



OST

Ostschweizer
Fachhochschule

Collaborative Modeling Lesson 5: Stakeholder Mapping and Value Impact Mapping

ITBO Learning Lab 2, Initiative 1 (ZIOL, KAPS)

Spring Term 2025

Departement Informatik and ITBO

Lesson 5: Stakeholder and Value Impact Mapping

Agenda

- Motivation
- Concepts and activities
- Example

- Introduction to lab
- More information

Lesson 5: Stakeholder and Value Impact Mapping

Context and Motivation: “Dieselgate” (Wikipedia)

- *TL;DR: market share and profit valued over transparency, fairness and honesty*
- Articles that analyze and comment what happened (with lessons learned):
 - <https://www.upet.ro/annals/economics/pdf/2017/p2/Dura.pdf>
 - <https://www.sciencedirect.com/science/article/pii/S0363811122000017>
 - https://iacis.org/iis/2024/1_iis_2024_208-220.pdf
 - <https://www.corporatecomplianceinsights.com/lessons-volkswagen-scandal-ethical-failings/>
 - https://eprints.lse.ac.uk/66926/1/Bovens_Ethics%20of%20diesalgtae_Author_2016%20_final.pdf
 - https://digitalcommons.shawnee.edu/cgi/viewcontent.cgi?article=1012&context=business_ethics_3100



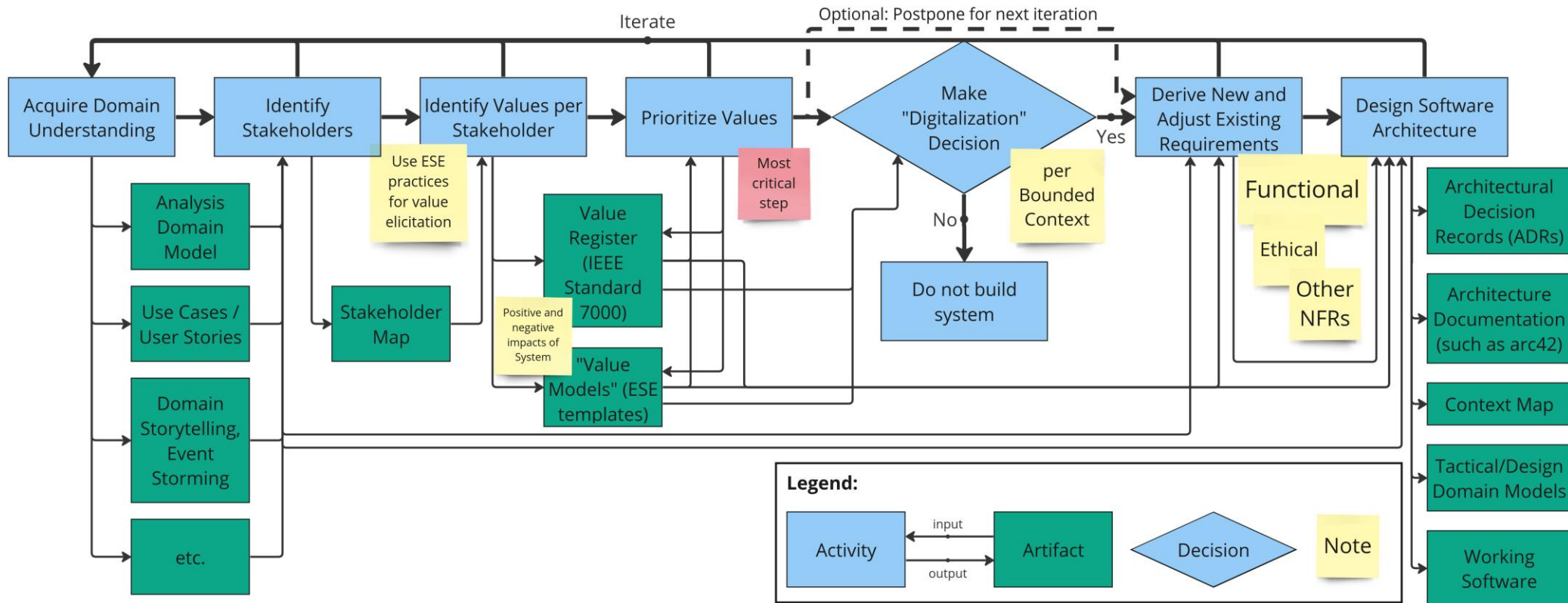
What can engineers (in any field/domain) do to prevent such incidents?



