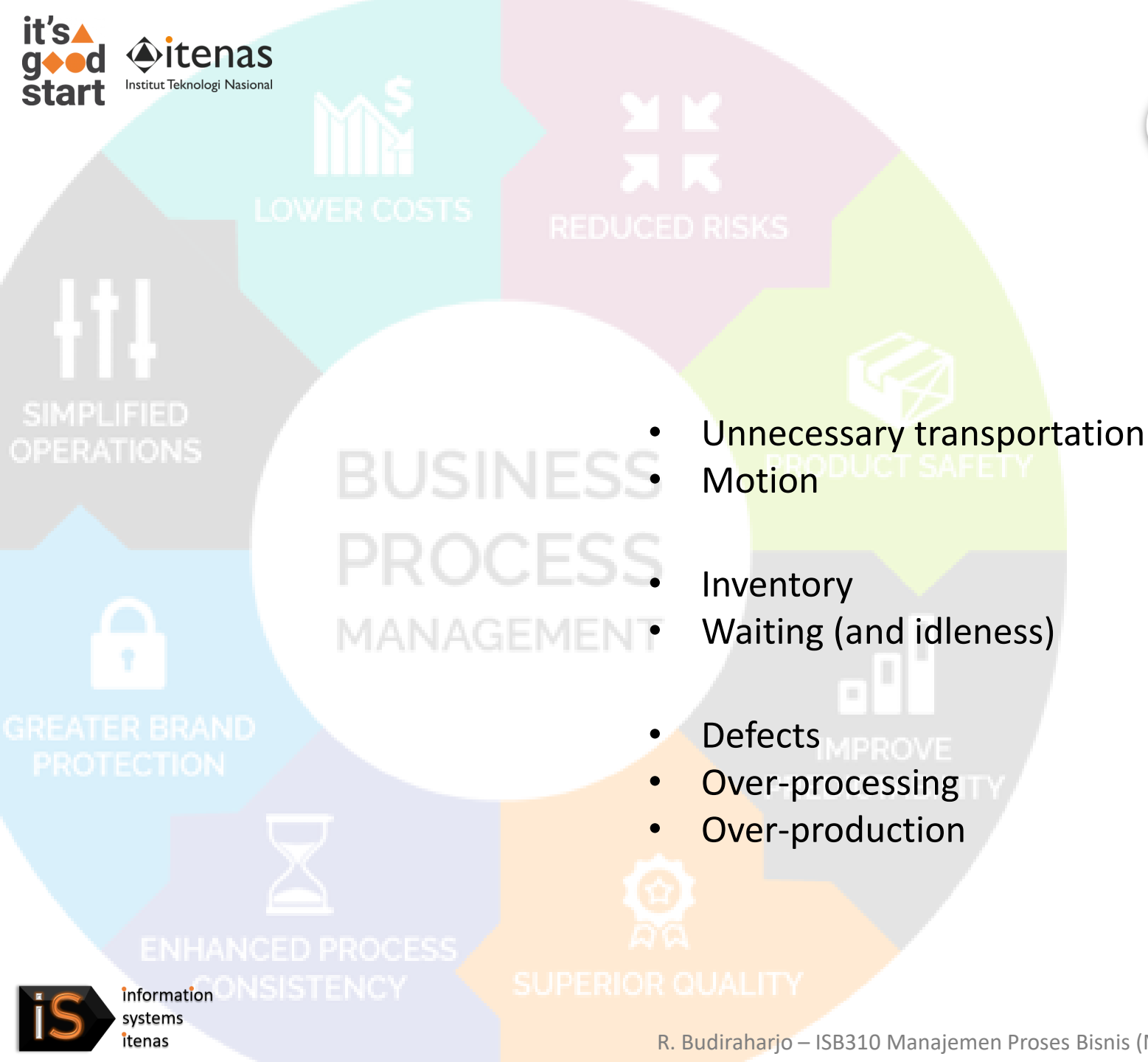
Part 2: Waste Analysis

Seven sources of waste

Move

Hold

Over-do



Part 2: Waste Analysis

Move

Unnecessary transportation

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

Example:

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 to 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 document type.

