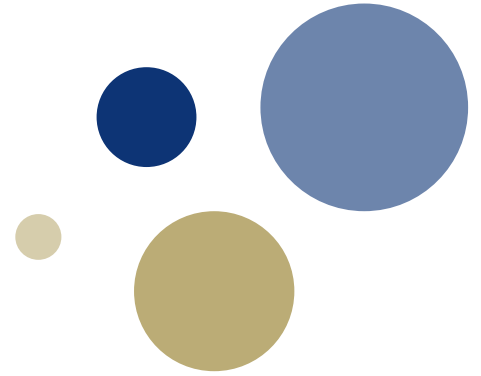




NTNU

Norwegian University of
Science and Technology



OptimalTime

Better projects through early involvement of contractors

When is the right time to involve the contractor's competence?

A large concrete suspension bridge spans across a body of water. The bridge features tall, slender concrete pylars and a network of cables supporting the deck. In the background, a white house with a red roof is visible on a grassy bank, surrounded by trees with autumn foliage. The sky is clear and blue.

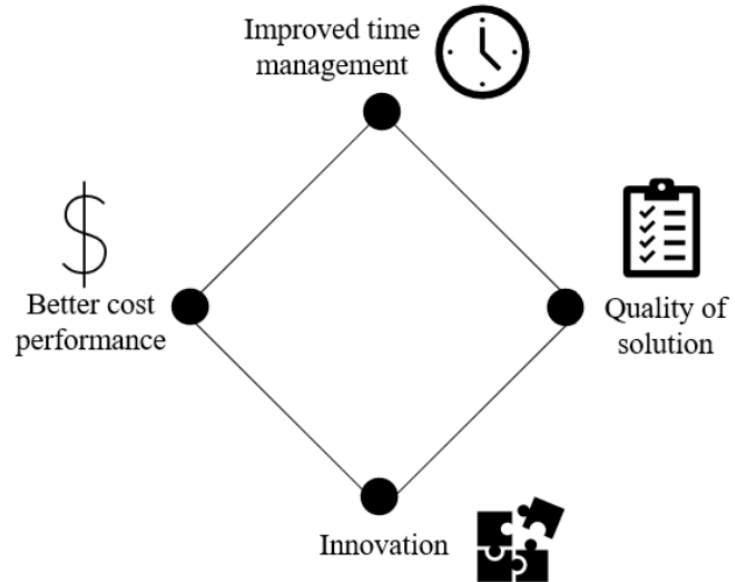
Right competence
on the right task
at the right time