Lesson 5: Stakeholder and Value Impact Mapping

Concept: Value-Driven Analysis and Design (VDAD)

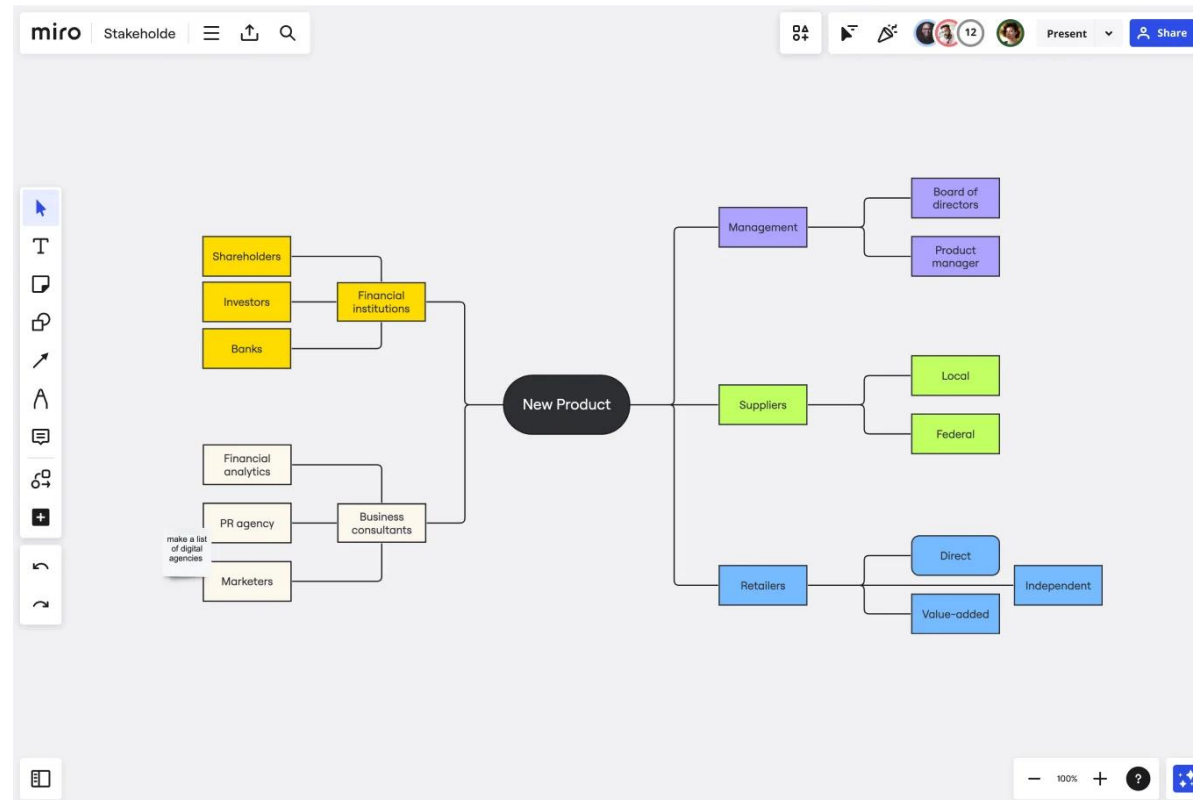
- <https://github.com/ethical-se/value-driven-analysis-and-design>



Lesson 5: Stakeholder and Value Impact Mapping

Concept: Stakeholder Map

- <https://ethical-se.github.io/value-driven-analysis-and-design/practices/stakeholder-mapping.html>



Lesson 5: Stakeholder and Value Impact Mapping

Stakeholder Classification

- https://research.vu.nl/ws/portalfiles/portal/179576160/Ethics_in_SE_TR_2022.pdf