Part 2: Waste Analysis

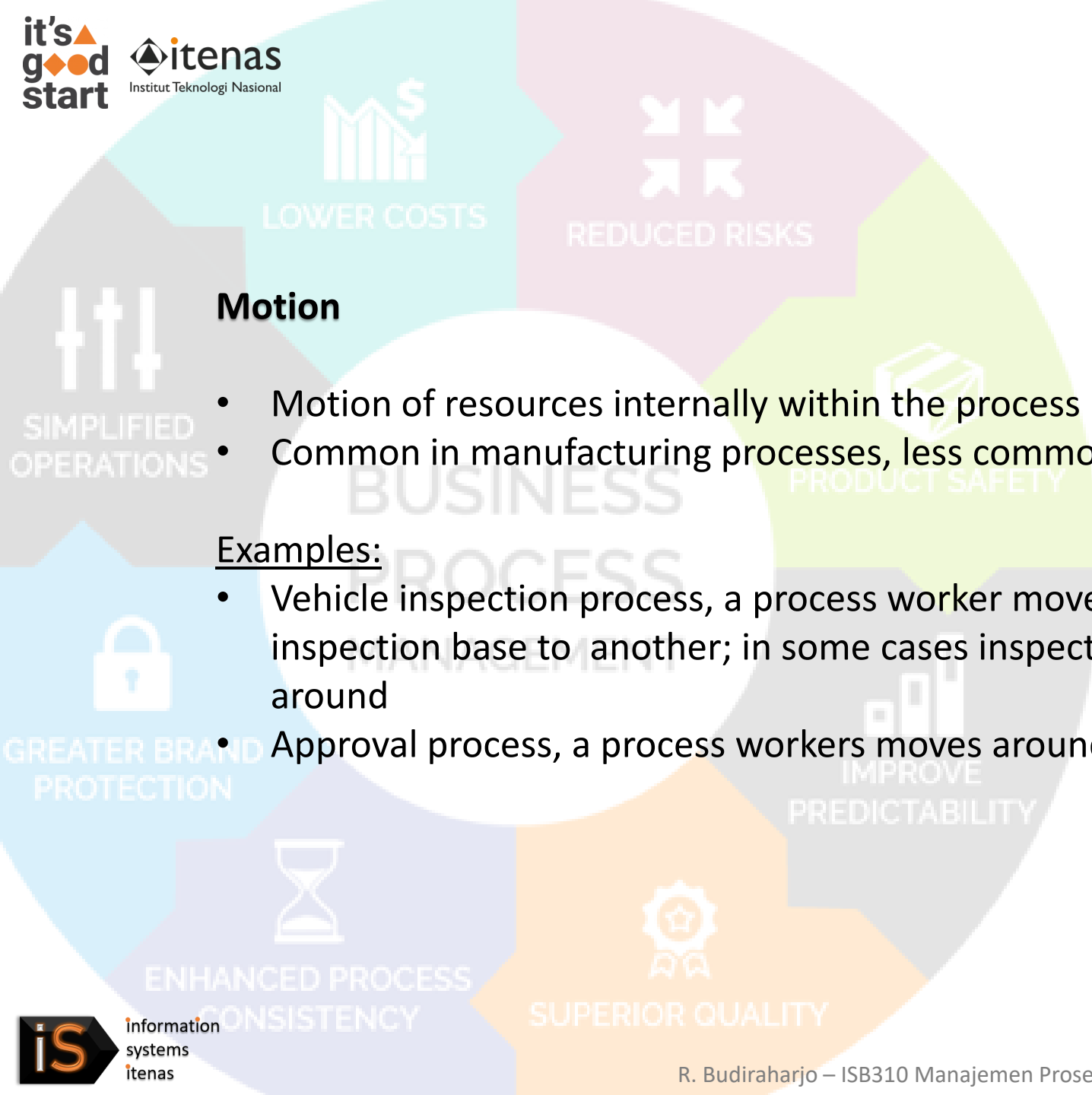
Move

Motion

- Motion of resources internally within the process
- Common in manufacturing processes, less common in business 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
- Approval process, a process workers moves around the organization to collect signatures



Part 2: Waste Analysis

Hold



Part 2: Waste Analysis

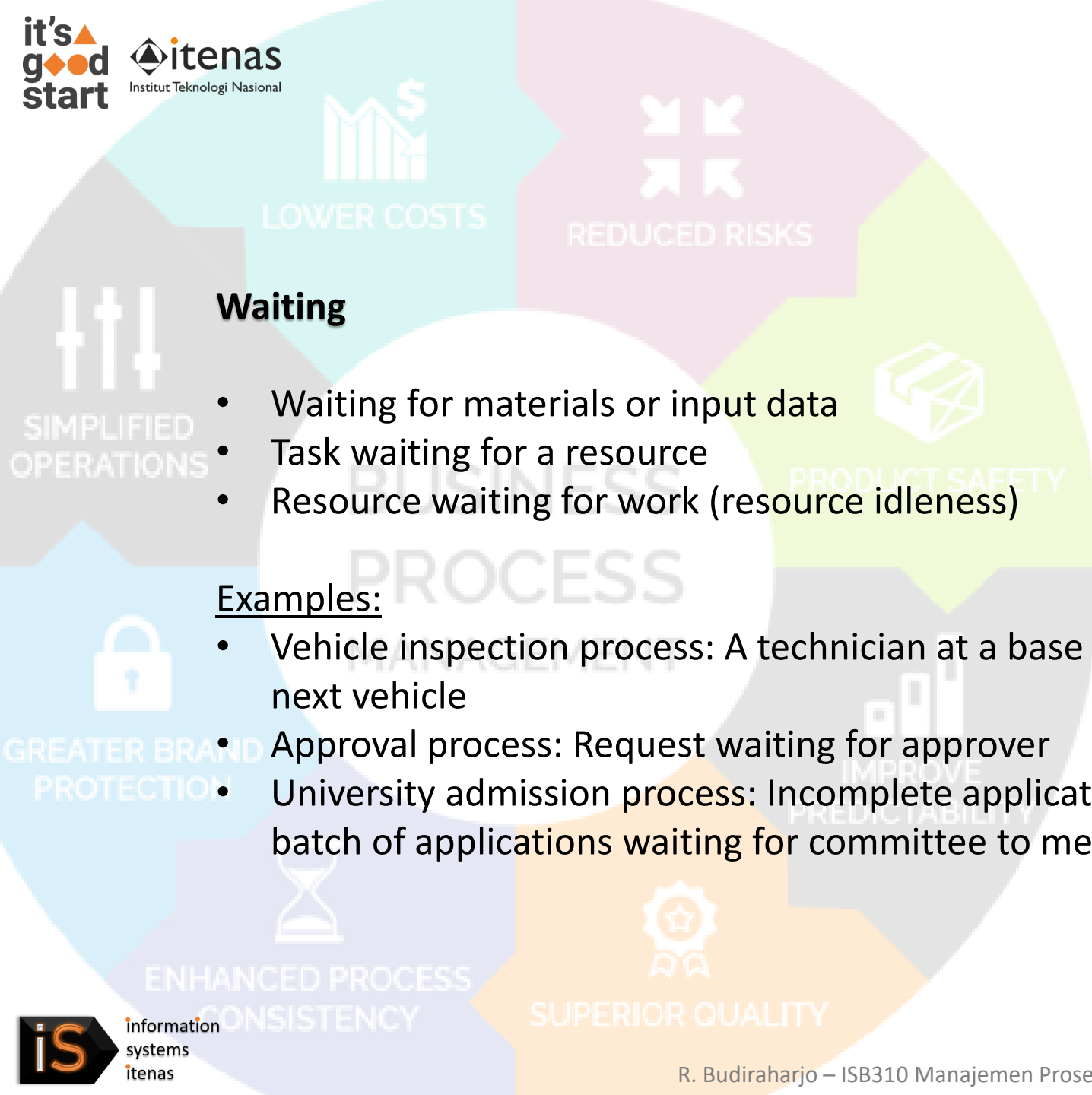
Hold

Waiting

- 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
- Approval process: Request waiting for approver
- University admission process: Incomplete application waiting for additional documents; batch of applications waiting for committee to meet



Part 2: Waste Analysis

Over-do

Defects

- Correcting or compensating for a defect
- Rework loops

Examples:

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



Part 2: Waste Analysis

Over-do

Over-processing

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

Examples:

- Vehicle inspection: 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: 10% of approvals are trivially rejected at the end of the process due to lack of budget
- University admission: 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