Observed benefits of ECI

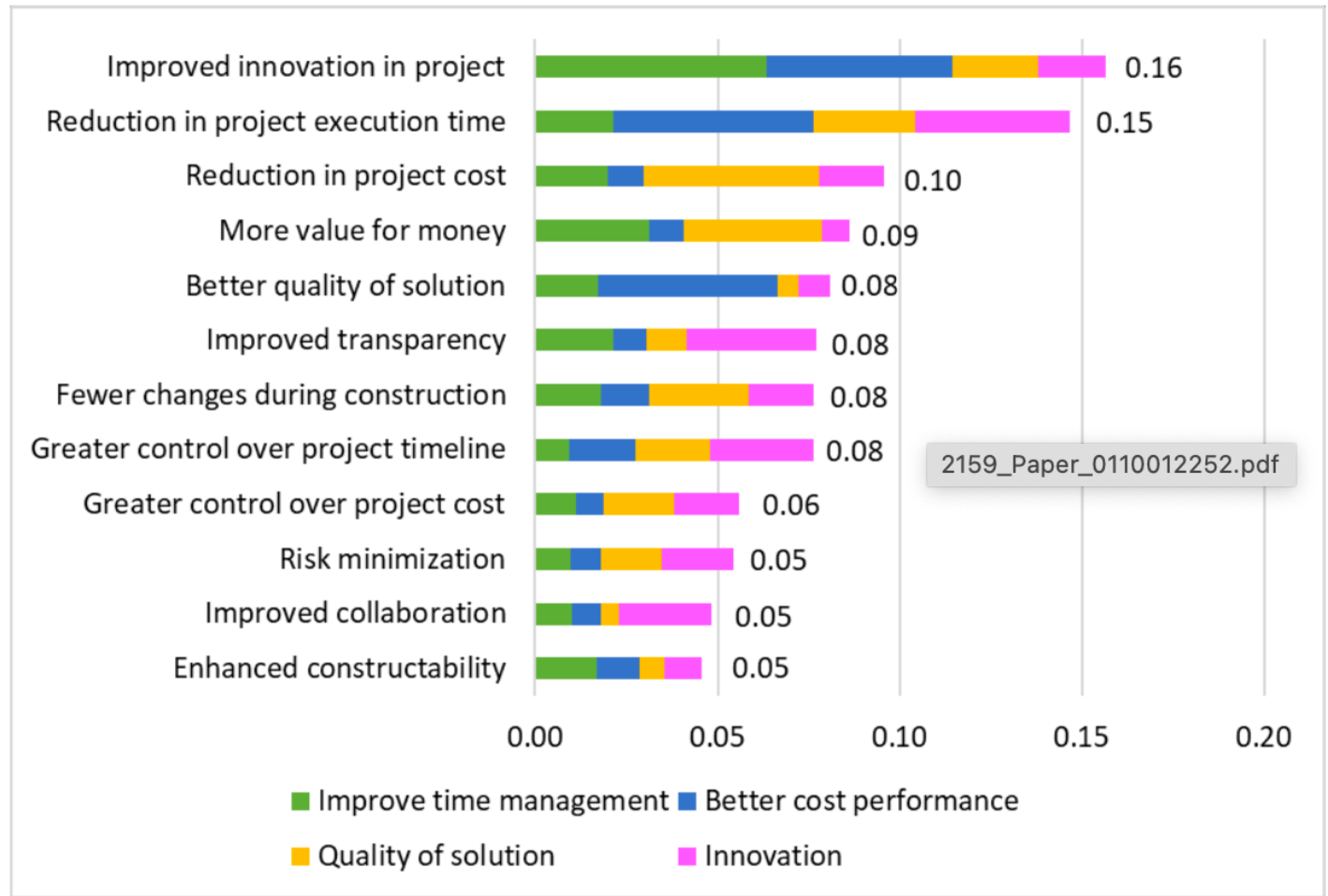
From extensive literature review:

- Improved innovation in project
- More value for money
- Better quality of solution
- Reduction in project cost
- Greater control over project cost
- Enhanced constructability
- Improved transparency
- Reduction in project execution time
- Greater control over project timeline
- Fewer changes during construction
- Improved risk minimization
- Improved collaboration

Key benefits



Ranking of benefits of ECI



Goal and organization

Develop a method for deciding the optimal time and measure the effect in pilot projects.