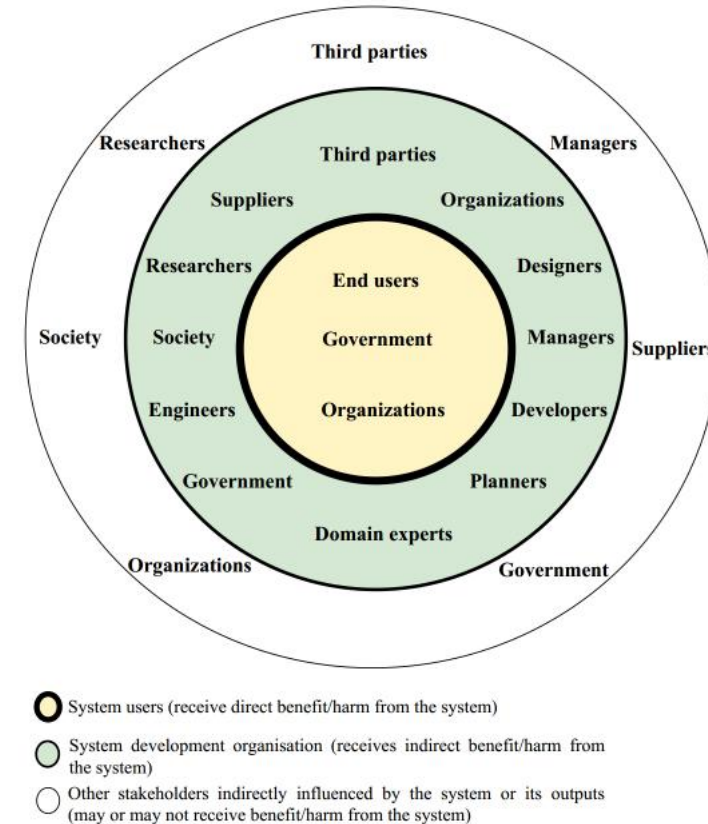


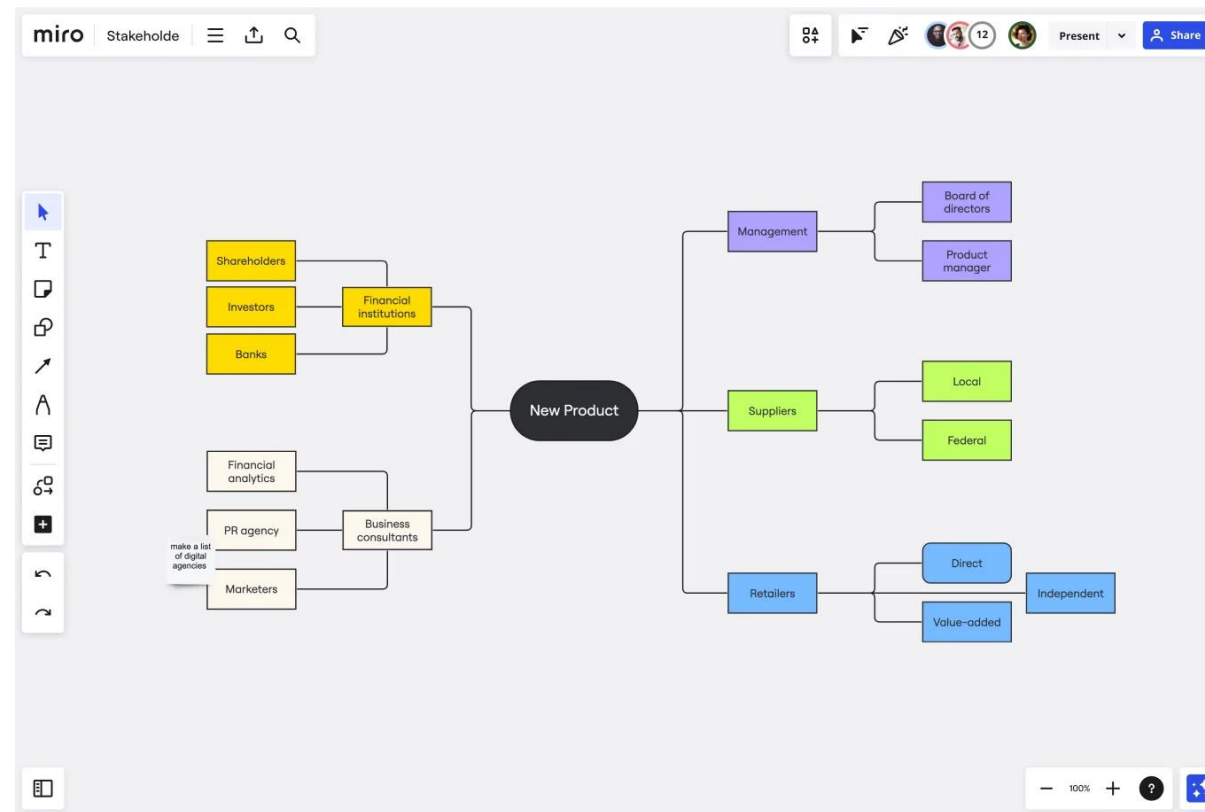
Figure 5: Stakeholders in terms of receiving benefit/harm from the system