Part 2: Waste Analysis

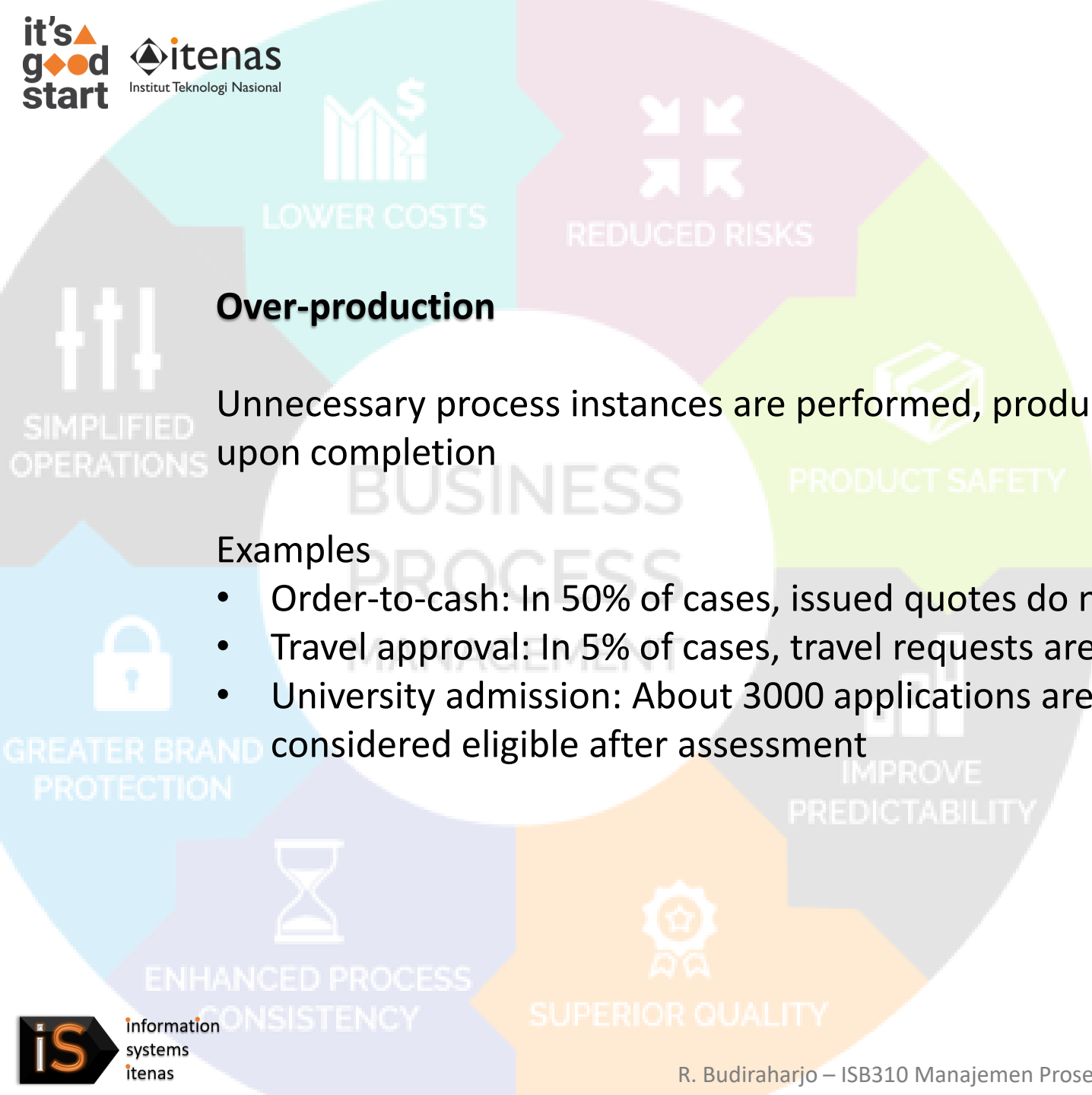
Over-do

Over-production

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

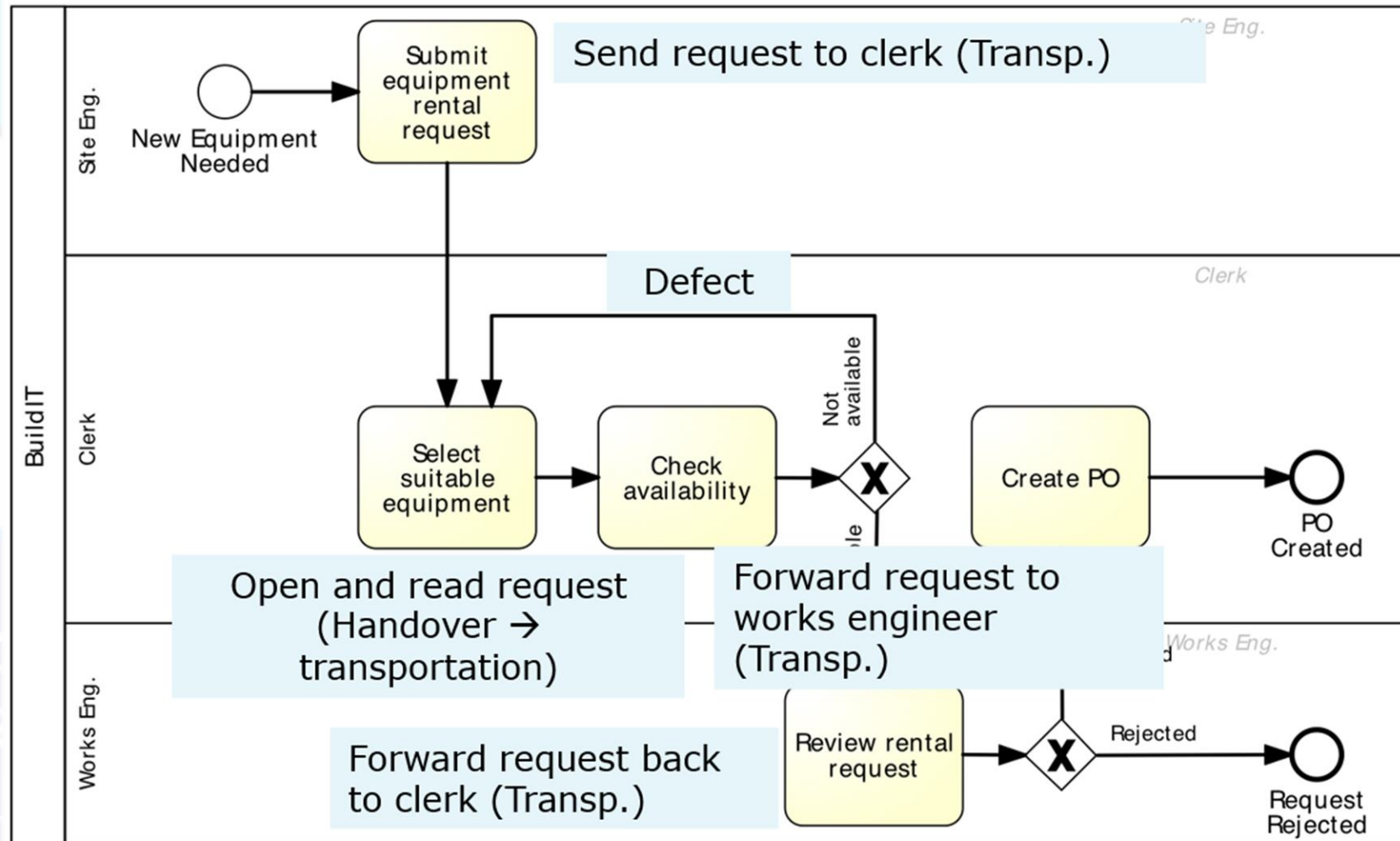
Examples

- Order-to-cash: In 50% of cases, issued quotes do not lead to an order
- Travel approval: In 5% of cases, travel requests are approved but the travel is cancelled
- University admission: About 3000 applications are submitted, but only 800 are considered eligible after assessment



