

Lab 5: Stakeholder Mapping, Value Impact Mapping

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Context and Motivation

This is a ChatGPT summary of Value-Driven Analysis and Design:

“The Value-Driven Analysis and Design (VDAD) framework provides a seven-step iterative process interweaving domain understanding, stakeholder/value elicitation, prioritization, digitalization decisions, requirements derivation, and architecture design. It’s supported by two core practices—Stakeholder Mapping (to identify both direct and indirect stakeholders using hierarchical groupings and context-mapping DSL) and Value Impact Mapping (to map stakeholder values—e.g. autonomy, privacy—against system features, noting benefits, harms, and mitigation actions).”

This explanation is quite ok, but not complete; we’ll get to know more facets of VDAD in this lab.

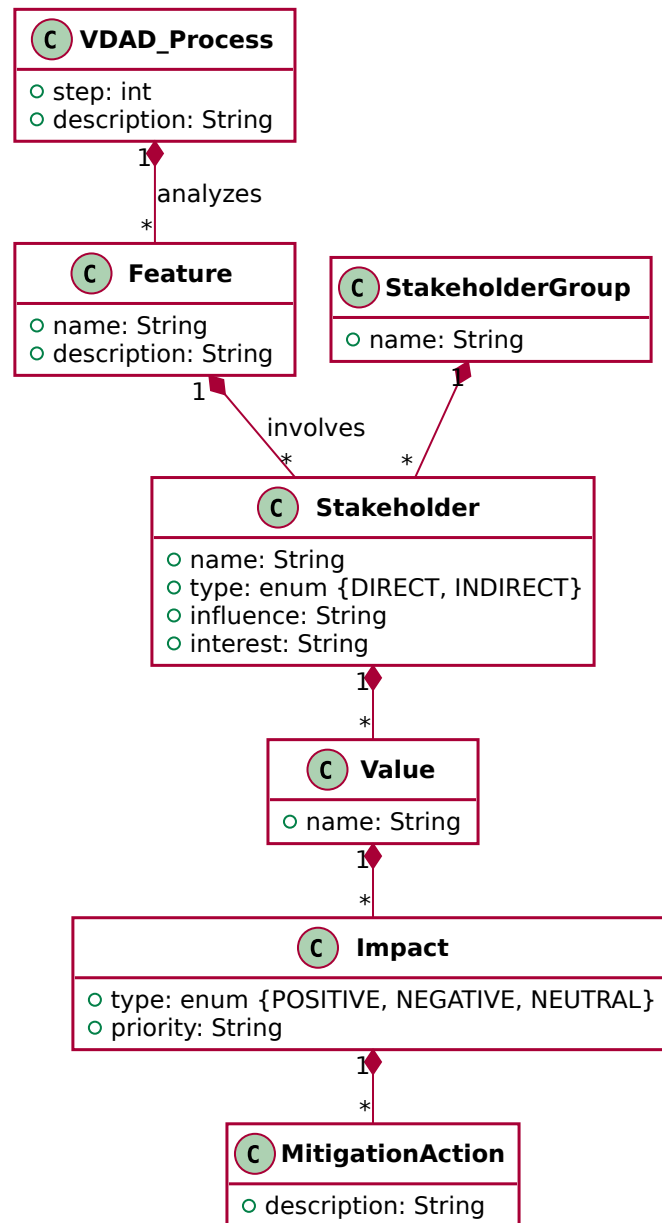


Figure 1: VDAD concepts summarized and visualized by ChatGPT.

ChatGPT explains its figure creation as this (Figure 1):

- VADAD_Process orchestrates analysis steps and system Features.
- Each Feature involves one or more Stakeholders (direct or indirect).
- Stakeholders belong to StakeholderGroups and have associated ethical Values.
- For each Value, an Impact is recorded (positive/negative/neutral, with priority).
- If negative, one or more MitigationActions are created to reduce harm.

Learning Objectives

Having completed this lab, participants are able to:

- Elicit and prioritize ethical values and value requirements.
- Convince stakeholders that such effort is worth it.
- Think about short-term and long-term consequences, good and bad, of scoping and design decisions.
- Apply the Value-Driven Analysis and Design (VDAD) practices to/on projects.
- Identify and manage value conflicts.

Steps Overview

This CoMo lab exercise has the following steps:

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 systematic approach to stakeholder identification.
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).

Optional: Study and discuss literature on ethical software engineering.

Starting Position (Baseline, Initial Position; dt. “Ausgangslage”)

See sample solution to Lab 4.

Step 1: Find stakeholders in product vision, domain story, event storms, story map (15 mins)

Task: Return to the instructions and sample solutions to Labs 1 to 4. Identify explicit and implicit stakeholders informally.