Lesson 5: Stakeholder and Value Impact Mapping

Concept: Value Impact Map

- <https://ethical-se.github.io/value-driven-analysis-and-design/practices/value-impact-mapping.html>



Lesson 5: Stakeholder and Value Impact Mapping

NFR: Non-Functional Requirement

IEEE Std. 7000

Standards ?

7000-2021 - IEEE Standard Model Process for Addressing Ethical Concerns during System Design

Publisher: IEEE

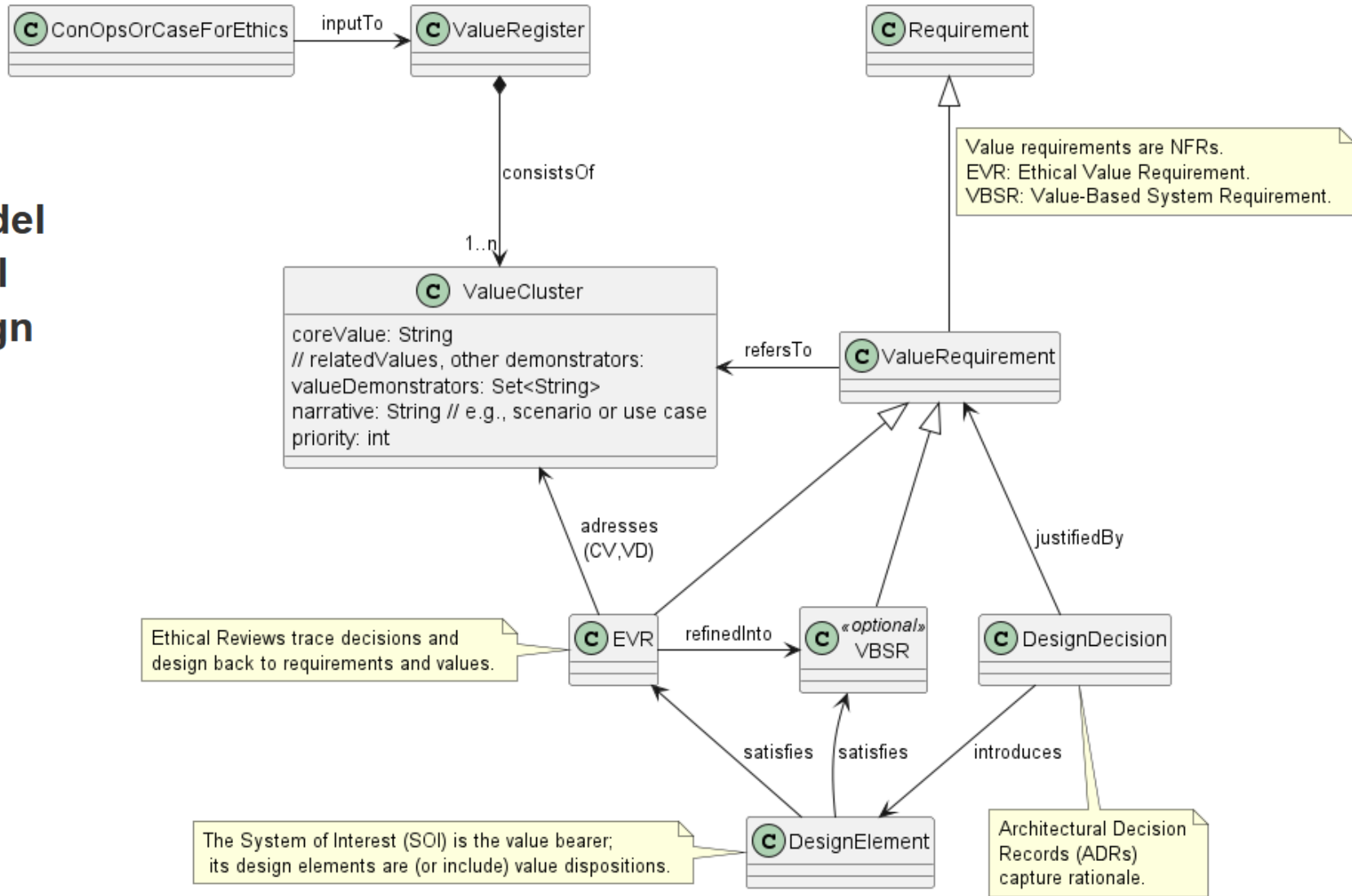