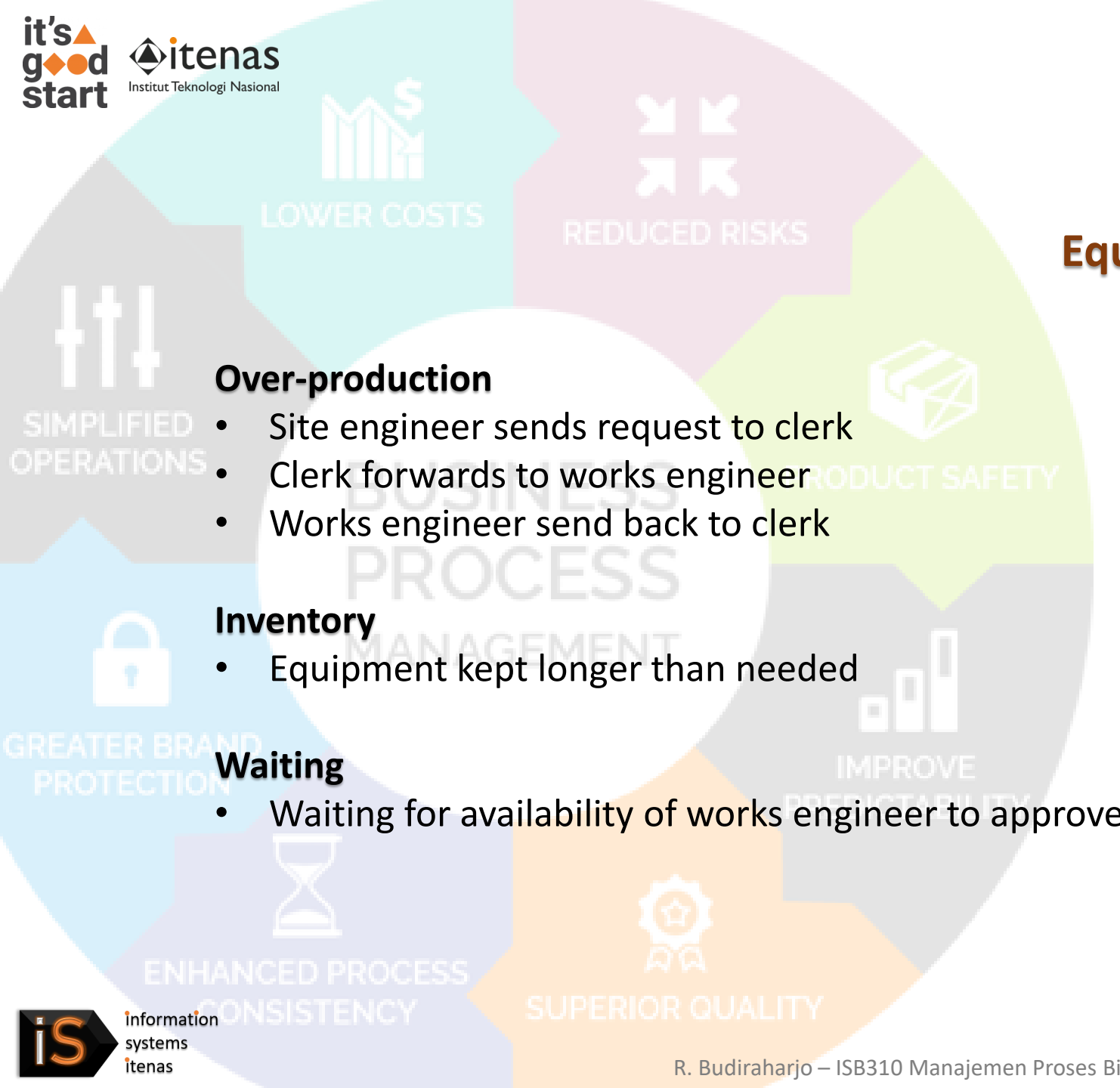
Part 2: Waste Analysis

Equipment rental process: wastes



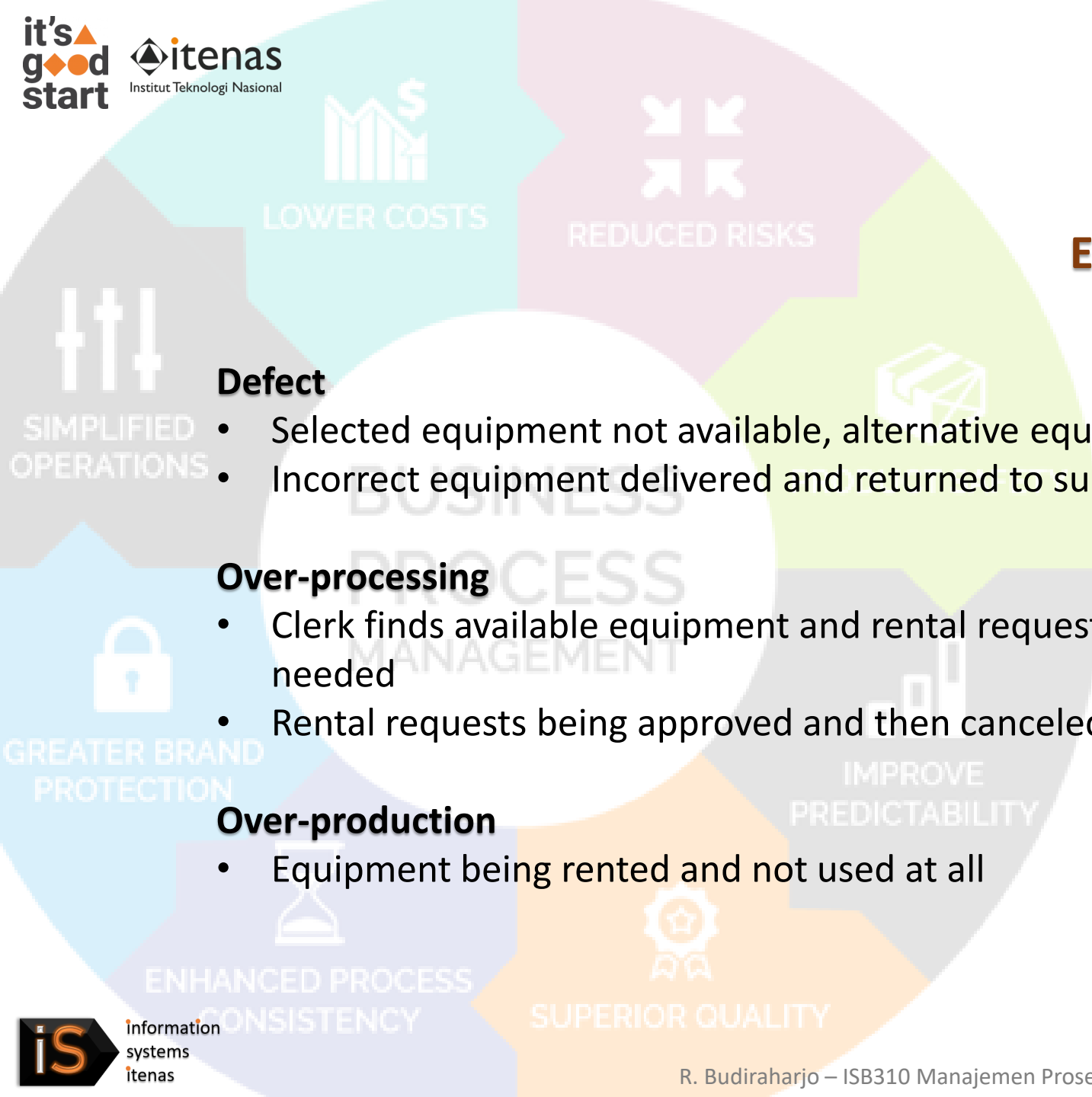
Part 2: Waste Analysis

Equipment rental process: wastes



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Equipment rental process: wastes





Part 3: Stakeholder Analysis & Issue Register

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Stakeholder analysis

Stakeholder analysis is about gathering data from multiple sources by interviewing stakeholders of different types and reconciling their viewpoints

In BPM, stakeholder analysis is commonly used to gather information about issues that affect the performance of the process from different perspectives.

There are typically five categories of stakeholders:

- The customer(s) of the process.
- The process participants.
- The external parties (e.g., suppliers, sub-contractors) involved in the process.
- The process owner and the operational managers who supervise the process participants.
- The sponsor of the process improvement effort and other executive managers who have a stake in the performance of the process.

Part 3: Stakeholder Analysis & Issue Register

Typical stakeholder concerns

- **Customers** are often concerned about slow cycle time, defects, lack of transparency, or lack of traceability (inability to observe the current process status).
- **Process participants** might be rather concerned about:
 - High resource utilization, working under stress.
 - Defects arising from handoffs in the process and wastes.
- **External parties** (e.g. suppliers and sub-contractors) are generally concerned about having a steady or growing stream of work from the process, being able to plan their work ahead, and being able to meet contractual requirements.
- **The process owner** is usually concerned with performance, be it high cycle times or high processing times. Also be concerned about common defects and wastes, and compliance with internal policy and external regulations.
- **The sponsor and other high-level managers** are generally concerned with the strategic alignment of the process and the contribution of the process to key performance indicators. Also concerned about the ability of the process to adapt to evolving customer expectations, competition, and market conditions.