- Which types of end users are mentioned there?
- Are any other stakeholders indicated explicitly?
- Which implicit ones can you find?

Hints: Pick one of the features (such as “check uploaded game”) from the product vision or from a story and focus on this feature only. Next, ask who and what is needed to provide this feature (“enter the system black box”).

Questions:

1. How do the lab outputs relate to each other: are they complementary or do they contradict each other?
2. Why should the team care about ethical values in addition to business value and end user value?
3. What do you typically do about these values w/o a dedicated set of related practices?

Step 2: Perform VDAD Stakeholder Mapping (15 mins)

Run through the tasks of VDAD stakeholder mapping practice (VDAD Step 2) as a more formal approach or alternative to Step 1.

Task: Follow the instructions for [VDAD Step 2 “Identify Stakeholders”](#). Collect a mind map of interest holders. Order it.

Hints: The practice details are documented here: <https://ethical-se.github.io/value-driven-analysis-and-design/practices/stakeholder-mapping.html>. You might want to consult existing examples and collections; VDAD provides pointers. “[How to Create a Strong Product Vision \(Examples and Templates Included\)](#)” features empathy maps that have four quadrants: says, thinks, does, feels. The article proposes to create an empathy map for each type of user when creating a product vision (see Lab 1); empathy maps can also be created for other types of stakeholders (to express their values and derive value requirements).

Questions:

1. Was it easy to choose stakeholders (and their values)? Did the mind mapping help?
2. Do you prefer the informal way (Step 1) or the systematic approach (Step 2)? Why?
3. Can you think of reasons not to refer to the people concerned about the business scenario and system under construction as “stakeholders”? Hint: is there a risk of offending people?

Step 3: Perform VDAD Value Identification and Prioritization (30 mins)

Task: Follow the instructions for [VDAD Step 3 “Identify Values per Stakeholder”](#) and [VDAD Step 4 “Prioritize Values”](#). Optionally, model the output of the previous steps in Context Mapper (CML).

Hints: The Value Impact Mapping practice is documented here: <https://ethical-se.github.io/value-driven-analysis-and-design/practices/value-impact-mapping.html>. We are specifically interested in its steps:

1. “Identify values per stakeholder, and the positive and negative impact of the system or feature on these values.”
2. “Find potential improvements to the system that reduce harm (mitigation actions).”
3. “Identify conflicting values, and try to prioritize them together with the stakeholders.”

To note the results, you might want to use sticky notes on a whiteboard or flipchart following a certain color code (see EventStorming Lab 3 for inspiration) first and then create a mind map; the VDAD practice page shows an example of such a mind map. Alternatively, you can choose your own notation to denote (stakeholder, value, priority) tuples use one of the Ethical Software Engineering (ESE) templates for Story Valuation: <https://github.com/ethical-se/ese-practices/blob/v101/practices/ESE-StoryValuation.md#notations> results.

Hint: Ask the following questions for each stakeholder in order to identify their values and the impact of the system or feature towards those values:

- Which benefits does the system provide for the individual stakeholder if the system were implemented at scale?
- Which harms could be caused for the individual stakeholder if the system were implemented at scale?
- What are the negative implications of the system or feature for the character and personality of the individual stakeholder?
- Which values and virtues would you consider as so important in terms of your personal maxims that you would want their protection to be recognized as a universal law and that should therefore be respected by the system or feature?

Questions:

1. Is it possible and/or important to be exact here?
2. Why is a mind map a suited notation in this step?
3. What is your impression about the IEEE Std. 7000?

Step 4: Decide what to do about H/H values and derive value requirements (30 mins)

Task: Derive value requirements (for the software under construction) from the values prioritized as high/high (risk: probability times impact), effectively performing VDAD Step 6 “Derive New and Adjust Existing Requirements” and also looking ahead to VDAD Step 7: “Design Software Architecture”.

Hints: You may want to return to previous labs to do so (e.g., Lab 4 featuring story mapping and splitting). The [arc42 quality model](#) may also assist (with NFR taxonomy and examples).

Questions:

1. What makes a good non-functional requirement?
2. Is there overlap with other sources of requirements?
3. What does the literature say about the transition from values to value requirements and value tactics?

Tools

As for most CoMo practices, a whiteboard or a flipchart can get you started and might be sufficient. That said, tool support is available:

- Context Mapper, see the documentation page “Value-Driven Analysis and Design (VDAD) Support” <https://contextmapper.org/docs/vdad-support/>

See previous labs for general tooling suggestions.

