University of Stavanger

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ILA-LEAN

Tablet course

Chapter 4.
Use of Lean Concepts in Innovation

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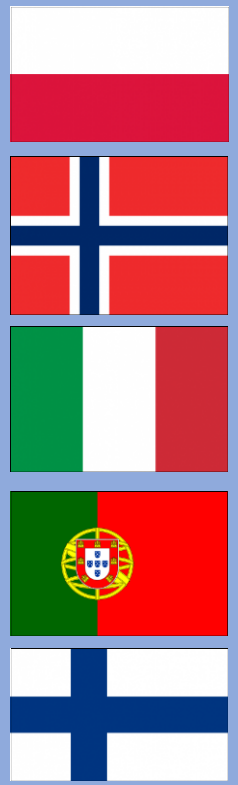
"Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity"

ILA-LEAN Project No 2016-1-PL01-KA203-026293
2016-2018

2018



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Project Title

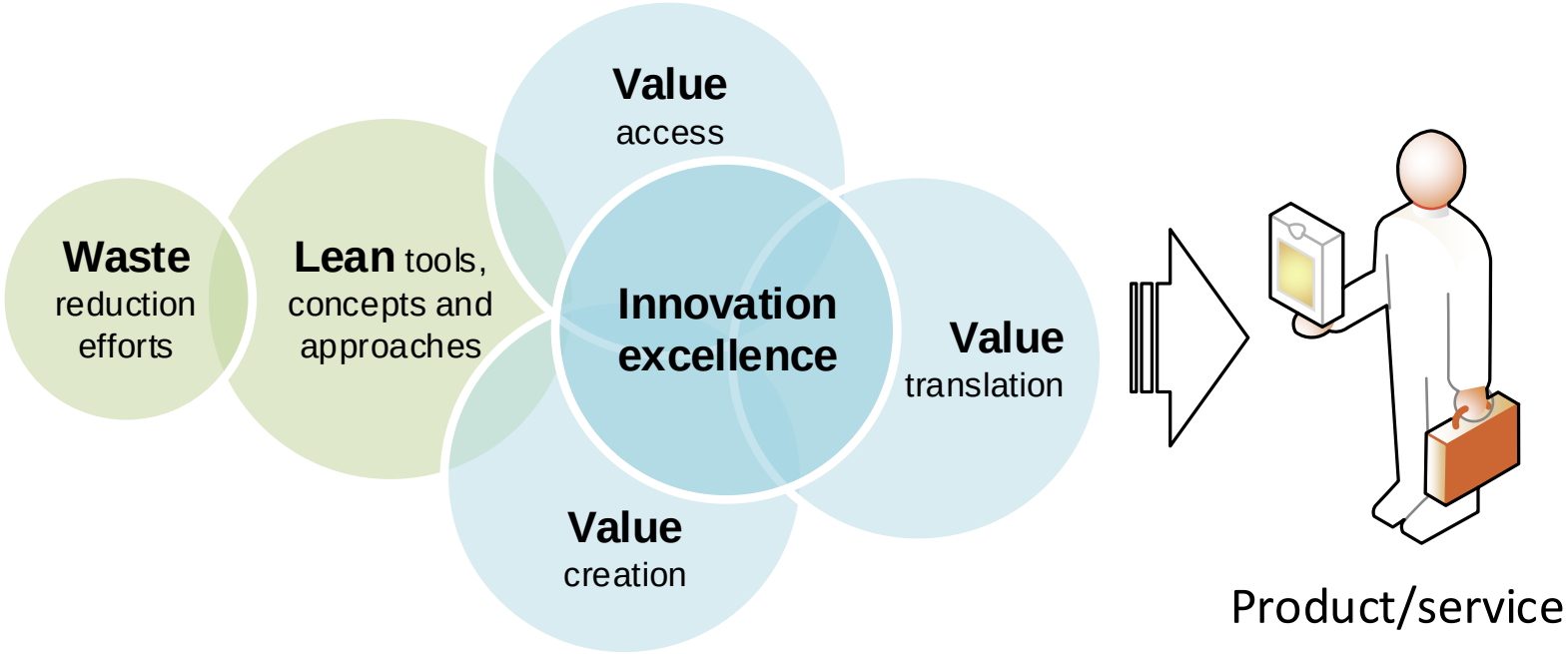
Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity

Project Number: 2016-1-PL01-KA203-026293

Use of Lean Concepts in Innovation

Learning outcomes:

- Learn some of **basic concepts** and their use in **knowledge work**
- **Efficiency improvement Innovation** has been selected as the '**knowledge work**' and the audience shall learn how to use a **lean tool** for **efficiency improvement innovation**.