Part 3: Stakeholder Analysis & Issue Register

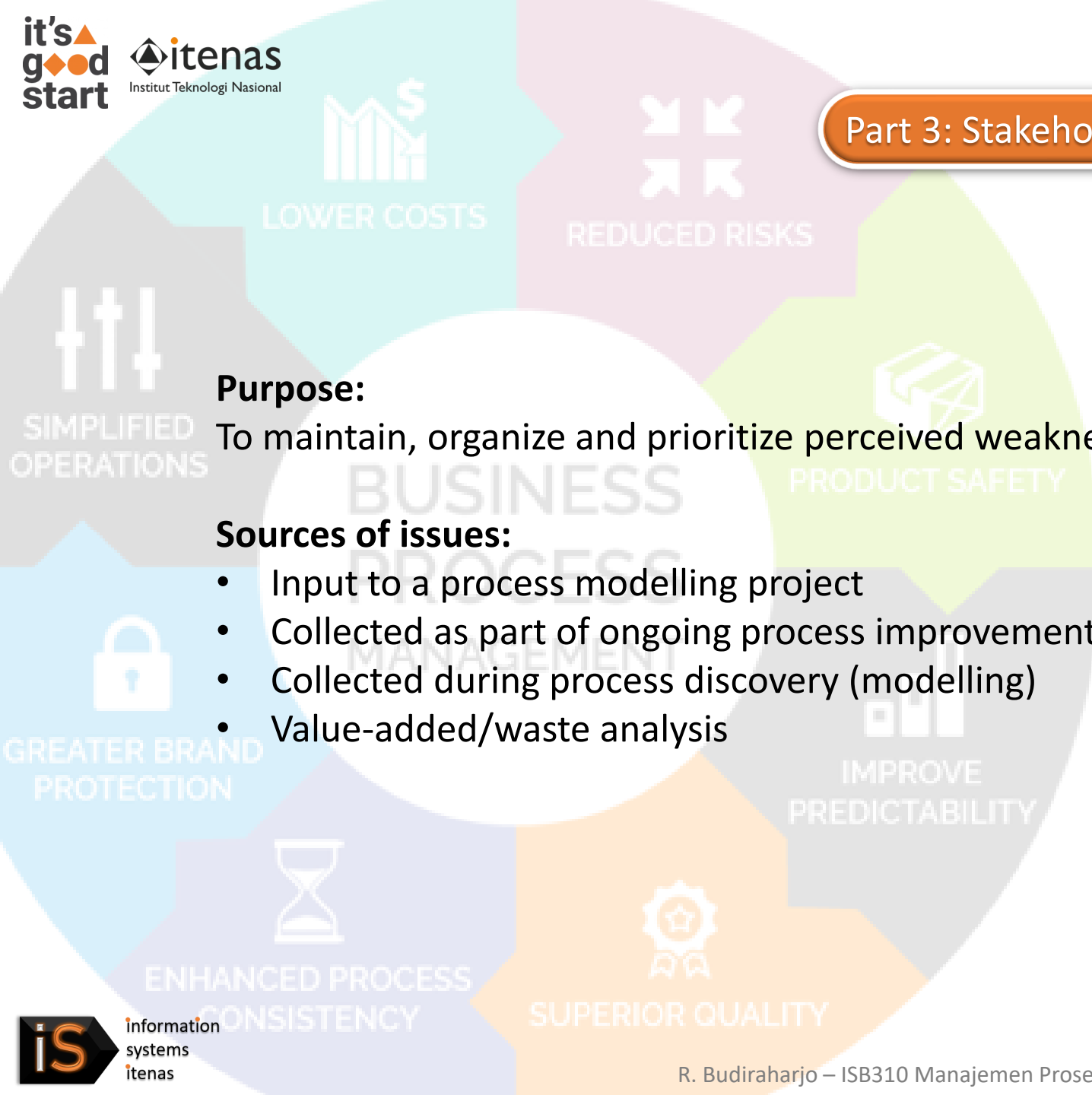
Issue register

Purpose:

To maintain, organize and prioritize perceived weaknesses of the process (issues)

Sources of issues:

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



Part 3: Stakeholder Analysis & Issue Register

Issue register example

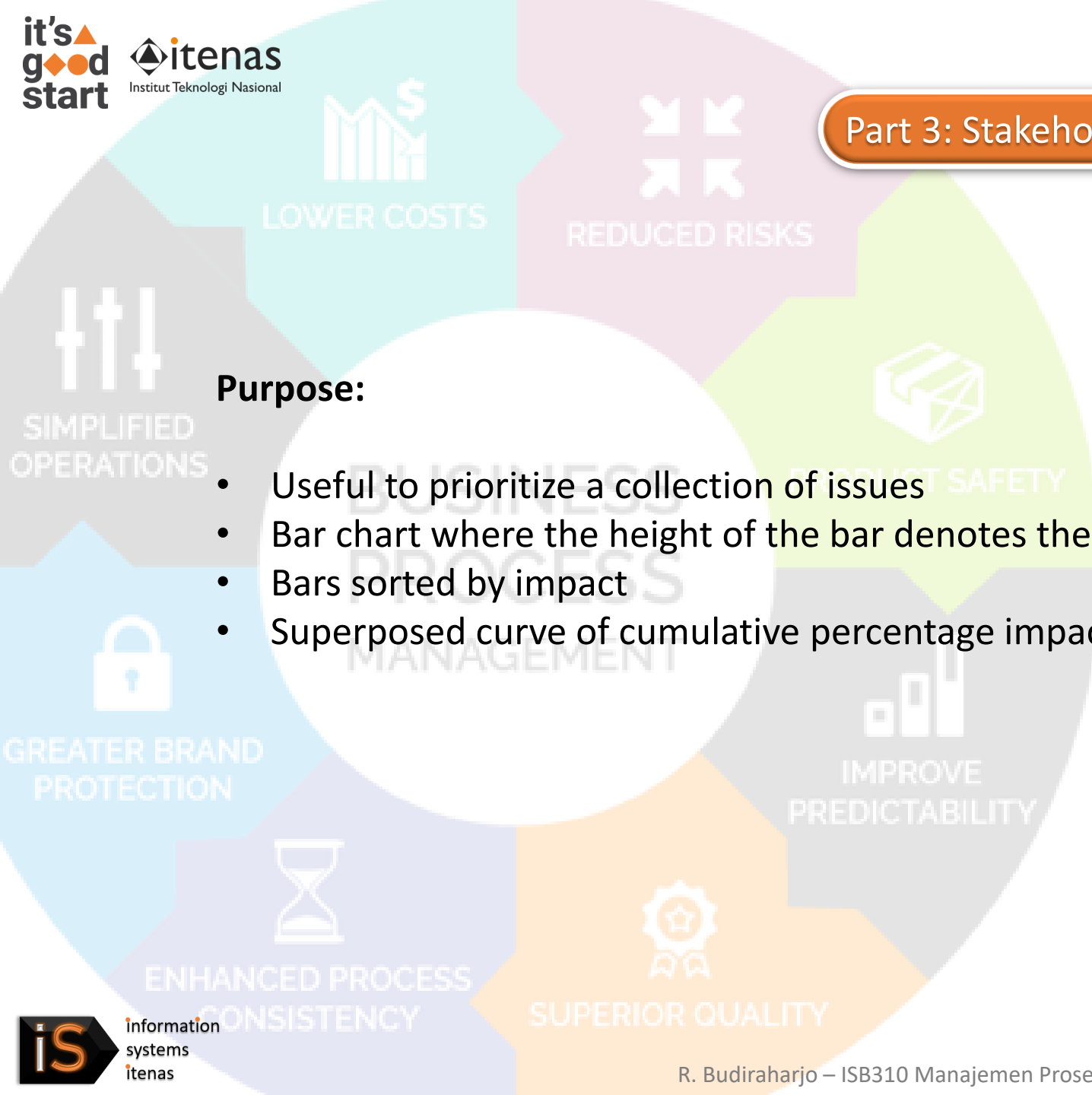
Name	Explanation	Assumptions	Qualitative Impact	Quantitative Impact
Equipment kept longer than needed	Site engineers keep equipment longer than needed via deadline extensions	3000 pieces of equipment rented p.a. In 10% of cases, equipment kept two days longer than needed. Rental cost is 100 per day		$0.1 \times 3000 \times 2 \times 100 = 60,000$ p.a.
Rejected equipment	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 100.	Disrupted schedules. Employee stress and frustration	$3000 \times 0.05 \times 100 = 15,000$ 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 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	$0.1 \times 3000 \times 4 \times 100 \times 0.02 = 2400$ p.a.

