

---

---

# Decision Framework Case Report

## ISO 25010: Product Quality - Light

Case Worker - engine@n3st.art

February 26, 2024

---

---

### Contents

<b>1</b>	<b>Problem Statement</b>	<b>2</b>
<b>2</b>	<b>Stakeholder Analysis</b>	<b>2</b>
<b>3</b>	<b>Value Identification</b>	<b>2</b>
<b>4</b>	<b>Value Extraction</b>	<b>2</b>
4.1	By Stakeholder Produkteier . . . . .	2
4.2	By Stakeholder Utviklere . . . . .	2
4.3	By Stakeholder Arkitekter . . . . .	3
<b>5</b>	<b>Solution Identification</b>	<b>3</b>
5.1	Identified Solutions . . . . .	3
5.2	Selected Evaluators . . . . .	3
<b>6</b>	<b>Solution Evaluation</b>	<b>3</b>
6.1	Evaluated by Applikasjonsarkitekt . . . . .	3
<b>7</b>	<b>Value Solution Matrix</b>	<b>3</b>
7.1	Based on Applikasjonsarkitekt's evaluation . . . . .	3
<b>A</b>	<b>Decision Framework</b>	<b>5</b>
A.1	Problem Statement . . . . .	5
A.2	Stakeholders analysis . . . . .	5
A.3	Values Identification . . . . .	5
A.4	Values extraction . . . . .	5
A.5	Solutions identification . . . . .	5
A.6	Solution evaluation . . . . .	6
A.7	Value Solution Matrix . . . . .	6

# 1 Problem Statement

## Problem Domain

Maintainability.

## Problem Statement

ISO 25010: Product Quality - Light.

# 2 Stakeholder Analysis

## Produkteier

30

## Utviklere

30

## Arkitekter

40

# 3 Value Identification

**Modularity** To which degree the solution is composed of discrete components such that a change to one component has minimal impact on other components.

**Reusability** To which degree the solution can be utilized on several systems or in building other components or assets

**Analysability** Degree of effectiveness and efficiency with which it is possible to assess the impact on the solution of an intended change to one or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identify parts to be modified.

**Modifiability** To which degree the solution can be effectively and efficiently modified without introducing defects or degrading existing product quality.

**Testability** Degree of effectiveness and efficiency with which test criteria can be established for the solution and tests can be performed to determine whether those criteria have been met.

Name	Unit	Direction	Min	Max
Modularity	Enum	HIGH	0.00	10.00
Reusability	Enum	HIGH	0.00	10.00
Analysability	Enum	HIGH	0.00	10.00
Modifiability	Enum	HIGH	0.00	10.00
Testability	Enum	HIGH	0.00	10.00

Table 1: Selected Values

# 4 Value Extraction

## 4.1 By Stakeholder Produkteier

Value	Weight	Past	Tolerable	Goal	Wish
Modularity	20.00	null	4.00	7.00	9.00
Reusability	20.00	null	4.00	7.00	9.00
Analysability	20.00	null	4.00	7.00	9.00
Modifiability	20.00	null	4.00	7.00	9.00
Testability	20.00	null	4.00	7.00	9.00

Table 2: Quantified by Produkteier

## 4.2 By Stakeholder Utviklere

Value	Weight	Past	Tolerable	Goal	Wish
Modularity	20.00	null	4.00	7.00	9.00
Reusability	20.00	null	4.00	7.00	9.00
Analysability	20.00	null	4.00	7.00	9.00

Value	Weight	Past	Tolerable	Goal	Wish
Modifiability	20.00	null	4.00	7.00	9.00
Testability	20.00	null	4.00	7.00	9.00

Table 3: Quantified by Utviklere

### 4.3 By Stakeholder Arkitekter

Value	Weight	Past	Tolerable	Goal	Wish
Modularity	20.00	null	4.00	7.00	9.00
Reusability	20.00	null	4.00	7.00	9.00
Analysability	20.00	null	4.00	7.00	9.00
Modifiability	20.00	null	4.00	7.00	9.00
Testability	20.00	null	4.00	7.00	9.00

Table 4: Quantified by Arkitekter

## 5 Solution Identification

### 5.1 Identified Solutions

#### AS-IS

Current solution

#### TO-BE

Future desired solution

### 5.2 Selected Evaluators

**b002@significant.no**

Applikasjonsarkitekt

**min@n3st.art**

min

**tolerable@n3st.art**

tolerable

**max@n3st.art**

max

## 6 Solution Evaluation

### 6.1 Evaluated by Applikasjonsarkitekt

Values	Solutions				
	AS-IS	TO-BE	min	tolerable	max
Modularity	8.00	9.00	0.00	4.00	10.00
Reusability	10.00	5.00	0.00	4.00	10.00
Analysability	6.00	6.00	0.00	4.00	10.00
Modifiability	7.00	10.00	0.00	4.00	10.00
Testability	5.00	9.00	0.00	4.00	10.00
<b>Total Score</b>	36.00	39.00	0.00	20.00	50.00