(Source: Ratnayake and Isoherranen, 2017)

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Industrial Context vs. Need of Innovation

Highlights…

- ‘The manufacturing sector is increasingly looking to innovation to ensure productivity growth,
  - Focus: to achieve non-price based competition’. (Roos, 2016)
- Example: Finland has reached the technology frontier could not rely simply on copying technology developed elsewhere but had to think outside the box. (Jalava, 2004)
  - It had to strive to attain genuine product and process innovations through substantial research and development (R&D) efforts. (Jalava, 2004)
  - Finnish growth transformed from the investment-driven sort to the innovation-driven kind” (Jalava, 2004)

Innovation – Definition?

- The Organization for Economic Co-operation and Development [OECD] (2005) defined innovation as;

  − the implementation of a new or significantly improved product (good or service), or a process, or a new marketing method, or a new organizational method in business practices, in the organization of the work-place or in external relations (OECD, 2009),
  −i.e. there is product, process, marketing or organizational innovation.

- …innovation is something that emerges from a new idea that must be necessarily put into practice, and should be **<u>capable of generating value</u>** for the company or for the stakeholders…(Claudino et al., 2017)

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Innovation, Invention and Research & Development

- "**Research** can be defined as the **conversion of money to knowledge**,

  - whereas **innovation** is the conversion of **knowledge to money**" (Roos, 2016).

- " research strategy is the articulation of the domains in which new knowledge is to be developed.

  - firms that invest heavily in R&D gain the benefits of invention in the form of patents and new insights that become published scientific articles". (Roos, 2016)

- "Invention is not innovation.

  - Invention requires the successful introduction of something new into the firm and/or marketplace" (Roos, 2016)

- "An innovation strategy is the articulation of particular problems whose solutions would improve company performance, but for which there are presently no known off-the-shelf solutions". (Roos, 2016)

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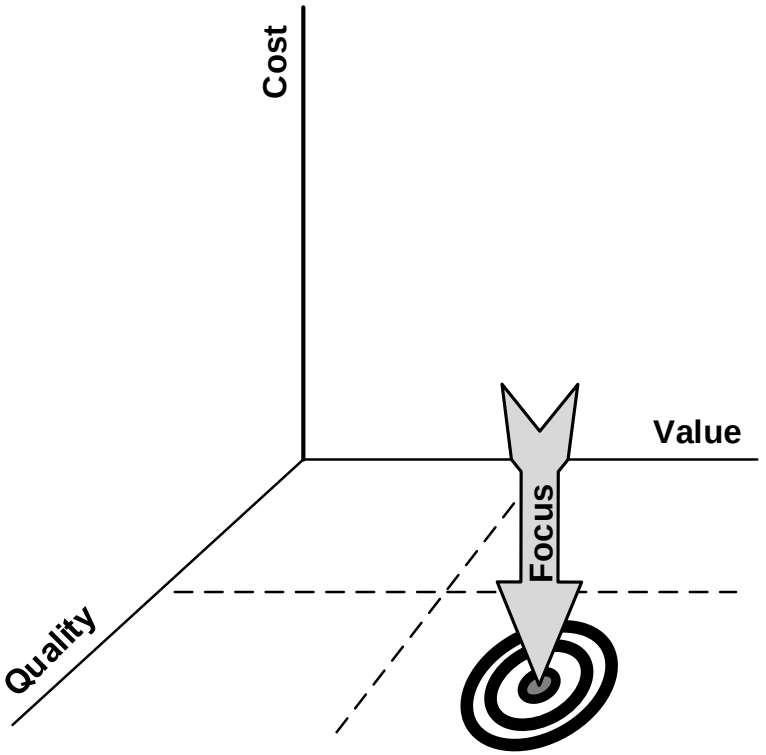
‘Value’ for Money…

- Successful non-price based competition requires continuous provision of multi-dimensional value for money (i.e. as opposed to offerings from low-cost operating environments)

- Applying the appropriate value-creating paradigm is essential for successful innovation’.

- It is possible to identify value-creating paradigms as:

  efficiency improving innovations, science and technology innovation, design-based innovation, art-based innovation, and reverse hermeneutic-based innovation.