Cite This

Status: Active - Approved

Available through the IEEE GET Program™

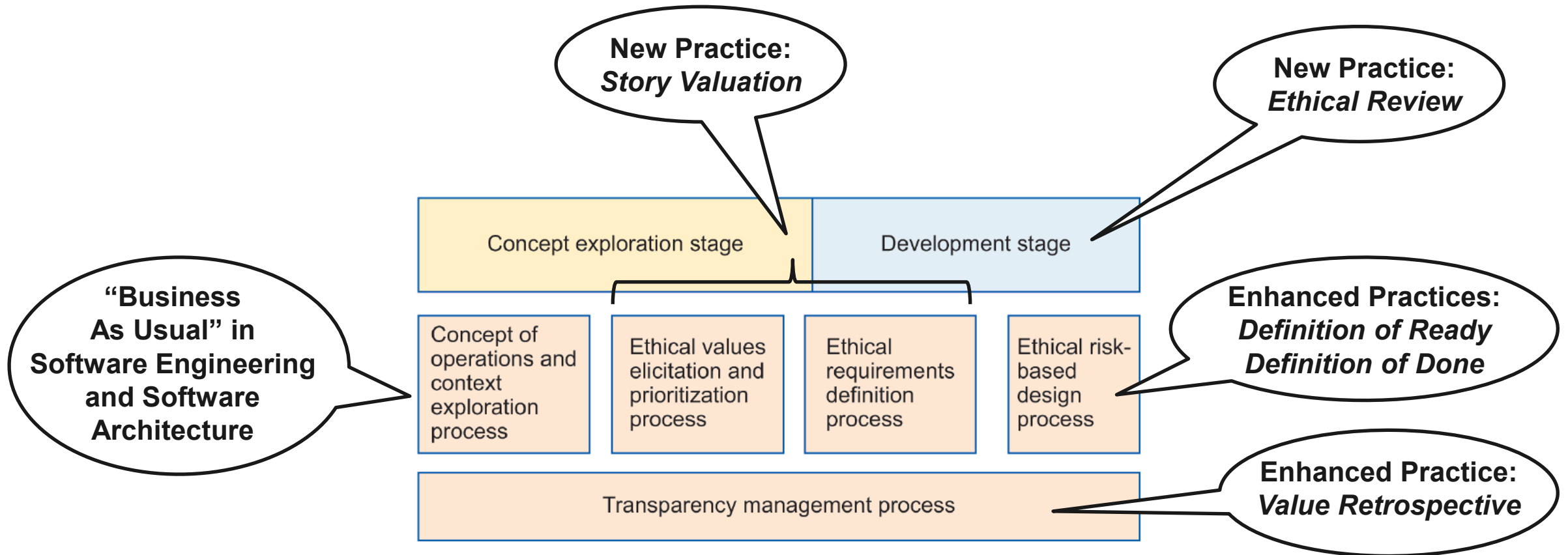
Free Access

<https://ieeexplore.ieee.org/document/9536679>



Lesson 5: Stakeholder and Value Impact Mapping

IEEE 7000 and ESE – Process/Practice Overlay



Reference: "Relationship of processes and stages in IEEE Std 7000" (Figure 1 in "IEEE Standard Model Process for Addressing Ethical Concerns during System Design")