Part 3: Stakeholder Analysis & Issue Register

Pareto chart

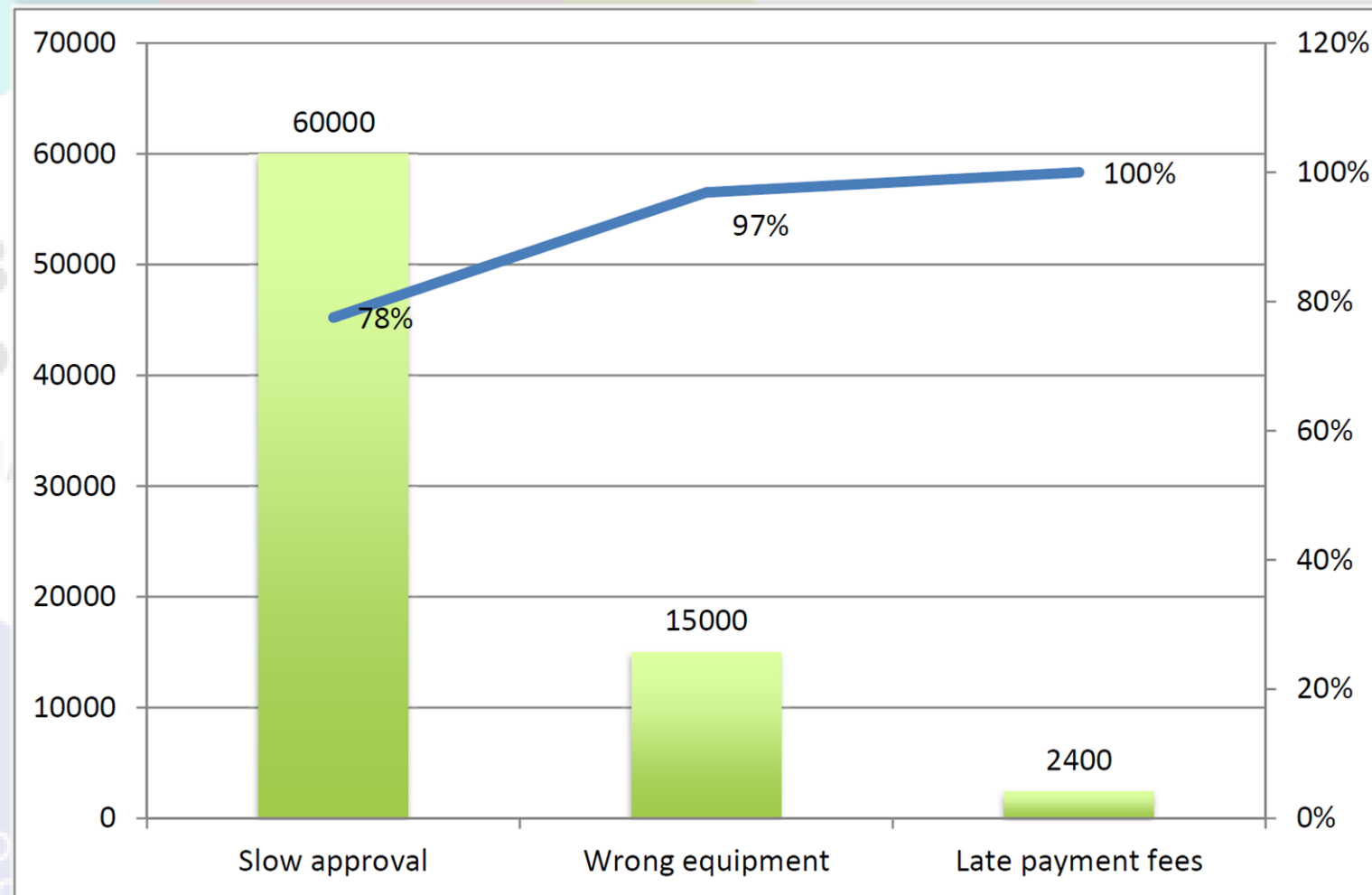
Purpose:

- Useful to prioritize a collection of issues
- Bar chart where the height of the bar denotes the impact of each issue
- Bars sorted by impact
- Superposed curve of cumulative percentage impact



Part 3: Stakeholder Analysis & Issue Register

Pareto chart example





Part 4: Root Cause Analysis

Part 4: Root Cause Analysis

Fishbone (cause-effect) diagram

Categories of causes – The six Ms:

1) **Machine:** factors stemming from technology used

- Lack of suitable functionality in the supporting software applications
- Poor User Interface (UI) design
- Lack of integration between systems

2) **Method:** factors stemming from the way the process is designed, understood or performed

- Unclear assignments of responsibilities
- Unclear instructions
- Insufficient training
- Lack of timely communication

3) **Material:** factors stemming from input materials or data

- Missing, incorrect or outdated data

Part 4: Root Cause Analysis

Fishbone (cause-effect) diagram

Categories of causes – The six Ms:

4) **Man:** factors stemming from wrong assessments or incorrect performance of steps attributable to

- Lack of training and clear instructions
- Lack of motivation
- Too high demands towards process workers