(Source: Roos, 2016).

Value Creating Innovations

- Efficiency improving innovations that enable cost cuts which are then (partially) passed on to customers.
- Science and technology innovations that increase customer perceptions of an offering's instrumental value.
- Design-based innovations that increase perceived instrumental value for customers.
- Art-based innovations that increase customer perceptions of a goods intrinsic value (i.e. tangible and intangible factors).
- Innovations grounded in reverse hermeneutics that increase perceived instrumental and intrinsic value for customers by changing their emotional state.

(Source: Roos, 2016).

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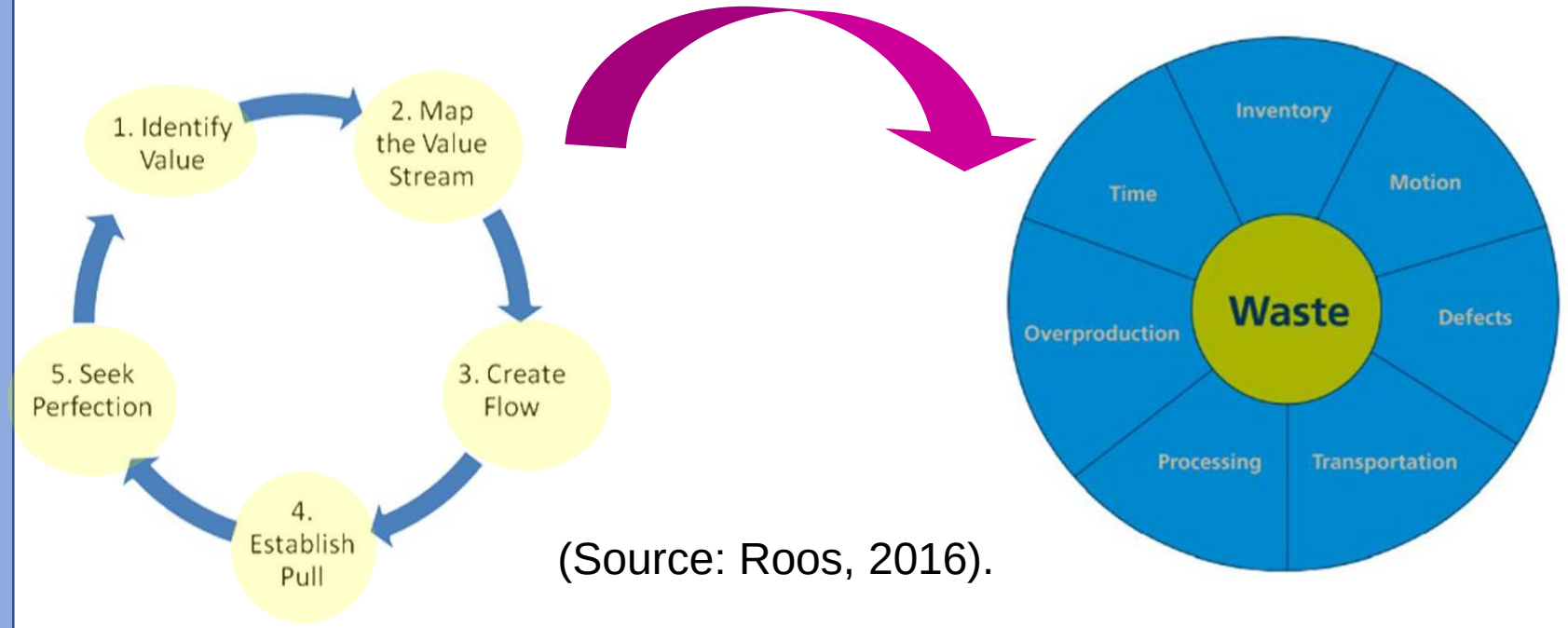
Key Lean Concepts vs. Innovation

- Focus: ‘Value-creating innovations’ … to maximize the ‘value’ that an ‘innovation holds’ from the ‘customers’ point of view’.



(Source: Roos, 2016).

- Efficiency improving innovations that enable cost cuts which are then (partially) passed on to customers.