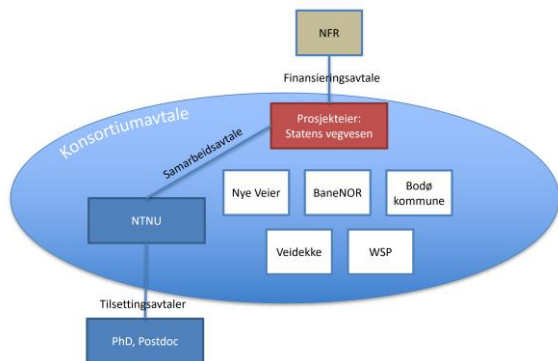
23,7 mill. NOK

4 years

1 postdoc

2 doctoral candidates

5 pilot projects



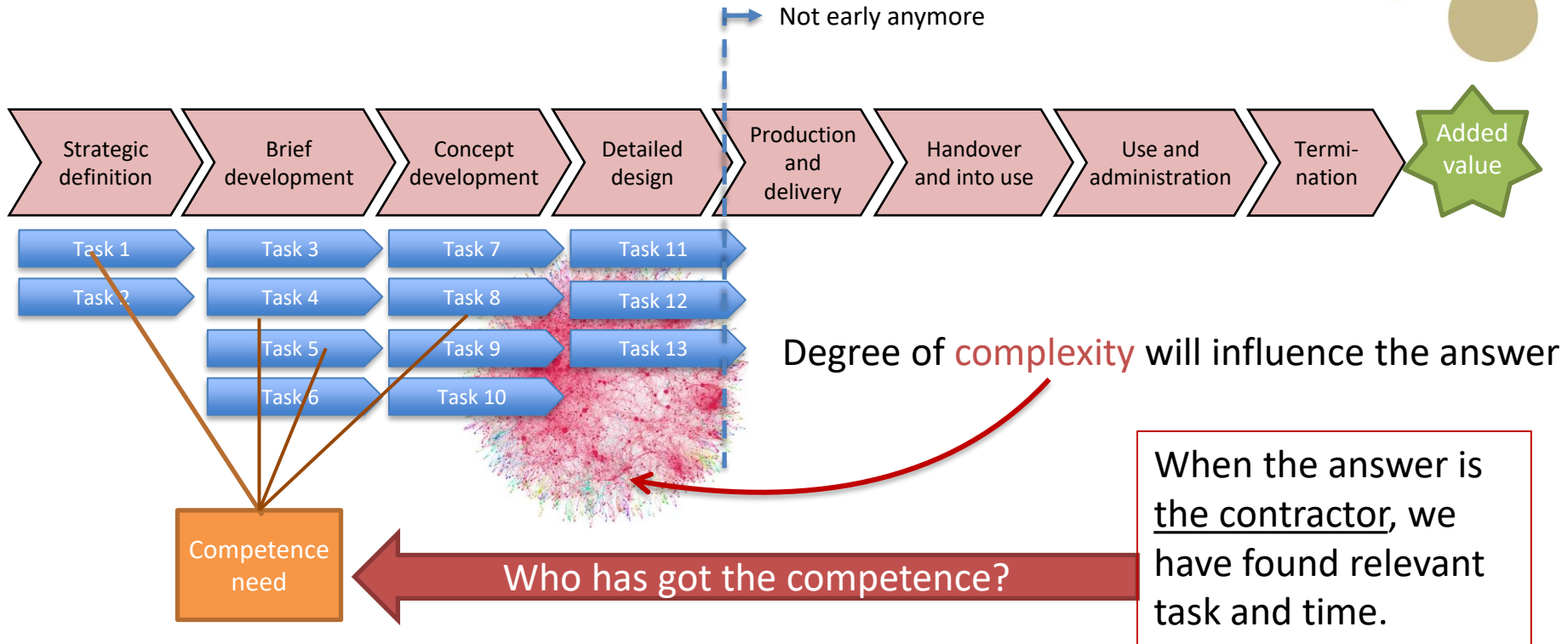
Better solutions,
Lower operational
cost
Efficient execution

Better use of public funds

Sustainable transport systems

Optimaltid - Right competence on the right task at the right time

Basic logic



Optimaltid method

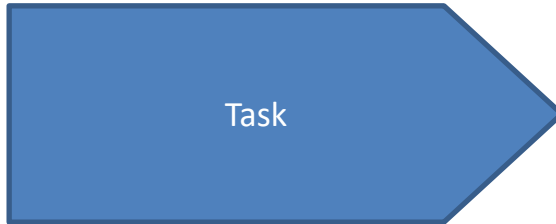
Actual task:

Need for:

- **Technical competence**
- **Relational competence**

Task:

- **Content**
- **Complexity**
- **Criticality/importance**



Process inherent

- **Risk**
- **Opportunities**

Assessed against:

Team

- **Technical competence**
- **Relational competence**



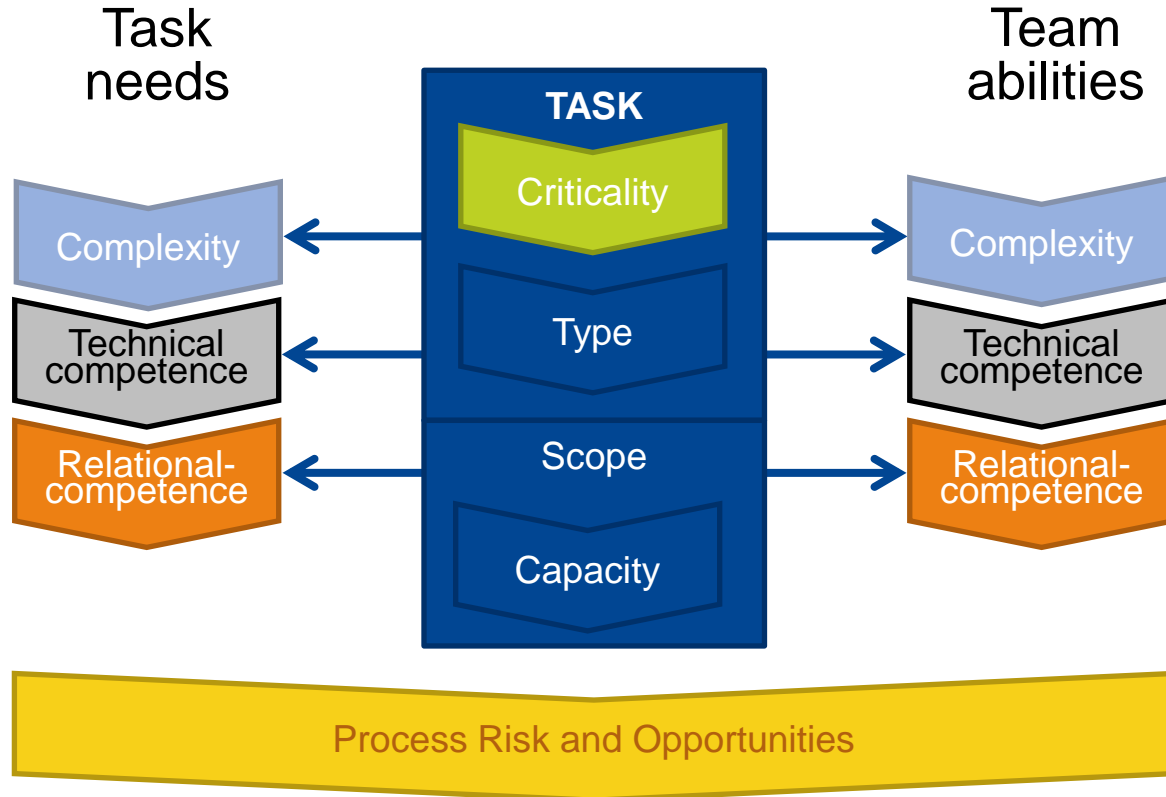
Team ability to handle:

- **Content**
- **Complexity**
- **Criticality/importance**

Team ability to handle

- **Risk**
- **Opportunities**

Optimaltid – tool concept



SCORING PROCESS:

Assessment:

- 1) Task criticality
- Balance task against team capability:
- 2) Complexity
 - 3) Technical comp.
 - 4) Relational comp.
- Then assess:
- 5) Risk & opportunities

Criteria

1. **Criticality:** A weight factor for the task. A critical task is very important for value creation. Less critical activities or tasks are not so important for the value in the end.
2. **Complexity:** The whole situation (including the task in question) has a degree of complexity. Complex situations call for more advanced competences (more experience) than simple tasks and situations.
3. **Technical competence:** The core of the problem – what technical competences are needed to solve the task in a good way.
4. **Relational competence:** The supporting competences needed for the team to perform on a high level.
5. **Balance:** Do the scales tilt towards the task (the needs are heavier than what the team have) – then we need to involve more competences, and there will be risks threatening success. If the scales tip over on the team side (more competence than needed) then there are opportunities to do more or increase the ambitions.
6. **Uncertainty:** The level of risks and opportunities left to handle. A normal decision maker will be risk averse and avoid risks (rather have more than needed). A risk neutral decision maker will go for a solution in balance (exact matching needs and capabilities). A decision maker with risk attraction will accept a situation with unbalance – hoping to find a way to gain from this situation.

Criticality

Criticality = Importance to achieve the goal and create value

Category	Not important	Not very important	Somewhat important	Very important	Extremely important
Score	1	2	3	4	5

Criticality at the task level – to prioritize correctly

Complexity

No.	Factor					
Team-specific capability factors		Very low (5)	Low (4)	Moderate (3)	High (2)	Very high (5)
1.1	Team leadership and organizational culture					
1.2	Team experience with relevant tasks					
1.3	Management system and experience in using it					
1.4	Uncertainty management and attitude toward risk					
1.5	Team stability					
Task-specific complexity factors		Very low (5)	Low (4)	Moderate (3)	High (2)	Very high (5)
2.1	How well known and defined is the task					
2.2	How clear and stable are the requirements					
2.3	How many different components/interfaces are involved					
2.4	How much risk remains to handle (safety, SHE, etc.)					
2.5	How much time is left to solve remaining problems					