Application Example: Same Day Deliv. in Context Mapper



CONTEXT
MAPPER

Documentation

Project Background

Getting Involved

News

Value



- See <https://contextmapper.org/docs/vdad-support/>
 - Stakeholders: <https://contextmapper.org/docs/stakeholders/>
 - Value registers: <https://contextmapper.org/docs/value-registers/>
- Transformations and PlantUML generator available:
 - <https://contextmapper.org/docs/stakeholder-and-value-modelling-transformations/>
 - <https://contextmapper.org/docs/plant-uml/>
- Complete example available at <https://github.com/ContextMapper/context-mapper-examples/blob/master/src/main/cml/same-day-delivery-shop/stakeholders-and-values.cml>

Ethical Software Engineering (ESE)

Example Revisited

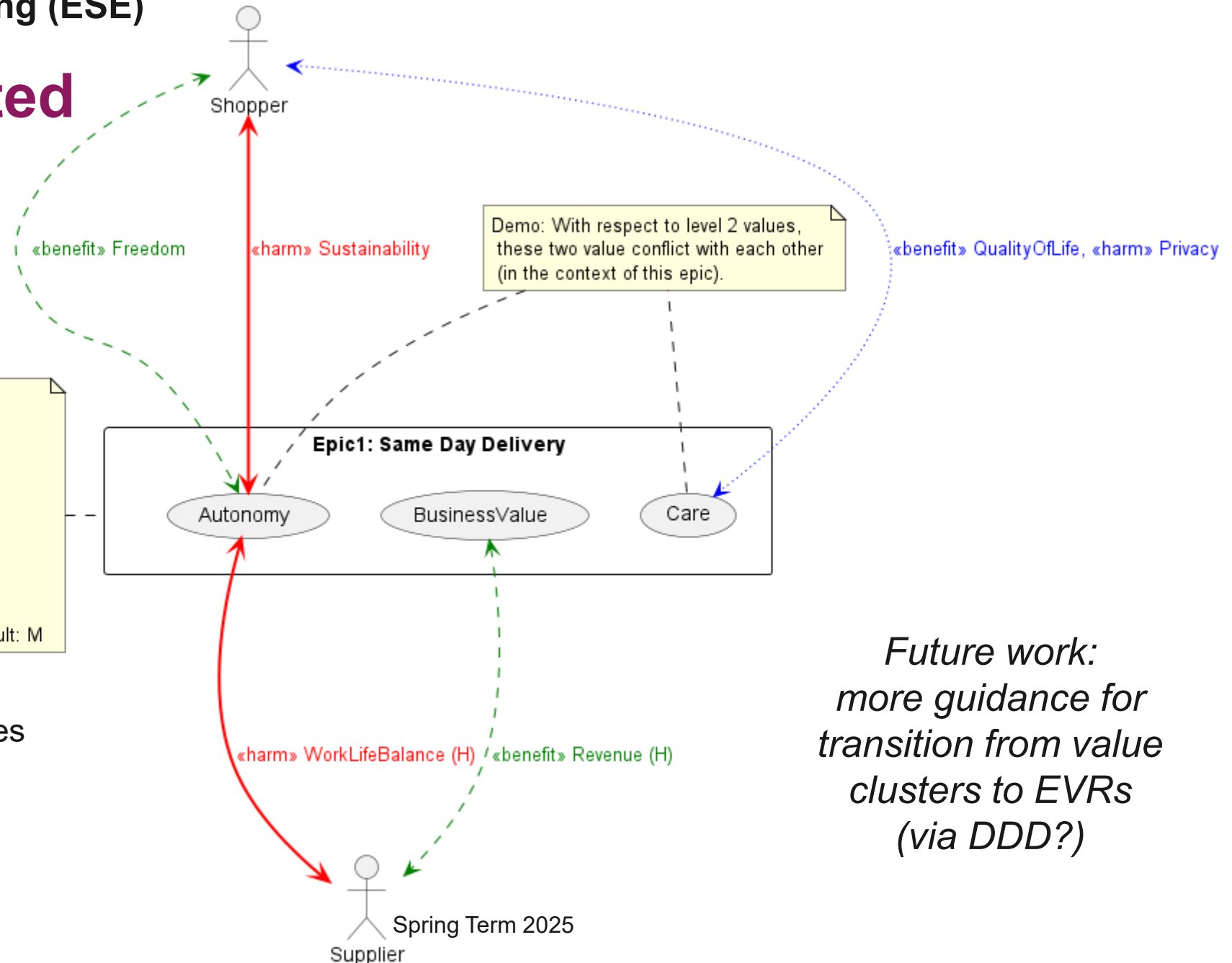
- IEEE 7000 value cluster
- Light, graphical representation
 - PlantUML (open source)