Table 5: Evaluated by Applikasjonsarkitekt

## 7 Value Solution Matrix

### 7.1 Based on Applikasjonsarkitekt's evaluation

Values	Solutions				
	AS-IS	TO-BE	min	tolerable	max
Modularity	16.00	18.00	0.00	8.00	20.00
Reusability	20.00	10.00	0.00	8.00	20.00
Analysability	12.00	12.00	0.00	8.00	20.00
Modifiability	14.00	20.00	0.00	8.00	20.00
Testability	10.00	18.00	0.00	8.00	20.00
<b>Total Score</b>	<b>72.00</b>	<b>78.00</b>	<b>0.00</b>	<b>40.00</b>	<b>100.00</b>

Table 6: VSM based on Applikasjonsarkitekt's evaluation

## A Decision Framework

A Framework for making sound decisions. A decision is essentially a mathematical equation that you can compute. Inputs of the decision equation are, a set of values and a set of solutions.

The difficulty and the main work remains in clarifying the input parameters. The better you are able to capture and quantify the inputs, the better result you get, as the garbage in, garbage out (GIGO) principles dictates.

The rest of the appendix describes each part of the DF in details.

### A.1 Problem Statement

DF dictates that you need to understand why you HAVE to make a decision in the first place.

**Problem statement** The problem or the need, can be very broad. The narrower the problem you have, the simpler and higher quality your decision will be. Thus a concise problem statement is crucial.

**Problem domain** Over time, you learn to group similar decisions together, and thus are able to reuse some aspects of the decision. You might even be able to do automatic decision making, if you are able to narrow the problem well.

### A.2 Stakeholders analysis

The need can not exists on its own. It comes from **SOMEWHERE**. So, the question you need to ask yourself is - how has the problem?

**Stakeholder** Its the Stakeholders how has the problem or the need. Stakeholders, could be a person, a company, a country, or even the law. Its the stakeholders that makes the need concrete, and when the need is made concrete, than we can search for solutions (options).

**Weight** Some stakeholder is more important. Here you prioritize among stakeholders.

### A.3 Values Identification

Values are the specific needs (requirements) that the stakeholders have. Each stakeholders might have a set of needs they want to satisfy. Lets call these needs values. Stakeholders want their values satisfied relevant to the problem at hand. This activity of the Decision Framework involves capturing all important/relevant values that the Stakeholders might have, as precise as possible. The values must be captured in a quantifiable and comparable form. Because, then the solution can be tested against the values, to see how well a solution satisfies.

**Name** A unique name for the relevant value with respect to the problem at hand across all stakeholders

**Scale Of Measure** Describe how is the value measured.

**Unit** What unit of measurement will be used.

**Direction** What direction is considered useful/beneficial

**Min** Minimum amount/score

**Max** Maximum amount/score

### A.4 Values extraction

The goal of this activity is to capture / quantify stakeholders values. DF dictates that Past, Tolerable, Goal and Wish state, which all can be placed between the Min and Max state, must be placed. And each stakeholder have to decide for them selves. As well as prioritize among values by the means for weight. By doing so, the quantified values, can be used to test the solution against stakeholders desired satisfaction of a solution for each values [gilb2005competitive].

**Weight** Weighting determines the prioritization of values in order of highest importance (from 0 to 1) with respect to the stakeholder

**Past** Relevant only for recurring problem.

**Tolerable** Minimum acceptable threshold.

**Goal** Goal threshold.

**Wish** Wish threshold.

### A.5 Solutions identification

DF dictates that only at this activity you start the search for solutions. So, this activity is about identifying all possible solutions, that might satisfy some or all stakeholders values.

**Name** A unique name for the identified solution

**Description** Description of the identified solution

Further more DF dictates that you have to identified a scoring function for each identified values. So, an evaluator know how to evaluate each identified solution.

You also, have to select one or more evaluator to perform an objective evaluation for each identified solutions.

**Name** A unique name for the selected evaluator

**Description** Description of the evaluators

**Other properties** An evaluator might have multiple properties, such as the price the evaluator might charge to do the evaluation, or level of strictness/expertise reflected via correctness, appropriateness and preciseness.

## A.6 Solution evaluation

DF dictates that evaluation have to be performed at this activity. This is probably the most difficult and labour intensive activity of all activities in DF.

**Score** The end result of solution fitness with respect to value.

**Rationale** Explanation for why an evaluator have given the given score for the solution with respect to value.

## A.7 Value Solution Matrix

DF dictates that this activity can be automated, since this is just a calculation. You might encounter a minor difficulty in visualizing the calculated result.

**Color coding** Color coding indicating solution fitness with respect to stakeholders thresholds.

**Solution Score** Total Solution score across all values.