- These innovations normally occur when the firm finds new ways of reducing the nine types of waste identified through the Lean approach: 1. Unnecessary transportation, 2. Rework, 3. Overstock, 4. Overproduction, 5. Waiting time, 6. Non-value adding activities, 7. Non-value adding processes, 8. Unused creativity, and 9. Intellectual waste (i.e. an overqualified person on the job)

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Wastes are re-defined… Knowledge work/Services

- Delay on the part of customers waiting for service, for a delivery, in queues, for a response, not arriving as promised. The customer's time may seem free to the provider, but when she takes the custom elsewhere the pain begins.
- Duplication. Having to re-enter data, repeat details on forms, copy information across, answer queries from several sources within the same organization.
- Unnecessary Movement. Queuing several times, lack of one-stop, poor ergonomics in the service encounter.
- Unclear communication, and the wastes of seeking clarification, confusion over a product or service use, wasting time finding a location that may result in misuse or duplication.
- Incorrect inventory. Being out-of-stock, unable to get exactly what was required, substitute products or services.
- A lost opportunity to retain or win customers, a failure to establish rapport, ignoring customers, unfriendliness, and rudeness.
- Errors in the service transaction, product defects in the product-service bundle, lost or damaged goods.
- Service quality errors, lack of quality in service processes.

(Source: Roos, 2016).

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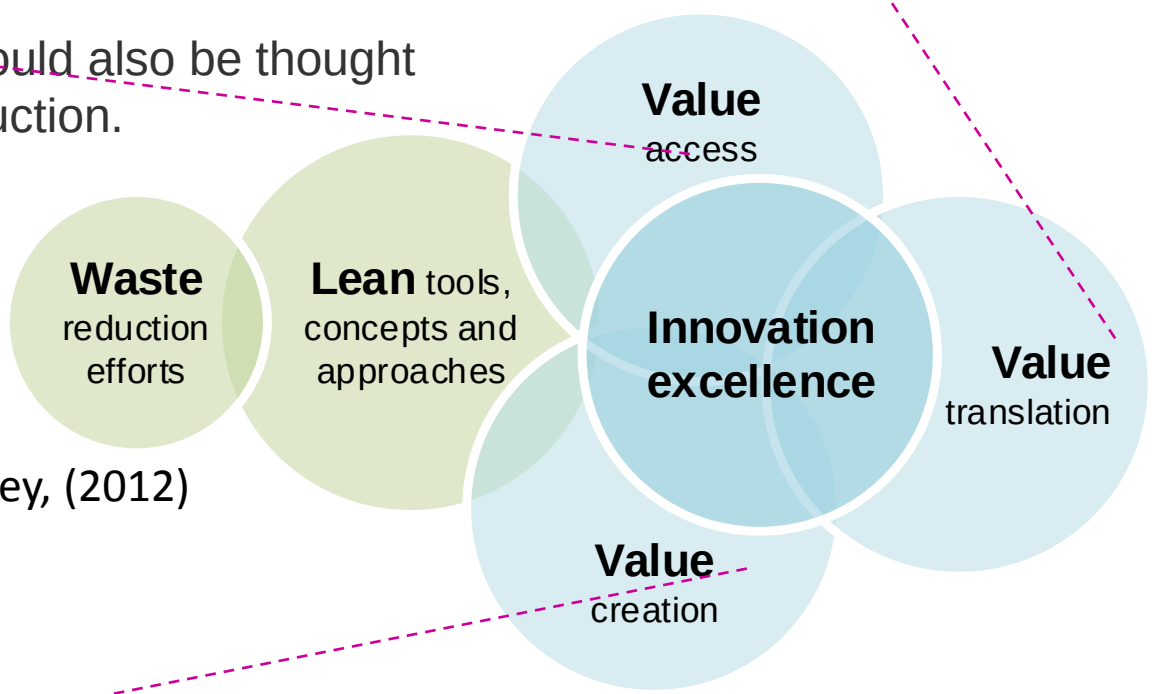
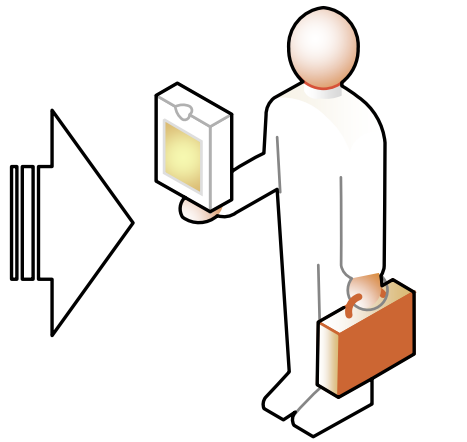
Value vs. Innovation

Value Translation is all about helping people understand the value you've created and how it fits into their lives.