Arrow legend:

Solid line: huge impact
Dashed line: medium impact
Dotted line: small impact

Red: harms
Green: benefits
Blue: neutral or ambivalent

(H/M/L) enum: priority for stakeholder, default: M



*Future work:
more guidance for
transition from value
clusters to EVRs
(via DDD?)*



Lesson 5: Stakeholder and Value Impact Mapping

Preview: Lab Exercise for This Lecture Lesson/Topic

1. Find stakeholders in previously exercised CoMo practices (Labs 1 to 4, that is), both explicit and implicit ones, as an informal approach to stakeholder identification.
2. Run through the tasks of VDAD stakeholder mapping (VDAD Step 2) as a more formal approach or alternative to Step 1
3. Perform VDAD value impact mapping and value prioritization (Steps 3 and 4 of VDAD).
4. Decide what to do about H/H values and identify/derive value requirements (VDAD Steps 6 and 7).

Lab 5: Stakeholder Mapping, Value Impact Mapping Collaborative Modeling (CoMo) Learning Lab

Lab 5: Stakeholder Mapping, Value Impact Mapping

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Summary

- See *Learning Lab PDF*, section “*Summary and Conclusions*”, “*Concepts Revisited*” in particular



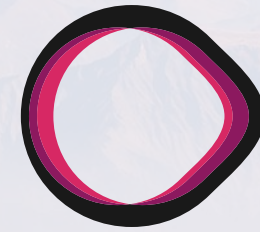
Resources (Links, Books, etc.)

- *See Learning Lab PDF*



Questions (Repetition, Practice)

- *See Learning Lab PDF*



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Collaborative Modeling Lesson 5: **BACKUP CHARTS**

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Motivating Example: eCommerce System

- **Epic:**
 - Add a “Same Day Delivery” capability to an online convenience store that sells groceries etc.
- **Stakeholders and their concerns:**
 - Shoppers, shop manager/owner, product suppliers, delivery contractors (self-employed); developers
 - Values (business, ethical): convenience, profit, business growth, health, income; quality of life, fairness, ...
- **Conflicts:**
 - Tough time commitments may please shoppers and stimulate growth, but also stress delivery contractors
 - Core value “care”: quality of life for shopper differs from quality of life of delivery staff and store owner
 - Autonomy vs. care (core values); transparency vs. privacy (core values)



*Should the epic be implemented?
If so, what are the ethical consequences of that?*

Values... there are way more than \$ and UX

Ethics Is a Software Design Concern

Ipek Ozkaya

Ethics as an Architecturally Significant Requirement

- Codes of Conduct ([ACM](#), IEEE, ...)
 - Related work: [ProactiveCARE](#), SoDIS
- Method engineering at OST (open source):
 - [VDAD](#) process, [ESE](#) practices

Reference: <https://ieeexplore.ieee.org/ielx7/52/8693065/08693077.pdf>

There will always be adversarial threats, either internal or external, that will breach data and abuse systems and resources. However, embracing ethics as an explicit, nonnegotiable software design concern will be a start toward conscious progress.