Complexity at the task level

Risk

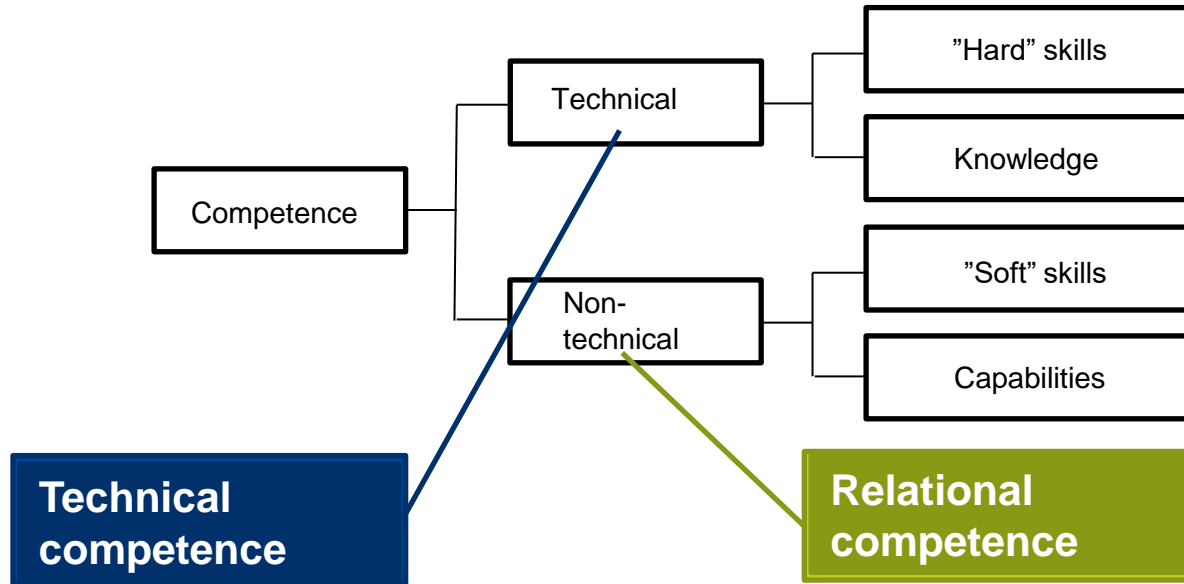


Probability	Consequence				
	1	2	3	4	5
5	1	2	3	4	5
4	0,8	1,6	2,4	3,2	4
3	0,6	1,2	1,8	2,4	3
2	0,4	0,8	1,2	1,6	2
1	0,2	0,4	0,6	0,8	1

Risk = Probability * Consequences

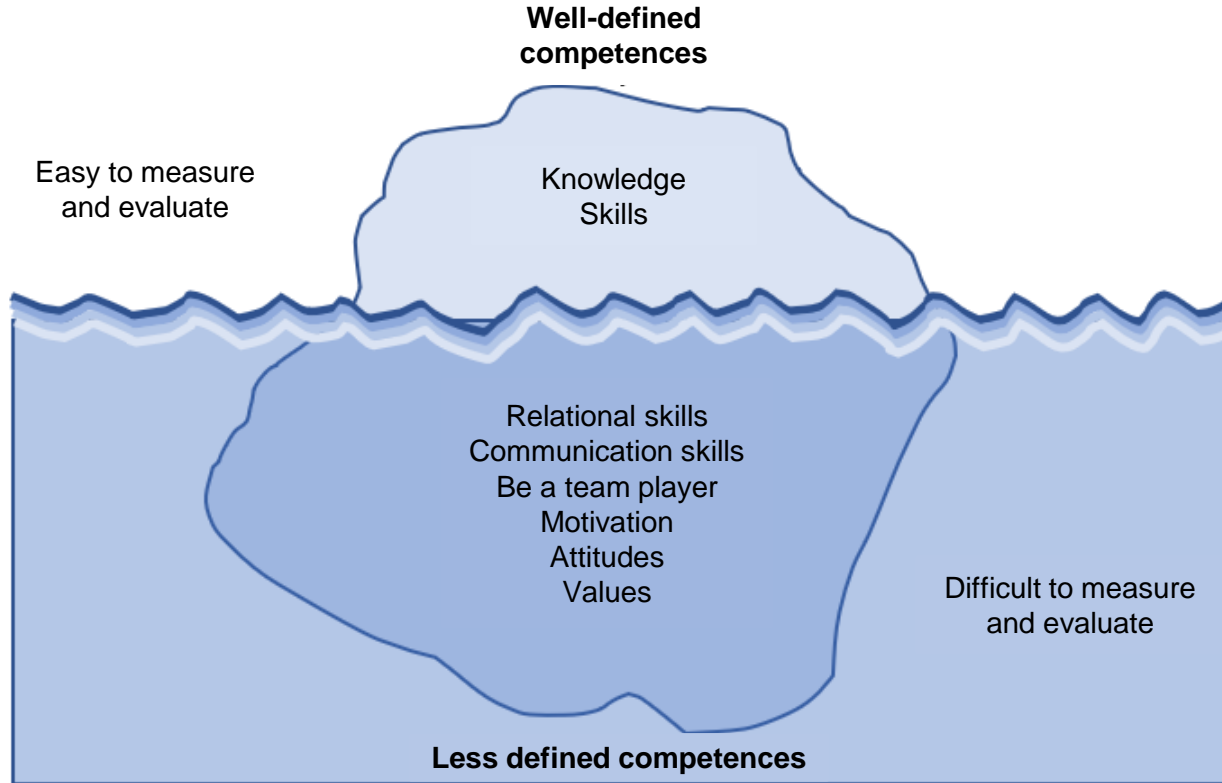
Probability	Probability	Unlikely	Moderate	Likely	Common
	1	2	3	4	5
Conse- quence	Negligible	Little	Moderate	Large	Catastrophical
	1	2	3	4	5