Value Access could also be thought of as friction reduction.



Source: Kelley, (2012)



Product/service

Value Creation is pretty self-explanatory.

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Five Why's Analysis

Example of 5 Why's

Problem: Order returned due to cold food

Why is this burger cold?
- Took too long from the grill to the customer.

Why did it take too long?
- Had to wait for chips to be added.

Why did it wait for the fries?
- Chips were not dropped into the fryer.

Why were the chips not dropped into the fryer?

- Fry station worker rotated to **help the cashier.**

Do we run the business like this or innovate a new work process?

Use of a Lean Concepts in ‘Efficiency Improving’ Innovation

Source: Ratnayake and Chaudry, (2017)

O&G operators

Engineering contractors (Esc)

Content

Valves

1. Methodology
2. Process cycle efficiency (PCE)
3. Tailor made Lean ‘efficiency improving’ innovation process in an EC organization
4. Data collection, analysis and results: Current state map (CSM)
5. Data collection, analysis and results: Future state map (FSM)
6. Results and discussion
7. Conclusions

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Methodology

- **VSM** has been employed "to **highlight the sources of waste** and **eliminate them** by the **implementation** of a **future state value stream** that can **become a reality** within a **short period of time**"; focus is to identify:
  - Value-added: These activities in a process add form, function and value to the final product or service and to the client.
  - Non-value-added: These activities do not add form, function and value or assist in the product or service generation process.
  - Non-value-added-but-necessary: These activities do not add value, but they are necessary to fulfill the requirements of the final value-added product or service.
- A metric process cycle efficiency (PCE) has been utilized to 'identify how much of a process is actually value-added'.

1. Map the process.
2. Identify the value-added activities, non-value added activities, and the non-value added but necessary activities.
3. Stratify the map according to the items in #2.
4. Add a time dimension to the process steps.

$$PCE = \left[\frac{\sum VAT_i}{\sum t_i} \times 100\right]\%$$

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Process cycle efficiency (PCE)

Source: Ratnayake and Chaudry, (2017)

$$PCE = \left[\frac{\sum VAT_i}{\sum t_i} \times 100\right]\%$$

PCE= Process cycle efficiency
$\sum VAT_i$ =Total value added time
VAT_i = Time of the i^{th} value added activity
$\sum t_i$ =Total lead time of the process
t_i = Time of the i^{th} activity

PCE: TYPICAL VS WORLD CLASS

Process type	Typical efficiency	World class efficiency
Machining	1%	20%
Fabrication	10%	25%
Assembly	15%	35%
Continuous	30%	80%
Transactional	10%	50%
Creative	5%	25%

- In this study, the **PCE value 25%** has been selected as the **threshold value** to assess whether a process is lean (i.e. if PCE > 25%) or not (i.e. if PCE < 25%).