Summary and Conclusions

Stakeholders have values, and hopefully some those go beyond business value (“sellability”) and end user value (usability). Ethical values matter, differ, conflict with each other and with other goals and constraints. “I did not have a choice” or “I was told to do this” do not qualify as acceptable explanations for unethical behavior in software design and development (and elsewhere); they are excuses.

The practices taught in this lab remove these excuses. Violations of moral obligations become explicit and conscious, agreed upon decisions when applying them.

Concepts Revisited

- Value-Driven Analysis and Design (VDAD) process (seven steps)

- VDAD Stakeholder Mapping practice, Stakeholder Map artifact
- VDAD Value Impact Mapping practice, Value-Impact Map artifact
- Process and concepts in IEEE Std. 7000
- Relationship to business-as-usual analysis and design

Reflection and Call to Action

Please review and recapitulate what you take away from this lab. Where and when can you apply the taught concepts?

Repetition Questions

1. Which types of stakeholders were discussed and featured?
2. Why is it important to prioritize values and value requirements?
3. What is the difference between a value and a value requirement?

Frequently Asked Questions (FAQ)

- *What does VDAD stand for?*
Answer: Value-Driven Analysis and Design, our extension of DDD to ethical software engineering (Kapferer, Zimmermann, and Stocker 2024). See its open source [repository](#) and GitHub [webpages](#) for more information.
- *VDAD has seven steps. We only did Steps 2, 3 and 4 in this lab. Step 6 was mentioned too. What about the remaining ones?*
Answer: We performed [Step 1 “Acquire Domain Understanding”](#) implicitly in CoMo Labs 1 to 4. [Step 7 “Design Software Architecture”](#) will implicitly be covered by the remaining CoMo labs, Lab 6 and Lab 7.
- *How to VDAD and ESE compare and relate to each other?*
Answer: VDAD and ESE (Zimmermann, Kapferer, and Stocker 2024) complement each other, addressing the same overall problem but putting emphasis on contextual differences (DDD vs. agile practices). Our [ISTAS 2024 paper](#) introduces both projects and methods/practice collections (Kapferer, Stocker, and Zimmermann 2024).
- *What is IEEE Standard 7000?* Both VDAD and ESE take inspiration and refer to concepts from (“IEEE Standard Model Process for Addressing Ethical Concerns during System Design” 2021). The standard can be downloaded for free with an IEEE Xplore account. The [Background Information](#) page of ESE provides access information.

- Does the CoMo community have a CoC?

Answer: Yes, a short one (see <https://comocamp.org/#team>): “Code of Conduct: Be open, Be honest, Be respectful”.

- Have data ethics been specified?

Answer: Check out “Data Ethics: Code of Ethics for Data-Based Value Creation” <https://data-innovation.org/data-ethics/> by doi, a Thun-based [data innovation alliance](#). An overview chart and four documents (basics, recommendations, implementation, context) are available in English, French, German and Italian.

More Information

The ethical software engineering practices featured in this lab are described online:

- <https://ethical-se.github.io/value-driven-analysis-and-design/practices/value-impact-mapping.html> as an ethics-specific refinement of <https://www.impactmapping.org/>.
- <https://github.com/ethical-se/value-driven-analysis-and-design/blob/main/practices/stakeholder-mapping.md>

Papers and more pointers can be found on the [VDAD Project Background and Related Work](#) page and in the [Ethical Software Engineering \(ESE\) Bibliography](#). The parent organization of ESE and VDAD on GitHub is <https://github.com/ethical-se>.

The general [Impact Mapping](#) positions itself as “a lightweight, collaborative planning technique for teams that want to make a big impact with software products. It is based on user interaction design, outcome driven planning and mind mapping. Impact maps help delivery teams and stakeholders visualise roadmaps, explain how deliverables connect to user needs, and communicate how user outcomes relate to higher level organisational goals.” Impact maps have a goal-actors-impacts-deliverables structure. Impacts relate to business goals in this Impact Mapping, deliverables are about scope (i.e., software features and organizational activities).

References

- “IEEE Standard Model Process for Addressing Ethical Concerns during System Design.” 2021. *IEEE Std 7000-2021*. <https://doi.org/10.1109/IEEESTD.2021.9536679>.
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- Kapferer, Stefan, Olaf Zimmermann, and Mirko Stocker. 2024. "Value-Driven Analysis and Design: Applying Domain-Driven Practices in Ethical Software Engineering." In *Proceedings of the 29th European Conference on Pattern Languages of Programs, People, and Practices, EuroPLoP 2024, Irsee, Germany, July 3-7, 2024*, 35:1–15. ACM. <https://doi.org/10.1145/3698322.3698332>.
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