Classification of competence

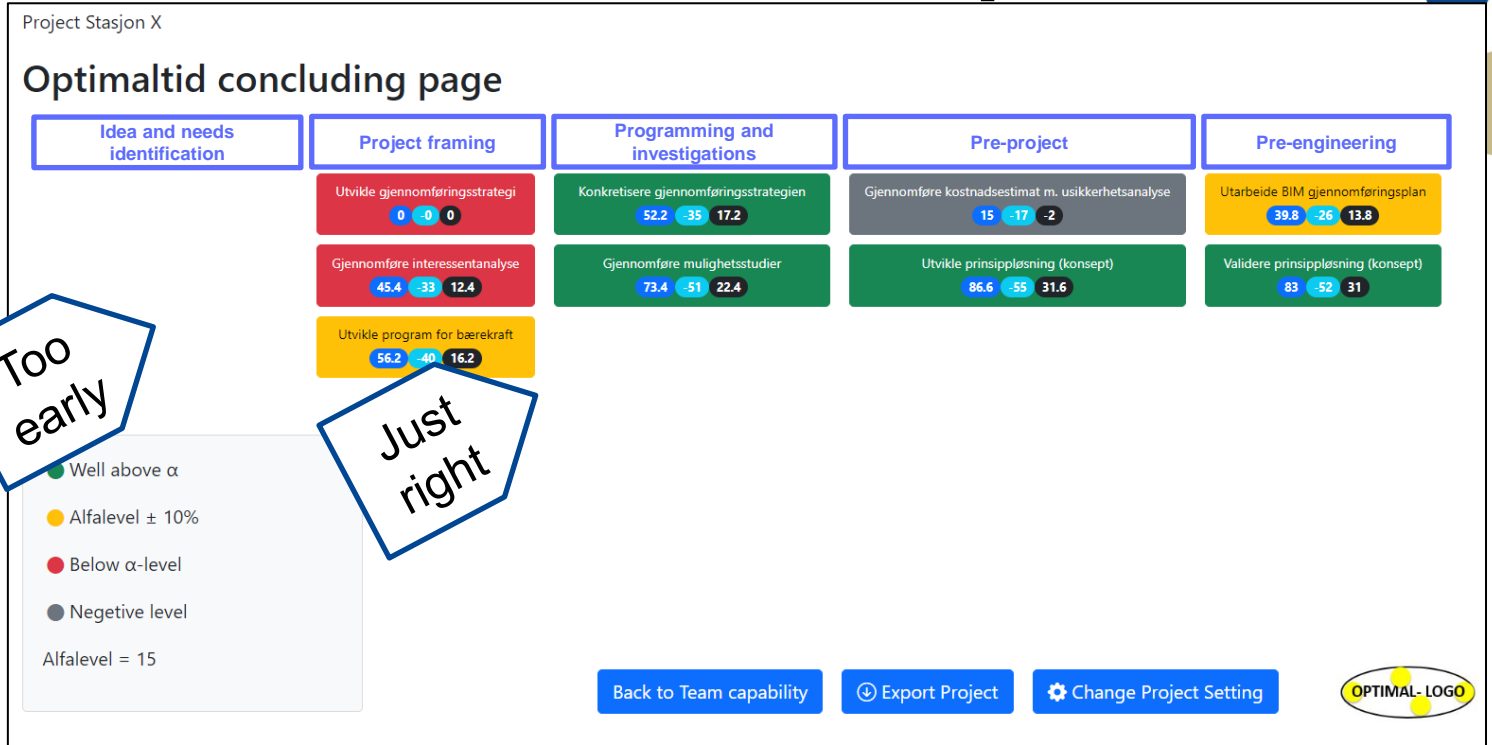


The overall concept of Competency (Abdullah, Yaman, Mohammad, 2017)

Relational competence



OptimalTime – tool concept



Factor	Weight	Comment
Criticality	3	Medium



The task needs (A)

Factor	Weight	Score	Contri bute	Comment
Complexity	3	2	6	Little complex
Technical comp. 1	3	2	6	Low level need sustainability
Technical comp. 2	3	1	3	Extremely low competence level need build.
Technical comp. 3	3	2	6	Low comp. level need
Relational comp. 1	4	3	12	Moderate rel. comp. level need
Relational comp. 2	4	2	8	Low rel. comp. level need
Total need score	20		43	

Sample scoring/ calculations

- **Weight:** 1 to 3
- **Score:** -5 to +5

The team ability (B)

Factor	Weight	Score	Contri bute	Comment
Complexity	3	3	9	Little experience with complexity
Technical comp. 1	3	3	9	Low competence on sustainability
Technical comp. 2	3	2	6	Moderate competence level buildability
Technical comp. 3	3	3	9	Moderate competence level
Relational comp. 1	4	2	8	Moderate rel. competence level
Relational comp. 2	4	2	8	Relatively low rel. comp. level
Total availability score	20		49	

Balance A to B for uncertainty assessment

Balance	Needs	Abilities	Difference	Comment
Total balance score	43	49	6	Good balance task vs team

Sample screenshots from the tool



Setup Page

Load previous project

Upload your project config file here

no file selected

Setup new project

Project Name

Please enter technical competence weight

Please enter relational competence weight

Please enter complexity weight

Please enter criticality (importance) weight

Please enter risk weight

Please enter the desired alfalevel

Upload your logo here