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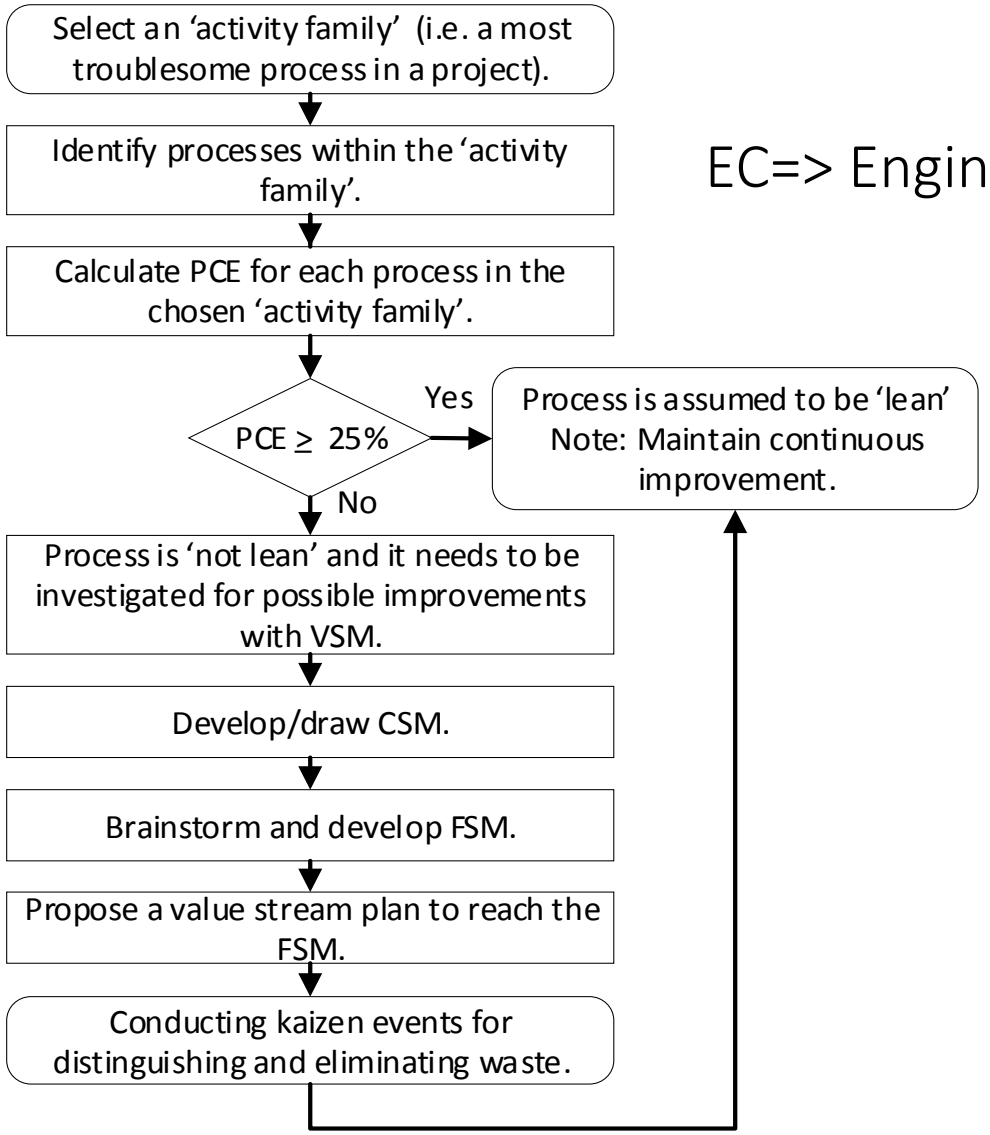
Tailor made work process for Lean ‘efficiency improving’ innovation



EC=> Engineering Contractor

Source: Ratnayake and Chaudry, (2017)

Current process: Value Stream Mapping (VSM)