5) **Measurement:** factors stemming from reliance on

- Inaccurate estimations
- Miscalculations

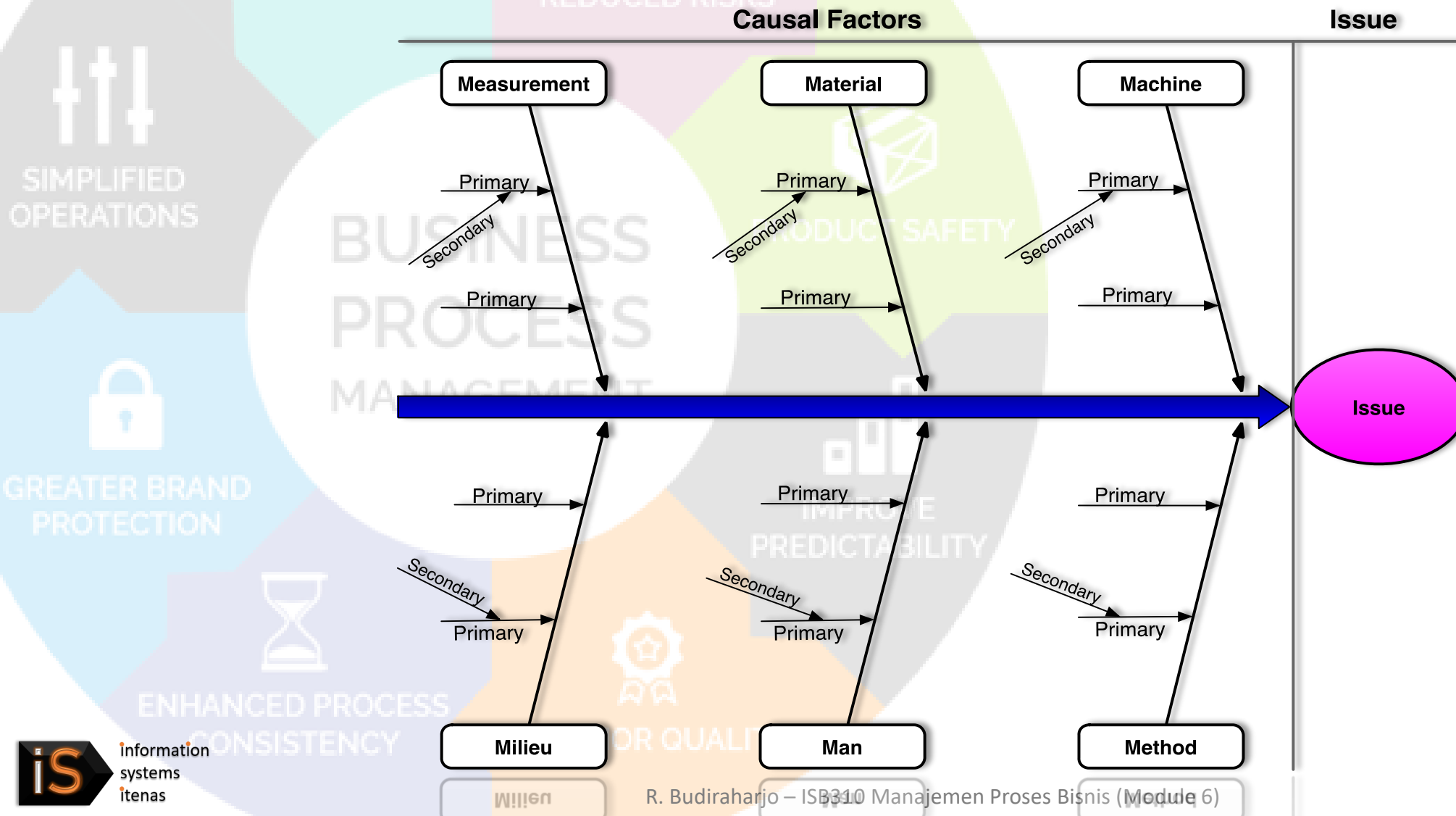
6) **Milieu (environment):** factors outside the scope of the process

- Delays caused because of unresponsive external actors
- Sudden increases of workload due to special circumstances



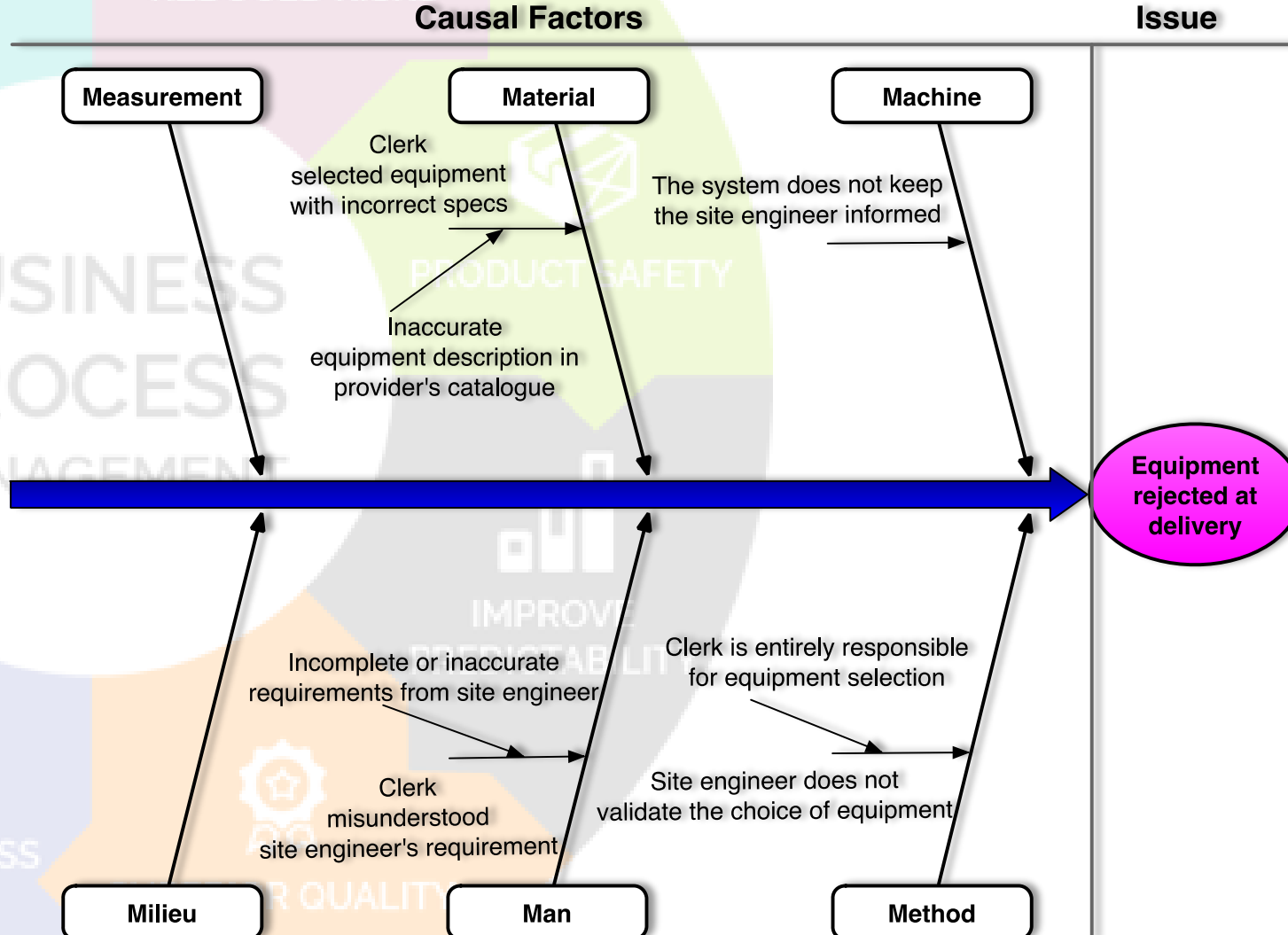
Part 4: Root Cause Analysis

Fishbone (cause-effect) diagram



Part 4: Root Cause Analysis

Fishbone diagram example





Questions?



Hatur nuhun... 😊