 Logo.png

Sample screenshots from the tool

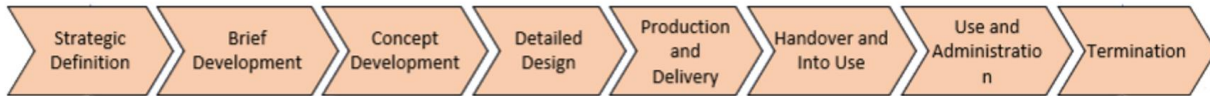


Choose your Project Model:

The standard project lifecycle model is as shown below. Do you want to proceed with standard model or do you want to define your own project lifecycle model?

Standard Model

User Defined Model



Sustainable mobility

Sample screenshots from the tool

Project Infrastructure Project A

Task Criticality (Importance):

Stage 1: Strategic Definition

Task Stakeholder analysis

Here you will define what makes this task critical for the success of this project.

You can define and rate several factors by choosing them from our library or by defining a new one by typing its name in the box and adding it.

Describe Task Criticality

Description

Importance for value of the resulting solution

Free text field

Select or type an option 

Select competence level 

To document your assessment

Add

Back to Task Assessment Page

Back to Tasks List

Sample screenshots from the tool

Project Infrastructure Project A

Task Risk:

Stage 2: Brief Development

Task Culvert design

Risk scale is calculated as probability score multiplied with consequence score. This number is used in the prioritization of the activity.

RISK Matrix

RISK Probability	RISK Consequence				
	1	2	3	4	5
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

Risk Scale:

Low	Medium	High	Very High
-----	--------	------	-----------

Please enter the RISK Probability: Select an option

Please enter the RISK Consequence: Select an option

Proceed

Questions

- If you have any feedback/improvement ideas, please send response to bjorn.andersen@ntnu.no
- If you would like to test the tool, get in touch