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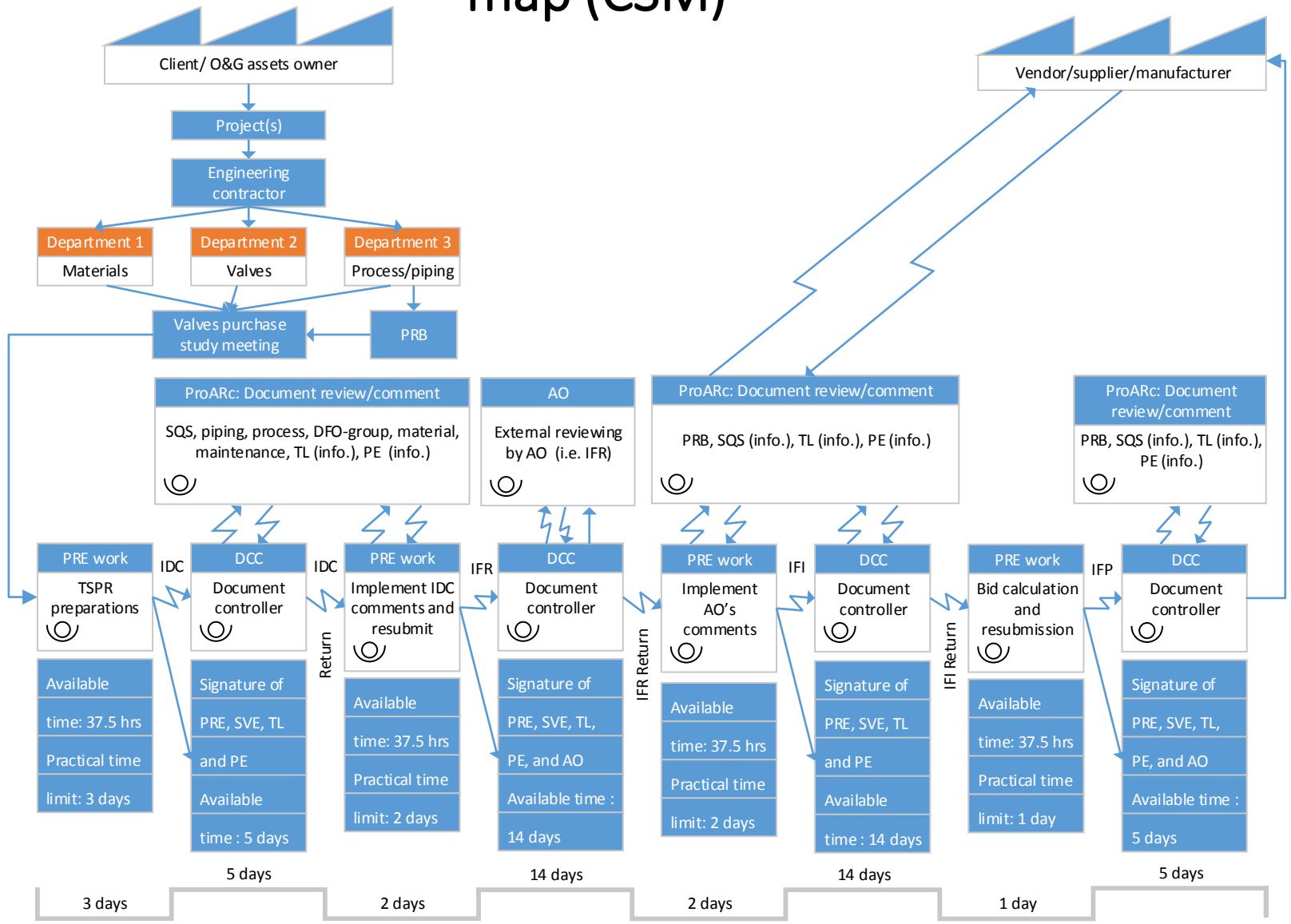
Data collection, analysis and results: Current state map (CSM)



Source: Ratnayake and Chaudry, (2017)

Five Why's Analysis

A Lean Tool (i.e. VSM) Supported Future State (or Innovated Process)

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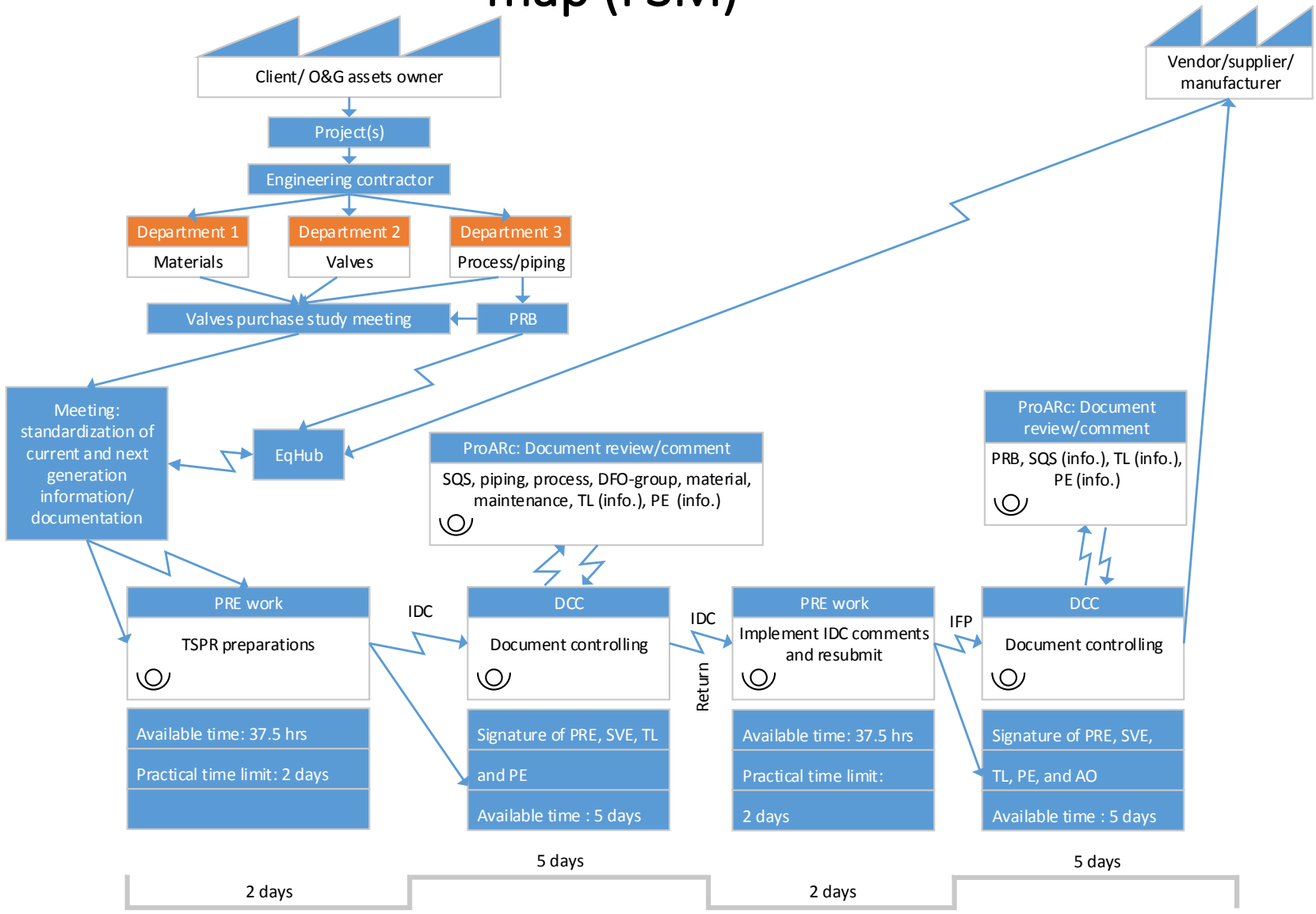
Data collection, analysis and results: Future state map (FSM)