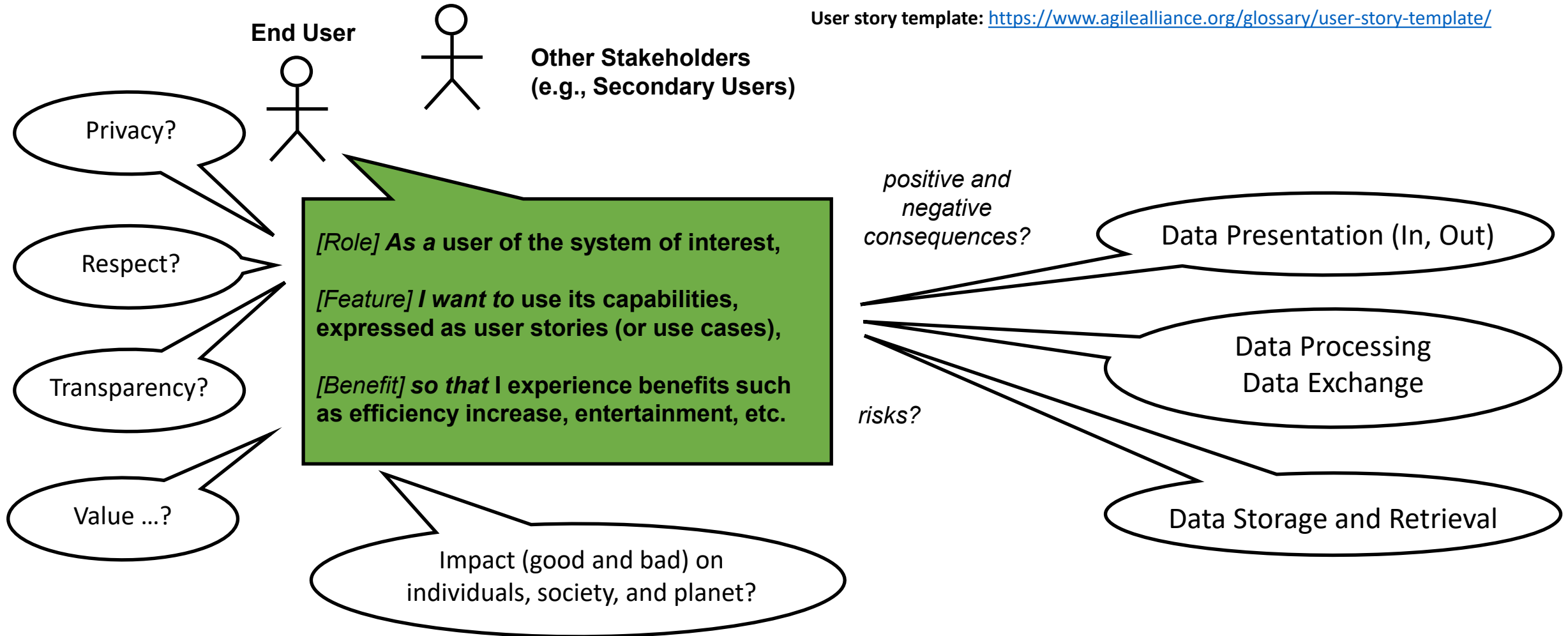
Ethical values yield non-functional requirements

- Ethical values complement business and end user value (and sometimes cause conflicts)
- Impossible to norm a single set of ethics
- Risk-based approach via set of processes

The screenshot shows the IEEE SA website interface. At the top left is the IEEE SA logo (IEEE SA STANDARDS ASSOCIATION) and at the top right is the IEEE logo. Below the logos is a navigation menu with the following items: Standards, Products & Programs, Focuses, Get Involved, Resources, and MAC ADDRESS (which is highlighted in blue). A search icon is visible to the right of the MAC ADDRESS menu item. The main content area is dark-themed and displays the following text: IEEE 7000-2021, IEEE Standard Model Process for Addressing Ethical Concerns during System Design. At the bottom of the content area, there are two buttons: 'Access via the IEEE Get Program' and 'Access via Subscription'. In the bottom right corner of the content area, it says 'Active Standard' with a blue underline.

User Story as Source of Value Requirements

User story template: <https://www.agilealliance.org/glossary/user-story-template/>



Experience Report about IEEE Std. 7000 (01/25)

<https://ieeexplore.ieee.org/document/10777892>

- Three interviewees
- Projects at UNICEF, city of Vienna, AI company reported on
- Example of stepwise refinement from core value to sub-value to value requirement
 - Education scenario



INSIGHTS

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How to Turn Ethical Values Into System Requirements

Lessons Learned from Adopting a New IEEE Standard in the Business World

Bärbel Bohr

From the Editors

Software engineering not only imports metaphors from other domains, it also exports disruption into society (at times). Hence, the ethical implications of software become more and more critical. In this Insights, our guest author and her interviewees reflect on the construction and early adoption of IEEE 7000, the first technical standard that integrates value-centric philosophies and ethical schools into a set of risk-based analysis and design processes.