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Source: Ratnayake and Chaudry, (2017)

Results and discussion

Source: Ratnayake and Chaudry, (2017)

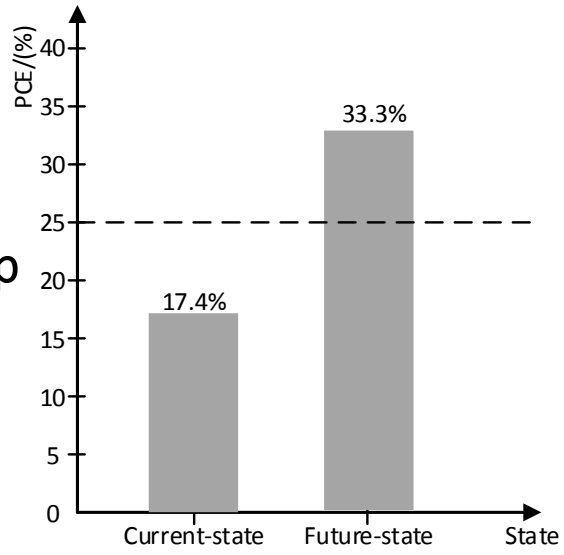
•VSM and value stream analysis using 5 why's method enabled to increase PCE by 91.4% .

• The standardization of different activities via EqHub **ideally eliminated a significant amount of waste** present in the current state.

•The case study AO has initiated a significant step towards the standardization of the documentation involved in the projects (i.e. to be performed in an EC).

• The **manufacturers (or vendors/suppliers)** may find it **difficult** to have EqHub service as the **cost of membership** and **maintaining membership is relatively high** compared to their **return on investments**

• In order to perform standardization, manufacturers (or vendors/suppliers) **require personnel with certain skills** which alternatively **add costs** to their operations.



Summary

Source: Ratnayake and Chaudry, (2017)

- The lean tool VSM enabled to minimize a significant amount of waste (i.e. in terms of time) compared to the existing *ad hoc* approaches and to innovate a new process (i.e. an efficiency improving innovation).
  - Note: Almost all personnel agreed that existing processes shall be improved with an appropriate Value Stream Management (VSMA) approach.
- Process cycle efficiency (PCE) was utilized to identify 'how much of a process is actually value-added.'
  - Note: OECD defined 'innovation' as the implementation of a new or significantly improved product (good or service), or a process, or a new marketing method, or a new organizational method in business practices, in the organization of the work-place or in external relations.

Navigation

GO TO THE TEST

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